Notice

For information pertaining to graduate programs offered by the various Faculties and Schools at AUB, consult 2011–12 edition of the Undergraduate Catalogue.

Information in this catalogue applies to academic year 2011–12. The University reserves the right to make changes without prior notice in programs, course offerings, academic requirements, and teaching staff as the need arises.

Student Responsibility for Catalogue Information

Students are responsible for reading the information in this catalogue. Failure to read and comply with faculty and university regulations will not exempt students from whatever penalties they may incur.

All students are assigned post office boxes and email addresses. Students are responsible for checking their post office boxes and email regularly for official announcements and information.

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This catalogue can also be viewed at http://www.aub.edu.lb/registrar/Pages/index.aspx.

Additional information about course requirements can be viewed on the on-line Banner Catalogue available at the AUB webpage.

The American University of Beirut is an affirmative action institution and an equal opportunity employer.
### International Programs Office
- Passports, Visas, and Residence Permits: 75
- Study Abroad/Student Exchange: 75
- Faculty Exchange/Research Opportunities: 76

### Faculty of Agricultural and Food Sciences (FAFS)
- Officers of the Faculty: 78
- Historical Background: 78
- Mission: 79
- Vision: 79
- Undergraduate Programs: 79
- Admission: 82
- Requirements for BS in Nutrition and Dietetics (Coordinated Program): 82
- Requirements for Premedical Study: 82
- Graduation Requirements: 83
- Minors in Nutrition and Dietetics, and in Food Science and Management: 84
- Second BS Degree: 84
- Dual Degree: 85
- Transfer of Courses: 85
- Elective Courses: 85
- Academic Rules and Regulations: 86
- Classification and Promotion: 86
- Eligibility for the Regular AREC Program: 87
- Curriculum for the BS Degree in Agriculture and Diploma of Ingénieur Agricole: 87
- Curriculum for the BS Degree in Landscape Design and Eco-management and Diploma of Ingénieur Agricole: 89
- Curriculum for the BS Degree in Nutrition and Dietetics: 91
- Curriculum for the BS Degree in Nutrition and Dietetics (Coordinated Program): 93
- Curriculum for the BS Degree in Food Science and Management: 93
- Curriculum for the BS Degree in Veterinary Sciences: 95
- Curriculum for the BS Degree in Agribusiness: 96

### Animal and Veterinary Sciences (AVSC)
- Course Descriptions: 99
- Core Courses for the BS Degree in Agriculture: 99
- Elective Courses for the BS Degree in Agriculture: 99
- Core Courses for the BS Degree in Veterinary Sciences: 100

### Agricultural Sciences (AGSC)
- Course Descriptions: 102
- Core Courses for the BS Degree in Agriculture: 102
- Core Courses for the BS Degree in Agribusiness: 105

### Nutrition and Food Sciences (NFSC)
- Course Descriptions: 108
- Core Courses for the BS Degree in Nutrition and Dietetics: 108
- Core Courses for the BS Degree in Food Science and Management: 110
- Elective Courses for the BS Degree in Nutrition and Dietetics: 111

### Landscape Design and Ecosystem Management (LDEM)
- Course Descriptions: 112

### Faculty of Arts and Sciences (FAS)
- Officers of the Faculty: 118
- Historical Background: 118
- Mission: 119
- Vision: 119
- Undergraduate Programs: 119
- Admission: 120
- Classification of Students: 120
- Full-Time Students and Maximum Credit Loads: 120
- Requirements for Premedical Study: 121
- Academic Rules and Regulations: 121
- Regular Freshmen Program: 121
- Graduation Requirements: 125
- Faculty Requirements: 125
- Transfers: 127
- Second Degrees: 128
- Dual Degree: 128
- Majorless Status: 128
- Minors: 129
- FAS Diplomas: 132
- Directed Study: 132
- Tutorials: 132
- Dean’s Honor List: 132
- Attendance and Withdrawal from Courses: 133
- Examinations and Quizzes: 133
- Grading System: 133
- Incomplete Grades and Make-Up Examinations: 134
- Academic Probation: 135
- Application for Readmission: 136
- Summer Session: 137
- Courses: 137

### Arabic and Near Eastern Languages
- Undergraduate Programs: 139

### Biology
- Undergraduate Program: 145

### Chemistry
- Undergraduate Program: 152
# Contents

<table>
<thead>
<tr>
<th>Category</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civilization Sequence Program (CVSP)</td>
<td>158</td>
</tr>
<tr>
<td>Requirements</td>
<td>159</td>
</tr>
<tr>
<td>Sequence I and Sequence II Course Offerings</td>
<td>160</td>
</tr>
<tr>
<td>Courses Restricted to Freshman Students</td>
<td>161</td>
</tr>
<tr>
<td>Courses Supplementary to the Regular Offerings</td>
<td>162</td>
</tr>
<tr>
<td>Computer Science</td>
<td>164</td>
</tr>
<tr>
<td>Undergraduate Program</td>
<td>164</td>
</tr>
<tr>
<td>Economics</td>
<td>172</td>
</tr>
<tr>
<td>Undergraduate Program</td>
<td>172</td>
</tr>
<tr>
<td>Education</td>
<td>177</td>
</tr>
<tr>
<td>Undergraduate Program</td>
<td>177</td>
</tr>
<tr>
<td>Diploma Programs</td>
<td>179</td>
</tr>
<tr>
<td>Teaching Diploma Programs</td>
<td>179</td>
</tr>
<tr>
<td>Teaching Diploma in Elementary Education</td>
<td>179</td>
</tr>
<tr>
<td>Teaching Diploma in Secondary Education</td>
<td>180</td>
</tr>
<tr>
<td>Admission to the Teaching Diploma Programs</td>
<td>180</td>
</tr>
<tr>
<td>Qualifications for the Teaching Diploma and</td>
<td>181</td>
</tr>
<tr>
<td>Official Recognition by the Lebanese Government</td>
<td>181</td>
</tr>
<tr>
<td>Diploma in Special Education</td>
<td>181</td>
</tr>
<tr>
<td>Diploma in Educational Management and Leadership</td>
<td>182</td>
</tr>
<tr>
<td>BA in Education</td>
<td>183</td>
</tr>
<tr>
<td>Course Descriptions</td>
<td>184</td>
</tr>
<tr>
<td>Methods Courses</td>
<td>186</td>
</tr>
<tr>
<td>English</td>
<td>190</td>
</tr>
<tr>
<td>Communication Skills</td>
<td>191</td>
</tr>
<tr>
<td>Literature</td>
<td>193</td>
</tr>
<tr>
<td>Language</td>
<td>198</td>
</tr>
<tr>
<td>Fine Arts and Art History</td>
<td>202</td>
</tr>
<tr>
<td>Studio Arts Program</td>
<td>202</td>
</tr>
<tr>
<td>Art History Program</td>
<td>203</td>
</tr>
<tr>
<td>Theater Program</td>
<td>204</td>
</tr>
<tr>
<td>Music Program</td>
<td>204</td>
</tr>
<tr>
<td>Geology</td>
<td>213</td>
</tr>
<tr>
<td>Undergraduate Program</td>
<td>214</td>
</tr>
<tr>
<td>History and Archaeology</td>
<td>219</td>
</tr>
<tr>
<td>History</td>
<td>219</td>
</tr>
<tr>
<td>Undergraduate Program</td>
<td>219</td>
</tr>
<tr>
<td>Archaeology</td>
<td>225</td>
</tr>
<tr>
<td>Undergraduate Program</td>
<td>226</td>
</tr>
<tr>
<td>Mathematics</td>
<td>229</td>
</tr>
<tr>
<td>Undergraduate Program</td>
<td>229</td>
</tr>
<tr>
<td>BA or BS in Mathematics</td>
<td>230</td>
</tr>
<tr>
<td>BA or BS in Applied Mathematics</td>
<td>230</td>
</tr>
<tr>
<td>BA or BS in Statistics</td>
<td>231</td>
</tr>
<tr>
<td>Philosophy</td>
<td>239</td>
</tr>
<tr>
<td>Undergraduate Program</td>
<td>239</td>
</tr>
<tr>
<td>Physics</td>
<td>244</td>
</tr>
<tr>
<td>Undergraduate Program</td>
<td>244</td>
</tr>
<tr>
<td>Political Studies and Public Administration (PSPA)</td>
<td>250</td>
</tr>
<tr>
<td>Undergraduate Program</td>
<td>250</td>
</tr>
<tr>
<td>Social and Behavioral Sciences</td>
<td>261</td>
</tr>
<tr>
<td>Undergraduate Programs</td>
<td>261</td>
</tr>
<tr>
<td>Psychology</td>
<td>261</td>
</tr>
<tr>
<td>Sociology-Anthropology</td>
<td>265</td>
</tr>
<tr>
<td>Diploma in Media Communication</td>
<td>272</td>
</tr>
<tr>
<td>Social and Behavioral Sciences (Six Minors)</td>
<td>273</td>
</tr>
<tr>
<td>The Anis Makdisi Program in Literature (AMPL)</td>
<td>274</td>
</tr>
<tr>
<td>The Prince Alwaleed Bin Talal Bin Abdulaziz Alsaud</td>
<td>275</td>
</tr>
<tr>
<td>Center for American Studies and Research (CASAR)</td>
<td>275</td>
</tr>
<tr>
<td>Center for Behavioral Research (CBR)</td>
<td>277</td>
</tr>
<tr>
<td>Center for English Language Teaching and Research (CELRT)</td>
<td>278</td>
</tr>
<tr>
<td>Science and Mathematics Education Center (SMEC)</td>
<td>279</td>
</tr>
<tr>
<td>University Preparatory Program (UPP)</td>
<td>280</td>
</tr>
<tr>
<td>The Writing Center</td>
<td>282</td>
</tr>
<tr>
<td>Zaki Nassif Music Program (ZNMP)</td>
<td>283</td>
</tr>
<tr>
<td>Suliman S. Olayan School Of Business (OSB)</td>
<td>286</td>
</tr>
<tr>
<td>Officers of the School</td>
<td>286</td>
</tr>
<tr>
<td>International Board of Overseers</td>
<td>286</td>
</tr>
<tr>
<td>Middle East Advisory Board</td>
<td>287</td>
</tr>
<tr>
<td>The Finance, Accounting, and Managerial Economics Tracks</td>
<td>288</td>
</tr>
<tr>
<td>The Management, Marketing, and Entrepreneurship Track</td>
<td>288</td>
</tr>
<tr>
<td>Business Information and Decision Systems Track</td>
<td>288</td>
</tr>
<tr>
<td>History and Overview</td>
<td>288</td>
</tr>
<tr>
<td>Accreditation</td>
<td>289</td>
</tr>
<tr>
<td>Vision</td>
<td>289</td>
</tr>
<tr>
<td>Mission</td>
<td>289</td>
</tr>
<tr>
<td>Ethics and Integrity</td>
<td>290</td>
</tr>
<tr>
<td>Organization and Governance</td>
<td>290</td>
</tr>
<tr>
<td>Undergraduate Program</td>
<td>291</td>
</tr>
<tr>
<td>The BBA Program</td>
<td>291</td>
</tr>
<tr>
<td>Philosophy</td>
<td>291</td>
</tr>
<tr>
<td>Admission to the Program</td>
<td>291</td>
</tr>
<tr>
<td>Criteria for Admission to the BBA Program</td>
<td>291</td>
</tr>
</tbody>
</table>
## Academic Calendar 2011–12

### Fall Term 2011–12

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 23–June 15</td>
<td>Registration for Med. III, and Med. IV</td>
</tr>
<tr>
<td>May 31-June 15</td>
<td>Payment of fees for Med. III, and Med. IV</td>
</tr>
<tr>
<td>June 1</td>
<td>Clerkships begin for Med. III, and Med. IV</td>
</tr>
<tr>
<td>June 30–August 9</td>
<td>Submission of applications for deferral of payment for the first semester for all current registered students, and new sophomore/first year students. Application available on the website</td>
</tr>
<tr>
<td>July 11–14</td>
<td>Fall Term (II–III) advising and (Phase II) on-line course registration for current students in all faculties except Medicine</td>
</tr>
<tr>
<td>July 18–August 5</td>
<td>Orientation, advising and on-line registration for all new undergraduate students (excluding students coming from abroad)</td>
</tr>
<tr>
<td>August 8–29</td>
<td>Payment of fees for the first semester for all current students and new sophomore/first year students (excluding new students coming from abroad)</td>
</tr>
<tr>
<td>August 8–September 13</td>
<td>Submission of documents for new sophomore/first year students in all faculties except Medicine, and new students coming from abroad</td>
</tr>
<tr>
<td>August 16–23</td>
<td>Registration for Med. I, Med. II and FM graduate students</td>
</tr>
<tr>
<td>August 19–23</td>
<td>Payment of fees for Med. I, Med. II and FM graduate students</td>
</tr>
<tr>
<td>August 22</td>
<td>Classes begin for Med. II</td>
</tr>
<tr>
<td>August 29</td>
<td>Classes begin for Med. I, and FM graduate students.</td>
</tr>
<tr>
<td>August 30–September 14</td>
<td>Late payment of fees for the first semester for all current students and new sophomore/first year students (excluding new students coming from abroad)</td>
</tr>
<tr>
<td>August 30–September 1</td>
<td>Id Al Fitr, holiday. No classes</td>
</tr>
<tr>
<td>September 15–16</td>
<td>Fall Term (II–III) advising and (Phase III) on-line course registration for current students in all faculties except Medicine</td>
</tr>
<tr>
<td>September 15–20</td>
<td>Submission of applications for deferral of payment for the first semester for old returning, new students coming from abroad, new graduates, new freshman students, special and transfer students. Application available on the website</td>
</tr>
<tr>
<td>September 15–16</td>
<td>Pre-registration for new students coming from abroad, new graduates and for new freshman students, special and transfer students, Office of Admissions, College Hall</td>
</tr>
<tr>
<td>September 16</td>
<td>International student orientation program, for all students coming from abroad, Office of International Programs, West Hall</td>
</tr>
<tr>
<td>September 19</td>
<td>Set registration holds for all new sophomore/first year students who did not submit their official documents</td>
</tr>
<tr>
<td>September 19</td>
<td>Set registration holds for all students who did not settle their financial account</td>
</tr>
<tr>
<td>September 19–21</td>
<td>Freshman orientation program, Office of Student Affairs.</td>
</tr>
<tr>
<td>September 19–21</td>
<td>Orientation program for new graduates, new students coming from abroad, special and transfer students</td>
</tr>
<tr>
<td>September 19–22</td>
<td>Advising for new graduates, new students coming from abroad, new freshman, old returning, and cross registering students special and transfer students</td>
</tr>
<tr>
<td>September 20</td>
<td>Cancel registration for all current and new sophomore students who did not settle their fees</td>
</tr>
<tr>
<td>September 21–23</td>
<td>On-line course registration for new students coming from abroad, new graduates, new freshman, old returning, cross registering students, special and transfer students</td>
</tr>
<tr>
<td>September 22</td>
<td>Cancel registration for all new sophomore students who did not submit their official documents</td>
</tr>
<tr>
<td>September 23–27</td>
<td>Payment of fees for the first semester for new graduates, old returning, cross registering students, new students coming from abroad, new freshman students, special and transfer students</td>
</tr>
<tr>
<td>September 26</td>
<td>First semester begins for all faculties except Medicine</td>
</tr>
<tr>
<td>September 26–29</td>
<td>Change of schedule for the first semester (Drop and Add)</td>
</tr>
<tr>
<td>September 28–October 5</td>
<td>Late payment of fees for the first semester for new graduates, old returning, cross registering students, new students coming from abroad, and new freshman students</td>
</tr>
<tr>
<td>October 3</td>
<td>Opening Ceremony</td>
</tr>
<tr>
<td>October 21</td>
<td>Deadline for submitting NSSF declaration for the academic year 2011–12</td>
</tr>
<tr>
<td>November 6–8</td>
<td>Al-Adha, holiday, No classes</td>
</tr>
<tr>
<td>November 22</td>
<td>Independence Day, holiday, No Classes</td>
</tr>
<tr>
<td>November 26</td>
<td>Hijra New Year, holiday, No classes</td>
</tr>
<tr>
<td>December 5</td>
<td>Ashoura, holiday, No classes</td>
</tr>
<tr>
<td>December 6</td>
<td>Founders Day. Classes will be held</td>
</tr>
<tr>
<td>December 6–9</td>
<td>Second semester advising for current students</td>
</tr>
<tr>
<td>December 6</td>
<td>Last day for withdrawal from courses for the first semester</td>
</tr>
<tr>
<td>December 7–February 7</td>
<td>Inter-faculty on-line transfer applications for the second semester 2011–12</td>
</tr>
<tr>
<td>December 12–15</td>
<td>Second semester on-line course registration for current students</td>
</tr>
<tr>
<td>December 23</td>
<td>10:00 p.m. Christmas and New Year vacation begins</td>
</tr>
<tr>
<td>January 1</td>
<td>10:00 p.m. Christmas and New Year vacation ends</td>
</tr>
<tr>
<td>January 2–13</td>
<td>Submission of applications for deferral of payment for the second semester for all current registered students. Application available on the website</td>
</tr>
</tbody>
</table>
January 6  Armenian Christmas, holiday. No classes
January 14  10:00 p.m. Classes end for all faculties except Medicine
January 15–18  Reading period for the first semester
January 17–February 8  Payment of fees for current students for the second semester
January 19  First semester examinations begin
January 24–February 10  Submission of applications for deferral of payment for the second semester for new and old returning students. Application available on the website
January 31–February 4  Second semester pre-registration for new, old returning and cross-registering students
February 1  First semester ends for all faculties except Medicine
February 4  Prophet’s Birthday, holiday. No classes
February 6  International student orientation program, for all students coming from abroad, Office of International Programs.
February 6–8  New students orientation, Office of Student Affairs
February 7–March 19  Inter-faculty on-line transfer applications for the Fall Term 2012–13
February 9  St. Maroun’s Day, holiday. No classes
February 10–25  Late payment for the second semester for all current registered students

Spring Term 2012
February 13  Second semester begins for all faculties except Medicine
February 13–18  Payment of fees for new students
February 13–16  Change of schedule for the second semester (Drop and Add)
February 20–25  Late payment for the second semester for new and old returning students
March 5  Deadline for submitting NSSF Declaration for the second semester
March 25  Annunciation Day, holiday. No classes
April 5  10:00 p.m. Latin Easter vacation begins
April 9  10:00 p.m. Latin Easter vacation ends
April 12  10:00 p.m. Greek Orthodox Easter vacation begins
April 16  10:00 p.m. Greek Orthodox Easter vacation ends

April 24–May 3  Inter-Faculty on-line transfer applications for Summer 2012 for students applying to FAFS and OSB.
April 27  Last day for withdrawal from courses for the second semester
April 30  Classes end for Med. II
April 30–May 3  Advising and on-line registration for current students for Summer 2012
May 1  Labor Day, holiday. No classes
May 14–16  Advising for current students for the Fall Term 2012–13
May 21–24  Fall term (2012–13) early (Phase I) on-line course registration for current students in all faculties except Medicine
May 26  10:00 p.m. Classes end for all faculties except Medicine
May 26–29  Reading Period for the second semester
May 30  Second semester examinations begin
May 31  Classes end for Med. III and Med. IV
June 11–14  Pre-registration, advising and on-line course registration for new, old returning and cross-registering students for the Summer 2012
June 12  Second semester ends for all faculties except Medicine
June 13–21  Payment of fees for the Summer 2012

Summer 2012
June 18  Classes begin for Summer 2012 for all faculties except Medicine
June 18–21  Change of schedule for Summer 2012 (Drop and Add)
June 22–27  Late Payment for Summer 2012
June 23  Commencement exercises
June 28  Classes end for Med. I
July 9–10  Fall Term (12–13) advising and early (Phase II) on-line course registration for current students in all faculties except Medicine
July 20  Last day for withdrawal from courses for Summer 2012
August 4  10:00 p.m. Classes end for all faculties except Medicine, Agricultural and Food Sciences, and Medical Laboratory Sciences
August 6–11  Final examinations for all faculties except Medicine, Agricultural and Food Sciences, and Medical Laboratory Sciences
August 11  10:00 p.m. Classes end for the Faculty of Agricultural and Food Sciences, and Medical Laboratory Sciences
August 13–18  Final examinations for the Faculty of Agricultural and Food Sciences, and Medical Laboratory Sciences
August 15  Assumption Day, holiday. No classes
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Muqeem Salameh, PhD, Registrar
Salim Kanaan, PhD, Director of Admissions
Lokman Meho, PhD, University Librarian
Karma El Hassan, PhD, Director of Institutional Research and Assessment
Rosangela Souto Silva, PhD, Director of Academic Computing
Leila Badre, Doctorat 3ème Cycle, Director of the University Museum
Fadila Homaidan, PhD, Director of Grants and Contracts
Nadine N. Naffah, MPH, MBA, Associate Director of Admissions
Hala Abou Arraj Deeb, MA, Associate Registrar
Randa Nawwam Soussi, BS, Assistant Registrar
Solange Constantine, Maîtrise es Sciences, Assistant Director of Admissions
Nabila Dandan Jabakhanji, BA, Assistant Director of Admissions
Faraj Mansour, MBA, Assistant Director of Admissions
Sobhi Renno, BA, Assistant Director of Admissions

Regional External Programs

Hassan Diab, PhD, Vice President for Regional External Programs
George Farag, PhD, Assistant Vice President for Regional External Programs
Ziad Shaaban, BS, Director of Continuing Education Center
Magda Abu-Fadil, MA, Director of Journalism Training Program

Human Resources

James Radulski, MBA, Vice President for Human Resources
Amal Hamadeh, BA, Director of Human Resources
Maroun Ghazal, BA, Director of Benefits
Antoine Chahine, BS, Director of Housing
Samar Diab, MA, Assistant Director of Human Resources

Facilities

Samer Maamari, MSCE, Vice President for Facilities
John Abdelnour, BS, Director of Physical Plant
Bassem Barhoumi, MSCE, Director of Facilities Planning and Design Unit
Ziad Yazbek, BBA, Director of Materials Management - Campus

Finance

Stephen Kenney, MBA, CPA, Vice President for Finance
Imad Dayya, MBA, CPA, Comptroller
Drew Wickens, MBA, CPA, Director of Financial Planning and Auxiliary Services
Nelly Abu Zaki, EMBA, Deputy Comptroller
Hanan Itani Ramadan, MPH, Director of Purchasing - Campus
Antoine Assaf, BE, Director of Business and Financial Systems Support
Katia Zakhem Nakhle, BS, MSC Director of Auxiliary Services

Legal Affairs

Peter F. May, BA, JD, Vice President for Legal Affairs

Information Technology

Rita Khayat Toubia, CIO, Vice President for Information Technology
Sami Cortas, MSEE, Information Technology Officer
Rosangela Souto Silva, PhD, Director of Academic Computing
Nabil Bukhalid, BSc EE, EMBA, Director of Computing and Networking Services

University Advancement

Richard J. Brow, MA, Vice President for University Advancement

Alumni Relations

Eva Klimas, MLA, Director of Alumni Relations (New York)
Arabia M. Ali Osseiran, MPH, Director of Alumni Relations (Beirut)

Communications

Omar Odeh, MA, Assistant Vice President for Marketing and Communications
Hikmat Beaini, MLA, Director of Information and Public Relations (Beirut)
Ada H. Porter, BA, Director of Communications (New York)
Najib Attieh, MA, Graphic Design Manager
Faculty of Engineering and Architecture
Makram Suidan, PhD, Dean

Faculty of Health Sciences
Iman Nuwayhid, MD, DPH, Dean
Rima Affif, PhD, Associate Dean

Faculty of Medicine
Mohamed H. Sayegh, MD, Vice President for Medical Affairs and the Raja N. Khuri Dean of the Faculty of Medicine
Ziyad Ghazzal, MD, Deputy VP/Dean and Associate Dean for Clinical Affairs
Ghassan Hamadeh, MD, Associate Dean and Director of University Health Services
Adnan Tahir, MD, Medical Center Director and Chief Medical Officer
Dania El-Baba Wazzan, PhD, Chief Operating Officer - AUBMC
Saleem Kiblawi, MD, Chief of Medical Staff
Faek Jamali, MD, Deputy Chief of Medical Staff
Walid Uthman, MBA, Chief Financial Officer
Jad Khayat, MBA, Deputy Chief Financial Officer

Faculty of Agricultural and Food Sciences
Nahla Hwalla, PhD, Dean
Jad Chaaban, PhD, Assistant Dean for Academic Affairs

Faculty of Arts and Sciences
Patrick McGreevy, PhD, Dean
Malek Tabalb, PhD, Associate Dean
John Meloy, PhD, Associate Dean

Suliman S. Olayan School of Business
George Najjar, PhD, Dean
Assem Safieddine, PhD, Associate Dean for Academic Affairs
Ibrahim H. Osman, PhD, Associate Dean for Research Affairs
Hanin Abdallah, PhD, Assistant Dean for Student Services
Mohamad Jamal Zeidan, PhD, Assistant Dean for Corporate Programs

Medical Center
Mohamed H. Sayegh, MD, Vice President for Medical Affairs and the Raja N. Khuri Dean of the Faculty of Medicine
Ziyad Ghazzal, MD, Deputy VP/Dean and Associate Dean for Clinical Affairs
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Saleem Kiblawi, MD, Chief of Medical Staff
Faek Jamali, MD, Deputy Chief of Medical Staff
Walid Uthman, MBA, Chief Financial Officer
Jad Khayat, MBA, Deputy Chief Financial Officer

Student Affairs
Talal Nizameddin, PhD, Dean of Student Affairs
Antoine Khabbaz, PhD, Director of the Counseling Center
Maryam Ghandour, PhD, Career and Placement Specialist
Ghaleb Halimi, MS, MA, Director of Athletics
Nay Khatcherian, MA, Psychologist
Victoria Chertok, MA, Coordinator of Student Housing
Hiba Hamadeh, BA, Coordinator of Student Activities

International Programs
Katherine Yngve, PhD, Director
Rania Murr, BA, Coordinator of International Student Services
Danielle Ouimet, MA, Coordinator for International Programs and Admissions

Financial Aid
Salim Kanaan, PhD, Director
Hanaa Kobeissi, MPH, Associate Director of Financial Aid
The University

The American University of Beirut (AUB) is a private, independent, non-sectarian institution of higher learning founded in 1866. It functions under a charter from the State of New York and is governed by a private, autonomous Board of Trustees.

The University has six faculties: Agricultural and Food Sciences, Arts and Sciences, Engineering and Architecture, Health Sciences, Medicine (including the Rafic Hariri School of Nursing), and the Suliman S. Olayan School of Business. At present, AUB offers programs leading to Bachelor’s, Master’s, MD, and PhD degrees.

The University became co-educational in 1922. The language of instruction is English.

Statement of Accreditation Status (SAS)

Degrees awarded by the American University of Beirut are officially registered with the Ministry of Higher Education in Lebanon and with the New York State Department of Education in the United States. AUB has been accredited as an institution since 2004 by the Commission on Higher Education of the Middle States Association of Colleges and Schools (3624 Market Street, Philadelphia, PA 19104, Tel. 267-284-5000). The University’s accreditation was most recently reaffirmed in June 2009, after the completion of an extensive self-study that was reviewed by educational experts chosen in consultation with Middle States. Over the last several years, a number of AUB faculties, in addition to the Medical Center, have also sought accreditation with more specialized bodies. In September 2006, the Faculty of Health Sciences’ Graduate Public Health Program became the first such program to be accredited by the Council on Education for Public Health (CEPH) outside of North America. One year later, the Rafic Hariri School of Nursing became the first nursing school beyond American territories to have its nursing programs accredited by the Commission on Collegiate Nursing Education (CCNE). In 2008, the AUB Medical Center received official accreditation from Joint Commission International (JCI), the international arm of the US-based Joint Commission on Accreditation of Healthcare Organizations (JCAHO). The Medical Center had previously been accredited by JCAHO from 1965 until 1983; however, the outbreak of civil war in Lebanon subsequently prevented periodic site visits by review teams. The Medical Center is also accredited by the American Nurses Credentialing Center (ANCC) as a provider of continuing nursing education. ANCC’s Magnet Recognition Program B granted AUBMC its prestigious Magnet designation in June 2009, making the Medical Center the first healthcare institution in the Middle East and the third in the world outside of the United States to be recognized in this way. Also in 2009, undergraduate and graduate programs offered by the Suliman S. Olayan School of Business were accredited by the Association to Advance College Schools of Business (AACSB). In July 2010, four undergraduate programs at the Faculty of Engineering and Architecture were accredited by ABET, Inc. (the Accreditation Board of Engineering and Technology), retroactive to October 1, 2008.

The University is a member of the Association of American Colleges and Universities (AACU); the Council of Graduate Schools (CGS); the Association of American International Colleges and Universities (AAICU); the American Association of Collegiate Registrars and Admissions Officers (AACRAO); the Arab Association of Collegiate Registrars and Admissions Officers (AACRATO); the Association for Institutional Research (AIR); the College Board; the Council on International Educational Exchange (CIEE); the Association of International Educators (NAFSA); Student Affairs Administrators in Higher Education (NASPA); the National Association of College and University Business Officers (NACUBO); the American Society for Quality (ASQ); the American Productivity and Quality Center (APQC); the National Association for College Admission Counseling (NACAC); the Overseas Association for College Admission Counseling (OACAC); the American International Consortium of Academic Libraries (AMICAL); and the European Council of International Schools (ECIS). Members of the AUB administration regularly attend meetings and professional development activities organized by these and other international organizations, as well as associations, syndicates, and other formal groupings located in Lebanon and the region.

Mission Statement

The American University of Beirut (AUB) is an institution of higher learning founded to provide excellence in education, to participate in the advancement of knowledge through research, and to serve the peoples of the Middle East and beyond. Chartered in New York State in 1863, the University bases its educational philosophy, standards, and practices on the American liberal arts model of higher education. The University believes deeply in and encourages freedom of thought and expression and seeks to foster tolerance and respect for diversity and dialogue. Graduates will be individuals committed to creative and critical thinking, life-long learning, personal integrity and civic responsibility, and leadership.

History

In 1862, American missionaries in Lebanon and Syria, under the American Board of Commissioners for Foreign Missions, asked Dr. Daniel Bliss to withdraw from the evangelical work of the mission in Lebanon to found a college of higher learning that would include medical training. It was felt that this college should have an American educational character, should be administered independently from the mission, and should be maintained by its own funds. Dr. Bliss traveled to the United States in the summer of 1862 to solicit funds for this new enterprise. By August 1864, he had raised $100,000 but, because of inflation during the Civil War, it was decided that he should raise a sterling fund in England to start the operations of the college, leaving the dollar fund to appreciate. After collecting £4,000 in England, Dr. Bliss traveled to Beirut in March 1866.

On April 24, 1863, while Dr. Bliss was raising money for the new school, the State of New York granted a charter under the name of the Syrian Protestant College. The college opened with its first class of 16 students on December 3, 1866.

The cornerstone of College Hall, the first building on the present campus in Ras Beirut, was laid December 7, 1871, by the Honorable William E. Dodge, Sr., then Treasurer of the Board of Trustees. At the ceremony, President Daniel Bliss expressed the guiding principle of the college in these words:

“This college is for all conditions and classes of men without regard to color, nationality, race or religion. A man, white, black, or yellow, Christian, Jew, Mohammedan or heathen, may enter and enjoy all the advantages of this institution for three, four or eight years; and go out believing in one God, in many gods, or in no God. But it will be impossible for anyone to continue with us long without knowing what we believe to be the truth and our reasons for that belief.”

College Hall and the first medical building were completed and put to use in 1873, and the bell in the tower of College Hall pealed for the first time in March 1874. However, College Hall was extensively damaged by a savage explosion in the early morning of November 8, 1991, and the building had to be demolished. It was later rebuilt, and the new College Hall was inaugurated in June 1999.

Since the earliest years, the University has continually expanded and developed new faculties and programs. In 1867, it started the School of Medicine. Four years later, in 1871, both a school of pharmacy and a preparatory school were added. The latter became independent in 1960 and is currently known as International College. In 1900, the University established a school of commerce.
which was later incorporated into the Faculty of Arts and Sciences. In 2000, it regained its independence and was later named the Suliman S. Olayan School of Business. When the hospital (currently the American University of Beirut Medical Center) opened in 1905, a school of nursing—today the Rafic Hariri School of Nursing—was also established. In 1910, the University opened a School of Dentistry, which operated for thirty years. In the early years of the 1950s, several program expansions took place. The Faculty of Engineering and Architecture was established in 1951; the Faculty of Agriculture—now the Faculty of Agricultural and Food Sciences—first opened its doors in 1952; and, finally, the School of Public Health—now the Faculty of Health Sciences—was founded in 1954.

On November 18, 1920, the Board of Regents of the University of the State of New York (USNY) changed the name of the institution from the Syrian Protestant College to the American University of Beirut; other charter amendments expanded the functions of the University.

At the end of February 2011, the number of degrees and diplomas awarded since June 1870 totaled 78,283.

Marquand House, completed in 1879, is the campus residence of the President of the University. All presidents have lived there during their presidencies, except for Dr. Calvin Plimpton, Dr. Frederic Herter, Dr. Robert Haddad, and Mr. David Dodge.

Three presidents died while in office: Dr. Howard Bliss, Dr. Stephen Penrose, and Dr. Malcolm Kerr. Dr. Kerr, the ninth president, was assassinated outside his College Hall office on January 18, 1984.

Location and Climate

The University is situated in Beirut, Lebanon, at the crossroads of the Middle East. The campus on the Ras Beirut peninsula stretches along the Mediterranean shore and overlooks St. George’s Bay toward northern Lebanon and the snow-capped mountains to the east. The campus of around 84 acres has 64 buildings, including faculty and administrative buildings, five libraries, three museums, the Charles W. Hostler Student Center, two men’s and five women’s dormitories, and the Medical Center. The luxuriant flowers, shrubs, and trees make it one of the most beautiful campuses in the world.

Lebanon enjoys a Mediterranean climate and for eight months of the year is pleasant and sunny. The winter rainy season from November to March, however, is at times damp and cold. Although most Beirut buildings are centrally heated, warm clothing is recommended for the winter months. The average annual rainfall of 86 cm (34 inches) comes chiefly in the winter when the temperature may drop below 7°C (50°F).

Academic Services

Academic Computing Center

The mission of the Academic Computing Center (ACC) is to promote the use of teaching and learning technologies at AUB. To this end, ACC provides advice, training and assistance to AUB faculty members interested in integrating technology tools into their teaching to enhance and facilitate students’ learning. In addition to its regular schedule of workshops, ACC provides instructors, at their request, with face-to-face training sessions that help them to acquire confidence and capacity in a wide variety of computer applications. Faculty may also request training for students enrolled in their courses. ACC’s activities and resources reflect AUB’s commitment to a state-of-the-art education for all its students, an education that prepares them to be lifelong learners and successful professionals in the contemporary information age.

Center for Teaching and Learning (CTL)

The Center for Teaching and Learning (CTL) promotes and supports high quality teaching and learning in keeping with AUB’s mission of excellence in education and its commitment to independent thinking and life-long learning. The CTL is an independent, multipurpose, interdisciplinary unit that serves all of the faculties at the University. It is administratively under the Office of the Provost. The CTL works in collaboration with AUB’s academic support services, especially the University Libraries, the Academic Computing Center, and the Office of Institutional Research and Assessment.

Computing and Networking Services

Computing and Networking Services (CNS) is AUB’s central information and communication technology support unit and a regional leader in technological initiatives for institutions of higher learning. CNS deploys and maintains infrastructure services aimed at enhancing user productivity through seamless access to services and resources, focusing on functionality, flexibility, manageability, standardization, security, and data safety. CNS also manages the hardware and software underlying the networked and web-based applications used to accomplish most of the University’s academic
and administrative functions. These include the Student Information System (AUBsis) operated by the Registrar’s Office, the Library Information System operated by the Libraries, and the Financial Information System (AUBfis) operated by the Comptroller’s Office. CNS also handles the Storage Area Network (SAN) that provides the University’s enterprise storage and back-up system. The smooth and efficient functioning of those systems is ensured by a team of experienced system and database administrators. CNS provides regular hardware and software consulting to the University and Medical Center.

**AUBnet Intranet and Internet Services**

AUBnet provides a state-of-the-art wired and wireless network infrastructure ensuring high-speed, secure, reliable, and widespread access for AUB users across the entire campus and hospital, including all dorms and faculty apartments. AUB students can connect to AUBnet using the networked public PCs available in computer labs or they can use their personal laptops or PDAs and connect via the campus-wide wireless network, AUBwlan. Using any web browser, they have access to over 100 online e-learning courses, most of which are computer-related.

With an AUBnet account, all students, faculty, and staff have full access to the internet, email, and personal websites subject to quotas established to ensure an optimum level of access to the community. CNS offers quota-free access after business hours and during holidays, and maintains AUB’s official website and server, and the Digital Documentation Center’s website.

**Computer Labs**

In addition to providing internet access, computer labs also offer a variety of other resources to students, such as printers, CD burners, and secure network storage for personal data. They may also request access to servers hosting such applications as Microsoft Office, special software for students, such as printers, CD burners, and secure network storage for personal data. They may also request access to servers hosting such applications as Microsoft Office, special software for statistics and graphics, and various programming languages.

**Medical Center Information Systems**

Medical Center Computing and Networking Services (MC-CNS) caters to the information technology needs of the hospital’s administration, clinical departments, and nursing services, and supports academic and research activities at the Faculty of Medicine. The Medical Center is presently going through a fast-paced computerization process focused on improving the provision of medical care and streamlining operations in accordance with JCI accreditation standards. Information technology plays an essential role in achieving this goal.

The integrated hospital information system comprises a web portal and web services that link various medical, clinical and financial applications running on disparate platforms. This architecture allows us to transition gradually to new technologies without the need to compromise or re-develop existing solutions, while at the same time affording us the flexibility needed to develop the system in the highly dynamic fields of medical science and information technology.

Most major areas of the hospital are currently computerized and work continues on projects to expand, upgrade, and address new needs in all areas and to take advantage of evolving information technologies.

**Help Desk**

Friendly and knowledgeable CNS help desk specialists are always ready to support students, faculty, and staff. For computing support contact the CNS help desk at http://cns.aub.edu.lb/cns/ or email cns.helpdesk@aub.edu.lb or dial ext. 2260. For more information on CNS and computing at AUB, visit our website: http://www.aub.edu.lb/cns/

**Medical Center**

The American University of Beirut Medical Center (AUBMC) is a private, not-for-profit, in-patient and out-patient teaching facility of the Faculty of Medicine. As a state-of-the-art tertiary/quaternary medical facility, it operates 333 beds (and is growing its bed capacity), serving 23,968 in-patients per year, and an out-patient facility receiving 277,034 visits (200,631 private; 29,157 general outpatient department; and 47,246 emergencies) per year. It provides a wide spectrum of medical, nursing, and paramedical training programs at the undergraduate and post-graduate levels in different specialties and subspecialties with 319 residents (48 Fellows, 1 PGY VII, 4 PGY VI, 10 PGY V, 35 PGY IV, 56 PGY III, 66 PGY II, 99 PGY I). It is served by 247 predominantly US-trained highly-credentialed physicians. AUBMC is considered the primary and tertiary/quaternary referral medical center in Lebanon and neighboring countries. It is fully equipped and hosts a number of centers of excellence.

**Archaeological Museum**

Founded in 1868, the University Archaeological Museum is the third oldest museum in the Near East. It was established with a donation from General Cesnola, the American Consul in Cyprus, and the collection has since grown steadily. In 2006, the Museum was completely renovated with the construction of an additional mezzanine and an extensive reorganization and thematic treatment of its collections. Today the museum exhibits a wide range of artifacts (15,000 objects; 10,000 coins) from Lebanon and neighboring countries. It traces humankind’s progress in the Near East from the Early Stone Age to the Islamic period. The collections on display provide educational benefits to students and scholars in Near Eastern archaeology.

The museum runs a research program including field excavations and publications of museum collections. Several types of educational activities (e.g., lectures, exhibitions, children’s programs, trips) are also organized in collaboration with the Society of the Friends of the Museum, which also runs the Museum Shop. The museum may be enjoyed by the public free of charge.

Opening hours are Monday through Friday, 9 am to 5 pm. The museum is closed during official and AUB holidays.

**Office of Institutional Research and Assessment (OIRA)**

The Office of Institutional Research and Assessment (OIRA) coordinates institutional assessment and research activities. It is responsible for the collection, analysis, and dissemination of accurate and timely information about the University’s environment and performance. In addition, the office develops and conducts assessments for various purposes at institutional, regional, and international levels.
More specifically, the functions of OIRA are to

- formulate and implement data-gathering activities such as surveys, interviews, and focus groups for a wide variety of internal (e.g., accreditation) and external (e.g., comparison with peer institutions) uses;
- coordinate assessment and evaluation of University programs and processes (e.g., registration, admission, advising) to support planning, decision-making, and improvement;
- act as a resource and repository for official institutional statistics, information, and policies;
- develop, administer, and report assessments required by the University for admissions, placement, and other educational purposes;
- serve as a testing center for various international administrations and organizations (e.g., ACT, CFA, MELAB, and the Open University);
- administer instructor and course evaluations, and provide feedback to faculty members for the improvement of teaching.

Office of Communications

Responsible for developing and executing the University’s overall marketing strategy, the Office of Communications works to define and extend AUB’s brand and reputation locally, regionally and worldwide. The Office establishes relationships with the external media and serves as a liaison between the internal AUB community and relevant external audiences. Public relations activities include issuing press releases, maintaining a faculty expertise database, monitoring AUB in the media, and communicating information to both internal and external audiences using a range of print, electronic, and web-based media. The Office also oversees AUB’s on-line presence and manages the University’s social media sites.

In addition, the Office assists with planning and managing University events to ensure relevant exposure in the media, developing promotional material, and organizing professional photography. Campus tours are arranged for visitors, prospective students, high school pupils, and other guests.

The Office of Communications is also responsible for managing the design and production of over 300 official University publications. Our creative team further provides design-related services for internal clients – including concept development, institutional advertising, web-based communications and animation, and other forms of creative content.

Libraries

The AUB library system consists of two main libraries: the University Libraries and the Saab Memorial Medical Library. The University Libraries include the Jafet Memorial Library (the central library of the AUB campus), the Engineering/Architecture Library, and the Science/Agriculture Library with its annex AREC (Farm) Library.

The University Libraries have a long history in Lebanon and in the region which is reflected in the rich collections that they own. The collections consist of 587,778 volumes and 923 periodical titles, of which 244 are in Arabic. Access is provided to 57,679 electronic journals in 206 databases. There are about 1,139,340 audiovisual items of all formats, the majority of which are microforms of a substantial number of local and regional journals and newspapers going back to the early 20th century. The Archives and Special Collections contain 1,398 manuscripts, some of which have been appraised as museum pieces, 7,714 volumes of theses, projects, and dissertations going back to 1907, and 3,940 posters and 1,902 maps, as well as 46,418 photographs, of a unique and historical nature. These print and electronic collections are developed and enriched on a regular basis to support the academic and research programs of the University.

The University Libraries are fully automated and many of their resources, databases, electronic books, and references are remotely accessible, providing a modern and virtual environment that is conducive to research. They are equipped with a state-of-the-art electronic classroom and computer lab. Secure and reliable wireless connections are available in all the libraries. The University Libraries provide customized reference and instruction services through emails, to walk-ins, and in classes, in an active program of user education which promotes a culture of information literacy at all levels. Researchers from Lebanon, the region, and beyond continuously seek out the University Libraries for their unique, rich, and historical collections, particularly on Lebanon and the Middle East. The University Libraries open a total of 103.5 hours per week and 24/7 during reading and exam periods.

The Saab Memorial Medical Library (SML), dedicated to the memory of Dr. Nicholas Saab (AUB School of Medicine graduate, 1959), is one of the best medical libraries in the Middle East. It consists of 188 printed periodical titles, over 84,000 backfile periodical volumes, and nearly 48,000 books, over 2,000 of which are of historical value (such as Avicenna’s Canon of Medicine, 1593). SML now acts as a hybrid library that is constantly increasing its e-resources while maintaining traditional services. It has a large number of the most important bibliographic medical and allied health databases, more than 5,500 e-journals, and more than 4,000 e-textbooks. In 1978 SML was designated by the World Health Organization as the National Focal Point for Lebanon. The library has a special collection called the Lebanese Corner, which includes publications about Lebanon, or by Lebanese authors, in the fields of medicine and other health related topics. SML also started a Medical Institutional Repository in 2007. SML services are provided mainly to an AUB clientele, but also to all other medical and allied health users throughout Lebanon. The library is open 90 hours per week. With its rich, up-to-date medical collection, SML aims to promote research, education, and patient care in the medical and allied health fields. SML is a member of three consortia in Lebanon and the Arab world, and it provides training to medical librarians and healthcare professionals in Lebanon and the region.
Admissions

The American University of Beirut seeks students of sound character and demonstrated academic achievement and promise. In accordance with the policies of its founders and with its equal opportunity policy, the University admits students regardless of race, color, religion, gender, disability, or national origin. While it attracts students from more than sixty countries from around the world, AUB primarily serves applicants from Lebanon, the Arab world, and other countries of the Middle East, and also seeks to maintain geographic distribution within the region. The University values its strong ties with its alumni and considers the attendance of alumni children important to the maintenance of these ties and to the continuation of its traditions.

Application Procedures

Applications are available at the Office of Admissions at either of the addresses below, and are mailed to applicants upon request. Applications can also be downloaded from the AUB website: www.aub.edu.lb/admissions/Pages/index.aspx

Applicants Outside North America

Office of Admissions
American University of Beirut
PO Box 11-0236
Riad El-Solh 1107 2020
Beirut, Lebanon
Email: admissions@aub.edu.lb
Telephone: 961-1-374374/374444
Ext: 2590/2585/2596
Fax: 961-1-750775

Applicants in North America

American University of Beirut
3 Dag Hammarskjold Plaza, 8th Floor
New York, NY 10017-2303
Telephone: 1-212-583-7600
Fax: 1-212-583-7650

Admission to Undergraduate Study

Students may apply for admission to AUB's four-year undergraduate program as freshmen in the Faculty of Arts and Sciences, as sophomores/first year professional students in all the faculties, as transfer students from other universities, as visiting students, or as special students not working for a degree, or as second degree applicants. They may apply for entrance in the first (fall) semester or in the second (spring) semester. All students except freshmen may apply to one, two, or three of AUB's six faculties. Freshmen and sophomore/first year professional students may apply for the fall semester under a special early admission plan. All applications should be submitted to the Office of Admissions by the deadlines specified below.

Admission decisions are made on completed applications based primarily on the student's academic record (school grades) and SAT I results. Factors such as geographic distribution, alumni relationships, and character may also be considered especially with applicants to the freshman class, whereby extracurricular activities, recommendations from teachers and counselors in addition to academic achievements are taken into consideration. The selection of freshman applicants is made by the Freshman Admissions Committee and selection of sophomore applicants is made by the Unified Admissions Committee (except for transfer students to junior standing or those applying for a second degree whose applications are considered by the respective faculties).

All admission decisions are conditional upon evidence of the student having received the certificate or degree (recognized by the Ministry of Education of the originating country) on the basis of which admission is sought, and based on evidence of having met the English Language Proficiency Requirement (ELPR). A student is not eligible to register until all conditions of his/her admission are met. Conditions are stated in the letter of admission.

Students applying for entrance in the fall semester are notified of conditional admission by the end of April. Applicants for the spring semester are notified by mid-January, and applicants for the summer session are notified by early June. Upon notification of conditional admission, a student can hold a place for the fall semester by making a non-refundable enrollment deposit of $300 by June 30. This deposit is credited to the student's account upon registration.

Deadlines for Undergraduate Applications

<table>
<thead>
<tr>
<th>For admission to</th>
<th>Deadline</th>
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<tbody>
<tr>
<td>spring semester of academic year 2011–12</td>
<td>November 30, 2011</td>
</tr>
<tr>
<td>fall semester of academic year 2012–13</td>
<td>February 1, 2012</td>
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<tr>
<td>spring semester of academic year 2012–13</td>
<td>November 30, 2012</td>
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<th>For early admission to</th>
<th>Deadline</th>
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<tbody>
<tr>
<td>fall semester of academic year 2012–13</td>
<td>November 30, 2011</td>
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Students applying as undergraduates should submit the items listed below by the appropriate deadline. Note that recommendations, official transcripts of records, and all other documents presented to complete an application for admission are the property of AUB and are not returned to applicants.
• Application Forms

• School Record: official report of grades for the two years of schooling prior to the year in which the student is filing the application, including average and rank in class. Schools that do not provide complete information, particularly average and rank in class, may jeopardize the admission of their students. Applicants should ask the officials of the school they have attended for the last two years to send their school grades directly to the AUB Office of Admissions.

• Applicants to the freshman class are required to present at least two letters of recommendation, one from a Math or Science teacher and another from the school counselor or principal.

• SAT I: The SAT I is required of all undergraduate applicants except junior and senior transfer students and special and visiting students. Each student is responsible for registering and taking the SAT I. Applicants planning to enroll during the spring semester must take the test by the November testing session of the previous year. Students applying for the fall semester must take the SAT I by the December testing session of the year before their planned enrollment. For students who take the test more than once, the University considers the highest score achieved in each of the critical reading and mathematical sections. Students should make sure to submit their SAT scores before admission decisions are issued (unofficial scores are considered pending receipt of official ones).

• For details on the dates and locations of the SAT I, contact the nearest testing center. In Lebanon, contact AMIDEAST. When registering for the SAT I, applicants should enter AUB’s code, 0902, and ask the Educational Testing Service (ETS) to send the scores directly to the Office of Admissions.

• Note: For Lebanese Applicants: Lebanese applicants to the freshman class are required to present the “permission” to enter the freshman class from the Equivalence Committee of the Lebanese Ministry of Education and are required to take both the SAT I and the SAT II (which can be taken prior to registration for the freshman class or during the freshman year). Students admitted to the freshman class at AUB are not classified as freshman sciences or freshman arts; however, the Equivalence Committee of the Lebanese Ministry of Education specifies that the SAT II tests must be taken by Lebanese applicants to the freshman class according to one of two tracks: a sciences track or an arts track. Students who choose the sciences track should take the SAT II subjects as follows: Mathematics II C (obligatory); plus two tests from biology, chemistry, or physics, and score a total of 2850 in both SAT I and SAT II. Students choosing the arts track should take the SAT II subjects as follows: Mathematics IC (obligatory), two subject tests of the applicant’s choice, and score a total of 2750 in both SAT I and SAT II (please refer to pp. xx, xx for details).

• Note: Non-Lebanese applicants to the freshman class are also required by the Equivalence Committee of the Lebanese Ministry of Education to take both the SAT I and the SAT II (if they wish to get the equivalence of their freshman year to the Lebanese Bacc. at a later date: SAT II is to be taken prior to registration for the freshman class or during the freshman year).

• Photocopy of applicant’s identity card or passport and one recent passport-size color photo.

• A non-refundable application fee of $50 (LL75,000).

### English Language Proficiency Requirement (ELPR)

Prior to registration at the University, undergraduate students admitted to AUB must demonstrate a level of English proficiency consistent with the demands of a program carried out almost exclusively in the English language. This should be done as early as possible (but no later than the end of August) and may be done in any one of the following ways:

• By achieving on the Test of English as a Foreign Language (TOEFL) a minimum score of 573 on the paper and pencil test. Applicants who have taken the computer-based TOEFL should have a score of not less than 230 and those who have taken the Internet-based TOEFL (IBT) should score not less than 88. (Institutional TOEFL scores are not accepted for admission to AUB).

• By achieving a minimum score of 380 on the writing section of the Scholastic Assessment Test (SAT I) for applicants seeking admission at the undergraduate level.

• By passing the AUB English Entrance Examination (EEE) with a minimum score of 500. The EEE is given at AUB by the Office of Institutional Research and Assessment on published dates (check website) at a cost of LL60,000 ($33.33).

• By achieving on the International English Language Testing System (IELTS) a minimum score (overall band) of 5.5.

### Summary

<table>
<thead>
<tr>
<th>Test</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOEFL (computer-based)</td>
<td>230</td>
</tr>
<tr>
<td>TOEFL (paper and pencil)</td>
<td>573</td>
</tr>
<tr>
<td>TOEFL (Internet-based)</td>
<td>88</td>
</tr>
<tr>
<td>EEE</td>
<td>500</td>
</tr>
<tr>
<td>SAT I (writing section)</td>
<td>380</td>
</tr>
<tr>
<td>IELTS</td>
<td>5.5</td>
</tr>
</tbody>
</table>

Upon registering for these tests applicants must specify that results be sent to the AUB Office of Admissions.

- Information and application forms for the TOEFL can be requested from AMIDEAST
- Educational Testing Service
- AMIDEAST
- Rosedale Road, P.O. Box 6155
- Princeton, NJ 08541-6155
- USA
- Website: www.AMIDEAST.org

Applicants who take the TOEFL must use the institutional code number for AUB: 0902, when registering for the test.

- For information pertaining to IELTS applicants should contact the British Council in their respective countries.

### Intensive English Course

The Intensive English Course (IEC), ENGL 100, is intended for undergraduate applicants to AUB who have been selected for admission but have not met the English Language Proficiency Requirement (ELPR). The minimum score for admission to IEC is 375 on the AUB EEE or 490 on the paper-based TOEFL (equivalent to 163 on the computer-based TOEFL [CBT] or 57 on the Internet-based TOEFL [IBT]) or 350 on the Writing section of the SAT I.

Students are placed in one of two levels, ENGL 100A (15 hours) or ENGL 100B (10 hours), based on EEE, TOEFL, and SAT I writing scores. Students with scores of 375–449 on the EEE or 490–500 on the TOEFL (163–173 on the CBT or 57–61 on the IBT) or 350 on SAT I writing go into 100A. Those with scores of 450–499 on the EEE or 503–567 on the TOEFL (177–227 on the CBT or 62–87 on the IBT) or 360–370 on the SAT I writing go into 100B.
Students enrolled in IEC may register for one or two regular university courses (a minimum of six credits), based on placement in ENGL 100A or ENGL 100B, respectively, thus earning credits toward a degree while working toward achieving the level of English needed for carrying a full course load in the regular program. Such courses are restricted to Arabic and mathematics/statistics/computer literacy courses (maximum six credits) in the Faculty of Arts and Sciences, and equivalent courses in statistics in the Faculty of Agricultural and Food Sciences, the School of Business, and the Faculty of Health Sciences.

The length of time required to complete the IEC varies with the linguistic background and performance of the student; it usually ranges between one to two semesters, depending on the level of proficiency at the time of entry. However, a student who fails to pass the IEC by the end of the second semester loses his/her admission to the University.

Regular IEC attendance is expected due to the intensive nature of the course. Continued class absence may result in a recommendation that the student discontinue IEC.

IEC is designed to develop students’ linguistic and communicative competence with special emphasis on developing areas of weakness identified by diagnostic tests. The four skills (reading, writing, listening, and speaking) are integrated. Students are exposed to a wide variety of readings and communicative tasks, which help develop critical thinking. The different stages of the writing process are introduced through a variety of academic and non-academic writing tasks. Lab sessions reinforce grammar, reading speed, vocabulary building, and study skills.

University Preparatory Program

The Program is designed for high-achieving students who have completed the high school/Baccalaureate II/or other secondary school diploma (based on 12 years of schooling starting with Elementary One Class) and who have minimal formal background in English. The 20 hour per week English curriculum stresses an integrated approach to listening, reading, writing, and speaking. Study skills, pronunciation and research skills are incorporated into the Course which is especially tailored to meet student needs. An additional six hours of Mathematics and/or Science is given to ensure that students are prepared for university work.

It is recommended that students live on campus in one of AUB’s all-men or all-women residence halls and participate in a partial on-campus meal plan. Residence is a means of fostering an “immersion approach” to language learning, giving students the opportunity to practice their English language skills outside the classroom.

Besides the residence/boarding experience, students have the opportunity to participate in regular AUB extracurricular activities and a series of field trips planned in conjunction with course work.

Students enrolled in the UPP are accepted into the Freshman Class at AUB after taking an exit exam and fulfilling the requirements set by the Program; students applying to the Sophomore Class need to take the SAT I and go through the normal admission procedure for regular students.

Early Admission

A special early admission plan for fall admission has been designed for students who fulfill the following requirements:

- submission of application form by November 30
- class rank in the top 25 percent in each of the last two years prior to application
- SAT I scores (last session considered is the November session), Mathematical reasoning and Critical Reading as follows:
  - 1,050 for freshman or nursing I
  - 1,100 for sophomore arts (humanities/social sciences except Economics) or nursing II
  - 1,200 for sophomore sciences quantitative thought, natural sciences or business, first year in the Faculties of Agricultural and Food Sciences and Health Sciences, and first year graphic design
  - 1,250 for first year engineering and architecture

Admission decisions are issued by January 30 and admission is granted to the first choice of major in each of the faculties applied for. Admission is conditional upon the student receiving the certificate or diploma (recognized by the Ministry of Education of the originating country) on the basis of which admission was sought and on evidence of having met the English Language Proficiency Requirement (ELPR). Students may not register until these conditions are met. Applicants who apply early but are not granted early admission are automatically placed in the pool of all other applicants to the same level and same faculty/school and are given equal consideration. Decisions are issued by the end of April.

Transfer from Other Universities

Students enrolled at a recognized institution of higher learning may apply for transfer to the sophomore/first year professional level of any of the faculties if they have completed a class equivalent to that of the freshman class of the Faculty of Arts and Sciences at AUB.

Admission in the above mentioned cases is based on the SAT I scores, and school and university grades and applications should be submitted by the deadlines set for Sophomore applications.

Transfer applicants to the junior or senior classes in the Faculty of Arts and Sciences, or to the second or third years within any of the other faculties, need not submit SAT I results. All transfer applicants should consult the appropriate faculty sections of the catalogue, taking particular note of the residence requirement and any particular admission requirements of that faculty. All admitted transfer applicants must submit the most recent transcript of their grades and must meet the English Language Proficiency Requirement (see pp. xx, xx) before registration.

All transfer applicants need to submit the syllabi of the courses for which they expect to receive credit at AUB together with the application form to the Office of Admissions before April 30 if applying for the fall semester. The deadline for receipt of additional/missing syllabi is May 30, after which no equivalence will be given for courses. Transfer applicants for the spring semester are required to submit the syllabi of the courses by November 30.

Courses of suitable academic standard and in recognized academic disciplines that have been satisfactorily completed at other institutions are given transfer credits only (not grades) pending review by the relevant departments and faculties at AUB. Credits alone may be transferred; grades are not transferable.
Credit for University Work Done at the Secondary Level

With approval of the academic departments concerned, freshman credits may be given for high grades on higher level (HL) examinations of the International Baccalaureate, on advanced placement (AP) examinations of the College Board, or on advanced level (A-level) examinations of the General Certificate of Education (GCE).

Admission of Special Students Not Working for a Degree

Persons enrolled at recognized universities other than AUB (or who have completed some course work—at least one semester—at other universities) and who have a recognized secondary school diploma, or the equivalent from a recognized university, may apply to take up to sixteen credits per semester at the undergraduate level in any faculty for the fall semester (by June 30/rolling till one month prior to the beginning of classes) or for the spring semester (by November 30/rolling till one month prior to the beginning of classes), using an application available from the Office of Admissions. Admission is normally offered for one semester, but may be extended to one year depending on course offerings and achievement in courses taken. Courses successfully completed at AUB by a special student not working for a degree may be considered for credit toward an AUB degree if the student subsequently applies for, and is admitted to, degree candidacy through the regular admission process. Students whose native language is English, or who have completed two years of higher education in a university in which English is the primary language of instruction, are exempted from the English Language Proficiency Requirement (see pp. xx, xx) for registration.

Admission as a Visiting (Exchange) Undergraduate Student

This category applies to students who are on study abroad or as part of an exchange program. Applicants must be a student at another recognized institution of higher learning pursuing and have completed at least the sophomore year or its equivalent at their home universities. Applications should be submitted to the Office of Admissions along with the degree and transcript of record by April 1 if applying for fall or October 30, if applying for spring. Applicants should specify their intended course of study during their visiting status. Admission is offered normally for one semester, but may be extended to one year depending on the specific agreement and following the approval of the Unified Admissions Committee. Students whose native language is English, or who have completed two years of higher education in a university in which English is the primary language of instruction, are exempted from the English Language Proficiency Requirement (see pp. xx, xx) for registration.

Admission of University Employees

Employees of the University who meet at least minimum undergraduate admission requirements are given admission by the director of Admissions as part-time students. Such applicants must take the SAT I within the set deadlines and must meet the English Language Proficiency Requirement (see pp. xx, xx) prior to registration. Employees who leave the service of AUB and wish to continue their instruction, are exempted from the English Language Proficiency Requirement (see pp. xx, xx) for registration.

Admission to the Summer Session

Candidates who are not registered at AUB but who wish to join only the summer session must submit their applications before June 1, must hold a recognized secondary school certificate, must be enrolled at a recognized university and must meet the English Language Proficiency Requirement (see pp. xx, xx). The director of admissions evaluates such applications and decides on the admission or non-admission of these applicants. Currently registered students need not complete an application for admission to the summer session.

Admission to Non-Degree and Other Programs

Some faculties and schools offer non-degree and special programs for which admission requirements differ from those of the degree programs. For information about the admission requirements of these programs, refer to the appropriate faculty or school section and to the Continuing Education Center section in this catalogue.

Re-admission/Reactivation

The following factors govern students seeking re-admission:

- Students in good standing who withdrew voluntarily shall be granted re-activation to their former faculty if the period between the end of the semester or session of withdrawal, and the beginning of the semester for which re-admission is sought, is not more than four regular semesters. The reactivation form, available on the Registrar’s Office web page at http://www.aub.edu.lb/registrar/Documents/pdfdoc/reactivation-form.pdf, must be submitted to the Registrar’s office at least one month prior to the beginning of the semester or summer session to which re-admission is sought. Re-admission is then automatic.

- Students who have left the University for more than two years must submit the re-admission request (reactivation form) available on the Registrar’s Office web page at http://www.aub.edu.lb/registrar/Documents/pdfdoc/reactivation-form.pdf) must be submitted to the same office, and must receive re-admission approval from the admissions committee of their faculty/school.

- Students who have left the Faculty of Arts and Sciences while on probation remain on probation for one semester and are required to take 12 or 13 credits. If students do not remove probation at the end of that semester, they are dropped from the faculty.

Deferred Registration of Admitted Students

Undergraduate applicants who are offered admission for the fall semester and who do not register for that semester may be eligible for admission to the spring semester of the same academic year, pending availability of places. A petition should be submitted to the Office of Admissions by December 15 of the same academic year.

Applicants who have been admitted to the fall semester or to the spring semester in two different faculties, and who actually register in one of these, must petition the Office of Admissions by July 31 if they intend to use their second admission for Fall, and December 15 if they intend to use their second admission for Spring. Admission to the second faculty depends on availability of places.
Requirements of Admitted Students for Registration

Students admitted to AUB are required to meet several requirements prior to registering with the University. These include a medical examination, the English Language Proficiency Requirement (ELPR), and evidence of having received the diploma, certificate, degree, or level of university education on the basis of which the student applied and admission was granted. The ELPR may be met in a variety of ways, as outlined under the ELPR section. The diploma/certificate requirement may also be met in a variety of ways, which in turn determines the faculty and level to which a student applies, is admitted, and may register at the University.

Secondary School Certificate/Diploma Requirements for Registration and the Classes to Which They Admit

All applicants to the freshman class must hold a secondary school certificate awarded either by a public school or a private school. The certificate must be recognized by the Lebanese Ministry of Education and by AUB. The University does not recognize secondary diplomas or certificates that are based on fewer than 12 years of schooling, starting with grade one (Elementary I Class). For example, the GCE ordinary level, and one year of the Collège d’Enseignement Général et Professionel (CEGEP) do not qualify for admission to AUB.

Lebanese applicants to the freshman class may have followed a high school diploma program that fulfills the above criteria. In such cases a student must obtain permission from the Equivalence Committee of the Lebanese Ministry of Education allowing them to pursue their higher education on the basis of a foreign (non-Lebanese) program. Applicants are advised to begin the process of securing this permission at least two months prior to the time set for registration at AUB.

This permission can be obtained by applying to the Equivalence Committee of the Ministry of Education.

- Applicants must provide evidence of having lived and studied outside Lebanon for at least two years. Evidence normally consists of proof of legal residence in a foreign country and the official records of grades from two years of secondary education in that country.
- If the years of study abroad took place at the elementary level, then proof of legal residence and school grades should cover three years.
- Applicants must provide a photocopy of their passport or Lebanese ID.
- Applicants must also provide official score reports for the required SAT I and SAT II.

The Equivalence Committee of the Lebanese Ministry of Education requires Lebanese applicants to the freshman class, who have received permission to pursue higher education on the basis of a foreign program, to take the SAT I and three SAT II subject tests. SAT II should be taken prior to registration in the Freshman Class or during the freshman year prior to registration in the Freshman Class. The SAT I is composed of three parts: mathematical reasoning, critical reading, and writing. The Equivalence Committee requires all Lebanese applicants to take the new SAT I (all three parts) and specifies that the SAT II tests be taken in three subjects as follows:

For admission to freshman year (science track)
- Mathematics IIC (obligatory)
- Two tests from biology, chemistry, or physics

For admission to freshman year (arts track)
- Mathematics IC (obligatory)
- Two tests from subjects of the applicant’s choice

At the time of registration for the freshman class, Lebanese students should check with their advisers to ensure that the number of credits and the types of subjects taken during their freshman year are in compliance with the specifications of the Equivalence Committee of the Lebanese Ministry of Education.

The total score of the combined SAT I mathematical reasoning, critical reading, and writing, together with the scores on the three SAT II subject tests, must be at least 2850 for the science track and at least 2750 for the arts track.

Upon completion of the freshman class at AUB, Lebanese students who have secured this permission are entitled to have their freshman class equated to the Lebanese Baccalaureate by the Equivalence Committee of the Ministry of Education. Students must provide evidence of having received the Lebanese Baccalaureate, or its equivalent, for promotion to the sophomore class or equivalent classes in other faculties/schools.

All applicants for admission to the sophomore class, or to the equivalent classes in other faculties, should hold the Lebanese Baccalaureate, or its equivalent, as recognized by the Lebanese Ministry of Education and by the University.

Candidates admitted to the University as non-Lebanese are not permitted to change their nationality to Lebanese in the records of the University, unless the requirements for admission of Lebanese students were fulfilled at the time of admission to the University.

Admitting Certificates and the Classes to Which They Admit

Lebanese Baccalaureates

There are four types of Lebanese baccalaureates: literature and humanities, sociology and economics, general sciences, and life sciences. There is also a Technical Baccalaureate. For the classes and majors to which the four Lebanese baccalaureates permit admittance, see pp. xx-xx. The Technical Baccalaureate permits admittance to programs that are similar in nature to the area of concentration of the particular technical baccalaureate.
Certificates Issued by Governments

Other government secondary certificates entitle their holders to apply to the freshman class in the Faculty of Arts and Sciences, or to the sophomore or equivalent classes in the other faculties.

Some government certificates are divided into categories of literary and scientific certificates. A literary certificate generally qualifies for consideration of admission to arts or business. However, students with a literary certificate may apply to a science major. Those students are given additional prerequisite courses required for the science major. A scientific certificate qualifies for consideration of admission to all majors (see chart on pp. xx-xx).

Some systems of education do not distinguish in their secondary certificates among literary, scientific, or other types of certificates, but indicate the subjects passed. The applications of holders of such certificates are evaluated on a case by case basis by the Unified Admissions Committee. The University requires certain certificates to show passes with credit standard. Certificates that do not meet this standard are not considered.

Commercial, Agricultural, and Vocational Secondary Certificates

These certificates are generally not considered for admission to AUB. If, however, the issuing government recognizes the certificate to be equivalent to the official (governmental) secondary school certificate, a student will be eligible for admission consideration. The class and programs to which such certificates admit depends on the area of concentration of the certificate.

Informal Education Preparation

Requirements of formal education for admission to the freshman class may be waived for applicants who have passed their 25th birthday. Such applicants must, however, meet the specific requirements established by the university committee on admissions.
Certificate and Class Chart

The following chart provides information about the types of certificates and the classes to which such applicants may be admitted. In all cases the SAT I (mathematical reasoning, verbal reasoning, and writing) must be taken by the deadline, and the English Language Proficiency Requirement must be met.

The abbreviations used in the chart are as follows:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agri</td>
<td>Agricultural and Food Sciences</td>
</tr>
<tr>
<td>Arch</td>
<td>Architecture</td>
</tr>
<tr>
<td>Biol</td>
<td>Biology</td>
</tr>
<tr>
<td>Chem</td>
<td>Chemistry</td>
</tr>
<tr>
<td>CmpS</td>
<td>Computer Science</td>
</tr>
<tr>
<td>Eng’g</td>
<td>Engineering</td>
</tr>
<tr>
<td>Eng</td>
<td>English</td>
</tr>
<tr>
<td>FAS</td>
<td>Faculty of Arts and Sciences</td>
</tr>
<tr>
<td>Fr</td>
<td>Freshman</td>
</tr>
<tr>
<td>Geol</td>
<td>Geology</td>
</tr>
<tr>
<td>GD</td>
<td>Graphic Design</td>
</tr>
<tr>
<td>HS</td>
<td>Health Sciences</td>
</tr>
<tr>
<td>Math</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Nurs</td>
<td>Nursing</td>
</tr>
<tr>
<td>PtSt</td>
<td>Petroleum Studies</td>
</tr>
<tr>
<td>Phys</td>
<td>Physics</td>
</tr>
<tr>
<td>SB</td>
<td>School of Business</td>
</tr>
<tr>
<td>Soph</td>
<td>Sophomore</td>
</tr>
<tr>
<td>Stat</td>
<td>Statistic</td>
</tr>
</tbody>
</table>

Certificate and Class and department to which the certificate permits admittance

<table>
<thead>
<tr>
<th>Certificate Type</th>
<th>Class and department</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School Diploma or Secondary School Leaving Certificate, based on at least twelve years of schooling starting with Elementary I Class Students with high grades on certain advanced placement (AP) examinations of the College Board may apply for freshman course credit in those subjects (see p.xx)</td>
<td>Freshman or Nursing I</td>
</tr>
<tr>
<td>Government Secondary Certificates (literary or scientific), including the German Abitur and the Diplome d’Etudes Collegiales (DEC) based on two years of the CEGEP Program</td>
<td>Freshman or Nursing I</td>
</tr>
</tbody>
</table>

Students who successfully complete the freshman class are promoted to the sophomore class in the Faculty of Arts and Sciences, or may seek admission to the equivalent classes in other faculties. These equivalent classes are the first year in the Faculty of Agricultural and Food Sciences, the first year in the Suliman S. Olayan School of Business, the first year in the Faculty of Engineering and Architecture, the first year in the Faculty of Health Sciences, and the second year in the Rafic Hariri School of Nursing. Students admitted to the freshman class are urged to consult with their advisers to familiarize themselves with the requirements for admission to the majors offered by the various faculties of the University.

1 Please note than the abbreviations listed above are NOT the course codes used in the course listings or descriptions, but rather a guideline for use in the following charts.
Certificate and Class Chart

Government Secondary Certificates also qualify the student for admission to the sophomore class in the Faculty of Arts and Sciences, and to equivalent classes in the other faculties, as follows:

<table>
<thead>
<tr>
<th>Government Secondary Certificate</th>
<th>Class and department to which the certificate permits admittance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literary</td>
<td>Sophomore majors in FAS, SB, NURS II, AGRI I, GD I, ENGG I, ARCH I, or HS¹</td>
</tr>
<tr>
<td>Scientific</td>
<td>All sophomore majors in the Faculty of Arts and Sciences, and equivalent classes in other faculties</td>
</tr>
<tr>
<td>Lebanese or French Baccalaureate (Literature and Humanities; Sociology and Economics)</td>
<td>All sophomore majors in FAS, SB², NURS II, AGRI I, GD I, ENGG I, ARCH I, or HS¹</td>
</tr>
<tr>
<td>Lebanese or French Baccalaureate (General Sciences, Life Sciences)</td>
<td>All sophomore majors in the Faculty of Arts and Sciences, and equivalent classes in other faculties</td>
</tr>
</tbody>
</table>

General Certificate of Education (GCE) and Oxford or Cambridge Higher Certificate

- A total of five different subjects are required, at least two of which are at advanced level. (Advanced Subsidiary level subjects may replace the 2 required A levels depending on the program applied for).
- Arabic at advanced level is not counted as one of the two required subjects at Advanced Level. It is also advised to take an extra subject if one of the subjects is a language.
- The GCE advanced supplementary subjects may be recognized for the purpose of admission upon the approval of the department concerned. This department may require extra remedial courses to replace lacking subjects.
- A GCE certificate based only on O-level subjects does not permit admittance to the University at any level.
- Holders of the GCE certificate with subjects as specified above may apply for admission to the freshman class. If they choose to do so, they may be given freshman credits for courses equivalent to A-level subjects in which they received high scores.
- Holders of the GCE certificate as specified above may apply for admission to the sophomore class in FAS, and to the equivalent classes in other faculties in the manner indicated below:

Certificate (GCE Continued) Departmental Requirements

To major in the following departments, students must take the following subjects at the Advanced Level (AL), or take the freshman equivalents:

<table>
<thead>
<tr>
<th>Major</th>
<th>Required Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL</td>
<td>MATH and BIOL</td>
</tr>
<tr>
<td>CHEM</td>
<td>MATH and CHEM</td>
</tr>
<tr>
<td>PHYS</td>
<td>MATH and PHYS</td>
</tr>
<tr>
<td>CMPS</td>
<td>MATH and PHYS</td>
</tr>
<tr>
<td>GEOL, MATH, PTST, or STAT</td>
<td>MATH and one from BIOL, CHEM, or PHYS</td>
</tr>
</tbody>
</table>

Applicants who lack one of the required AL subjects may be required to take remedial course(s) in the missing subject.

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2 Students who hold the Lebanese or French Baccalaureate (literature and humanities or sociology and economics) or a government secondary certificate, or a certificate or diploma considered by the University to be equivalent to such Baccalaureates (literature and humanities or sociology and economics) may be required to take additional freshman level courses in mathematics and sciences pertaining to their majors in FAS (nearly sciences and economics) or OBD.
3 Students who hold the Lebanese or French Baccalaureate (literature and humanities or sociology and economics) or a government secondary school certificate, or a certificate or diploma considered by the University to be equivalent to the Lebanese Baccalaureate, may seek admission to any of the four engineering majors or to architecture after they have completed a minimum of six credit of freshman level mathematics and a minimum of nine credits of freshman level natural sciences. This minimum credit requirement is waived for students who hold the Lebanese Baccalaureate in sociology and economics and are seeking admission to architecture if they have completed their Première year (old Baccalaureate Part 1) in Sciences.
4 Students who hold the Lebanese or French Baccalaureate (literature and humanities or sociology and economics) or a government secondary school certificate, or a certificate or diploma considered by the University to be equivalent to the Lebanese Baccalaureate, may seek admission to the first year in HS provided they take the following additional courses: CHEM 200 and MATH 201 for literature and humanities students; only CHEM 200 for sociology and economics students.
5 Although GD I is in the Faculty of Engineering and Architecture, admission to this major does not require scientific background.
International Baccalaureate Diploma (IB)

- Six different subjects are required: three at Higher Level (HL) and three at Standard Level (SL)
- For admission to the freshman class or Nursing I, a combination of three HL and three SL are required that includes one of the following:
  - Mathematical Studies
  - Math SL, or Math HL

The applicant may choose admission to the freshman class. Freshman credits may be given for courses equivalent to those earned with the diploma. Holders of the IB Diploma may apply for admission to the sophomore class in FAS, and to equivalent classes in the other faculties in the manner indicated below:

<table>
<thead>
<tr>
<th>Certificate</th>
<th>Class and department to which the certificate permits admittance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• For those who followed the literary track</td>
<td>• All sophomore majors(^2) in FAS, SB(^2), NURS II, AGRI I(^3), GD I (^4), ENG'G I(^1), ARCH I(^1), or HS(^5)</td>
</tr>
<tr>
<td>• For those who followed the scientific track</td>
<td>• All sophomore majors in FAS, SB, GD I, or NURS II</td>
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</tbody>
</table>

### Diploma Subjects

<table>
<thead>
<tr>
<th>Major</th>
<th>BIOL at HL, plus MATH SL or MATH HL</th>
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</thead>
<tbody>
<tr>
<td>BIOL</td>
<td>BIOL</td>
</tr>
<tr>
<td></td>
<td>CHEM at HL, plus MATH SL or MATH HL</td>
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<tr>
<td>CHEM</td>
<td>CHEM</td>
</tr>
<tr>
<td></td>
<td>PHYS at HL, plus MATH SL or MATH HL</td>
</tr>
<tr>
<td>PHYS</td>
<td>PHYS or CMPS</td>
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<tr>
<td></td>
<td>One from BIOL, CHEM, or PHYS, plus MATH SL or MATH HL</td>
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<td>CMPS, GEOL, MATH, or STAT</td>
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<tr>
<td></td>
<td>PHYS at HL plus MATH HL</td>
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<tr>
<td></td>
<td>ENG'G I</td>
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<tr>
<td></td>
<td>PHYS at SL, plus MATH SL</td>
</tr>
<tr>
<td></td>
<td>ARCH I</td>
</tr>
<tr>
<td></td>
<td>CHEM at HL, plus MATH SL or MATH HL</td>
</tr>
<tr>
<td></td>
<td>AGRI I, HS I, or NURS II</td>
</tr>
</tbody>
</table>

Applicants who lack one of the required HL subjects may be required to take remedial course(s) in the missing subject.

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\(^2\) Students who hold the Lebanese or French Baccalaureate (literature and humanities or sociology and economics) or a government secondary certificate, or a certificate or diploma considered by the University to be equivalent to such Baccalaureates (literature and humanities or sociology and economics) may be required to take additional freshman level courses in mathematics and sciences pertaining to their majors in FAS (namely sciences and economics) or OSB.

\(^3\) Students who hold the Lebanese or French Baccalaureate (literature and humanities or sociology and economics) or a government secondary school certificate, or a certificate or diploma considered by the University to be equivalent to the Lebanese Baccalaureate, may seek admission to any of the four engineering majors or to architecture after they have completed a minimum of six credit of freshman level mathematics and a minimum of nine credits of freshmen level natural sciences. This minimum credit requirement is waived for students who hold the Lebanese Baccalaureate in sociology and economics and are seeking admission to architecture if they have completed their Premiere year (old Bacalaureate Part 1) in Sciences.

\(^4\) Students who hold the Lebanese or French Baccalaureate (literature and humanities or sociology and economics) or a government secondary school certificate, or a certificate or diploma considered by the University to be equivalent to the Lebanese Baccalaureate, may seek admission to the first year in HS provided they take the following additional courses: CHEM 200 and MATH 203 for literature and humanities students; only CHEM 200 for sociology and economics students.

\(^5\) Although GD I is in the Faculty of Engineering and Architecture, admission to this major does not require scientific background.
General University
Academic Information

Academic Advisers

Each student has an academic adviser who must approve the student’s schedule each semester. Freshmen are assigned an adviser from a group of advisers appointed by the dean of the Faculty of Arts and Sciences. The adviser continues advising the student until s/he has been accepted into a major. Names of advisees and their respective advisers are available through the Student Information System (SIS).

Attendance
(Also see Withdrawal from Courses.)

Classes and Laboratories

• Students are expected to attend all classes, laboratories, or required fieldwork. All missed laboratory or fieldwork must be made up. A student is responsible for the work that is done, and for any announcements that are made during his/her absence.

• Students who, during a semester, miss more than one-fifth of the sessions of any course in the first ten weeks of the semester (five weeks in the case of the summer term) are dropped from the course if the faculty member has stated in the syllabus that attendance will be taken.

• Students who withdraw or are forced to drop a course receive a grade of W.

• A student cannot withdraw, or be withdrawn, from a course after the announced deadline unless approved by the appropriate faculty committee.

• Without prior approval of the appropriate faculty committee, a student cannot withdraw, or be forced to withdraw, from a course at any time if this results in the student being registered for fewer than 12 credits.

Examinations and Quizzes

Students who miss an announced examination or quiz must present an excuse considered valid by the instructor of the course. The course instructor should then require the student to take a make-up examination.

Medical reports and/or qualified professional opinions issued by an AUB employee, AUH doctor, or by the University Health Services are accepted. Should there be a question about the validity of any excuse presented by the student, the matter should be referred to the appropriate faculty committee.
Categories of Students

Full-Time Students
To be considered full-time a student must carry a minimum load of 12 credits per semester. For the required number of credits for summer full-time, refer to the summer session section for each faculty.

Special Students
The category of special students is restricted to the following students:
- Those who are not working for a degree. Such students should be accepted by the University Admissions Committee.
- Those who have an undergraduate degree from AUB but who want to work for another undergraduate degree. Such students need permission from the appropriate faculty committee and must carry a minimum of 12 credits per semester.

Part-time Students
The category of part-time students is restricted to the following students:
- AUB staff members who are working toward a degree.
- Those who need fewer than 12 credits to complete work for an undergraduate degree.
- Those who are granted permission by the appropriate faculty committee for one of the following reasons:
  - health
  - family problems that may influence academic performance of the student

Auditing Courses
Those who wish to attend individual classes without receiving credit may apply as auditors. Applications to audit courses are available at the registrar’s office.

The applicant should:
- secure eligibility from the admissions office. An applicant is eligible to audit a course if s/he meets the following requirements:
  (a) Bacc. II, or equivalent, to audit an undergraduate course
  (b) Bachelor’s degree, or equivalent, from a recognized academic institution to audit a graduate course
- secure approval from the instructor of the course.
- receive approval from the dean of the faculty/school offering the course.
- pay the tuition charge at the Comptroller's Office (student accounts section).
- register as an auditor at the Office of the Registrar.
Applicants are not eligible to audit laboratory, studio, or seminar courses.

Course Loads
To be considered full-time, a student must carry a minimum load of 12 credits per semester. (See the required number of credits for summer full-time status under summer term for each faculty.) If a full-time student wishes, or is forced, to reduce his/her load to fewer than 12 credits, the issue must first be referred to the appropriate faculty committee.

Students can normally register for up to 17 credits per semester and nine credits during the summer term. Students in the following categories must petition the appropriate faculty committee but are, however, normally granted permission to register for more than 17 credits:
- Freshman students intending to go into medicine or engineering, and who have an average of at least 80 in the first semester, may take an additional course in the second semester.
- Junior and senior (third and fourth year in the professional schools) students who have completed their English communication skills requirements at the level required by their major departments may register for a maximum of 18 credits per semester (a maximum of 19 credits per regular semester in FEA).
- If the program requires that students register for more than 17 credits in a particular semester.

In all other cases, students who wish to register for more than 17 credits must petition the appropriate faculty committee for permission to do so. Their requests are handled on a case-by-case basis.

The credit load in a regular term of a student who continues to be on probation beyond one semester or is placed on three non consecutive probations shall neither be fewer than 12 nor more than 13 credit hours.

Correct Use of Language
Facility in clear, correct, and responsible use of language is a basic requirement for graduation.

Papers (term papers, essays, or examinations) that are ill-written, no matter what the course, may receive a lower grade for the quality of the writing alone.

The final grade in any course may be lowered for consistently substandard written or oral expression; in extreme cases a failing grade may be given for this reason alone.

See information on the English Language Proficiency Requirement (ELPR) on pp. xx, xx of this catalogue.
Plagiarism

Students who fail to credit properly ideas or materials taken from another commit plagiarism. Putting your name on a piece of work—any part of which is not yours—constitutes plagiarism, unless that piece is clearly marked and the work from which you have borrowed is fully identified. Plagiarism is a violation of the University's academic regulations and is subject to disciplinary action.

All AUB students are required to complete a plagiarism tutorial and pass a plagiarism test during the first semester they join the university. You can reach the "Plagiarism Tutorial and Test" by following this path: AUB Homepage > A-Z > Academic Computing Centre > Plagiarism Tutorial and Test.

You can take the test as many times as necessary. When you achieve 100 percent on the test, a notification will be generated and saved in your files in the Office of the Registrar. This notification will become part of your permanent record as evidence of your understanding of plagiarism and how to recognize it. Failure to pass the plagiarism test will prevent your registration for the next semester at AUB.

Dean’s Honor List

To be placed on the dean's honor list at the end of the semester, a student must

• be carrying at least 12 credits
• not be on probation
• have passed all courses and attained an overall average of 85 or be ranked in the top 10 percent of the class and have an overall average of 80
• not have been subjected to any disciplinary action within the University during the semester
• be deemed worthy by the dean to be on the honor list

Directed Study

(Faculty of Arts and Sciences only)

A student with an average of at least 85 in his/her major at the beginning of the senior year may elect to pursue a course of directed study. Students with averages below 85 may be admitted to directed study at the discretion of the department.

Students who elect a course of directed study choose their courses in consultation with a faculty member selected by the student, with the department's approval. These courses may include a three- or six-credit course directed by the faculty member. This course may consist of independent research, original creative compositions, or directed reading, and include the presentation of a report or thesis.

Disclosure of Student Records

The University may disclose routine information without prior written consent from the student. This information is of a directory nature and includes only the following items: student’s name, degrees received, major field(s) of study, awards received, and participation in officially recognized activities and sports.

With the exceptions specified below, the University releases other information, including information from academic records, only upon written consent from the student. This consent must specify the information that is to be disclosed, state the purpose of the disclosure, and provide the names and addresses of the individuals or institutions to whom disclosure is to be made. However, the University may disclose information, including information on academic records, without prior written consent of the student:

• upon the request of officers of other educational institutions where the student seeks to enroll (in such cases the student is given, upon his/her request, a copy of the information sent to the institution)
• as necessary to academic officers, academic advisers, and faculty members within the University
• to parents of a dependent student
• in compliance with a judicial order
• to financial aid services in connection with financial aid for which the student has applied or which the student has received

General Education Requirements

AUB is committed to offering its students a broad undergraduate liberal arts education that enables them to acquire the analytical skills and habits of life-long learning that they will need to compete successfully in the twenty-first century. The General Education distribution requirements are intended to expose students to a range of intellectual experiences during their time at AUB. We want to give our students the opportunity to make choices and to question and test what they believe are their career goals and their intellectual interests.

In addition to courses in their academic majors and the opportunity to take minor concentrations in specific fields, all AUB students must take a minimum of 33-36 credits of general education requirements distributed in the following fields:

• 3-6 credits in English Communication Skills through English 204 (English 206 in FEA).
• 3 credits in Arabic Communication Skills (except those formally exempted)
• 6 credits in Natural Science.
• 12 credits in Humanities.
• 6 credits in Social Science.
• 3 credits in Quantitative Thought.

We believe that a student who has chosen to follow a course of study at AUB leading to a degree in a professional field such as engineering should be exposed to the humanities and social sciences. By the same token, a student who plans to major in history should have the opportunity to take science courses and to work in a lab.
While being exposed to various fields of knowledge, we also want our students to have the opportunity to experience different modes of learning (lectures, seminars, labs, and independent research projects). Different modes of analysis are designed to enhance students’ verbal and interactive skills (seminars), writing and analytic skills (research projects), and hands-on experimental skills (laboratories).

These distribution requirements may be met by either required or elective courses.

Humanities and Social Sciences courses are divided into two lists: List I and List II within each domain. Students are required to select their courses as follows:

- Two Humanities courses from Humanity List I. (FAS, OSB, and SON Students are required to select CVSP courses).
- Two Humanities courses from either Humanities lists I and II.
- One Social Science course from Social Sciences List I.
- One Social Science course from either Social Sciences lists.

In addition, no more than two courses from the student’s major may fulfill the Humanities requirement, no more than one course from the student’s major may fulfill the Social Science requirement, and no more than one course from the student’s major may fulfill the Natural Science requirement.

Students who are exempted from Arabic are required to take a Humanity or a Language course instead, unless their Faculty requires otherwise. Students who cannot fulfill the Arabic Communications Skills requirement will be asked to sit for an Arabic Placement Test. According to the result, they may take ARAB201A in replacement to the Arabic Communications Skills requirement.

FAS, OSB, and SON require that a minimum of six credits in Humanities must be taken from CVSP courses 201-208. FAS, OSB, and SON Students must complete one course from each of the two CVSP sequences; that is, one course from Sequence I followed by one course from Sequence II.

The list of approved General Education courses will be updated regularly on the Registrar’s Office website.

**Arabic Communication Skills Courses:**
ARAB 201B, ARAB 230, ARAB 235, ARAB 236, ARAB 238, ARAB 249

**English Communication Skills Courses**
ENGL 203, ENGL 204, ENGL 206, ENGL 208

**Humanities**

**List I:**
ARAB: ARAB 211, ARAB 215, ARAB 218, ARAB 221, ARAB 223, ARAB 225, ARAB 226, ARAB 231, ARAB 234, ARAB 235, ARAB 236, ARAB 238, ARAB 239, ARAB 240, ARAB 243, ARAB 247, ARAB 251
ARCH: ARCH 121, ARCH 122, ARCH 123, ARCH 124
AROL: AROL 201, AROL 212, AROL 214, AROL 217, AROL 219, AROL 222, AROL 225, AROL 226, AROL 231, AROL 234, AROL 235, AROL 236, AROL 238, AROL 239
CVSP Sequence I: CVSP 201, CVSP 202, CVSP 205, CVSP 207A, CVSP 207C, CVSP 207E, CVSP 207H, CVSP 295L

**CVSP Sequence II:**
CVSP 203, CVSP 204, CVSP 208C, CVSP 208D, CVSP 208F, CVSP 208G, CVSP 208H, CVSP 208J

CVSP: CVSP 212, CVSP 215, CVSP 216, CVSP 217, CVSP 250, CVSP 251
ENGL: ENGL 201, ENGL 207, ENGL 210, ENGL 216, ENGL 219, ENGL 221, ENGL 224, ENGL 225, ENGL 226, ENGL 227, ENGL 236, ENGL 244D, ENGL 242, ENGL 243, ENGL 246, ENGL 249, ENGL 251
PHIL: PHIL 201, PHIL 205, PHIL 210, PHIL 213, PHIL 214, PHIL 217, PHIL 218, PHIL 222, PHIL 223, PHIL 230, PHIL 231, PHIL 232, PHIL 249
OTHERS: PSPA 210, SOAN 207, SOAN 225, SOAN 238A

**List II:**
AMST: AMST 276I
ARAB: ARAB 216, ARAB 231, ARAB 236, ARAB 246
AMST: AMST 211, AROL 215, AROL 216, AROL 223, AROL 224, AROL 235, AROL 235F, AROL 235L
ENGL: ENGL 205, ENGL 211, ENGL 212, ENGL 213, ENGL 214, ENGL 215, ENGL 218, ENGL 222, ENGL 223, ENGL 229, ENGL 233, ENGL 237, ENGL 244S, ENGL 248A, ENGL 250, ENGL 252, ENGL 253
FAAH: FAAH 235, FAAH 240, FAAH 241, FAAH 244, FAAH 245, FAAH 261
HIST: HIST 260, HIST 261
PHIL: PHIL 206, PHIL 209, PHIL 216, PHIL 221, PHIL 251, PHIL 262C
OTHERS: BUSS 215, EDUC 228, EDUC 229, EDUC 290C, ENGM 504, PSPA 216, PSPA 217, SOAN 217

**Social Sciences**

**List I:**
ECON: ECON 211, ECON 212
EDUC: EDUC 215, EDUC 223, EDUC 290K
PSPA: PSPA 202, PSPA 212, PSPA 218, PSPA 222, PSPA 238
PSYC: PSYC 202
SOAN: SOAN 201, SOAN 203, SOAN 204, SOAN 205, SOAN 206, SOAN 210, SOAN 213, SOAN 228, SOAN 229, SOAN 230, SOAN 231, SOAN 232, SOAN 233, SOAN 236, SOAN 240, SOAN 241, SOAN 243, SOAN 290I, SOAN 290L
OTHERS: ARCH 331, AGSC 212, AGSC 213, GRDS 231, HBED/HPCH 200, HBED/HPCH 201, MNGT 215, ENGL 230, ENGL 235

**List II:**
ECON: ECON 203
EDUC: EDUC 218, EDUC 230
PSPA: PSPA 201, PSPA 213, PSPA 221
SOAN: SOAN 207, SOAN 232, SOAN 234, SOAN 235, SOAN 242, SOAN 245
OTHERS: HBED/HPCH 203, HMPD 204, HMPD 251

**Natural Sciences**
BIOL: BIOL 200, BIOL 201, BIOL 209, BIOL 210, BIOL 290EE
CHEM: CHEM 200, CHEM 201, CHEM 202, CHEM 205, CHEM 208, CHEM 209
GEOG: GEOG 201, GEOG 205
PHYS: PHYS 200, PHYS 206, PHYS 205, PHYS 210, PHYS 211, PHYS 212
OTHERS: ARCH 151, AVSC 224, BIOC 246, ENHL 220, PHYL 246
Quantitative Thought

CMPS: CMPS 200, CMPS 206, CMPS 209
MATH: MATH 201, MATH 203, MATH 204, MATH 211, MATH 218
OTHERS: ECE 230, EPHD 203, EPHD 213, NURS 203, PHIL 211, PHIL 220, STAT 201, STAT 210, EDUC 271

English Proficiency

AUB students must demonstrate English language proficiency in order to graduate. Grades on papers (term papers, essays, or examinations), or a final course grade, may be lowered for the quality of the writing alone.

The Intensive English Course (IEC), ENGL 100, is intended for students who have been admitted but have not met the English Language Proficiency Requirement (ELPR). The minimum score for admission to IEC is 375 on the AUB EEE or 490 on the paper-based TOEFL (equivalent to 163 on the computer-based TOEFL [CBT] or 57 on the Internet-based TOEFL [IBT]) or 350 on the Writing section of the SAT I.

Students are placed in either ENGL 100A (15 hours) or ENGL 100B (10 hours) based on their EEE and TOEFL and SAT I Writing scores. Students with scores of 375–449 on the EEE or 490–500 on the TOEFL (163–173 on the CBT or 57–61 on the IBT) or 350 on SAT I writing go into 100A. Those with scores of 450–499 on the EEE or 503–567 on the TOEFL (177–227 on the CBT or 62–87 on the IBT or 360–370 on the SAT I writing) go into 100B.

Students enrolled in the IEC may register for one or two regular university courses (up to a maximum of six credits) depending on whether they are placed in ENGL 100A or ENGL 100B, respectively, thus earning credits toward a degree while working toward achieving the level of English needed in order to carry a full load of courses in the regular program. Such courses are restricted to Arabic and mathematics/statistics/computer literacy courses (maximum six credits) in the Faculty of Arts and Sciences, and equivalent courses in mathematics and statistics in the Faculty of Agricultural and Food Sciences, the School of Business, and the Faculty of Health Sciences.

Students usually complete the IEC in one or two semesters. A student who fails to pass IEC by the end of the second semester loses his/her admission to the University. A student in the IEC program is subject to the same attendance requirements as all other AUB students.

ENGL 100A Intensive English Course/ENGL 100B Intensive English Course. These zero-credit courses are offered each semester. The courses are designed to help students develop linguistic and communication skills with a special emphasis on strengthening areas of particular weakness that are identified by diagnostic tests. The four skills (reading, writing, listening, and speaking) are integrated. Students are exposed to a wide variety of assignments to assist them in developing critical thinking skills. Laboratory sessions reinforce grammar, reading speed, vocabulary building, and study skills.

Grading System

In the faculties of Agricultural and Food Sciences, Arts and Sciences, Engineering and Architecture, Health Sciences, School of Business, and Rafic Hariri School of Nursing, the following grading system is used.

<table>
<thead>
<tr>
<th>Cumulative Average</th>
<th>GPA</th>
<th>Cumulative Average</th>
<th>GPA</th>
<th>Cumulative Average</th>
<th>GPA</th>
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</table>

I: Incomplete
P: Pass
PR: In Progress
W: Withdraw
F: Fail

All final grades are expressed in multiples of one.

Graduation

Requirements

Students are strongly advised to prepare their registration schedules with their advisers to ensure graduation requirements are fulfilled. Failure to do so may mean that a student has to spend an additional semester, or more, to complete graduation requirements.

Commencement Exercises

Commencement exercises are held at the end of the academic year. Students who graduate in October or February may participate in the commencement exercises. Graduates of October or graduates of February who wish to participate in the July commencement exercises should notify the Office of the Registrar of their intention by completing Form CE1 and submitting it to the Office of the Registrar no later than June 10.

Students who graduate in June have places reserved for them in the June commencement exercises. July graduates who opt not to participate in the commencement exercises should complete Form CE2 and submit it to the Office of the Registrar no later than June 10. July graduates who do not receive their degrees during the commencement exercises and who have submitted Form CE2 within the above-indicated deadline can receive their diplomas at the Office of the Registrar at a date subsequent to commencement.
Names on Diplomas and Degrees

Names on diplomas and degrees are spelled exactly as they appear on passports or identity cards. According to the Lebanese Ministry of Education, names of Lebanese students should include first name, father’s name, and family name. Names on AUB diplomas and degrees appear both in Arabic and English. If a name on a passport or an identity card does not appear in both languages, then the name that does not appear in one language will be spelled on AUB diplomas and degrees according to the personal preference of the student.

Graduation with Distinction and High Distinction

To graduate with distinction a student must

- have an average of 85 or higher in all work of his/her final academic semesters, including summers: (two summer sessions are equivalent to one semester) during which 60 credits or more (65 credits or more in the Faculty of Health Sciences) have been completed at AUB
- be recommended by his/her department for distinction

To graduate with high distinction a student must

- have an average of 90 or higher in all work of his/her final academic semesters, including summers: (two summer sessions are equivalent to one semester) during which 60 credits or more (65 credits or more in the Faculty of Health Sciences) have been completed at AUB
- must be recommended by his/her department for high distinction

For purposes of graduation with distinction or high distinction, when a student repeats a course, all grades enter into the computation of the student's overall average.

Dual Degree

Students may, upon approval of the Faculty concerned, complete the requirements for a second degree while registered in another Faculty at AUB. In such a case, a student will be granted two degrees at the same time of graduation. If tuition differs, students will pay the higher of the tuitions.

Information about deadlines and applications are available on the following link: http://www.aub.edu.lb/REGISTRAR/Pages/forms.aspx

Change of Grade Policy

After grades are posted on the AUB Student Information System [AUBSIS], a change of grade is not allowed unless a demonstrable mistake was made in the correction of the final examination or in the calculation of the grade. In such a case, the instructor must complete a Change of Grade form and submit it to the chairperson of the department in which the course is offered, with the supporting evidence for the mistake warranting this change of grade. If the chairperson of the department approves the change of grade, s/he will sign the form and transmit it for final approval to the Dean (all Faculties except FAS) or to the FAS Student Academic Affairs Committee if the course is offered in FAS.

A student has the right to access his corrected exams including final exams and request review of his exams in case mistakes have been made in calculating grades or in corrections. The request by the student of the course instructor to review the course grade should take place within one week from the date of the posting of course grades. In case the review by the instructor results in a change of course grade, the instructor shall complete the Change of Grade form in accordance with the procedure outlined by the Faculty in which the course is offered.

If a dispute regarding the change of a grade continues, the student should discuss the issue with the chair of the department. If the student is still not satisfied, s/he may submit a petition to the Faculty Academic and Curriculum Committee, requesting further consideration.

Incompletes

A student who receives an incomplete grade for a course must petition or submit a valid reason for missing the work to the appropriate faculty committee within two weeks from the date of the scheduled final exam for permission to complete the course. Coursework must be completed within one month of the start of the next regular semester. In exceptional circumstances, the appropriate faculty committee may decide to give the student additional time to complete a course. In the Faculty of Engineering and Architecture a student who received incomplete grades will not be permitted to register for more than 16 credits.

Incomplete course work is reported as an “I”. Normally, “I” is followed by a numerical grade reflecting the evaluation of the student available at the end of the semester. This evaluation is based on a grade of zero on all missed work and is reported in units of five. If the work is not completed within the period specified, the “I” is dropped and the numerical grade becomes the final grade.

Majorless Status

(Faculty of Arts and Sciences)

A student in good academic standing, who has not yet chosen a major or is in the process of selecting a new major, is given the status of majorless. A student who is asked, or opts, to change his/her status to majorless must communicate this decision to the student affairs officer in the Office of the Dean. A student should be admitted to a major by the end of their junior year.

Medical Record

An entrance medical record form is sent to all admitted students who have committed to enroll in AUB. It is to be completed by the student’s family physician and mailed as soon as possible, and before the period of registration, in the pre-addressed envelope provided by AUB. Alternatively, the completed medical record form can be delivered by hand to the Office of Admissions.

All new students must have a tuberculin test at the time of the preliminary medical check, held during registration, and must report 48 hours later for a check on the test. Upon clearing the medical test, the student is issued a clearance slip to proceed with registration. Students are not registered unless they obtain this clearance slip. Students who report late for the medical check are charged a late fee.
Medical checks may be completed in advance of registration provided that the student reports to the University Health Services on campus, and brings the letter of acceptance and the entrance medical record.

Returning students are not required to complete any medical forms. Important changes in the student’s medical condition and/or updating immunizations should be reported to a university physician by appointment at the Health Services Center early in the first semester. Information is kept confidential.

National Social Security Fund (NSSF) Medical Branch

The Health Insurance Plan (HIP) provides medical and hospital coverage to the AUB community, namely academic and non-academic staff, retirees, students, and IC staff and their families.

- Health insurance coverage is mandatory for all students, at 2nd class health care coverage, during their years of study at AUB; therefore, a student, new or continuing, registered for at least 6 credit hours, is automatically enrolled under the Health Insurance Plan (HIP). However, a student may be exempted from enrolling in HIP if s/he presents proof that s/he is covered by another healthcare insurance provider.

- HIP members are required to use exclusively the medical services of the AUB Medical Center (AUBMC). HIP coverage to students is limited to medical care inside Lebanon only.

- ‘Student’ means a person registered for a course of study at the University, whether working or not working for a degree, on a full-time or part-time basis. Auditors are not considered students.

Graduate students registered for a thesis are eligible to continue HIP coverage for a period of two consecutive years only.

- Students who register at the beginning of the first semester are covered by HIP for twelve months, provided they do not graduate, withdraw, or are suspended and/or dropped from the University. HIP fee charges per semester are announced each year by the AUB Benefits Coordinator’s office.

- Students who register at the beginning of the second semester are covered until September 30 of the same year, provided they do not graduate, withdraw, or are suspended and/or dropped from the University.

- Students who register at the beginning of the summer session are covered until September 30 of the same year. Student coverage during the summer is strictly limited to use of the AUB Medical Center (AUBMC) services.

- In case of emergency during the fall and spring terms only, and if students are not on campus or within the vicinity of the AUB Medical Center, students can report to the nearest medical service provider and get the needed care. Reimbursement of the bill cannot exceed 80 percent of AUBMC rates.

- Eligible married students may enroll their spouse and children, who are living with them in Lebanon, at the regular 2nd class rate as long as they remain duly registered at the University and are HIP members.

- Unlike other HIP members, students are not charged co-payment or cost sharing applied by the plan to outpatient services.

These guidelines are meant to be a mere summary of the provisions of the plan and are provided solely as a matter of convenience and in no way define or limit the scope or intent of any provision of the plan.

Passports and Visas

Foreign students joining AUB must have passports valid for a period of not less than 13 months from the date of joining the University; they should also secure an entry visa to Lebanon from the nearest Lebanese embassy or consulate in their country. The Office of Student Affairs, in coordination with the Personnel Office, the Office of Admissions, and the Office of the Registrar, help provide the necessary certificates for registered foreign students to acquire residence permits from the Lebanese authorities.

Payment of Fees

All students must finalize registration, including payment of tuition and other charges, by the announced deadlines. For full instructions on payment of fees, see the Tuition Fees section on pp. xxx-xx.

Premed Requirements

Students seeking eligibility for admission to the Faculty of Medicine must complete the premedical requirements detailed on pages xxx-xx in the 2011–12 Graduate Catalogue.

Probation

Placement on Academic Probation

A student is placed on academic probation if the student’s overall average is less than 68 at the end of the 2nd regular semester, if the semester average is less than 69 at the end of the 3rd or 4th regular semester, or if the semester average is less than 70 in any subsequent semester, excluding the summer term.

It is to be understood that the semester in which the student is considered to be ‘on probation’ is the semester that immediately follows the semester in which the student has earned the grades leading to that placement.

For evaluation purposes, the minimum number of credits at the end of the 2nd regular semester at the university should be 24 including all repeated courses, and 12 in each subsequent fall or spring semester including all repeated courses.

Courses/credits taken during a summer term are counted towards the semester average of the next regular semester. If the number of credits taken in any one regular semester is less than 12 (for approved reasons), courses/credits taken during that semester are counted towards the semester average of the next regular semester.

Credit for incomplete courses will be included in the semester in which the incomplete courses were taken. The evaluation for that semester will be carried out as soon as the grades for the incomplete courses have been finalized.
For implementation purposes, the academic standing of a student is represented by two attributes (a, b).

- The first attribute (a) represents the student's current academic status as follows:
  i. 0: clear status
  ii. 1: student is currently on probation but was not on probation in the immediately preceding regular term
  iii. 2: student is currently on probation and was on probation in the immediately preceding regular term
- The second attribute (b) represents the probation history of a student, i.e. the number of times that the student has been placed on probation.

Removal of Probation
Probation is removed when the student attains a semester average of 69 or more in the 3rd or 4th regular semester, or a semester average of 70 or more in any subsequent regular semester. The student is off probation during the semester following the one in which such grades are earned.

Probation should be removed within two regular semesters, excluding summer, after the student is placed on probation, or when the student completes his/her graduation requirements (see Graduation Requirements).

Dismissal and Readmission
A student may be dismissed from the faculty for any of the following reasons:

- if the student's overall average is less than 60 at the end of the 2nd regular semester
- if the student fails to clear academic probation within two regular semesters, excluding the summer term, after being put on probation; i.e. the student is on the academic status (2,2), or (2,3) and failed to remove the probation.
- if the student is placed on academic probation for a total of four regular semesters (a student can be dropped for this reason even if s/he is in the final year at AUB); i.e. the student is on the academic status (0,3), or (1,3) and placed again on probation.
- if the student is deemed unworthy by the faculty to continue for professional or ethical reasons.

A student is normally considered for readmission only if, after spending a year at another recognized institution of higher education, the student is able to present a satisfactory record and recommendation. Exceptions may be made for students who left the University for personal or health reasons. Transfer credit is considered after departmental evaluation of a student's coursework.

Recognition of AUB Degrees by the Lebanese Ministry of Education
The Lebanese Ministry of Education recognizes all degrees awarded by the American University of Beirut provided students are admitted on the basis of the Lebanese Baccalaureate, or its equivalent, as determined by the Lebanese Ministry of Education.

<table>
<thead>
<tr>
<th>BA, BS, BBA</th>
<th>License</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA or BS, plus the teaching diploma, and on condition that the semester credit hours earned at the sophomore class level and above add up to not less than 111</td>
<td>License d’Enseignement</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MA, MS, MBA</th>
<th>Diplômes d’Études Supérieures</th>
</tr>
</thead>
<tbody>
<tr>
<td>PhD</td>
<td>Doctorat</td>
</tr>
</tbody>
</table>

The Ministry of Education also recognizes degrees in medicine, engineering and architecture, and agriculture as equivalent to the corresponding degrees awarded or recognized by the Lebanese University.

It is the responsibility of students to ensure the degrees they receive from AUB are duly evaluated by their respective governments.

Registration
Requirements
Before proceeding to registration, new students must ensure that all requirements for registration are met, particularly conditions detailed in the admission letter from the director of admissions. These conditions include 1) the English Language Proficiency Requirement (see pp. xx, xx); 2) evidence of having received the diploma, certificate, degree, or level of university education on the basis of which the student applied and admission was granted (see Requirements of Admitted Students for Registration, p. xx).

A registration guide is distributed to every student before registration begins. Subsequent to confirmation that all conditions have been met, students should follow the steps in this guide.

Students can introduce final adjustments to their schedules during the add/drop period. The add/drop period normally extends for two days and begins one week after the first day of classes.

Cross-Registration
Students Enrolled at AUB Taking Courses at Other Universities
A student studying at the American University of Beirut may be allowed to cross-register for a course at other recognized academic institutions if all of the following conditions are met:

- the course is required by AUB
- the course is not offered at AUB during the semester at the end of which the student expects to graduate
- the course in which the student intends to cross-register is equivalent to a course that AUB offers (the number and title of each of the two equivalent courses should be clearly indicated)
- the chairperson of the department in which the student is majoring sends the Registrar a written statement confirming that all the conditions listed above have been met
- the Registrar authorizes the student to cross-register; the student submits authorization to the concerned institution
Students Enrolled at Other Universities Taking Courses at AUB

For purposes of cross-registration, students studying at recognized academic institutions who wish to take courses at AUB must:

- secure permission from their institutions to take specified courses at AUB
- secure permission from the dean of the faculty concerned at AUB
- present the above permissions to the AUB Office of the Registrar
- register in accordance with the instructions specified in the registration guide, copies of which are sent to the above-named institutions

Special Instructions for Arts and Sciences Students Regarding Course Schedules

In preparing their course schedules, Arts and Sciences students should take into consideration that

- students who lack freshman courses must register for these courses during the sophomore year, if these courses are offered
- students who have failed a required course are obliged to repeat the course during the following semester, if the course is offered
- no student is allowed to register for a course unless its prerequisites have been met

Repeating Courses

A student who fails a required course must repeat the course at the earliest opportunity. No course may be taken more than three times including withdrawals from the course. When a course is repeated, the highest grade is considered in the calculation of the cumulative average. All course grades remain in a student’s permanent record.

Residence Requirements

Students transferring to AUB must earn the last 45 credits while in residence at AUB. An AUB student in good academic standing, who did not transfer to AUB from another university, and who wishes to study abroad, may spend up to one year and earn up to 30 credits at another university. An AUB student must spend his/her final semester at AUB. Also refer to Study Abroad/Student Exchange in the Office of Student Affairs catalogue section.

Transfer within the University

Transfer of Major within the Faculty of Arts and Sciences

Students who wish to transfer from one major to another in the Faculty of Arts and Sciences may do so only after completion of at least one full semester of work in their current major. Transfer forms are available on the FAS web page. The transfer form must be submitted to the chairperson of the prospective department at least three weeks before the end of a semester. If approved, the transfer becomes effective at the beginning of the following semester. Students must follow the following transfer procedures:

- complete the transfer form
- attach grades to the transfer form
- submit the form to the chairperson of the current department (who will make his/her recommendation to the chairperson of the prospective department)

The chairperson of the prospective department presents the form to the FAS Admissions Committee. The decision of the committee is communicated to the student by the Registrar.

Transfer from one Faculty to another within the University

Students who wish to transfer from one faculty to another must complete the application for transfer form available on AUBsis. Students must apply within deadlines specified in the University Calendar.

Tutorials and Directed Study

A student can register for a single tutorial of up to three credits during his/her final year at AUB. For the Faculty of Arts and Sciences, see Directed Study in this section.

Study Abroad for Undergraduate Students

AUB undergraduate students may choose to study abroad in their Junior year or equivalent class in professional schools, in an approved program of study, without losing their status at AUB. They may apply for an established program at a university that has an exchange agreement with AUB, or they may initiate their own proposal for study abroad at a university of their choice that is recognized by AUB.

In both cases, an application and approval of the faculty are required. More information regarding the Study Abroad is available on the following link:


Withdrawal from Courses

(Also see Attendance)

Students can withdraw from only one required course per semester. Students who wish to withdraw from more than one required course in any given semester must petition the appropriate faculty committee for permission.

Students can withdraw from elective courses, down to a minimum of 12 credits, no later than 10 weeks (five weeks in the summer term) from the start of the semester. Students receive a grade of W for the course.
Fees and Expenses

The American University of Beirut is a non-profit institution. Costs to students in tuition and other university fees are kept at a minimum consistent with the provision of high quality instruction and adequate facilities and equipment. The University reserves the right to change any or all fees at any time without prior notice. Such changes are applicable to students currently registered with the University as well as to new students.

Students are not permitted to enter classes at the beginning of the term until their fees are paid or special arrangements have been made with the Office of the Comptroller (see below). All fees are quoted in Lebanese pounds and US dollars.

Payment of Fees

• Each AUB student must pay all his/her tuition and other university fees.

• Statements of fees are available on the AUB website.

• All students must complete registration and the payment of tuition fees and other charges, according to the academic calendar on p. xx-xx for the first and second semesters. Under special circumstances, late payment is permitted during a period of no more than five working days after the announced deadline, and is subject to a late payment fee of $100.

• Checks must be issued to the order of the bank concerned using the following format: Pay to the order of (Name of Bank)—Account AUB.

• Students with zero or credit balances must inform the Office of the Comptroller—Students Section via email at comptroller@aub.edu.lb— to finalize their registration.

• Sponsored students, staff dependents, graduate assistants, and student staff members should contact the Office of the Comptroller—Students Accounts Section— before the payment deadline in order to finalize their registration.

• Students who demonstrate financial need must formally apply to the Office of the Comptroller for deferred payment arrangements for tuition fees, according to the academic calendar on page xx-xx for the first and second semesters. Applications for deferrals are not accepted thereafter. Deferred payments are not a right and are only agreed to under specific and special circumstances. Students who arrange for deferred payments are still required to complete all registration formalities within the set deadlines. Deferred payment arrangements are not permitted for the summer session in any faculty.

• Applications for deferred payment arrangements are reviewed by the Office of the Comptroller which is responsible for administering all deferred payment arrangements.

• A continuing student, as well as a graduate student who has studied at AUB, who applies for deferred payment arrangements, must pay at least 50 percent of the net amount of tuition due. All other charges must be paid in full with no deferrals. A student must pay a deferred payment application fee of $33, whether the application is approved or not. Should the student’s application be approved, the student must pay the balance of tuition, the deferred application fee of $33, and the late payment fee, if applicable. All payment must be concluded by the announced deadlines.
Withdrawals

In the event a student withdraws for justifiable reasons after registration, fees are refunded according to the following schedule for the fall and spring semesters:

- Before the official start of classes 100% of full tuition and other fees
- During the first week of classes 75% of tuition
- During the second week of classes 50% of tuition
- During the third week of classes 25% of tuition

The following schedule is applied in refunding fees for the summer session:

- Before the official start of classes 100% of full tuition and other fees
- During the first week of classes 75% of tuition
- During the second week of classes 25% of tuition

For additional information, contact:

Office of the Comptroller
Student Accounts Section
American University of Beirut
PO Box 11-0236
Riad El Solh 1107 2020
Beirut, LEBANON

Tel: +961 1 353195/350000
Ext: 2473/2478
Fax: +961 1 744465

1 Other charges include health insurance plan, internet fee, social activity fee and NSSF
Financial Aid

AUB offers financial aid to qualified students in the form of need-based financial aid grants and loans, merit scholarships, student work-study, and graduate assistantships. In 2009–10 the University awarded over $13.2 million in need-based grants and merit awards, and this amount is expected to increase for academic year 2010–11. An additional amount of around $3.9 million was awarded in funds for student work scholarships and graduate assistantships.

Financial need is a necessary condition for a financial aid grant. Need is assessed for each student, yearly, on the basis of factors such as family income, number of siblings enrolled in school/university, assets such as home(s), car(s), and other property, and major changes in financial status. Assessments are made by the Interfaculty Committee for Financial Aid using an application for financial aid completed by a student and his/her family before the required deadline. For new students living in Lebanon, an interview is usually required to help the committee assess need. Further need assessment may be carried out through house visits when deemed necessary. Need is a necessary but not sufficient condition for financial aid.

Need-Based Financial Aid Grants

Grants are outright awards of assistance, mainly for undergraduate and medical students, based on demonstrated need. Other graduate students may receive such grants, if eligible, in small amounts to cover a small part of the tuition. Selection is based first on need and then on academic performance. Students applying for the first time for financial aid may obtain applications from the Office of Financial Aid, West Hall, American University of Beirut, or can download the application from the AUB homepage: www.aub.edu.lb under the link Admissions then Financial Aid. New students applying for the academic year 2011–12 must complete and submit the application with all required supporting documents by February 2, 2011. Previous financial aid applicants re-applying for the academic year 2011–12 must complete the application on-line and submit a printed copy of the on-line application along with supporting documents by March 31, 2011. The required documents should be delivered in person to the Office of Financial Aid in the basement of West Hall. Awards are usually announced by the end of May for students admitted to the fall semester and by mid-January for students admitted to the spring semester.

Need-Based Student Loans

In September 2003 a loan program for students at the Faculty of Medicine was started to support the AUB financial aid program, allowing further financial support to those students finding it difficult to complete their medical studies. In 2004 undergraduate students in the Faculty of Engineering and Architecture (second year and on) also benefited from this program, followed by nursing students in 2005. In 2006 the loan program was extended for undergraduate business students, second year and on. The program is now available for the six faculties of AUB. Loans will be offered to undergraduate students who have at least a Junior status or equivalent and who have received financial aid. The students would apply for financial aid as usual, however, if eligible, the students would receive financial assistance in the form of a grant from AUB and a loan from one of the participant banks who are supporting the government subsidized loan program. Students will pay interest only on the loan during their period of study and for a one year grace period after graduation, at which time the students start repaying the full loan principal and interest over a maximum period of ten years. The amount of loan disbursed in 2009-10 reached $2.8 million.
Merit Scholarships

In 1999 the Board of Trustees of AUB established an AUB Merit Scholarship Program for new students. This program enables the University to award full-tuition merit scholarships each year to ten new undergraduates with outstanding academic qualifications. AUB merit scholarship awardees are selected from among the newly admitted undergraduate students on the basis of academic achievement and promise alone; no application is required for merit scholarships. Awards are renewable for each undergraduate year provided that the student maintains a minimum cumulative 85 percent average.

In 2006 AUB and the National Council for Scientific Research (NCSR) signed a cooperation agreement whereby the best three students in each of the four sections of the Lebanese Baccalaureate would be granted a full scholarship. The NCSR would provide 10 million Lebanese Pounds for each student while AUB would cover the remaining amount of the tuition in addition to the living expenses including boarding or transportation based on the student’s need.

Student Work-Study

As part of its financial aid program, the University provides full-time undergraduate and graduate students with the opportunity to participate in its student work-study program. Priority is given to students with financial need. Students contribute toward their educational expenses while also developing job skills in various campus offices and the Medical Center. Applications are available at the Office of Student Affairs and should be made early in the semester. Placement is made on the basis of need, capability, and job availability. Students may work a maximum twenty hours per week; the hourly rate is based on the type of work performed.

Graduate Assistantships

Assistantships covering partial or full tuition and partial living expenses are available to students at the graduate level in return for work at a specified number of hours each week for an academic department. Assistantships are made on the dual basis of their academic record and departmental needs. Application forms for new students are enclosed in the admissions application package. Continuing students may obtain application forms from the office of the dean of the faculty in which they are enrolled.
Office of Student Affairs

The Office of Student Affairs oversees student activities, athletics, counseling, student housing, career and placement services. The office also manages university-wide operations such as the bursary, the New Student Orientation and the work-study programs. The Office of Student Affairs provides services to students that enhance their overall well-being and create opportunities for them to enrich and broaden their educational experience.

The website has comprehensive information on all programs: http://staff.aub.edu.lb/~websao.

Contact
West Hall, ground floor, room 109 - 112
Tel:  +961-1-374374, ext. 3170 or ext. 3171
Fax: +961-1-744478
Email: sao@aub.edu.lb
The office is open during regular work hours.

Student Activities

Student Activities aims to provide opportunities for student development through co-curricular activities that complement AUB’s academic programs. The specific aims of the department are to:

- provide opportunities for student leadership in a variety of settings such as clubs/societies, student representative committees and student publications
- serve as an information resource for students about student life at AUB
- provide support services for student organizations
- promote diversity and civic responsibility
- coordinate and facilitate the work and events of AUB student organizations
- organize major campus events, such as the Outdoor Festival, the Folk Dance Festival and the New Student Orientation Program.

All activities organized by students must be approved by the Department of Student Activities and the Dean of Student Affairs. The department’s role is to supervise these activities and other student activities which take place in West Hall. West Hall hosts most student activities in addition to various AUB events sponsored by faculties, departments, centers, and alumni.

Contact
West Hall, ground floor, room 112-112 C
Tel:  +961-1-374374, ext. 3197 or ext. 3182
Fax: +961-1-744478
Email: std-act@aub.edu.lb
Counseling

Adjusting to university life can be a difficult transition and a very stressful experience for many students. Personal difficulties, whether of a recent or long-standing nature, can hinder academic success and seriously affect a student’s quality of life and well-being.

Personal counseling is offered to AUB students to help them identify and address their issues and problems. This could include anxiety, depression, grief, substance abuse, eating disorders, and relationship and family problems. In fact, there are no restrictions as to what can be discussed in counseling.

The counseling team provides assistance to students with study-related issues such as test anxiety and time management. Counseling is free and confidential.

Contact
West Hall, 2nd floor, room 210
Tel: +961-1-374374, ext. 3178, 3158, or 3196
Email: ak28@aub.edu.lb
nk63@aub.edu.lb

Career and Placement Services

The Career and Placement Services (CPS) aims at helping AUB students in their transition from being students to becoming professionals. The CPS encourages students to develop their career plans by providing resources, contacts, activities, workshops, seminars, job fairs, career events and career counseling. CPS strives to promote:

- **Career Exploration and Decision Making**
  Facilitating the exploration of career options and developing effective career planning skills.

- **Skills Development**
  Helping students develop skills within their academic disciplines to enhance their professional image.

- **Experiential Learning**
  Disseminating employment information and providing resources to explore changing trends in the global job market.

- **Career Placement**
  Helping current and former AUB students to achieve their career goals through the development of lifetime career planning and job search skills. Assisting them in finding full-time employment, internships, and part-time jobs.

- **Employer Development**
  Building and expanding long-term relationships between the American University of Beirut and the employment community.

Contact
West Hall, ground floor, room 112-112 E
Tel: +961-1-374374, ext. 3172
Fax: +961-1-744488
Email: mg03@aub.edu.lb
Website: http://www.aub.edu.lb/sao/cps/Pages/index.aspx

University Sports

The University offers a wide range of sports, athletics, fitness and recreational programs through University Sports. The Charles Hostler Student Center has invigorated athletic life on the lower campus. It includes a gymnasium with three full-size basketball, volleyball, handball and futsal courts, a 25 meter indoor pool, a free weight area, cardiovascular training area, an activity room for dance and martial arts, two squash courts, a 400 meter track, an artificial turf field, an auditorium, an amphitheater, conference rooms and much more. Between May and October, students may use the AUB beach for swimming, water sports, beach volley, recreation, or relaxation.

There are four floodlit tennis courts on campus. Professional tennis lessons are available. Opportunities for competitive and team sports abound, as do options for individual recreational activities.

The following are some programs offered:

- Basketball (Men, Women, Junior)
- Soccer (Men, Women, Junior)
- Volleyball (Men, Women)
- Handball (Men)
- Tennis (Men, Women)
- Badminton (Men, Women)
- Rugby (Men)
- Track and Field (Men, Women)
- Squash (Men, Women)
- Table Tennis (Men, Women)
- Body Building
- Judo
- Aerobics
- Pilates
- Dance
- Extreme Pump
- Youth Taek Won Do
- Beginning Swimming
- Fitness Swimming
- Swimming (Men, Women)
- Water Polo
- Yoga
- Aqua Gym
- Power
- Fight-Do
- X-55

Contact
Charles Hostler Student Center
Tel: +961-1-374374, ext. 3200 or 3201
Email: chsc@aub.edu.lb
Website: www.aub.edu.lb/~webchsc/
Student Housing

As one of the few residential universities in the Middle East offering a beautiful campus where a rich extracurricular activity prevails, strong and supportive communities flourished offering thousands of residents the chance to experience the wonders of community living.

Freshman students whose parents reside outside Beirut are required to live in the University’s residence halls throughout their first year unless otherwise requested in writing by their parents. Arrangements for on-campus housing are made through the Office of Student Affairs. The Admissions office sends each new student a residence application form as soon as he/she makes the commitment to enroll. A copy of the application is available on our webpage during June and early application is strongly advised.

The application form must be completed and returned to the Office of Student Affairs by Friday of the 2nd week of July for the fall semester, and by Friday of the 3rd week of December for the spring semester. Every new student applicant must pay a deposit fee of L.L. 300,000 which may be paid in cash at the AUB Cashier or by check issued in Lebanese Pounds or U.S. Dollars to the order of the American University of Beirut.

Students who do not live in a residence hall during the fall semester but wish to do so in the spring semester and/or summer session may apply and are assigned space subject to availability. For each semester the housing charges appear on the statement of fees issued to each student following the completion of the registration process; they vary depending on the type of accommodation selected as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double</td>
<td>LL 1,867,000 (double occupancy room with a shared floor bathroom)</td>
</tr>
<tr>
<td>Semi-private</td>
<td>LL 2,306,000 (two double occupancy rooms with their own bathroom)</td>
</tr>
<tr>
<td>Private</td>
<td>LL 3,019,000 (single occupancy room with a shared floor bathroom)</td>
</tr>
</tbody>
</table>

The above rates do not include to women’s off-campus MayFair Residence where the rooms are divided into double, single and suites, each having its own bathroom, balcony, and telephone.

MayFair Rates:

<table>
<thead>
<tr>
<th>Type</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double</td>
<td>LL 2,698,000</td>
</tr>
<tr>
<td>Private</td>
<td>LL 4,720,000</td>
</tr>
<tr>
<td>Suite</td>
<td>LL 5,058,000</td>
</tr>
</tbody>
</table>

Residence Halls

There are seven student residence halls: five for women, two for men. The rooms are divided mainly into shared double and in rare instances, when availability permits, a few private rooms. The priority is to accommodate undergraduate applicants, mainly freshman students from outside Beirut as well as international students. Graduate applicants are considered only if space remains. The semi private category is not available in the men's residence halls.

All residence halls have heating, air-conditioning, hot water, washing machines, dryers, irons, and wireless Internet. Each room is equipped with a bed, desk, chair, and closet. A phone service for making local and international calls through prepaid cards is available in the lobby or reception area of each hall.

Women’s Residence Halls

Four women’s halls are located on the lower campus overlooking the Mediterranean, while the fifth is located off-campus in the heart of Hamra area within a short walking distance from campus. The ground floor of each hall houses a reception desk, a kitchen, and a lobby for socializing, receiving guests and watching television with cable subscription. International pay phones, laundry facilities and vending machines with snacks and soft drinks are installed in the basements.

Men’s Residence Halls

The two men’s residence halls are located in the west part of the upper campus, overlooking the splendid Mediterranean and close to Bliss Street, with its abundance of shops. The ground floor of each hall houses a reception desk, a kitchen, and a lobby for socializing, receiving guests and watching television with cable subscription. International pay phones, laundry facilities and vending machines with snacks and soft drinks are available on the ground floor.

Contact:
West Hall, ground floor, room 112-112 A
Tel: +961-1-374374, ext. 3175
Fax: +961-1-744478
Email: stdhouse@aub.edu.lb

Bursary Program

A number of students from the Arab world and beyond are sponsored to study at AUB by their national governments, or through private institutions. The Office of Student Affairs provides administrative support and financial updates to the sponsoring institutions or embassies.

Contact:
West Hall, ground floor, room 109-109 C
Tel: +961-1-374374, ext. 3174
Fax: +961-1-744478
Email: sao@aub.edu.lb

Work-Study Program

The Office of Student Affairs coordinates an extensive work-study program that provides work-study opportunities on campus for eligible full-time undergraduate and graduate students.

During the academic year 2009-10 over 450 students participated in the work-study program working with faculty and administration in various campus offices and in the Medical Center.

All full-time students in good academic standing may apply for open positions at the Office of Student Affairs. Selection is competitive.

Contact:
West Hall, 2nd floor, room 326
Tel: +961-1-374374, ext. 3177
Fax: +961-1-744478
Email: rs19@aub.edu.lb
sao@aub.edu.lb
Office of International Programs

The Office of International Programs is located in West Hall, 3rd floor, Room 324.

Telephone: +961-1-374374 ext. 31746/7
Fax: +961-1-774478
Email: intstds@aub.edu.lb
Website: http://www.aub.edu.lb/oip

Passports, Visas, and Residence Permits

International students joining AUB, who do not hold Lebanese passports, must have their foreign passports valid for a period of not less than 13 months from the date of joining the University; they should also secure an entry visa from the nearest Lebanese Embassy or consulate in their country.

Once registered, all students who do not hold Lebanese passports are required to obtain a residence permit before the expiration of the entry visa stamped in their passports. Students must apply for this permit as soon as possible after arrival in Beirut, and ONLY after registering and paying AUB tuition fees. Applications are available in the Office of International Programs (OIP), or on the OIP website.

The Office of International Programs, in coordination with the Office of the Registrar, will help to provide the necessary certificates for registered foreign students to acquire residence permits from the Lebanese authorities. Information about obtaining a residence permit is distributed at International Student Orientation at the beginning of each semester.

International Student Services

The Office of International Programs provides support to international students studying at AUB. During International Student Orientation (ISOP), all international students will be asked to register with OIP, so that the University will know how to reach you, and so that you will know about these special services:

- pre-arrival assistance
- orientation programs for international students
- AUB Ambassadors: AUB student volunteers are matched with international students on campus to help newcomers adjust to AUB and Lebanon
- social gatherings, activities, and trips for international students
- visa, travel, and residence permit information

Study Abroad/Student Exchange

AUB has several exchange/study abroad programs for undergraduate and graduate students. AUB’s growing number of international partner institutions include: the American University, Washington D.C., the American University of Cairo; l’Institut d’Etudes Politiques (“Sciences Po”), France; Boston University, USA; Bogazici and Yeditepe Universities in Istanbul; and the Elliot School for International Relations at George Washington University (USA).

To obtain information about study abroad, and to discuss the guidelines for participating, contact the Office of International Programs, using the contacts listed above.

OIP Resources for Faculty

The Office of International Programs is pleased to provide information to faculty on international standards of practice for credit transfer and grade transfer upon request. In addition, OIP maintains a current listing of all institutions/consortia/universities with which AUB maintains formal agreements for purposes of student exchange. Please note that exchange agreements cannot be put into effect at AUB without the approval of the Provost, for whom the Office of International Programs serves as the official conduit. Guidelines for the setting up of new international academic exchange agreements and similar linkages are available on the OIP website or by request from the Director.
Faculty of Agricultural and Food Sciences (FAFS)
The importance of food and nutrition and their linkage to agriculture was recognized in the late seventies. The School, which had become the Faculty of Agricultural Sciences in 1958, was renamed the Faculty of Agricultural and Food Sciences (FAFS) in 1979, and a 3-year BS program in Nutrition and Dietetics (ND) was initiated in 1980. An eleven-month Dietary Internship program was established at the AUB Medical Center in 1983. The programs proved very successful and grew rapidly to become a significant component of FAFS. Global and regional changes in the role and functions of agriculture, nutrition and food created a demand for new courses. FAFS responded by launching several new programs. The BS program in Landscape Design and Eco-Management was started in 2000 and reflected the mounting significance of landscape and environmental issues. The BS program in Food Sciences and Management was launched in October 2002 in response to the rapid expansion of the agrifood industry in Lebanon and in the region. The rising importance of animal production in the Middle East, and the associated concerns around zoonotic diseases, triggered the initiation of the BS in Veterinary Sciences in October 2008. Lastly, the importance of entrepreneurship and the need to develop efficient and effective food value chains in the region led to the initiation of the Agribusiness program in February 2009.

Mission
The mission of the Faculty of Agricultural and Food Sciences is to promote, through higher agricultural education, teaching, research, and extension in agriculture, food and nutrition, environment and natural resources, and community and rural development as a basis for sustainable improvement in the lives of people throughout Lebanon, the Middle East region, and the world.

Vision
The vision of FAFS is to be an institution committed to helping the Middle East region in improving agricultural practices with the aim of approaching self-sufficiency in food production. It is an institution committed to research, development, and the training of dedicated and highly motivated men and women to satisfy the needs of human power resources in the Middle East. FAFS conducts on-campus academic instruction, research through its on-campus facilities and AREC, as well as outreach education, all patterned after the land-grant college system of the USA. In the coming years the Faculty of Agricultural and Food Sciences will develop as a center for excellence in higher agricultural education and research in the areas of sustainable and urban agriculture, environmental sciences related to agriculture and natural resources, arid land agriculture, food quality and safety, and nutrition. These areas are emphasized because they reflect important needs in agricultural education and development in the region we serve.

Undergraduate Programs
Six undergraduate programs are offered by FAFS:

BS in Agriculture and the Diploma of Ingénieur Agricole
This program is offered by FAFS for training in general agriculture. A limited number of elective credits allow students to select courses from among different disciplines in FAFS for desired areas of emphasis.
BS in Landscape Design and Eco-Management and the Diploma of Ingénieur Agricole

This is a specialized program offered by FAFS for training students in the design, implementation, and management of landscapes in natural, rural, and urban settings.

BS in Nutrition and Dietetics

This is a specialized three-year program offered by FAFS that prepares graduates trained in nutrition and dietetics to satisfy the needs of the country and the region. The purpose is to enhance the nutritional well-being and health of individuals, families, and populations through the promotion of scholarship in human nutrition and dietetics. Graduates wishing to qualify as licensed dietitians should complete an Internship for a minimum of 6 months in a recognized medical setting. Graduates of this program do not receive the Diploma of Ingénieur Agricole.

BS in Nutrition and Dietetics (Coordinated Program)

This is a four year program which will lead to a BSc degree in Nutrition and Dietetics (Coordinated Program). The program combines the three years theoretical learning with an additional year of supervised practice with an emphasis in clinical nutrition practice. The proposed educational framework is based on the knowledge, skills and core competencies established by the Commission on Accreditation for Dietetics Education (CADE) for entry level dietitians. The CP mission statement is based on the beliefs, values and vision conveyed in the American University of Beirut’s mission statement, the Department of Nutrition and Food Science’s mission statement and strategic plan and is guided by the Standards of Professional Performance for Dietitians set by the American Dietetics Association (ADA) in 2008. The mission of the CP in Dietetics is to equip graduates with the knowledge, expanded skills, and intellectual maturity to become progressive, innovative and inter-professional practitioners in the dietician profession capable of serving the public through promotion of optimal nutrition, health and wellbeing and to serve the profession and larger community through public service and leadership.

More specifically, the program involves several inter-related dimensions; it is:

• Dedicated to providing quality education that prepares the student for competent practice and current and future roles in the dietician profession.
• Committed to facilitating the intellectual, personal and professional growth and lifelong learning of students.
• Committed to developing critical thinking, problem solving and leadership skills to prepare students for the challenges of an evolving diverse community and workplace.
• Committed to providing an integration of theory with application of learning through a sequence of supervised practice experiences that encourages student self-evaluation and self direction.
• Dedicated to preparing students with added proficiency in providing nutrition education to a variety of clients.
• Committed to providing an environment for students to conduct research and develop professional attitudes, maturity and an ethical understanding of professional practice, thereby improving the dietetics practice.
• Committed to preparing competent nutrition professionals who perform in adherence with the Code of Ethics for the Profession of Dietetics.

Goals and Expected Outcomes of the proposed CP in Dietetics

The goals of the CP in dietetics are listed below; each is followed with supporting measurable expected outcomes.

• To provide quality didactic and supervised practice learning experiences that prepare students to be competent entry level dietitians.
  At least 80% of students who enter the CP will successfully complete the program and receive a verification statement within two years of enrolment.
  - Over a period of five years, at least 80% of all graduates of the CP who sit for the colloquium/RD exam will pass from the first time.
  - At least 90% of responses that evaluate the competencies attained from the CP will meet or exceed a rating of 3 on a 1–5 scale.
  - At least 90% of ratings of professional preparation from the CP graduate’s view will reach a rating of at least 3 on a 1–5 scale.
  - At least 90% of ratings of professional knowledge from the employer’s opinion will reach a rating of at least 3 on a 1–5 scale.
• To prepare students who will commit to improving the quality of life of the community through improved health and wellbeing.
  - Within five years of graduation from the CP, employment data will demonstrate that at least 70% of all graduates who sought employment will be employed in Lebanon or the Middle East region in a health-related position that requires nutrition expertise.
• To prepare graduates who will be successfully employed in their fields, attend graduate school or pursue other career options.
  - At least 80% of CP graduates, who have sought higher education or employment, will pursue an advanced degree or be employed in the field of dietetics within 12 months of graduation.
  - At least 80% of employers will indicate that they would hire a graduate of the American University of Beirut CP in Dietetics.

BS in Food Science and Management

This is a specialized three-year program offered by FAFS to prepare graduates to satisfy the needs of food industries and establishments in the region. Graduates of this program do not receive the Diploma of Ingénieur Agricole.

BS in Veterinary Sciences

This is a specialized three-year program offered by FAFS to graduate students with proper knowledge in animal pathology, veterinary microbiology, animal husbandry, nutrition, breeding and basic knowledge in other veterinary disciplines. Graduates of this program do not receive the Diploma of Ingénieur Agricole.

BS in Agribusiness

The BS in Agribusiness is a three year cross-disciplinary program designed to provide students with comprehensive knowledge of the decision-making processes of business and the technical aspects of modern agriculture and food systems. Graduates of this program do not receive the Diploma of Ingénieur Agricole.
Admission

AUB admits students from both twelve and thirteen-year secondary school systems. Students holding diplomas from a twelve-year secondary school system may gain admission to the Faculty of Agricultural and Food Sciences by completing the freshman program at AUB or its equivalent elsewhere. Those coming from the freshman program should have completed six credits of freshman math and nine credits of natural sciences (CHEM 101, 101L, 102, BIOL 106 except Agribusiness). Students from a thirteen-year secondary school system must hold the Lebanese Baccalaureate Part II in general sciences or life sciences, or the equivalent, if they come from another country. Holders of the Baccalaureate Part II in sociology and economics may be considered for admission (except in Nutrition and Food Sciences and Management) provided they take one additional course, CHEM 102, except Agribusiness students, while holders of Baccalaureate Part II in Humanity may be considered for admission provided they take two additional courses CHEM 102 and MATH 203. Students applying for transfer from another faculty or university must have a minimum grade point average of 70 for Agriculture and Veterinary Sciences, 75 for Agribusiness, for Nutrition, Food Sciences and Management, Landscape Design and Eco-Management to be considered for admission. Admission is by selection of the most promising eligible applicants. For complete and detailed information regarding admission to the University, including recognized certificates, see the admissions section in this catalogue.

Requirements for BS in Nutrition and Dietetics (Coordinated Program)

Students are first admitted to the three year Nutrition and Dietetics program, in addition, a separate application for the CP must be submitted during the second semester of the senior year (upon completion of at least 81 credits). The selection of students for the CP is based on cumulative average of the didactic program (80 or above, unless stated otherwise by the department), completion of the prerequisite courses as well as personal interviews. Individuals interested in applying to the CP must contact the department for application details at the beginning of the senior year.

A maximum of 20 students are admitted each year. Students applying to the NFSC department for a second BS in Nutrition and Dietetics are not eligible for the CP.

Requirements for Premedical Study

Students entering the Faculty of Agricultural and Food Sciences, and who intend ultimately to enter the Faculty of Medicine, must complete the premedical requirements as outlined in the admission section under the Faculty of Medicine in the 2010-11 Graduate Catalogue, pages xxx-xx.

Graduation Requirements

Eligibility for Graduation

To be eligible for graduation with the degree of BS in Agriculture (AGRI) or BS in Landscape Design and Eco-Management (LDEM), and the Diploma of Ingénieur Agricole, a student must

- complete a minimum of 128 semester credit hours (AGRI) or 139 semester credit hours (LDEM)
- complete a minimum of seven semesters of residency
- achieve an overall minimum grade average of 70
- be approved for graduation by the faculty

To be eligible for graduation with the degree of BS in Nutrition and Dietetics (NTDT) or BS in Food Sciences and Management (FSMT), or BS in Veterinary Sciences (VTSC) or BS in Agribusiness (AGBU) a student must

- complete a minimum of 96 semester credit hours for the NTDT program, 97 semester credit hours for the FSMT program, 102 semester credit hours for the VTSC program, and 96 semester credit hours for the AGBU
- complete a minimum of five semesters of residency
- achieve an overall minimum average grade of 70
- be approved for graduation by the faculty

To be eligible for graduation with the degree of BS in Nutrition and Dietetics (Coordinated Program), a student must

- Successfully complete a minimum of 129 credits hours
- Complete a minimum of 1200 hours of supervised practice in an affiliated hospital
- Achieve an overall minimum average grade of 70 in the didactic courses of the fourth year
- Achieve an overall minimum average grade of 80 in the supervised practice
- Successfully complete the program within one year of enrollment

Failure to meet the above CP graduate requirements will result in dismissal from the CP program in which case, students will graduate with a BS in Nutrition and Dietetics.

For transfer students to the Faculty of Agricultural and Food Sciences from another Faculty or University, course credits pertinent to the agricultural curriculum may be transferred at the discretion of the Academic and Curriculum Committee. However, advanced standing can be considered only for students who transfer from an agriculture program of another recognized institution of higher learning. Transfer students from faculties within AUB to FAFS are allowed to transfer a maximum of two semesters toward the residency requirements at FAFS, based on the rate of equating each 12 credits of transferable courses taken at AUB to one residency semester. For purposes of residency requirements, two summer sessions are equivalent to one semester.
Minors in Nutrition and Dietetics, and Food Science and Management

The Nutrition and Food Sciences Department offers two minors: A Minor in Nutrition and Dietetics, and a Minor in Food Sciences and Management, with a minimum of 16 credits/program.

Students already working on a bachelor’s degree outside Nutrition and Dietetics (ND) or Food Sciences and Management (FSM), and who wish to obtain a minor in ND or FSM, must apply to the relevant Minor before taking any course in the requested minor. The Department of Nutrition and Food Sciences evaluates all applicants for a minor and makes recommendations to the Academic and Curriculum Committee (ACC).

A student is eligible to be considered for a minor in either major after completing 24 credit hours in his/her major with a cumulative grade average of 75.

The courses required for a Minor in Nutrition and Dietetics are NFSC 221, NFSC 222, NFSC 240, NFSC 265, NFSC 274, and NFSC 285. Additional courses may be required from Agriculture and Food Sciences and Management students to replace required courses common to the major and minor.

The courses required for a Minor in Food Sciences and Management are NFSC 265, NFSC 278, NFSC 282, NFSC 288, MNGT 215, and MKTG 210. Additional courses may be required from Agriculture and Nutrition and Dietetics students to replace required courses common to the major and minor.

Minor in Food Systems

Food security, climate change and depletion of natural resources are now major concerns at the national and global levels. The vital need for sustainable production techniques able to reconcile economic profitability and environmental preservation is exerting an increasing pressure on public policies and agendas. The interdependence of these concerns requires the development of a comprehensive and multidisciplinary approach to food systems.

Goal

This interdisciplinary minor in Food Systems equips students with the knowledge and skills required to develop a comprehensive view and understanding of the different yet interdependent stages of food systems including food production, processing, marketing, distribution and consumption. Eighteen credit hours are required; 3 credits of each of the majors listed below.

Learning Outcomes

- Identify key stages of food-products’ development.
- Acquire knowledge and practical skills in land preparation, farm irrigation methods and water measurement techniques.
- Develop an awareness of safe working environment and monitoring sustainable practices in livestock and field crops production.
- Determine the usefulness and limitations of various techniques in food production and processing practices and assessing their impact on human health.
- Understand concepts of environmental horticulture and its role in promoting nature conservation.
- Develop marketing and distribution strategies to promote food products.

List of courses for the Minor in Food Systems:
NFSC 220, NFSC 252, LDEM 211, AVSC 220, AGSC 203 and AGSC 210.

Minor Veterinary Sciences

Students wishing to pursue a minor in Veterinary Sciences should take 18 credits. The following courses are required:
AVSC 271 (3 cr.), AVSC 275 (3 cr.), AVSC 241 (3 cr.), AVSC 279 (3 cr.), AVSC 281 (3 cr.)

In addition, students should take 3 extra credits from the following:
AVSC 242 (3 cr.), AVSC 278 (3 cr.), AVSC 280 (3 cr.), AVSC 203 (1 cr.), AVSC 210 (2 cr.), AVSC 213 (4 cr.), AVSC 215 (4 cr.)

Agriculture students who have taken the required AVSC courses will have to compensate for the credits by taking other electives from within AGSC.

Second BS Degree

To obtain a second BS in Agriculture and the Diploma of Ingénieur Agricole, a student must complete all AGRL III and AGRL IV courses, including all FAFS electives and humanities courses.

Applicants who have a BS degree in biology, chemistry, or environmental health do not need to take any additional prerequisite courses. Holders of BS degrees from other majors will be required to

- complete additional prerequisite courses as recommended by the Admissions Committee and approved by the Academic and Curriculum Committee.
- complete at least five terms of residency at FAFS.

To obtain a second BS in Nutrition and Dietetics or Food Sciences and Management, a student must

- complete a minimum of 51 credits while registered in FAFS, including all NTDT II and NTDT III or FSMT II and FSMT III required core courses listed in this catalogue (of which up to 15 credits can be from transferred course credits).
- complete additional prerequisite courses as recommended by the Admissions Committee and approved by the Academic and Curriculum Committee.
- complete at least three semesters of residency at FAFS.
Transfer of Courses

Transfer of basic science courses taken at AUB with a minimum grade of 60 is allowed if these are also required courses in the core programs of FAFS. A minimum grade of 70 is required for transfer of elective courses. Students wishing to transfer one or more required or elective course should submit a written request to the Academic and Curriculum Committee.

Elective Courses*

Candidates for the degree of BS in Agriculture must complete twenty one credits of elective courses: nine credits of elective courses in FAFS and twelve credits in the humanities, 3 credits in social sciences.

Candidates for the degree of BS in Landscape Design and Eco-Management must complete fifteen credits of elective courses: three credits of elective courses in FAFS and twelve credits in humanities.

Candidates for the degrees of BS in Nutrition and Dietetics and BS in Food Sciences and Management must complete a minimum of twelve credits in humanities.

Candidates for the degree of BS in Veterinary Sciences must complete twelve credits in humanities and six in Social Sciences.

Candidates for the degree of BS in Agribusiness must complete twelve credits in humanities.

Academic Rules and Regulations

Changes made after the publication of this catalogue will be available through academic advisers or coordinators.

Please refer to pp. xx–xx General University Academic Information in this catalogue for information on the following: maximum course loads (under Credit Loads), dismissal from the faculty and re-admission, classes and laboratories (under Attendance), incomplete grades (under Incompletes), examinations and quizzes (under Attendance), withdrawal from courses, students not working for a degree (under Categories of Students), repeating courses, placement on academic probation, and removal from academic probation.

Students enrolled in the BS in Nutrition and Dietetics (Coordinated Program), should refer to the Nutrition and Dietetics Coordinated Program Student Handbook for program's specified policies and procedures.

* Elective Courses are outlined in General University Academic Information

Second BS Degree in Agriculture for Agribusiness Students

A candidate with a Bachelor’s degree in Agribusiness wishing to obtain a second degree in Agriculture and the Diploma of Ingenieur Agricole must complete a minimum of 45 credit hours with a minimum residency period of three semesters, and must complete the following course requirements with a minimum average of 70.

List of courses for Second BS Degree in Agriculture for Agribusiness Students:

Fall Semester: BJOL 200, CHEM 200, LDEM 215, AGSC 235, AVSC 275.

Spring Semester: AGSC 265, AVSC 226 OR AVSC 281, AGSC 224, AGSC 220, LDEM 227.

Fall Semester: AGSC 262, NFSC 221, AGSC 295, Six Credits of AGSC Electives.

FAFS students can transfer their earned residency between the two programs at FAFS.

Dual Degree

Students may, upon approval of the faculty concerned, complete the requirements for a second degree while registered in another faculty at AUB. In such a case, a student will be granted two degrees at the same time of graduation. If tuition differs, students will pay the higher of the tuitions.

Information about deadlines and applications are available on the following link:
Classification and Promotion

BS in Agriculture or in Landscape Design and Eco-Management and Diploma of Ingénieur Agricole

For clear promotion from year I to year II a student must complete a minimum of twenty seven credits. For promotion from year II to year III a student must complete a minimum of fifty eight credits. For promotion from year III to year IV a student must complete a minimum of ninety eight credits. All such credits should be from courses specified in the regular program.

BS in Landscape Design and Eco-Management and Diploma of Ingénieur Agricole

For clear promotion from year I to year II a student must complete a minimum of thirty three credits. For promotion from year II to year III a student must complete a minimum of sixty nine credits. For promotion from year III to year IV a student must complete a minimum of one hundred and seven credits. All such credits should be from courses specified in the regular program.

BS in Nutrition and Dietetics or in Food Science and Management

For clear promotion from year I to year II a student must complete a minimum of thirty credits. For promotion from year II to year III a student must complete a minimum of sixty three credits. All such credits should be from courses specified in the regular program.

BS in Veterinary Sciences

For clear promotion from year I to year II a student must complete a minimum of thirty credits. For promotion from year II to year III a student must complete a minimum of sixty nine credits. All such credits should be from courses specified in the regular program.

BS in Agribusiness

For clear promotion from year I to year II a student must complete a minimum of thirty credits. For promotion from year II to year III a student must complete a minimum of sixty nine credits. All such credits should be from courses specified in the regular program.

Eligibility for the Regular AREC Program

To be eligible to enroll in the regular program at AREC during the third year of Agriculture or Landscape, a student must

- complete a minimum of fifty eight credits by the end of the first semester of Agriculture III with a cumulative grade average >70
- not have accumulated more than twelve credits of failed-missed courses (of which no more than six credits are in failed courses) specified in the regular program
- be approved for such action by the Academic and Curriculum Committee

Curriculum for the BS Degree in Agriculture and Diploma of Ingénieur Agricole

Agriculture I

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AGSC 201</td>
<td>Orientation to Agriculture and Food Systems</td>
</tr>
<tr>
<td>BIOL 200</td>
<td>Diversity for Life</td>
</tr>
<tr>
<td>CHEM 200</td>
<td>Basic Chemistry</td>
</tr>
<tr>
<td>CHEM 205</td>
<td>Introductory Chemistry Laboratory</td>
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<tr>
<td>CMPS 209</td>
<td>Computers and Programming for the Sciences</td>
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Second Semester

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<th>Course</th>
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<tr>
<td>ARAB</td>
<td>Arabic Communication Skills</td>
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<tr>
<td>CHEM 208</td>
<td>Survey of Organic Chemistry</td>
</tr>
<tr>
<td>ENGL 203</td>
<td>Academic English</td>
</tr>
<tr>
<td>AGSC 212</td>
<td>Microeconomics Theory of Food and Farming</td>
</tr>
<tr>
<td>MATH 201 or MATH 204</td>
<td>Calculus and Analytic Geometry III or Mathematics for Social Sciences II</td>
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<td><strong>Total</strong></td>
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Agriculture II

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<th>Course</th>
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<tbody>
<tr>
<td>AVSC 243</td>
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</tr>
<tr>
<td>AGSC 215</td>
<td>Introduction to Soils</td>
</tr>
<tr>
<td>AGSC 241</td>
<td>Farm Management</td>
</tr>
<tr>
<td>NFSC 261</td>
<td>Introductory Biochemistry</td>
</tr>
<tr>
<td>AGSC 220</td>
<td>Principles of Plant Physiology</td>
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<td><strong>Total</strong></td>
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Second Semester

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<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AGSC 225</td>
<td>Rural Social Systems in Agricultural and Rural Development</td>
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<td>AGSC 265</td>
<td>Soil Fertility</td>
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<tr>
<td>AVSC 224</td>
<td>Agricultural Microbiology</td>
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<td>ENGL 204</td>
<td>Advanced Academic English</td>
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<td>STAT 210</td>
<td>Elementary Statistics for the Sciences</td>
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1 A minimum of 128 credits required for graduation
2 The Arabic Placement Test is optional
3 Course offered in fall and spring
4 Course offered in spring and fall
### Agriculture III

**First Semester**
- AVSC 271 Animal Nutrition 3
- AVSC 275 Anatomy and Physiology of Farm Animals 3
- AGSC 221 Principles of Entomology 3
- AGSC 232 Principles of Plant Pathology 3
- Humanities Elective 3

**Second Semester (AREC)**
- AVSC 222 General Livestock Production 3
- AGSC 228 Irrigation Principles 3
- AGSC 231 Principles of Agronomy 3
- AGSC 224 General Horticulture 3
- AGSC 284 Weed Science 3

**Summer Session (AREC)**
- AVSC 223 Agricultural Project 2
- AGSC 226 Poultry Production 3
- AGSC 226 Farm Power and Machinery 3

**Total 15 Credits**

### Agriculture IV

**First Semester**
- AGSC 235 Agricultural Extension in Development 2
- NFSC 221 Basic Nutrition 3
- NFSC 288 Technology of Food Products 3
- Social Science 3
- Humanities Elective 3

**Second Semester**
- AGSC 296 Agriculture Project Presentation 1
- Electives in FAFS 9
- Humanities Electives 6

**Total 14 Credits**

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### Curriculum for the BS Degree in Landscape Design and Eco-Management, and Diploma of Ingénieur Agricole

**Year I**

<table>
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<td>ARCH 100</td>
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<td>LDEM 200</td>
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</tr>
<tr>
<td>ENGL 203</td>
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<td>Humanities Elective</td>
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**Total 18 Credits**

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<td>ARCH 112</td>
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<td>LDEM 202</td>
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<td>LDEM 211</td>
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<tr>
<td>ENGL 204</td>
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<tr>
<td>Humanities Elective</td>
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**Total 18 Credits**

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<th>Summer Session</th>
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<td>ACCT 210</td>
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<tr>
<td>LDEM 250</td>
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**Total 6 Credits**

**Year II**

<table>
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<td>LDEM 216</td>
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<tr>
<td>LDEM 217</td>
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<tr>
<td>CHEM 202</td>
<td>3</td>
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<tr>
<td>MATH 204</td>
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</table>

**Total 18 Credits**

---

5 Offered interchangeable
6 Offered interchangeable
7 Course offered spring and fall

8 A minimum of 139 credits required for graduation
### Second Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>LDEM 246</td>
<td>Landscape Design III</td>
<td>6</td>
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<tr>
<td>LDEM 212</td>
<td>Landscape Horticulture II</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 252</td>
<td>Ecology</td>
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<tr>
<td>ARAB</td>
<td>Arabic Communication Skills</td>
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**Total 16**

### Year III

#### First Semester

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<tr>
<td>LDEM 204</td>
<td>Ecological Landscape Design I</td>
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<tr>
<td>LDEM 290</td>
<td>Professional Practice</td>
<td>3</td>
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<tr>
<td>LDEM 203</td>
<td>The Environment and Sustainable Development</td>
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**Total 15**

#### Second Semester (AREC)

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<tbody>
<tr>
<td>LDEM 228</td>
<td>Ecological Landscape Design II</td>
<td>6</td>
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<tr>
<td>LDEM 263</td>
<td>Landscape Appreciation</td>
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<tr>
<td>LDEM 265</td>
<td>Landscape Management</td>
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<td>LDEM 245</td>
<td>Irrigation Methods for Landscape Design</td>
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<tr>
<td>AGSC 227</td>
<td>Surveying and Irrigation Principles</td>
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**Total 16**

### Year IV

#### First Semester

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<tbody>
<tr>
<td>LDEM 241</td>
<td>Final Year Project: Landscape Design</td>
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<tr>
<td>LDEM 230</td>
<td>Water in the Environment</td>
<td>3</td>
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<tr>
<td>LDEM 295</td>
<td>Landscape Seminar</td>
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<tr>
<td>MNGT 215</td>
<td>Management of Organizations</td>
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**Total 16**

#### Second Semester

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<th>Course Title</th>
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<tbody>
<tr>
<td>LDEM 242</td>
<td>Final Year Project: Landscape Implementation and Management</td>
<td>6</td>
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<tr>
<td>LDEM 227</td>
<td>Applied Plant Protection in Landscape</td>
<td>3</td>
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<tr>
<td>LDEM 296</td>
<td>Landscape Seminar</td>
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<tr>
<td>STAT 210</td>
<td>Elementary Statistics for the Sciences</td>
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**Total 16**

### Curriculum for the BS Degree in Nutrition and Dietetics

#### Nutrition and Dietetics I

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>BIOL 201</td>
<td>General Biology I</td>
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<tr>
<td>CHEM 208</td>
<td>Survey of Organic Chemistry</td>
<td>3</td>
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<tr>
<td>CHEM 209</td>
<td>Introductory Organic Laboratory</td>
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<tr>
<td>ENGL 203</td>
<td>Academic English</td>
<td>3</td>
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<tr>
<td>NFSC 221</td>
<td>Basic Nutrition</td>
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**Total 15**

#### Second Semester

<table>
<thead>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CHEM 200</td>
<td>Basic Chemistry</td>
<td>3</td>
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<tr>
<td>CHEM 205</td>
<td>Introductory Chemistry Laboratory</td>
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</tr>
<tr>
<td>NFSC 261</td>
<td>Introductory Biochemistry</td>
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<tr>
<td>PHYL 246</td>
<td>Physiology for Nursing Degree Students and Undergraduates</td>
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<td>SOAN 201</td>
<td>Introduction to the Study of Society</td>
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**Total 15**

#### Nutrition and Dietetics II

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>AGSC 212</td>
<td>Microeconomics Theory of Food and Farming</td>
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<tr>
<td>ARAB</td>
<td>Arabic Communication Skills</td>
<td>3</td>
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<tr>
<td>ENGL 204</td>
<td>Advanced Academic English</td>
<td>3</td>
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<tr>
<td>NFSC 240</td>
<td>Nutrition Status Assessment</td>
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<td>NFSC 274</td>
<td>Human Nutrition</td>
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</table>

**Total 17**

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9 The Arabic Placement Test is optional.

10 A minimum of 96 credits required for graduation

11 Course offered in spring and fall

12 Course offered in spring and fall

13 Course offered in spring and fall

14 The Arabic Placement Test is optional.
Curriculum for the BS Degree in Nutrition and Dietetics (Coordinated Program) ¹⁹

The first three years of the program are similar to those of the Nutrition and Dietetics program. In addition, the fourth year includes the below courses:

**Nutrition and Dietetics (CP) IV**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>NFSC 283</td>
<td>Nutrition Education and Communication</td>
</tr>
<tr>
<td>NFSC 284 A</td>
<td>Seminar in Clinical Dietetics</td>
</tr>
<tr>
<td>NFSC 298F</td>
<td>Dietetic Practicum (not billed)</td>
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<table>
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<tbody>
<tr>
<td>NFSC 284 B</td>
<td>Seminar in Clinical Dietetics</td>
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<tr>
<td>NFSC 298S</td>
<td>Dietetic Practicum (not billed)</td>
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Curriculum for the BS Degree in Food Science and Management ²⁰

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 200</td>
<td>Diversity of Life</td>
</tr>
<tr>
<td>CHEM 208</td>
<td>Brief Survey of Organic Chemistry</td>
</tr>
<tr>
<td>CHEM 209</td>
<td>Introductory Organic Laboratory</td>
</tr>
<tr>
<td>ENGL 203</td>
<td>Academic English</td>
</tr>
<tr>
<td>MATH 204</td>
<td>Mathematics for Social Sciences II</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 200</td>
<td>Basic Chemistry</td>
</tr>
<tr>
<td>CHEM 205</td>
<td>Introductory Chemistry Laboratory</td>
</tr>
<tr>
<td>ENGL 204</td>
<td>Advanced Academic English</td>
</tr>
<tr>
<td>AGSC 212</td>
<td>Microeconomics Theory of Food and Farming ²¹</td>
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<tr>
<td>NFSC 221</td>
<td>Basic Nutrition ²²</td>
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<td><strong>Total 17</strong></td>
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15 Course offered in spring and fall
16 Course offered in spring and fall
17 Course offered in spring and fall
18 Course offered in spring and fall
19 A minimum of 129 credits required for graduation
20 A minimum of 97 credits required for graduation
21 Course offered in spring and fall
22 Course offered in spring and fall
### Faculty of Agricultural and Food Sciences (FAFS)

### Food Science and Management II

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EDUC 227</td>
<td>Statistics in Education</td>
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<tr>
<td>MNGT 215</td>
<td>Management of Organizations</td>
</tr>
<tr>
<td>NFSC 261</td>
<td>Introductory Biochemistry(^{23})</td>
</tr>
<tr>
<td>NFSC 265</td>
<td>Food Chemistry(^{24})</td>
</tr>
<tr>
<td>NFSC 267</td>
<td>Food Analysis(^{25})</td>
</tr>
<tr>
<td>NFSC 277</td>
<td>Food Microbiology I</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ACCT 210</td>
<td>Financial Accounting</td>
</tr>
<tr>
<td>ARAB</td>
<td>Arabic Communication Skills(^{26})</td>
</tr>
<tr>
<td>CMPS 209</td>
<td>Computers and Programming for the Sciences</td>
</tr>
<tr>
<td>NFSC 272</td>
<td>Introduction to Food Service and Industries</td>
</tr>
<tr>
<td>NFSC 278</td>
<td>Food Microbiology II</td>
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<td>Humanities Elective</td>
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<thead>
<tr>
<th>Summer Session</th>
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<tr>
<td>NFSC 280</td>
<td>Summer Training in Food Establishments</td>
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### Food Science and Management III

<table>
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<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ACCT 215</td>
<td>Management Accounting</td>
</tr>
<tr>
<td>NFSC 282</td>
<td>Food Quality Management</td>
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<tr>
<td>NFSC 288</td>
<td>Technology of Food Products</td>
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<tr>
<td>FINA 210</td>
<td>Business Finance</td>
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<td>Humanities Elective</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MKTG 210</td>
<td>The Marketing Function</td>
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<tr>
<td>NFSC 287</td>
<td>Food Processing</td>
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<tr>
<td>NFSC 289</td>
<td>Food Processing Lab</td>
</tr>
<tr>
<td>NFSC 291</td>
<td>Elements of Food Engineering</td>
</tr>
<tr>
<td>NFSC 296</td>
<td>Current Topics in Food Sciences and Nutrition(^{27})</td>
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<tr>
<td>NFSC 299</td>
<td>Projects in Nutrition and Food Sciences(^{28})</td>
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<td><strong>Total</strong></td>
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23 Course offered in spring and fall
24 Course offered in spring and fall
25 Course offered in spring and fall
26 The Arabic Placement Test is optional
27 Course offered in spring and fall
28 Course offered in spring and fall

### Curriculum for the BS Degree in Veterinary Sciences\(^{29}\)

#### Veterinary Sciences I

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 200</td>
<td>Diversity of Life</td>
</tr>
<tr>
<td>CHEM 200</td>
<td>Basic Chemistry</td>
</tr>
<tr>
<td>CHEM 205</td>
<td>Introductory Chemistry Laboratory</td>
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<tr>
<td>CMPS 209</td>
<td>Computers and Programming for the Sciences</td>
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<tr>
<td>Humanities Electives</td>
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>MATH 201 or 204</td>
<td>Calculus and Analytic Geometry II or Mathematics for Social Sciences II</td>
</tr>
<tr>
<td>CHEM 208</td>
<td>Survey of Organic Chemistry</td>
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<tr>
<td>ENGL 203</td>
<td>Academic English</td>
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<tr>
<td>AVSC 224</td>
<td>Agricultural Microbiology</td>
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#### Veterinary Sciences II

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<tbody>
<tr>
<td>ENGL 204</td>
<td>Advanced Academic English</td>
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<tr>
<td>PHYS 204</td>
<td>Classical Physics for Life Sciences</td>
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<td>PHYS 204L</td>
<td>Classical Physics for Life Sciences Laboratory</td>
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<tr>
<td>ARABIC 222</td>
<td>Arabic Communication Skills(^{29})</td>
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<tr>
<td>AVSC 275</td>
<td>Anatomy and Physiology of Animals</td>
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<td>AVSC 243</td>
<td>Genetics</td>
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<table>
<thead>
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<tbody>
<tr>
<td>MKTG 210</td>
<td>The Marketing Function</td>
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<tr>
<td>NFSC 261</td>
<td>Introductory Biochemistry (Biochemistry I)</td>
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<tr>
<td>AVSC 271</td>
<td>Animal Nutrition</td>
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<td>AVSC 210</td>
<td>Applied Ethology</td>
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<td>Social Sciences</td>
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29 A minimum of 102 credits required for graduation
30 The Arabic Placement Test is optional
Curriculum for the BS Degree in Agribusiness

Agribusiness I

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<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AGSC 204</td>
<td>Natural Sciences for Agribusiness 3</td>
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<tr>
<td>AGSC 211</td>
<td>Introduction to Agricultural Issues and Policies 3</td>
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<tr>
<td>CMPS 209</td>
<td>Computers and Programming for the Sciences 3</td>
</tr>
<tr>
<td>ENGL 203</td>
<td>Academic English 3</td>
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<tr>
<td>MATH 204</td>
<td>Mathematics for Social Sciences 3</td>
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Agribusiness II

<table>
<thead>
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<th>Credits</th>
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<tbody>
<tr>
<td>ACCT 215</td>
<td>Management Accounting 3</td>
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<tr>
<td>AGSC 212</td>
<td>Microeconomics Theory of Food and Farming 3</td>
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<tr>
<td>AGSC 239</td>
<td>Agribusiness Communication Skills Workshop 0</td>
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<tr>
<td>NFSC 252</td>
<td>Food Processing 3</td>
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<td>STAT 210</td>
<td>Elementary Statistics for the Sciences 3</td>
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Summer Session

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<tr>
<td>AGSC 229</td>
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Veterinary Sciences III

<table>
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<tr>
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<tbody>
<tr>
<td>AVSC 213</td>
<td>Comparative Vertebrate Anatomy 4</td>
</tr>
<tr>
<td>AGSC 220</td>
<td>Principles of Plant Physiology 3</td>
</tr>
<tr>
<td>PHRM 240</td>
<td>Pharmacology and Therapeutics 3</td>
</tr>
<tr>
<td>HUMR 246</td>
<td>Human Morphology for Paramedical Students 3</td>
</tr>
<tr>
<td>AVSC 206</td>
<td>Clinical Diagnostics 2</td>
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<td>LABM 201</td>
<td>Clinical Chemistry I 2</td>
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Second Semester

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>AVSC 215</td>
</tr>
<tr>
<td>AVSC 277</td>
</tr>
<tr>
<td>AVSC 222</td>
</tr>
<tr>
<td>LABM 202</td>
</tr>
<tr>
<td>AVSC 299B</td>
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<td>Humanities Electives</td>
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31 Offered interchangeable
32 Offered interchangeable
33 A minimum of 96 credits required for graduation
34 The Arabic Placement Test is optional
35 Course is offered in spring and fall
# Agribusiness III

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AGSC 236 New Trends in Agricultural and Food Systems</td>
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<td>AGSC 240 Career Planning Workshop for Agribusiness</td>
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<tr>
<td>FINA 210 Business Finance</td>
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<tr>
<td>DCSN 205 Managerial Decision Making: Models and Techniques</td>
<td>3</td>
</tr>
<tr>
<td>MNGT 215 Principles of Management</td>
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<tr>
<td>Humanities Elective</td>
<td>3</td>
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<tr>
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<table>
<thead>
<tr>
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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGSC 213 Legal Aspects of Agribusiness</td>
<td>3</td>
</tr>
<tr>
<td>AGSC 248 Operation Management for Agribusiness</td>
<td>3</td>
</tr>
<tr>
<td>AGSC 292 Agribusiness Final Year Project (capstone course)</td>
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<td><strong>Total credits 96</strong></td>
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</table>
Department of Animal and Veterinary Sciences (AVSC)

Chairperson: Barbour, Elie
Professors: Barbour, Elie; Farran, Mohamad; Hamadeh, Shady; Sleiman, Fawwak

Vision
The department of Animal and Veterinary Sciences strives to be recognized as a center of excellence in animal and veterinary sciences education, research and outreach. The Department works to promote and support the veterinary science program to attract and maintain a diversified and highly qualified student body.

Mission
The main function of the Department of Animal and Veterinary Sciences is to produce qualified graduates capable of serving the region in all areas of animal and veterinary sciences: research, services, business, and education. The Department offers a BS degree in Veterinary Sciences and two graduate programs of study leading to MS degrees in Animal Science and Poultry Science that prepare students for life-long learning and professional advancement in the field. The Department is also engaged to serve the animal and veterinary sector in Lebanon and the region by providing extension work, consultations, and diagnostic support.

Undergraduate Program
The main function of the Animal and Veterinary Sciences Department is to produce qualified graduates capable of serving the region in all areas of animal and veterinary sciences: research, services, business, and education.

The department participates in offering courses within the FAFS undergraduate core program. Selected senior courses that cover areas of major importance in animal agriculture (i.e., nutrition, physiology, management, production) are also offered to students wishing to select an area of emphasis in animal sciences.

The department also offers the BS degree in Veterinary Sciences that prepares the graduates for life-long learning and professional advancement in the field. In this program students will get the solid basics in animal health, husbandry, nutrition, and breeding. The curriculum is integrative, multidisciplinary and multifunctional allowing graduates to have broader abilities in finding jobs in the local, regional and international markets. This program will also prepare students to pursue their graduate studies in poultry and animal sciences as well as in the basic medical sciences. The courses of the first two years in the Veterinary Sciences program will satisfy most of the premedical requirements needed to enter the Faculty of Medicine at AUB.

The following courses are offered by the department:
Course Descriptions

Core Courses for the BS Degree in Agriculture

**AVSC 222** General Livestock Production 2.3; 3 cr.
Modern principles and practices in beef, sheep, and dairy production and reproduction.

**AVSC 224** Agricultural Microbiology 2.3; 3 cr.
A course that covers basic and applied microbiology. The basic microbiology includes bacteriology, virology, parasitology, and immunology, and the applied microbiology includes veterinary, soil, water, and food microbiology.

**AVSC 226** Poultry Production 2.3; 3 cr.
Modern principles and practices in poultry production with special emphasis on Middle Eastern conditions. Prerequisite: AVSC 271.

**AVSC 243** Genetics 3.0; 3 cr.
Principles of inheritance, with an introduction to modern genetics.

**AVSC 271** Animal Nutrition 3.0; 3 cr.
Structure and functioning of digestive systems of livestock and poultry; bioenergetics, nutritional deficiencies, and nutrient requirements of farm animals. Prerequisite: NFSC 261.

**AVSC 275** Anatomy and Physiology of Farm Animals 3.0; 3 cr.
Systematic anatomy and physiology of farm animals.

Core Course for the BS Degree in Agribusiness

**AVSC 220** Livestock Production 3.0; 3 cr.
The course is divided into three main sections. The first section introduces the types and breeds of livestock, terminology, methods, management systems, techniques of animal production and consumer impact. The second section introduces the students to the modern management practices required for the production of economically beneficial avian species including the domestic chickens, turkeys, water fowls, game birds and others. The third section discusses the nature of economic diseases in domestic animals and avian species and the regulations of World Trade Organization in import and export of animals, including rules that prevent the trans boundary transmission of microbes causing economic diseases.

Elective Courses for the BS Degree in Agriculture

**AVSC 241** Principles of Dairying 2.3; 3 cr.
Management, housing, feeding, breeding, and record-keeping in dairy production.

**AVSC 242** Small Ruminant Production in Arid Regions 2.3; 3 cr.
Breeding, feeding, and management of sheep and goats under arid conditions.

**AVSC 276** Animal Physiology Laboratory 0.3; 1 cr.
Pre- or co-requisite: AVSC 275.

**AVSC 277** Animal Breeding 2.0; 2 cr.
Principles of permanent improvement of animal and poultry production. Prerequisite: AVSC 243 or BIOL 223.

**AVSC 278** Feeds and Feeding 2.3; 3 cr.
Characteristics, conservation, and preparation of feeds; feeding of various classes of livestock.

**AVSC 279** Companion Pet Birds and Animals 3.0; 3 cr.
Breed and stock selection, equipment, stocking densities, routine management, rearing, feeding, behavior and interaction with humans, optimum production, and health care of pet birds and pet animals. Free elective.

**AVSC 280** Aquarium, Marine, and Farming Fish 3.0; 3 cr.
A course that covers the different fishing techniques, fish farming, characteristics of fish, comparison of classes of fish, the setup of fresh water and marine aquariums, and the common diseases of fish. Free elective.

**AVSC 281** Production of Novel Avian Species 3.0; 3 cr.
Management practices in the production of economically beneficial avian species other than the domestic chicken (e.g., ratites, turkey, water fowl, and others).

**AVSC 282** Pet Birds and Animals 3.0; 3 cr.
A course that describes the anatomy and physiology of pets belonging to mammalia, reptilia, aves, and oistechythes. The history, classification, breeds, selection, rearing, feeding, production, and health of sixteen pets will be studied. Prerequisite: BIOL 200.

**AVSC 285** Aquatic Animal Science 3.0; 3 cr.
The course covers the different fishing techniques, fish farming, characteristics of fish, comparison of classes of fish, the setup of fresh water and marine aquariums, and the common diseases of fish.

**AVSC 289** Special Topics in Animal Sciences for Agriculture program 2 cr.
Directed study. Tutorial. Prerequisites: Fourth year standing and consent of instructor.

**AVSC 290** Special Topics in Animal Sciences for Agriculture program 2 cr.
Directed study. Tutorial. Prerequisites: Fourth year standing and consent of instructor.

Core Courses for the BS Degree in Veterinary Sciences

**AVSC 201** Microbiology I-III (Bacteriology and Virology) 1 cr.
The course summarizes the main characteristics of bacteria, fungi and viruses including their morphology, resistance, molecular structure, virulence factors, antigenicity, and animal and human pathogenicity.

**AVSC 202** Animal Breeding and Genetics I 2 cr.
The course introduces the principles of Mendelian and population genetics and their application in breeding, improvement and management of farm, companion and pet animals with the goal of profitable animal production and improved health status. Selection and breeding methods are elaborated in addition to basic topics related to biotechnological advances in this field and its role in relation to other aspects of animal production.

**AVSC 203** History of Veterinary Medicine 1 cr.
The course explores the beginnings of veterinary medicine from ancient times to the middle ages and ending with modern times. The different specializations and branches of veterinary medicine are also explored.

**AVSC 204** Pathology I 2 cr.
The course is divided into two main topics. General pathology describes the causes and the common nature of disease processes including the genetic and immunological disorders, inflammation, neoplasia, and malformation. Systemic pathology discusses the pathological changes of specific diseases according to the organ-systems and the whole pathology of certain infectious and non-infectious diseases.
AVSC 205  Topographic and Applied Anatomy  2 cr.
The course is divided into six major sections starting with the palpable landmarks of the body followed by the topography of the thorax, abdomen, pelvic cavity and ending with the limbs. Superficial veins, sites of venous blood sampling, and investigation points will be explored in different body parts.

AVSC 206  Clinical Diagnostics  2 cr.
The course deals with examination techniques and symptomology of internal diseases. The course is organized according to organs and organic systems, with special attention to the corresponding instrumentation used and species specific differences.

AVSC 207  Microbiology III (Veterinary Immunology)  1 cr.
The subject introduces the protective functions of the hosts to different microbes, and the humoral and cellular immune system, and provides the theoretical background of immune-prophylaxis against infectious diseases.

AVSC 208  Animal Breeding and Genetics II  2 cr.
The course teaches the general and specific significance of cattle, swine, sheep, goat, horse, poultry, dog, cat and fur animal breeding in the world. It introduces the main productive characteristics of the internationally recognized breeds and types of the above mentioned species. The various methods of applied breed improvement and heritable diseases are discussed in detail according to the different species. The local aspects and facilities receive particular emphasis.

AVSC 209  Animal Nutrition + Dietetics I  2 cr.
The subject consists of an introduction to the basics of animal nutrition, characteristics of feedstuffs, animal feeding, and nutrition. The effect of different feedstuffs and feed additives on the animals’ health, production, and reproduction will be addressed in addition to the techniques of balanced ration formulation.

AVSC 210  Applied Ethology  2 cr.
Applied ethology is the branch of animal science, which on the basis of the description of the innate behavior of farm animals and pets, studies the behavior of animals kept in intensive farming systems or, in the case of companion animals, kept in the close vicinity of humans. It also studies the effects of housing, nutrition, and attendants’ care on the establishment of behavioral patterns. This subject also deals with the formation, prevention, and treatment of abnormal behavior (misbehavior, ethostasis) and describes ethical aspects of animal welfare.

AVSC 211  Microbiology I + II Laboratory (Bacteriology and Virology)  1 cr.
The AVSC 211 laboratory course will introduce the students to the most recent technologies used in collection of animal specimens, transportation of specimens from the field to the laboratory, cultivation of organisms, purification of cultures, identification of major etiologic agents in different pets and farm animals, and procedures followed in transportation of pure isolates to reference laboratories around the world for identity confirmation.

AVSC 212  Microbiology III Laboratory (Veterinary Immunology)  1 cr.
The AVSC 212 laboratory course will introduce the students to the most recent technologies used in collection of lymphoid system specimens, transportation of specimens from the field to the laboratory, study the normal versus the abnormal lymphoid organs and their histology, the different methods used in quantification of the cell-mediated and humoral immunities, and the serological methods used in diagnostics of animal diseases.

AVSC 213  Comparative Vertebrate Anatomy  4 cr.
This course introduces the students to the field of Comparative Vertebrate Anatomy. It is organized in a manner within the unifying framework of form, function, and evolution.
Department of Agricultural Sciences (AGSC)

Chairperson: Haidar, Mustafa
Professors: Abou Jawdah, Youssef; Bashour, Isam; Haidar, Mustafa; Nimah, Musa; Saad, Adib; Yau, Sui-Kwong
Assistant Professors: Chaaban, Jad; Chalak, Ali
Senior Lecturer: "Abou-Fakhr Hammad, Efat
Lecturers: "El Aridi, Joumana; "Khailil, Youssef
Instructors: "Frangieh, Maria; "El Husseini, Hashem; "El Zein, Mohamad; "Jawhar, Katia; "Ollaik, Rami

Undergraduate Program

The Department of Agricultural Sciences offers a multidisciplinary program with the objective of training students in the various theoretical and practical aspects of agricultural sciences and agribusiness. Department graduates are prepared to successfully contribute to the agricultural research, business, and education programs in the region.

The department offers two programs, one leading to BS degree in Agricultural Sciences and the Diploma of Ingénieur Agricole, and the other leading to a BS degree in Agribusiness.

The AGSC program prepares students to address current agricultural issues at the regional and global levels using their scientific knowledge to improve production and protect the environment. The department provides practical and up-to-date knowledge in plant production, plant health management, and conservation of water and energy, and trains students to become skilled farm operators and managers who are innovative and responsive to the local and regional needs, and capable of adapting to market changes and rising production costs.

Undergraduate courses are offered in the areas of agronomy, agro-chemicals, agricultural machinery, entomology, horticulture, irrigation, plant health management, plant breeding, plant pathology, soils, weed science, agricultural economics and rural development. Introductory courses in these subjects are offered to agriculture students within the framework of a core curriculum. Specialized and advanced courses are also offered as electives to undergraduates.

The Agribusiness (AGBU) program combines the study of management with agricultural science, in order to provide students with an understanding of the economic and business principles that underlie management tools and their application to agricultural and related businesses. The Educational Objectives of the AGBU program are to prepare students to become entrepreneurs, business leaders, skilled farm operators and future policy advisers who are well-grounded in agriculture and food production; capable of communicating and using their skills in order to improve their livelihoods and that of their community.

Undergraduate courses are offered in the areas of agriculture, business management and accounting, marketing, agriculture economics, entrepreneurship and rural development. Specialized and advanced courses are also offered as electives to undergraduates.

Course Descriptions

Core Courses for the BS Degree in Agriculture

AGSC 201 Orientation to Agriculture and Food Systems 2.0; 2 cr.
A survey of the natural resource potentialities with emphasis on the principal input requirements for agricultural development; and the current trends in modernization of agricultural production with emphasis on the difficulties this process faces.

AGSC 212 Microeconomic Theory of Food and Farming 3.0; 3 cr.
The course introduces economic principles, which are then used to explain the production of goods and services, household behavior, economic equilibrium and the welfare consequences of alternative exchange mechanisms. Special applications will be given to decision-making and the allocation of resources for the agricultural firm, and consumer behavior and demand for agricultural and food products.

AGSC 215 Introduction to Soils 2.3; 3 cr.
Origin, properties, classification, and management of soil with emphasis on soil behavior in relation to irrigated agriculture, ecology, and the environment. Prerequisite: CHEM 200 or CHEM 202 or equivalent.

AGSC 220 Principles of Plant Physiology 2.3; 3 cr.
An introduction to environmental and physiological factors affecting crop growth and development. Prerequisite: BIOL 200.

AGSC 221 Principles of Entomology 2.3; 3 cr.
Insect morphology, anatomy, classification, and biology in relation to pest control in agroecosystems. Prerequisite: BIOL 200.

AGSC 222 Farm Practices 0.6; 1 cr.
Practical experience in operational activities and management decisions essential in modern agriculture. Prerequisites: AGSC III standing and eligibility for enrollment in the regular program at AREC.

AGSC 223 Agricultural Project 0.6; 2 cr.
Directed study with field and laboratory work. Prerequisites: AGSC III standing and eligibility for enrollment in the regular program at AREC.

AGSC 224 General Horticulture 2.3; 3 cr.
Principles and practices in the production of fruits, ornamentals, and vegetables.

AGSC 225 Rural Social Systems in Agricultural and Rural Development 3.0; 3 cr.
An examination of institutional and sociological problems of rural areas; influence of rural institutions on rural development.
AGSC 226  Farm Power and Machinery  2.3; 3 cr.
Internal combustion engines, power trains, drawbar performance, stability, and safe operation of tractors; functional requirements, principles of operation, performance evaluation, and selection of farm machinery.

AGSC 227  Surveying and Irrigation Principles  0.3; 1 cr.
Topographic surveying, irrigation methods evaluation, soil physical properties, soil water, and water flow measurement.

AGSC 228  Irrigation Principles  2.3; 3 cr.
Surveying, land preparation, water measurement, conveyance and application, pumping, drainage and soil-water relationships; introduction to farm irrigation methods.

AGSC 231  Principles of Agronomy  2.3; 3 cr.
Principles and cultural practices in the production of field crops.

AGSC 232  Principles of Plant Pathology  2.3; 3 cr.
Fundamentals and practical aspects of plant diseases, their causes, and control.

AGSC 235  Agricultural Extension in Development  2.0; 2 cr.
A comparative study of developmental philosophy, objectives, and adaptation to developing countries; principles and methods of extension and adult teaching. Prerequisite: AGSC 225.

AGSC 241  Farm Management  3.0; 3 cr.
A course that focuses on the application of modern principles and techniques of management to the farm sector. Prerequisite: AGSC 212 or ECON 203.

AGSC 265  Soil Fertility  2.3; 3 cr.
Behavior of native and applied fertilizer elements in soils in relation to crop production, soil fertility evaluation, fertilizer manufacture, fertilizer application in irrigation systems, and economics of fertilizer use. Prerequisite: AGSC 215.

AGSC 284  Fundamentals of Weed Science  2.3; 3 cr.
Fundamentals of weed biology and weed management practices with emphasis on chemical weed control.

AGSC 290  Project Planning and Appraisal  3.0; 3 cr.
Introduces different techniques commonly used in project planning and appraisal.

AGSC 296  Agriculture Project Presentation  1 cr.
Prerequisite: AGSC IV standing.

Elective Courses for the BS Degree in Agriculture

AGSC 250  Organic Farming  1.2; 3 cr.
Advances in organic farming and growing systems with emphasis on farm planning, certification, marketing, information, and organic farming practices.

AGSC 261  Hydraulics  3.0; 3 cr.
Principles of mass and energy conservation, pipe flow, canal flow, measurement of fluid flow, and application of hydraulic principles to irrigation system design.

AGSC 288  The Art of Honey Making  2.3; 3 cr.
The art and science of keeping honeybee colonies. Covers the processes of caring for bee colonies through utilizing available resources around the social honeybee colony, and wild and cultivated plants in the use of food, to glean as many potential products and services from the colony as possible. Free elective.

AGSC 291  Introduction to Beekeeping  2.3; 3 cr.
Different aspects of culturing the honeybee starting with the behavioral patterns of bee colonies and ending with bee management considerations.

AGSC 293  Integrated Plant Health Management for Economic Crops  3.0; 3 cr.
Basic concepts of the integrated approach to the proper management of plant diseases and insect pests of economic crops including components of plant health management (PHM) programs, and the feasibility and economics of various management strategies; specific PHM cases on major crops are discussed. Prerequisites: AGSC 221 and AGSC 232.

AGSC 294  Applied Plant Protection  2.3; 3 cr.
Observation and study of insect pests and plant diseases on field and greenhouse crops, with emphasis on recognition, evaluation, and control. Prerequisites: AGSC 221, AGSC 232 or equivalent.

AGSC 295  Pesticides  3.0; 3 cr.
A survey of the commonly used insecticides, fungicides, rodenticides, and related materials as to their chemistry, mode of action, and relation of structure to activity, toxicity, metabolism, and hazards to the environment.

AGSC 299  Special Topics in Agricultural Science  2 cr.
Directed study. Tutorial. Prerequisites: fourth year standing and consent of instructor.

Core Courses for the BS Degree in Agribusiness

AGSC 202  Introduction to Land and Water Resources  2.3; 3 cr.
Develop an understanding of current issues in land and water resources, including: soil and water conservation and management; land classification and reclamation; soils and environmental quality; sustainable agro-ecosystems. Prerequisite: AGSC 204.

AGSC 203  Crop Production and Protection  2.3; 3 cr.
The course provides an overview of the technologies used in the production of crops. The student will acquire a knowledge and understanding of current crop production systems, the end market requirements for products as well as the quality standards of these products. Students will also learn current techniques in crop protection and yield management.

AGSC 204  Natural Sciences for Agribusiness  3.0; 3 cr.
This course is an introduction to chemistry and biology designed for first year agribusiness students. It aims to familiarize students with the basic concepts and theoretical principles of modern chemistry and biology. Students will gain an appreciation of the importance that biology and chemistry play in our natural lives.

AGSC 210  Marketing in Agribusiness  3.0; 3 cr.
An overview of marketing activities in Agro-food industries, including marketing inputs in strategic planning, global marketing, marketing research, analysis of buyer behavior, market segmentation and positioning, and development of the marketing mix elements. Prerequisite: Junior status standing.
AGSC 211  Introduction to Agricultural Issues and Policies  3.0; 3 cr.
Survey of global food and agricultural issues. Covers: role of agriculture in economic development; trade in food and agricultural products; global food production, consumption and marketing patterns; economics of technical change and food assistance; agriculture and the environment.

AGSC 212  Microeconomic Theory of Food and Farming  3.0; 3 cr.
The course introduces economic principles, which are then used to explain the production of goods and services, household behavior, economic equilibrium and the welfare consequences of alternative exchange mechanisms. Special applications will be given to decision-making and the allocation of resources for the agricultural firm, and consumer behavior and demand for agricultural and food products.

AGSC 213  Legal Aspects of Agribusiness  3 cr.
The main objective of the course is to help Agribusiness students understand the Lebanese and American legal aspects of common agricultural business activities, as well as the formation and function of Agri-commercial companies and related ethical principles. Prerequisite: Junior status standing.

AGSC 219  Entrepreneurship in Agriculture  3.0; 3 cr.
Integration of production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in management of agricultural businesses using the compilation by students of agribusiness plans. Prerequisite: Junior status standing.

AGSC 236  New Trends in Agricultural and Food Systems  3.0; 3 cr.
Current trends in agricultural trade; developments in private sector markets and in public policy; the concerns related to the effects of agricultural trade on the environment, food security, and regional development. The course will also address the issue of the challenges to food exporters from developing countries posed by the need to comply with ever-stricter standards. The course will also cover the global market structures of the agricultural products most relevant to the Mediterranean countries and the experience and present thinking about the pros and cons of the spread of genetically modified products, designation of origins and other food labeling mechanisms. Prerequisite: Senior status standing in Agribusiness.

AGSC 240  Career Planning Workshop for Agribusiness  0 cr.
A ten-hour workshop designed to introduce students to the various communication skills needed in a typical work environment. Mastering these skills plays a profound role in shaping and advancing professional careers in all types of industries and work scopes. The workshop introduces specific guidelines for the effective use of a variety of communication skills in the workplace in an interactive manner, simulating the work environment.

AGSC 248  Operation Management for Agribusiness  3 cr.
This course covers the essentials of supply chain management and quantitative techniques needed for the planning and implementation of agribusiness operations. This course includes optimization of production and cost minimization. Prerequisite: Senior status standing.

AGSC 253  Harvest and Post-harvest Issues and Strategies  3.0; 3 cr.
Discusses: the structure of the agricultural harvesting and marketing system with emphasis on factors determining farm level prices; emphasizes how markets coordinate consumer desires and producer costs through marketing channels; impact of market structure, grades, information, product form, and advertising on farm prices; International trade impact on producers, consumers, agribusiness, and government. Prerequisites: AGSC 202, AGSC 203 and AGSC 212.

AGSC 255  Field Study of the Rural Agro-economy  3.0; 3 cr.
Tours of agribusiness enterprises and rural farms in Lebanon are organized with the intent to observe the management and marketing practices used in successful operations of different agribusiness structures. Students will also learn how the agriculture value chain is structured within the rural economy. Prerequisites: AGSC 202 and AGSC 203.

AGSC 256  Summer Internship  1 cr.

AGSC 292  Agribusiness Final Year Project  5.0; 5 cr.
Milestone course for students in Agribusiness. Application of concepts, tools, and principles including management, finance, marketing, economic theory, and quantitative methods to applied agricultural decisions on selected agricultural and agribusiness projects that enhance team-building as well as written, and oral communication skills. Prerequisite: Senior status standing.
Department of Nutrition and Food Sciences (NFSC)

Chairperson: Olabi, Ammar
Professors: Hwalla, Nahla; Obeid, Omar; Toufeili, Imad
Associate Professor: Olabi, Ammar
Assistant Professors: Abiad, Mohammad; Ghattas, Hala; Kassaify, Zeina; Naja, Farah; Nasreddine, Lara
Lecturer: Natour, Jamila
Instructors: Chamieh, Marie Claire; Ghandour, Sana; Habib-Mrad, Carla; Hamadeh, Basma; Mikati, Nadine
Research Associate: Adra, Nada
Adjunct Professor: Sahyoun, Nadine

Undergraduate Program

The mission of the Department of Nutrition and Food Science is to produce qualified graduates capable of serving the region in various areas of food science, nutrition, and dietetics. The department participates in offering courses within the FAFS undergraduate core program and, in addition, offers junior and senior courses that cover areas of major importance in food science, nutrition, and dietetics.

The department offers two three-year programs, one leading to a BS degree in Nutrition and Dietetics, and the other leading to a BS degree in Food Science and Management. Graduates wishing to qualify as licensed dietitians should complete an Internship for a minimum of six months in a recognized medical setting.

In addition, the department offers a Coordinated Program in Nutrition and Dietetics (CP) which combines the didactic three year Nutrition and Dietetics Program with an additional year of supervised practice. The CP provides students who complete it with the academic and supervised practice requirements established by the Commission on Accreditation for Dietetics Education (CADE) of the American Dietetic Association (ADA) for entry level dietitians.

Students who intend ultimately to enter the Faculty of Medicine must complete the premedical requirements as outlined in the AUB catalogue Faculty of Arts and Sciences section titled Premedical Study. Graduates of these programs do not receive the Diploma of Ingénieur Agricole.

The following courses are offered by the department:

Course Descriptions

Core Courses for the BS Degree in Nutrition and Dietetics

NFSC 221  Basic Nutrition  3.0; 3 cr.
Nutritional survey of nutrients, including their food sources, digestion, metabolism, functions, and requirements in humans. Course offered in fall and spring.

NFSC 222  Community Nutrition  3.0; 3 cr.
An introduction to key concepts and current topics in community nutrition. Discusses the role of nutrition in improving the health and well being of communities and familiarizes students with population nutritional status assessment, principles of nutrition research, and factors involved in planning, implementing and evaluating community nutrition programs and policies. Prerequisites: NFSC 221, and NFSC 285.

NFSC 240  Nutritional Status Assessment  1.3; 2 cr.
Exposes students to the theoretical basis of various aspects of nutritional assessment (counseling dietary assessment, anthropometric measurement, biochemical assays, and clinical assessment). The course also familiarizes students with nutritional status assessment tools and techniques through practical experimentation in the lab. Prerequisite: NFSC 221; Pre- or co-requisite: NFSC 274.

NFSC 261  Introductory Biochemistry  3.0; 3 cr.
Chemistry of biological compounds, their enzymatic degradation and intermediary metabolism. Prerequisite: CHEM 208. Course offered in fall and spring.

NFSC 265  Food Chemistry  3.0; 3 cr.
Chemical composition, physical and sensory properties of foods. Prerequisite: CHEM 208. Course offered in fall and spring.

NFSC 267  Food Analysis  1.3; 2 cr.
Laboratory methods for chemical analysis of nutrients and chemicals in food products. Prerequisites: CHEM 205, CHEM 209; Pre- or co-requisite: NFSC 265. Course offered in fall and spring.

NFSC 274  Human Nutrition  3.0; 3 cr.
Human physiological needs for energy, carbohydrates, fats, proteins, vitamins, and minerals; control of nutrient metabolism. Prerequisites: NFSC 221, NFSC 261, and PHYL 246.

NFSC 277  Food Microbiology I  3.0; 3 cr.
A survey of micro-organisms and their role in causing food spoilage and food poisoning, and the control of microbial spoilage and pathogenic micro-organisms in foods.

NFSC 285  Nutrition in the Life Cycle  2.3; 3 cr.
Focuses on the basic nutritional needs of individuals throughout their life cycle: infancy, childhood, adolescence, adulthood, and old age, and special nutritional requirements for pregnancy and lactation. Prerequisites: NFSC 221 and NFSC 274.

NFSC 287  Food Processing  2.0; 2 cr.
Technology and processing of foods; includes processing food products in the Pilot Plant. Prerequisites: NFSC 265, ND III or FSM III.
Core Courses for the BS Degree in Food Science and Management

**NFSC 261**  
Introductory Biochemistry  
3.0; 3 cr.  
Chemistry of biological compounds, their enzymatic degradation, and intermediary metabolism.  
Prerequisite: CHEM 208. Course offered in fall and spring.

**NFSC 265**  
Food Chemistry  
3.0; 3 cr.  
Chemical composition, physical and sensory properties of foods. Prerequisite: CHEM 208. Course offered in fall and spring.

**NFSC 267**  
Food Analysis  
1.3; 2 cr.  
Laboratory methods for chemical analysis of nutrients and chemicals in food products. Prerequisites: CHEM 205, CHEM 209; Pre- or co-requisite: NFSC 265. Course offered in fall and spring.

**NFSC 272**  
Introduction to Food Service and Industries  
1.3; 2 cr.  
An introduction to food service and the food industry. This course explains the food chain system, and describes the food service institutions and the different food industries; it also includes visits to different institutions in the food chain. Prerequisites: NFSC 265 and NFSC 277.

**NFSC 277**  
Food Microbiology I  
3.0; 3 cr.  
A survey of micro-organisms and their role in causing food spoilage and food poisoning, and the control of microbial spoilage and pathogenic micro-organisms in foods.

**NFSC 278**  
Food Microbiology II  
2.3; 3 cr.  
Microbiological aspects of food preservation; beneficial utilization of micro-organisms in food applications; detection of microbial contamination and hazards of importance to public health. Prerequisite: NFSC 277.

**NFSC 280**  
Summer Training in Food Establishments  
1 cr.  
Involves students in supervised training in one of the food service institutions or food industries. Prerequisite: NFSC 272.

**NFSC 282**  
Food Quality Management  
2.0; 2 cr.  
Basic principles of food quality control, quality assurance, and quality management in food service establishments and food industries; emphasis on modern concepts such as HACCP, ISO 9000, and Good Manufacturing Practices.

**NFSC 287**  
Food Processing  
2.0; 2 cr.  
Technology and processing of foods; includes processing food products in the Pilot Plant. Prerequisites: NFSC 265, ND III or FSM III.

**NFSC 288**  
Technology of Food Products  
2.3; 3 cr.  
Principle of food spoilage, food preservation, and the different methods of food processing. Prerequisites: NFSC 261, ND III, FSM III or AGR IV.

**NFSC 289**  
Food Processing Laboratory  
0.3; 1 cr.  
Laboratory exercises in the Pilot Plant in food preservation and processing. Co-requisite: NFSC 287, ND III or FSM III.

**NFSC 291**  
Elements of Food Engineering  
3.0; 3 cr.  
Basic concepts and principles of food engineering; emphasis on food handling and unit operations utilized in food processing. Prerequisites: MATH 204, FSM III.
NFSC 296  Current Topics in Food Sciences and Nutrition  1 cr.
Prerequisite: ND III or FSM III. Course offered in fall and spring.

NFSC 299  Projects in Nutrition and Food Sciences  2 cr.
Directed study. Tutorial. Prerequisite: ND III or FSM III.

Core Course for the BS Degree in Agribusiness
NFSC 252  Food Processing  3.0; 3 cr.
Technology and processing of foods; includes processing food products in AREC. Prerequisite: Junior status standing.

Elective Course not for Nutrition and Dietetics or Food Science and Management
NFSC 220  Food and Nutrition Awareness  3.0; 3 cr.
Introduces the discipline of nutrition and assists students in making optimal food choices for better health. Free elective.
Department of Landscape Design and Ecosystem Management (LDEM)

Chairperson: Talhouk, Salma
Professors: Makhzoumi, Jala; Talhouk, Salma; Zurayk, Rami
Associate Professor: Farajalla, Nadim
Visiting Professor: Abunnasr, Yaser
Senior Lecturer: Battikha, George
Lecturers: Berger, Elke; El-Amine, Bachar; Issa, Maha; Khalil, Nahida; Melhem, Wissam; Shibli, Rabih; Weltzien, Julie; Yazbek, Mariana
Instructor: Fabian, Monika; Fayyad, Reem; Haidar, Ammar; Rachid, Dima; Tawk, Larma Y.

Undergraduate Program

The mission of the department is to graduate students that adopt a holistic view of landscape and environment; and are equipped with cutting edge scientific knowledge and creative, flexible skills for the design and management of natural and cultural resources. The essence of the department lies in its interdisciplinarity, equally in teaching and in research with applications in the Middle East region. To that end, the Department builds on the strong linkages established with other academic units within and outside FAFS.

The following design courses are part of the program requirement. There is a grade average requirement for: ARCH 100, LDEM 202, 204, 216, 228, 241, 242 and 246, an average of 70 must be attained in the two preceding design courses in each case.

Course Descriptions

Core Courses for the BS Degree in Landscape Design and Eco-management

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDEM 200</td>
<td>Landscape Technical Drawing</td>
<td>4 cr.</td>
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</tbody>
</table>

An introduction to basic graphical skills in landscape design. Students learn to use different drawing tools and techniques, 2D-orthographic projections and 3D-drawings. Course material also covers understanding of scale and of shade and shadow.

P Part time
1 Visiting
LDEM 202 Landscape Design I 6 cr.
An introductory studio that guides students through the multi-layered meaning of landscape. Visual, perceptual, and spatial qualities are explored and alternatives for their graphic representation investigated. Prerequisite: ARCH 100.

LDEM 203 The Environment and Sustainable Development 3.0, 3 cr.
An introduction to sustainable development: concepts, goals, and economic and social aspects; environmental issues associated with development: natural resource management, population, food production, and energy; institutional framework; standards and policies; emerging technological applications and their impacts; resolution of environmental conflicts; future trends. Prerequisite: LDEM 211.

LDEM 204 Ecological Landscape Design I 6 cr.
An introduction to the objectives and methodology of ecological landscape design in Mediterranean and semi-arid ecosystems. This course emphasizes the larger context for landscape design introducing students to environmental sustainability, use of native plant resources and, biodiversity conservation. Applications are selected from urban and rural public spaces. Prerequisite: LDEM 246.

LDEM 209 Plant Biology 3.3; 4 cr.
An introduction to botany and the general principles of plant biology. The course material is aimed at developing an understanding and appreciation of the interaction of plants with their environment, and providing applications and insights relevant to landscape students. Prerequisite: LDEM 211.

LDEM 211 Landscape Horticulture I 2.3; 3 cr.
This course explores the science, the technique and the art of landscape horticulture. Students will identify plants, learn how to represent and produce them through practical sessions, and understand the theory behind successful plant management practices. They will become familiar with the landscape horticulture literature through written exercises, and will be introduced to concepts of environmental horticulture and its role in promoting nature conservation. Prerequisite: LDEM 209.

LDEM 212 Landscape Horticulture II 2.3; 3 cr.
Survey, identification, landscape characters, and management of herbaceous and woody landscape plants. The student will learn about the landscape uses of plants and the management requirements in different site/use situations. Prerequisite: LDEM 211.

LDEM 215 Introduction to Landscape Pests 2.3; 3 cr.
The fundamentals, biology, and ecology of landscape insects, mites, plant pathogens, and weeds.

LDEM 216 Landscape Design II 6 cr.
The process of landscape design is introduced, starting with site appreciation and analysis, through concept development and articulation using building materials, plants, and landscape furniture. The focus is on conceptual thinking and communication both verbally and graphically. Prerequisite: LDEM 202.

LDEM 217 Soils in the Landscape 2.3; 3 cr.
Specifically designed for landscape students, the course aims at developing an understanding of the relationship between geology, landform, soils and landscapes. The course also aims to emphasize the management actions essential in landscapping, such as soil preparation, soil amendments and fertilization.

LDEM 227 Applied Plant Protection in Landscape 2.3; 3 cr.
The diagnosis of landscape pests including diseases, insects, mites, and weeds of major importance, and applied measures for their prevention and control in urban and natural environments.

LDEM 228 Ecological Landscape Design II 6 cr.
A course offered at the Agricultural Research and Educational Center (AREC) in the Bekaa. The concepts and methods introduced in the previous term are applied to rural and agricultural landscapes with a hands-on approach to landscape design. Prerequisite: LDEM 228.

LDEM 230 Water and the Environment 3.0; 3 cr.
Introduces physical hydrological processes and their interactions with natural environment and human activities. Topics covered include hydrologic cycle, watershed hydrology, runoff generation, precipitation, evapotranspiration, infiltration, stream processes, groundwater, erosion, and statistical hydrology.

LDEM 241 Final Year Project: Landscape Design 6 cr.
Each student will work on a project of his/her choice, with the guidance and approval of an appointed faculty committee. The natural, environmental, socio-cultural, and legal constraints, together with the specific requirements of the project, will form the basis for developing the landscape design. Prerequisite: LDEM 228.

LDEM 242 Final Year Project: Landscape Implementation and Management 6 cr.
Having finalized the landscape design in the previous term, the last term focuses on developing technical and implementation drawings and a management plan. Working on their individual projects, the students have the opportunity to integrate the knowledge and skills gained in the previous years into a comprehensive landscape design proposal. Prerequisite: LDEM 241.

LDEM 245 Irrigation Methods for Landscape Designs 3 cr.
A course that acquaints students with the design and production of economical irrigation systems that keep landscapes green while conserving water.

LDEM 246 Landscape Design III 6 cr.
This studio continues the emphasis on landscape design development with a focus on design details, building materials and construction, landscape furniture, plant selection and their role in articulating the landscape design. Landscape specifications, bills of quantities, and costing are also introduced. Prerequisite: LDEM 216.

LDEM 250 Computer-Aided Design 2.3; 3 cr.
An introduction to computer-aided landscape design and analysis. Students are provided with software tools for landscape drafting that can be applied in landscape design projects. Prerequisite: LDEM 202.

LDEM 263 Landscape Appreciation 3.0; 3 cr.
This course introduces the students to specific landscapes of Lebanon and teaches their reading through analyzing the interrelationship between natural conditions and human settlement and land use over time. Field trips are included in the course. Frequently.

LDEM 265 Landscape Management 2.3; 3 cr.
This course is designed to help students develop field expertise and practical skills by building on knowledge acquired in previous science courses (plant biology, landscape horticulture and soils in the landscape,) and learn implementation and management actions essential in landscaping.

LDEM 290 Professional Practice 3.0; 3 cr.
This course discusses the professional practice of the landscape architecture profession. It introduces basic issues in the practice and the profession of landscape design, challenging the students to critically examine professional, political, commercial, and other problems in current practice. Prerequisite: ENGL 203 and junior standing.
LDEM 295  Landscape Seminar  1 cr.
Current issues in landscape design and ecosystem management.

LDEM 296  Landscape Seminar  1 cr.
Current issues in landscape design and ecosystem management.

**Elective Courses for the BS Degree in Landscape Design and Eco-management**

LDEM 201  Landscape History and Theory  3 cr.
A historical review of garden and landscape design that explores the role of regional resources and environmental, socio-economic, and political factors in shaping garden and landscape design concepts.

LDEM 229  Turfgrass Culture, Machinery, and Management  2.3; 3 cr.
An introduction to turfgrass use, establishment, and management. This course focuses on the environmental impact of turfgrass landscapes in arid regions. Students are introduced to the machinery used in landscape management.

LDEM 260  Current Issues in Landscape Design  3 cr.
A review of recent developments in landscape design on an international basis. The course emphasizes case studies and a critical review of the contemporary role of the profession.

LDEM 261  Spatial Structure and Movement  3 cr.
The course is concerned with the experience of outdoor and indoor spaces, and the direct influence the placement of any object has on the perception of the latter and the movement within. The course is based on the assumption that the notion of movement and body proportion for mankind has been a primary design tool throughout history, and will try to reevaluate this tool for contemporary design.

LDEM 262  Healing Gardens: Theoretical Perspectives and Applications  3 cr.
This course is offered relative to the current view that an outdoor garden at health care facility is an essential supplement to medical interventions. Introducing the concepts of healing environments in terms of medical geography and environmental psychology, the course proceeds to examine prevailing approaches to the design of healing gardens at medical settings in the present day. Theoretical perspectives from social sciences are used to interpret these healing places as well as those associated with historic precedents for healing - The Japanese garden and the landscape traditions of medieval Christianity and Islam.

LDEM 270  Ornamental Plants for Dry Landscapes  2 cr.
A survey of native, wild, and domesticated plants adapted to dry areas with potential use in dry landscapes, with an overview of the different environmental and physiological factors that determine plant growth and developments under such dry conditions.
Faculty of Arts and Sciences (FAS)
Faculty of Arts and Sciences (FAS)

In the mid-1970s the University undertook a major planning exercise, which was known as the Horizon 2000 Plan, aimed at reorganizing the University as a whole. Several changes were introduced in the Faculty of Arts and Sciences as a result: a number of departments and programs (Fine and Performing Arts, Religious Studies, European Language and Literature) were cancelled, and a few others were either merged (e.g., Psychology and Sociology/Anthropology) or became independent from the faculty (e.g., Education and the University Orientation Program). In the past few years the faculty has attempted a major self-review, particularly in its academic programs, faculty composition, and graduation requirements. Several master’s degree programs were introduced (e.g., Computer Science and Financial Economics) or re-introduced (e.g., Middle Eastern Studies) and a separate Department of Computer Sciences was created. In 2000 the School of Business, which was part of the Faculty of Arts and Sciences, became an independent school, and Education became once more a department in Arts and Sciences. In Fall 2001 the Central Research Science Laboratory was established to promote scientific research in the faculty and at the University at large. The faculty has reactivated the PhD programs in Arabic, Cell, and Molecular Biology, Islamic and Modern Middle East History and Theoretical Physics. In 2004-05 the Center for American Studies and Research (CASAR) was introduced as well as a new undergraduate program in Fine Arts and Art History.

Mission
The Faculty of Arts and Sciences represents the core of the University and is its main gateway for higher studies and professional education. It follows a liberal arts program that stresses freedom of academic choice, integrity, ethical conduct, equal opportunity and respect for diversity. The faculty offers undergraduate and graduate programs committed to excellence in research and teaching in the most fundamental disciplines of the arts, humanities, and social, natural and mathematical sciences.

Vision
The Faculty of Arts and Sciences strives to have a governance system that is transparent and based on peer participation and review. The faculty encourages and supports high quality research and teaching. The curriculum is built on a pivotal and formative freshman year. Excellence is achieved at the undergraduate and graduate levels through a continuous revision of curricula, assessment of needs for equipment and facilities, and recruitment and development of faculty profiles. The faculty is committed to academic growth through the establishment of successful and sustainable Bachelor, Master and Doctoral degrees.

Undergraduate Programs
Students entering the Faculty of Arts and Sciences as freshmen, except those admitted as special students or auditors, select one of the following programs:

- Bachelor of Arts: four years
- Bachelor of Science: four years
- Pre-Business Administration, pre-Health Sciences, pre-Engineering and Architecture, or pre-Agricultural and Food Sciences
Students entering the Faculty of Arts and Sciences as sophomores select one of the following two programs, for each program a period of three years of study is normally required:

- Bachelor of Arts
- Bachelor of Science

There are three major categories of disciplines in the Faculty of Arts and Sciences. Their distribution according to degree-offering departments is as follows:

- Humanities: Arabic, English, Fine Arts and Art History, History and Archaeology, Middle Eastern Studies, and Philosophy
- Social Sciences: Economics, Education, Political Studies and Public Administration, and Social and Behavioral Sciences
- Sciences: Biology, Chemistry, Computer Science, Geology, Mathematics, and Physics

Admission

For complete and detailed information regarding admission to the University, including certificates recognized, see the Admission section of this catalogue. The specific requirements for admission to the freshman or sophomore class are found on pp. xx-xx.

Classification of Students

An undergraduate student shall be considered to have completed a class when s/he has taken and passed 30 or more credits beyond the requirements for the previous class.

A student will not be granted a certificate stating that s/he has completed a class until s/he has completed the specified courses in the regular program for that class and has acquired the requisite number of credits. The credit requirements are as follows:

<table>
<thead>
<tr>
<th>Major and Faculty</th>
<th>Freshman Standing</th>
<th>Sophomore Standing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30 credits</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>60 credits</td>
<td>Cumulative 30 credits -</td>
</tr>
<tr>
<td></td>
<td>90 credits</td>
<td>Cumulative 60 credits Cumulative</td>
</tr>
</tbody>
</table>

Full-time Students and Maximum Credit Loads

To be considered full-time a student must carry a minimum load of 12 credits per semester. A full-time student who, for compelling reasons, is forced to reduce his/her load to fewer than 12 credits must first petition the Student Academic Affairs Committee for permission to do so. This should be done no later than 10 weeks after the start of the semester (five weeks in the case of summer school). Students in their first semester at AUB may be allowed to reduce their load to fewer than 12 credits by requesting permission from the Student Academic Affairs Committee. Requests are handled on a case-by-case basis.

Students can normally register for up to 17 credits per semester and 9 credits during the summer term. English course requirements must be taken as of the first semester at the University. Students who wish to register for more than 17 credits must petition the Student Academic Affairs Committee for permission to do so. Requests are handled on a case-by-case basis. Students in the following categories will normally be granted permission by the Student Academic Affairs Committee to register for more than 17 credits:

- Freshman students intending to go into medicine or engineering, and who have an average of at least 80 for the first semester, may take an additional course in the second semester.
- Graduating senior students in their last semester who are not on academic probation and who have completed their English communication skills requirements at the level required by their major departments may register for a maximum of 18 credits.
- If the program requires that a student register for more than 17 credits in a particular semester.

Requirements for Premedical Study

Faculty of Arts and Sciences students who intend ultimately to enter the Faculty of Medicine must select and complete one of the regular degree programs given as Bachelor of Arts (four years including the Freshman year) or Bachelor of Science (four years including the Freshman year). Please refer to the Admission section in the Faculty of Medicine in the 2010-11 graduate catalogue, p. xxx-x.

Academic Rules and Regulations

For information on Academic Advisers, Categories of Students, Correct Use of Language, Grading System, and Graduation with Distinction and High Distinction see pp. xx-xx in General University Academic Information in this catalogue.

Regular Freshman Program

The freshman program requires the completion of 30 credits, whether or not the student remains in the Faculty of Arts and Sciences or transfers to another faculty. Students intending to major in a subject within the Faculty of Arts and Sciences may be accepted as provisional majors upon completion of 24 credits.

University Requirements

General Education

All FAS students must take a minimum of 33-36 credits of general education courses. Please refer to the General Education section pp. xx-xx in the General University Academic Information in this catalogue.

English: All new students at AUB are placed in one of the English communication skills courses (ENGL 102, ENGL 203, or ENGL 204) on the basis of their score on the TOEFL or the AUB-EN (EEE) or the SAT Writing. A student placed in one of the courses in the sequence has to complete that course and all following courses. During the freshman year students are required to take a minimum of three credits in English at level 200 or above (either ENGL 203 or ENGL 204 depending on placement). English 102 and ENGL 204 may be considered electives for freshman students to complete their freshman program in addition to ENGL 203.
Arabic: All students who have been admitted to the Faculty of Arts and Sciences and whose native language is Arabic must satisfy the Arabic Language Requirement (ALR)—except for those students who have completed their secondary education in a non-Arabic medium program and who receive exemption from the Office of Admissions. Students may apply for exemption to the Office of Admissions any time before pre-registration. Non-exempted students entering the freshman class must take three credits of Arabic at the 100 level, and the performance in this course (or in the two freshman Arabic courses, if taken) determines the required Arabic course at the sophomore level. Students who are exempted from Arabic should replace this requirement by taking ARAB 200, ARAB 203, 206, or any other 3-credit course in the humanities.

Lebanese students must also satisfy the requirements listed on pp. xx-xx of this catalogue in order for their freshman year to be granted the equivalency of the Lebanese Baccalaureate Part II.

Faculty Requirements
In order to complete 30 credits for the freshman class, every freshman student must take at least one course in each of the following areas of study: humanities, mathematics, natural sciences, social sciences, plus the departmental requirements that will allow him/her to qualify for a major beginning in the sophomore year. See Table 1 for the distribution of these requirements in the various academic units of the Faculty of Arts and Sciences and other faculties.

Freshman Courses
Students are recommended to take their electives from the following list of courses. Most of these courses have been specifically designed for, and are only open to, freshman students. Students who wish to take courses numbered 200 and above (not listed below) may do so, as exceptions with the approval of their advisers. The freshman level courses listed below are arranged according to the areas of study.

Humanities: ARAB 101, ARAB 102, AROL 101, CVSP 110, CVSP 111, CVSP 112, ENGL 103, ENGL 104, ENGL 105, ENGL 106, ENGL 107, ENGL 108, FAAH 150, HIST 101, HIST 102, HIST 200, PHIL 101, PHIL 102, SOAN 103
Mathematics: MATH 101, MATH 102, MATH 203
Natural Sciences: BIOL 101, BIOL 105, BIOL 106, CHEM 101, CHEM 101L, CHEM 102, CHEM 102L, CHEM 200, GEOG 101, GEOG 102, GEOG 103, GEOG 104, PHYS 101, PHYS 101L or PHYS 103, PHYS 200, and ENHL 200 from the Faculty of Health Sciences.
Social Sciences: ECON 101, ECON 102, PSPA 101, SOAN 101, PSYC 102
Electives: As necessary to add up to a 30 credit total (e.g. CMPS 101). See Tables 2 and 3 for requirements to transfer into a major.

Lebanese freshman students: Lebanese students who are admitted to the freshman class should check with their advisers at registration time to ensure that the number of credits and the types of subjects that they take during their freshman year are in compliance with the specifications of the Equivalence Committee of the Lebanese Ministry of Education. The equivalence committee requires that out of the thirty (30) freshman credits nine (9) must be in the humanities and social sciences with at least three (3) credits in each of these two areas. The committee further requires that the thirty (30) freshman credits should include six (6) credits in the natural sciences and mathematics with at least three (3) credits in the natural sciences.

Courses Numbered 200 and Above
Some courses numbered 200 and above are suitable for freshman students. Note, however, that these courses are also open to sophomores, juniors, and seniors and therefore may be more competitive than courses offered at the 100 level. Such courses include those that are freshman requirements (see above) and those that are listed in Tables 1 and 2 (see pp. xxx, xxx).

Transfer to a Major
Any student in his/her freshman year who is not on probation at the time of application may transfer into a major within the Faculty of Arts and Sciences upon completion of 24 credits and the departmental requirements as shown in Table 2.

Transfer to other Faculties
Any freshman student who wishes to transfer to another faculty must complete the freshman program and the faculty requirements, as shown in Table 3. Students who successfully complete the freshman year are eligible to apply for admission to professional schools when the conditions listed in Table 3 are satisfied.

Table 1 Credit Requirements for Completion of the Freshman Program

<table>
<thead>
<tr>
<th>Major</th>
<th>English</th>
<th>Arabic</th>
<th>Humanities</th>
<th>Math</th>
<th>Natural Sciences</th>
<th>Social Sciences</th>
<th>Electives</th>
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<tbody>
<tr>
<td>Applied Mathematics</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>3</td>
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<td>3</td>
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<tr>
<td>Arabic</td>
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<td>3</td>
<td>3</td>
<td>6</td>
<td>3</td>
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<td>Anthropology</td>
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<td>3</td>
<td>6</td>
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<td>3</td>
<td>6</td>
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<td>3</td>
<td>6</td>
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</tbody>
</table>

1 Lebanese applicants to the freshman class, pp.xx-xx
2 The required math courses for science students are MATH 101 and 102.
Table 2 Requirements to Join a Major in FAS from the Freshman Class

<table>
<thead>
<tr>
<th>Department</th>
<th>Requirements</th>
<th>Some Useful Electives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Mathematics</td>
<td>A minimum cumulative average of 70 in MATH 101 and 102, and a minimum grade of 70 in MATH 102</td>
<td>Math 205</td>
</tr>
<tr>
<td>Arabic</td>
<td>A minimum cumulative average of 70 in ARAB 101 (and 102 if taken)</td>
<td>AROL 201</td>
</tr>
<tr>
<td>Archaeology</td>
<td>A minimum cumulative average of 70 in English courses taken in the freshman year</td>
<td>AROL 201</td>
</tr>
<tr>
<td>Biology</td>
<td>Completion of CHEM 101, CHEM 101L, PHYS 103, MATH 101, and MATH 102, and a minimum grade of 70 in BIOL 101, and a minimum cumulative average of 70 in the freshman year</td>
<td>STAT 210 and CMPS 209</td>
</tr>
<tr>
<td>Chemistry</td>
<td>A minimum cumulative average of 70 in CHEM 101, CHEM 101L and CHEM 102, CHEM 102 and a minimum cumulative average of 70 in MATH 101 and 102</td>
<td>PHYS 101 and PHYS 101L</td>
</tr>
<tr>
<td>Computer Science</td>
<td>Completion of PHYS 101, and a minimum cumulative average of 70 in MATH 101 and 102</td>
<td>CMPS 200 and MATH 211</td>
</tr>
<tr>
<td>Economics</td>
<td>A minimum cumulative average of 70 in English courses taken in the freshman year</td>
<td>ECON 101, 103, 105, 107, 201, 203, 205</td>
</tr>
<tr>
<td>Education</td>
<td>A minimum cumulative average of 70 in the freshman year</td>
<td>ENGL 103, 104, 105, 106, 205, and 207</td>
</tr>
<tr>
<td>Geology</td>
<td>Completion of MATH 101, 102, CHEM 101, CHEM 101L, GEOG 101, a third science course, and a minimum cumulative average of 70 in the freshman year</td>
<td>GEOL 101, 102, 201, and 203</td>
</tr>
<tr>
<td>History</td>
<td>A minimum cumulative average of 70 in English courses taken in the freshman year</td>
<td>AROL 201 and 202</td>
</tr>
<tr>
<td>Mathematics</td>
<td>A minimum cumulative average of 70 in MATH 101 and 102, and a minimum grade of 70 in MATH 102</td>
<td>MATH 201</td>
</tr>
<tr>
<td>Petroleum Studies</td>
<td>Completion of MATH 101, 102, CHEM 101, CHEM 101L, 102, 102L, GEOG 101, and a minimum cumulative average of 70 in the freshman year</td>
<td>GEOL 101, 102, 201, 203, ECON 101, 102, 103, 203, 205, and SOAN 201</td>
</tr>
<tr>
<td>Philosophy</td>
<td>A minimum cumulative average of 70 in English courses taken in the freshman year</td>
<td>PHIL 101 and PHIL 102</td>
</tr>
<tr>
<td>Physics</td>
<td>A minimum cumulative average of 70 in PHYS 101 and 101L, and a minimum cumulative average of 70 in MATH 101 and 102</td>
<td>CMPS 200</td>
</tr>
<tr>
<td>Political Studies</td>
<td>A minimum cumulative average of 70 in English courses taken in the freshman year</td>
<td>CMPS 200</td>
</tr>
<tr>
<td>Psychology</td>
<td>A minimum cumulative average of 70 in English courses taken in the freshman year</td>
<td>CMPS 200</td>
</tr>
<tr>
<td>Public Administration</td>
<td>A minimum cumulative average of 70 in English courses taken in the freshman year</td>
<td>CMPS 200</td>
</tr>
</tbody>
</table>

1. Applies to all majors in Engineering except Chemical Engineering.
2. It is recommended that elective courses numbered 200 and above be taken in the third semester.
3. Students who wish to major in chemistry may be accepted to the major on completion of the requirements as stated above. However, if they wish to continue in the major they should have a minimum of one year of high school physics.
Faculty of Arts and Sciences (FAS)

Graduation Requirements

Degrees of Bachelor of Arts and Bachelor of Science

The following are the graduation requirements for the degrees of BA and BS:

Residency and Total Credit Requirements

- A maximum of eight calendar years is allowed for graduation of students who begin the freshman class; six calendar years for sophomores; four calendar years for juniors; and two calendar years for seniors. A student who fails to complete his/her degree program within these specified times must petition the Student Academic Affairs Committee for an extension of time.
- A minimum of seven semesters of residence beginning with the freshman class, or five semesters beginning with the sophomore class. For purposes of this requirement two summer sessions shall be considered equivalent to one semester.
- Regular FAS students (non-transfer students) who wish to spend time at other recognized institutions of higher learning abroad may do so at any time before graduation provided they secure the permission of the Dean of FAS. Transfer of credits will be considered on a course by course basis.
- Transfer students from other recognized institutions of higher learning must spend the final three semesters and complete at least 45 credits at AUB. For purposes of this requirement two summer sessions shall be considered equivalent to one semester.
- A minimum of 120 credits for students who enter as freshmen (90 of which should be courses numbered 200 or above) and 90 credits (in courses numbered 200 or above) for students who enter as sophomores.

Departmental Requirements

- A minimum of 36 credits in the major department, in courses numbered 200 or above, of which a minimum of 30 credits must be numbered 210 or above; and a cumulative average of 70 in the major, plus any additional requirements set by the department. For the distribution of the requirements according to discipline, consult the matrices of the departments in each department entry.
- A student must spend a minimum of one semester in a department as a major before s/he graduates in that major field.

Repeating Courses

A student may repeat any course irrespective of the grade s/he has received. A student who fails a required course must repeat the course at the earliest opportunity. No course may be taken more than three times. When a course is repeated, the highest grade is considered in the calculation of the cumulative average. All course grades remain part of the student’s permanent record.

Faculty Requirements

Arabic and English Requirements

All Arabic-speaking students in the Faculty of Arts and Sciences (except those officially exempted) must take the Arabic language requirements. These students are required to take, in addition to the Arabic course required of freshmen, one Arabic language or literature course. The Arabic Placement Test (APT) is optional. Students who opt not to sit for the APT will have to register in ARAB 201B or any course 211 or above, excluding ARAB 213, ARAB 214, ARAB 215, ARAB 216, ARAB 217, and ARAB 218. The option of taking the APT will be open to students who think they may be too weak to follow coursework higher than the basic language course (ARAB 201A). Such students may sit for the APT to ascertain if their level of proficiency in Arabic is not appropriate for a higher course. This will be further ascertained during the course itself. Students exempted from Arabic must take one course in humanities instead (this includes ARAB 200, ARAB 203, ARAB 206, or ARAB 204).

All students in the Faculty of Arts and Sciences must take English communication skills courses as determined by their placement. A student must enroll in the required course in their first term and continue without interruption until s/he has completed through ENGL 204. For example, a student placed in ENGL 102 must take three consecutive semesters of English (ENGL 102, ENGL 203, and ENGL 204; 9 credits of English); a student placed in ENGL 203 must take two consecutive semesters (ENGL 203 and ENGL 204; 6 credits). A student placed in ENGL 204 is not required to enroll in any additional communication skills courses offered by the English department. Freshmen are required to take a minimum of three credits of English during their freshman year. Students whose test scores do not qualify them to be placed in ENGL 102 are required to take the Intensive English Course (IEC); for more information on the IEC, refer to pages xx-xx.

General Education Requirements

In implementation of the General Education Requirements for all faculties, all FAS students should show competence in the basic intellectual approaches of fields of learning in four major disciplinary fields and should take: 6 credits in Natural Science, 12 credits in Humanities1, 6 credits in Social Science2 and 3 credits in Quantitative Thought. Please refer to the General Education section pp. xx-xx in the General University Academic Information section in this catalogue for the list of approved General Education courses.

CVSP and Humanities Requirements

All students in the FAS are required to take twelve credits in the humanities. All students who wish to register in these courses should have demonstrated English language skills which placed them in ENGL 203 or above. A minimum of six credits must be taken in the Civilization Sequence Program (CVSP 201–208). For details refer to the Civilization Sequence Program section pages xxx-xxx.

Other Requirements

- A student must complete a minimum of 18 additional credits outside their major department, exclusive of the university course requirements stated above and of the normal freshman program.
- Grades of 70 or above in at least 50 credits of courses numbered 200 or above for students entering at the sophomore level. Students entering at the freshman level must obtain grades of 70 or above in at least 12 additional credits of courses numbered 100 or above.

1 No more than two courses from the student’s major may fulfill this requirement (Archaeology, Civilization Sequence Program, English, Fine Arts and Arts History, History, Philosophy).
2 No more than one course from the student’s major may fulfill this requirement (Anthropology, Communication, Economics, Political Studies, Public Administration, Sociology).
Transfers

- All undergraduate transfer students from outside AUB to the Faculty of Arts and Sciences must take, after admission to the faculty, a minimum of 21 credits in their major department to graduate from AUB.
- All undergraduate transfer students from outside AUB to the Faculty of Arts and Sciences must present a TOEFL score in order for the Office of Admissions to determine the English communication skills courses they need to take at AUB. Only credits received for communication skills courses at a lower level than that in which the student has been placed can be transferred from other universities.
- Requirements for interdepartmental transfer within FAS: students wishing to transfer from one major to another in the Faculty of Arts and Sciences may do so after they have completed two full semesters of work in their current major and met any requirements for their prospective major (see the table of requirements on the following page).
- Requirements for transfer from other faculties: AUB students wishing to transfer to a major in FAS may do so after they have completed at least two full semesters (minimum 24 credits) of coursework at AUB, attained a minimum cumulative average of 70, as well as a minimum average of 70 in at least 15 credits taken in FAS.

Second Degrees

- Students already holding a bachelor’s degree from FAS who wish to obtain a different bachelor’s degree (BA or BS) must complete a minimum of 30 credit hours of courses in FAS and must complete all departmental requirements for the degree with a minimum average of 70 in those requirements.
- Students already holding a bachelor’s degree from another faculty at AUB who wish to obtain a different bachelor’s degree (BA or BS) must complete a minimum of 30 credit hours, and must meet all faculty and departmental requirements for the degree with a minimum average of 70.

Dual Degree

Students may, upon approval of the Faculty concerned, complete the requirements for a second degree while registered in another Faculty at AUB. In such a case, a student will be granted two degrees at the same time of graduation. If tuition differs, students will pay the higher of the tuitions.

Information about deadlines and applications are available on the following link: http://www.aub.edu.lb/Registrar/Documents/pdfdoc/dualdegree.pdf.

Majorless Status

A student in good academic standing, who has not yet chosen a major or is in the process of selecting a new major, will be given the status of majorless. A department who opts to drop a student from his/her major must communicate this decision to the Student Services Office in the Office of the Dean. A student who opts to change his/her status to majorless must communicate this decision to the Student Record Officer in the Office of the Dean through his/her academic adviser and/or department chair. All students should be admitted to a major by the end of their junior year. A student who wishes to join a new major must also complete the Departmental Transfer Form and submit it to the Office of the Dean, provided the student meets the requirements for admission to the new major.

Table 4 Requirements for Interdepartmental Transfer within FAS

<table>
<thead>
<tr>
<th>Major</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td>a minimum grade of 70 in any two humanities courses excluding communication skills courses in Arabic and English</td>
</tr>
<tr>
<td>Archaeology</td>
<td>a minimum grade of 70 in any two humanities courses excluding communication skills courses in Arabic and English</td>
</tr>
<tr>
<td>Art History</td>
<td>a minimum grade of 70 in any two humanities courses</td>
</tr>
<tr>
<td>Biology</td>
<td>a grade of 70 or above in BIOL 201 and BIOL 202 and the completion of CHEM 201 all. By the end of their third regular semester at AUB, and a cumulative average of 70 or more; BIOL 201 and BIOL 202 cannot be repeated more than twice</td>
</tr>
<tr>
<td>Chemistry</td>
<td>a minimum grade of 70 in CHEM 201; a cumulative average of 70 or more in any of the following three combinations: CHEM 201 and MATH 202 or PHYS 211/212 or PHYS 211 and CHEM 211</td>
</tr>
<tr>
<td>Computer Science</td>
<td>a minimum cumulative average of 70 in CMPS 200, 211, 212, and other computer science courses, if taken; and a minimum grade of 70 in CMPS 202</td>
</tr>
<tr>
<td>Economics</td>
<td>a cumulative average of 70 or more; a minimum grade of 70 in each of ECON 211, ECON 212, and ECON 213; a minimum cumulative average of 70 in MATH 201 and MATH 202</td>
</tr>
<tr>
<td>Education</td>
<td>a minimum cumulative average of 70 in ENGL 203 and/or ENGL 204; a minimum cumulative average of 70 in EDUC course(s) if taken</td>
</tr>
<tr>
<td>English</td>
<td>a minimum grade of 70 in ENGL 203, 204, and any two of the following four introductory courses: ENGL 201, 205, 207, and 227</td>
</tr>
<tr>
<td>Geology</td>
<td>a minimum grade of 70 in GEOG 201 and GEOG 203</td>
</tr>
<tr>
<td>History and Archaeology</td>
<td>a minimum grade of 70 in any two humanities courses excluding communication skills requirements in Arabic and English</td>
</tr>
<tr>
<td>Mathematics</td>
<td>a minimum cumulative average of 70 in MATH 201, and other math courses if taken</td>
</tr>
<tr>
<td>Petroleum Studies</td>
<td>a minimum grade of 70 in GEOL 201 and GEOL 203</td>
</tr>
<tr>
<td>Philosophy</td>
<td>a minimum grade of 70 in any two humanities courses excluding communication skills requirements in Arabic and English</td>
</tr>
<tr>
<td>Physics</td>
<td>a cumulative average of 70 in PHYS 210, 210L, and 212, and a cumulative average of 70 in MATH 201 and MATH 202</td>
</tr>
<tr>
<td>Political Studies</td>
<td>a minimum grade of 70 in each of PSYN 201 and PSYN 202; and a minimum combined grade average of 70 in ENGL 203 and ENGL 204</td>
</tr>
<tr>
<td>Psychology</td>
<td>a minimum grade of 70 in PSYD 202*; ENGL 203, and ENGL 204; PSID 202 cannot be repeated more than twice</td>
</tr>
<tr>
<td>Public Administration</td>
<td>a minimum grade of 70 in each of PSYN 201 and PSYN 202; and a minimum combined grade average of 70 in ENGL 203 and ENGL 204</td>
</tr>
<tr>
<td>Sociology-Anthropology</td>
<td>a minimum grade of 70 in SOAN 201, SOAN 203 or SOAN 204, ENGL 203, and ENGL 204; SOAN 101 and SOAN 201 cannot be repeated more than twice</td>
</tr>
<tr>
<td>Statistics</td>
<td>a minimum cumulative average of 70 in MATH 201, and other math courses if taken</td>
</tr>
<tr>
<td>Studio Arts</td>
<td>a minimum grade of 70 in any two humanities courses</td>
</tr>
</tbody>
</table>

* Freshman students who have taken PSYC 102 or SOAN 101 and received a grade of 70 or above do not need to take PSYC 202 or SOAN 201.

Minors

Most departments in the Faculty of Arts and Sciences offer minors, which require the completion of a number of courses as specified below:

- **American Studies requires 15 credits:** AMST 215, one course from AMST 220, 230, 265/266, 298, HIST 200, 271, 272, 273, 274, 278/279, PSYA 251, SOAN 215; plus one course from AMST 275/276, 299, CVSP 260AM, ENGL 201, 224, 225, 226; plus two additional courses chosen from any of the above or from the following (with the stipulation that no more than one from the following list may be counted): ARCH 223, CVSP 208E, ENGL 215, 216, 218, 219, 222, 241, 242, PHIL 240, 263A, PSA 234, 237.

- **Arabic and Near Eastern Languages** requires 15 credits: ARAB 211 or ARAB 212 (or an equivalent language course), at least one course in classical Arabic literature, at least one course in modern Arabic literature, plus two other courses in the department.

FOR FURTHER DETAILS CONCERNING INDIVIDUAL DEPARTMENTAL REQUIREMENTS SEE THE RELEVANT SECTIONS OF THIS CATALOGUE.
Biology requires 15 credits: core courses BIOL 201 (4 credits), BIOL 202 (4 credits), plus at least two or more biology courses (provided the prerequisites for the courses have been fulfilled).

Chemistry requires 18 or 19 credits: CHEM 201, CHEM 206/215, CHEM 212, CHEM 228, and one course from CHEM 217 or CHEM 218. MATH 201 is a prerequisite.

Computational Sciences (interdisciplinary, involving courses from more than one FAS department) requires 16 credits (excluding prerequisite courses): CMPS 212, CMPS 251, CMPS 288; plus six credits from the following: MATH 211, CMPS 255, CMPS 256, DCSN 200, PHYS 222, or a tutorial course in either PHYS 231 or PHYS 232, or a Chemistry course which has computational contents. New computational courses will be introduced by various departments as future electives for this minor.

Computer Science requires 18 credits: CMPS 200, CMPS 212, CMPS 255, and nine credits in CMPS courses numbered 211 or above. [Note: If ECEE 230 is completed, a student can get credit for only one of CMPS 200 or ECEE 230.]

Economics requires 18 credits: ECON 211, ECON 212, ECON 214, plus three elective courses to be chosen from available economics offerings provided the prerequisites or their equivalents have been completed.

Education requires 15 credits: EDUC 211 or EDUC 216, EDUC 215 or EDUC 225, EDUC 230, and one elective from the following courses: EDUC 219, EDUC 221, EDUC 223, plus a general elective in education (3 credits).

English

- English Literature requires 15 credits: two core courses from ENGL 201, ENGL 205, ENGL 207, plus three other courses: one period course, and any two courses from the different categories of the literature curriculum.
- English Language requires 15 credits: ENGL 227 and four other courses chosen from ENGL 224–238 and/or ENGL 245–294.
- Creative Writing requires 15 credits: ENGL 236, two courses chosen from ENGL 237, ENGL 239, ENGL 249, ENGL 250, or ENGL 251, one 200-level course chosen from the offerings in Literature, and one course chosen either from the Literature offerings or from ENGL 237, ENGL 239, ENGL 249, ENGL 250, or ENGL 251.

Environmental and Aquatic Sciences requires 15 credits in addition to BIOL 202 or BIOL 200 chosen as follows: one course from BIOL 252, BIOL 250, BIOL 256; one course from BIOL 266, BIOL 246, BIOL 267, BIOL 255; the remaining credits are completed by choosing from the following: CHEM 202, PHIL 209, PSPA 288F, BIOL 240, BIOL 241, BIOL 245, BIOL 246, BIOL 250, BIOL 252, BIOL 254, BIOL 255, BIOL 256, BIOL 258, BIOL 259, BIOL 266, BIOL 267, BIOL 281, BIOL 286, AGSC 215, LDEM 230, AGSC 284, AGSC 295, LDEM 211, LDEM 215, LDEM 203, ENHL 220, CIVE 350, CIVE 450.

A minimum of three courses should be taken outside the student’s major field of study and should be chosen from two different disciplines.

Fine Arts and Art History requires 15 credits each.

- Art History requires 9 credits chosen from FAAH 221, FAAH 222, FAAH 223, FAAH 224 or equivalents, and 3 credits from any Special Topics in Art History course and 3 credits from the following group: FAAH 232, FAAH 235, FAAH 238.
- Studio Art requires fifteen credits: FAAH 200; nine credits taken from any studio courses; and one course from FAAH 229A or FAAH 229B or FAAH 229C or FAAH 224 or equivalent, or FAAH 235 or FAAH 238 or equivalent.

- Theater requires 15 credits: FAAH/Theatre 267, CVSP 212, FAAH/Theatre 265 or 270, FAAH/Theatre 283 or 284, and one course from the following group FAAH/Theatre 274, FAAH 286, ARAB 240, ENGL 212, ENGL 216, ENGL 251, or other theatre electives and approved by the Department.
- Music requires 15 credits: FAAH 240 or FAAH 241, FAAH 262, FAAH 247 and FAAH 242A, B, applied music Choir (3 semesters at 1 credit) or other ensemble music course as approved by the Department; and 3 credits to be taken from FAAH 240, FAAH 241, FAAH 244, FAAH 261, FAAH 260 or other music elective as approved by the department.
- Gender Studies (interdisciplinary) requires 15 credits from the following courses:
  - BIOL 290 (Gender Biology), HIST 262, EDUC 290 (Gender Issues in Education), PHIL 249, CVSP 207G (Gender and Society), CVSP 230, CVSP 295 (Arab Feminism)

- Geology requires 16 credits: core courses GEOL 201, GEOL 202, GEOL 203 and GEOL 205, plus any two of the following elective courses: GEOL 210, GEOL 211, and GEOL 222.

History and Archaeology requires 15 credits each:

- History: five courses numbered 200 and above. All minors, especially those considering graduate work in history, are encouraged to take HIST 287 as one of the five courses.
- Archaeology: five courses numbered 200 and above, including one of the following: AROL 211, AROL 212, AROL 233, AROL 291, or AROL 292.

- Human Rights and Transitional Justice requires 15 credits: SOAN 245, SOAN 240 or PSPA 235, and three electives from the following: SOAN 221, SOAN 230, SOAN 231, SOAN 232, SOAN 242, PSYC 211, PHIL 216, PHIL 252, PSPA 222, PSPA 232 any special topics course in SOAN, PSYC, PHIL, PSPA, which will fit with the minor topic, upon the approval of the respective department chair and the coordinator of the minor program. Students majoring in sociology-anthropology should take at least three courses other than SOAN courses.

Mathematics requires 18 credits each:

- Mathematics requires 18 credits: MATH 201, MATH 210, either MATH 218 or MATH 219; and nine more credits in mathematics courses numbered 202, 211, or above; and statistics courses numbered 230 or above.
- Statistics requires 18 credits: MATH 201, MATH 210, and STAT 233; and 9 credits in statistics courses numbered 211 or above, excluding STAT 231.
- Applied Mathematics requires 18 credits: MATH 201, MATH 210; either MATH 218 or MATH 219; and nine more credits in mathematics courses numbered MATH 202, MATH 211 or above, and statistics courses numbered 230 or above.

- Philosophy requires 15 credits from courses numbered 200 and above, including two of the following: PHIL 210, PHIL 211, PHIL 213, and PHIL 214.

- Physics requires 17 credits: PHYS 210, PHYS 211, PHYS 212, PHYS 221L or (PHYS 210L and PHYS 211L) and six more credits in physics selected from the following: PHYS 217, PHYS 220, PHYS 223, PHYS 222, PHYS 231, PHYS 235, PHYS 236.

- Political Studies and Public Administration requires 15 credits each:

- Political Studies: PSPA 201; one of the following three: PSPA 210, PSPA 211, or PSPA 213; and any three upper level courses from the following list: PSPA 214, PSPA 215, PSPA 216, PSPA 217, PSPA 218, PSPA 219, PSPA 221, PSPA 222, PSPA 223, PSPA 225, PSPA 228, PSPA 229, PSPA 231, PSPA 232, PSPA 233, PSPA 234, PSPA 235, PSPA 236, PSPA 237, PSPA 238, PSPA 239, PSPA 250, PSPA 251, PSPA 252, PSPA 253, PSPA 254, PSPA 255, or PSPA 256.
• Public Administration: PSPA 202, PSPA 212, and any three upper level courses in public administration.
• Public Policy: PSPA 201, PSPA 276, PSPA 298; plus two upper-level courses from the following list: PSPA 223, PSPA 225, PSPA 238, PSPA 250, PSPA 259, PSPA 260, PSPA 261, PSPA 262, PSPA 263, PSPA 277, PSPA 278, or PSPA 279.

Social and Behavioral Sciences (offers five minors) requires 15 credits each:
• Anthropology: SOAN 203 or SOAN 212, SOAN 222 or SOAN 225, and SOAN 221 or 227; plus two electives from SOAN 212, SOAN 214, SOAN 220–227, SOAN 232, SOAN 240–242, and SOAN 250-252.
• Cognitive Science: PSYC 251 and 12 credits chosen from the following courses: PSYC 219, 221, 227, 233, 235, 247; PHIL 221, 222, 223, 257, 258; ENGL 227, 230, 232, 246; EDUC 215, 221, 225, 290, 290F; CMPS 287; BIDL 243, 290AF-1 and BIDL 290T-1; on condition that the courses chosen span three of the five disciplines, and that no more than one course counting toward a student’s major can also be counted toward the minor in Cognitive Science.
• Communication: SOAN 205, SOAN 228, and SOAN 229; plus two electives from communication courses including the following: SOAN 204, SOAN 206, SOAN 230, SOAN 231, SOAN 233, SOAN 234, SOAN 235, SOAN 236 and SOAN 243.
• Psychology: PSYC 102 or PSYC 202, PSYC 227, plus three electives from PSYC 211–251 except for PSYC 213, PSYC 223, and PSYC 243.
• Sociology: SOAN 101 or SOAN 201, SOAN 213, SOAN 214, plus two electives from the following: SOAN 210, SOAN 220, SOAN 222, SOAN 223, SOAN 224, SOAN 225, SOAN 232, and SOAN 240–242.

Social and Political Thought requires 15 credits: PSPA 210 or PHIL 216, one senior seminar, and three courses from: ENG 222, ENG 235, ENG 240, ENG 243, ENG 247, PHIL 210, PHIL 225, PHIL 251, PHIL 252, PSYC 214, PSYC 215, PSYC 216, PSYC 217, PSYC 218, PSYC 219, PSYC 221, PSYC 290A, PSYC 290B, PSYC 290C, SOAN 213, SOAN 221, SOAN 223, SOAN 290 (after securing the approval of the SPT Committee), ARCH 021, ARCH 022, ARCH 037, ARCH 039 and GRDS 020. No more than 9 credits can be taken from the same department; no more than 3 credits can be counted toward the student’s major; no more than 6 credits can be taken from the student’s home department.

Translation requires 15 credits: ARAB 225, ARAB 226, ENGL 233; plus two of the following courses: ARAB 211, ARAB 212, ENGL 231 or 294, and ENGL 247.

Students who opt for a minor (one or more) must do so while working toward their undergraduate degree at AUB. To graduate with a minor a student must attain an average of 70 or more in courses taken to satisfy the requirements of that minor.

Students who have completed the requirements for a minor in any department should complete the Certificate of Fulfillment of the Requirements for a Minor and submit it to the Office of the Dean. Copies of this form are available in the departments offering minors and on the FAS website. The transcript of the student shall indicate the minor(s) chosen.

FAS Diplomas
1) Teaching Diploma
See Department of Education in this catalogue.

2) Diploma Program in Media Communication
See Department of Social and Behavioral Sciences in this catalogue.

Directed Study
A student with an average of at least 85 in his/her major at the beginning of the senior year may elect to pursue a course of directed study. Students with averages below 85 may be admitted to directed study at the discretion of the department.

Students who elect a course of directed study choose their courses in consultation with a faculty member selected by the student with the department’s approval. These courses may include a three- or six-credit tutorial directed by the faculty member. This tutorial may consist of independent research, original creative compositions, or directed reading, and includes the presentation of a report or thesis.

Tutorials
A student can register for a single tutorial of up to 3 credits during his/her final year at AUB, after securing the permission of his department. Grades for tutorials are either P (Pass) or F (Fail).

Dean’s Honor List
To be placed on the dean’s honor list at the end of the semester, a student must
• be carrying at least 12 credits
• not be on probation
• have passed all courses and attained an overall average of 85 or be ranked in the top 10 percent of the class and have an overall average of 80
• have no failing or incomplete grades in courses that carry credits
• not have been subjected to any disciplinary action within the University during the semester
• be deemed worthy by the dean to be on the honor list.

Attendance and Withdrawal from Courses
• Students are expected to attend all classes, laboratories, or required fieldwork. All missed laboratory or fieldwork must be made up. A student is responsible for work done, and for any announcements made, during his/her absence.
• Students who, during a semester, miss more than one-fifth of the sessions of any course in the first ten weeks of the semester (five weeks in the case of the summer term) can be dropped from the course. A faculty member who drops a student from the course for this reason must have stated in the syllabus that attendance will be taken.
• Individual instructors may, at their discretion, keep attendance records. Instructors who drop students for excessive absence are requested to submit the attendance record for the whole class as well as the attendance policy which has been announced in the syllabus of the course distributed to students at the beginning of the semester and kept on record in the department.
• Students who withdraw or are dropped for excessive absence from a course will receive a grade of “W”.
• Students can withdraw from registered courses, not later than 10 weeks (five weeks in the summer term) from the start of the semester, provided that their credit load during the semester does not drop below 12 credits.
• A student cannot withdraw, or be withdrawn, from a course after the deadline for withdrawal from courses mentioned above, unless approved by the Student Academic Affairs Committee.
• Students cannot withdraw, or be withdrawn, from a course if this results in the student being registered for less than 12 credits without prior approval of the Student Academic Affairs Committee.
Examinations and Quizzes

Students who miss an announced examination or quiz must present an excuse considered valid by the instructor of the course. Unless stated otherwise in the course syllabus, the course instructor should then require the student to take a make-up examination. Make-ups for quizzes and mid-terms as well as class assignments must be completed BEFORE the final grade of the course is issued at the end of the semester. Only medical reports and/or qualified professional opinions issued by an AUB employee, AUBH doctor, or by the University Health Services will be accepted. Should there be a question about the validity of any excuse presented by the student, the matter should be referred to the Student Academic Affairs Committee. Instructors should make sure that there is no time conflict between an exam and a regularly scheduled course.

Grading System

In the Faculty of Arts and Sciences (FAS), the following grading system is used: 90-100 (Outstanding); 85-89 (Excellent); 80-84 (Very Good); 75-79 (Good); 70-74 (Fair); 60-69 (Weak); Below 60 (Fail). Letter grades reported for final course work are as follows: I (Incomplete followed by a grade); F or P (Fail or Pass for tutorial/Comprehensive Exam); PR or P (In Progress or Pass for thesis); W (Withdraw). All final course grades are expressed in multiples of 1. No grade should be left blank. Even though the AUB SIS may give the possibility of reporting the grade "X", this option, (i.e. grade X) is not applicable for FAS courses. The "W" option is not available to faculty members; all course withdrawals should be entered by the Office of the Registrar. All course instructors are to submit their final course grades electronically no later than 72 hours after the final examination.

Incomplete Grades and Make-up Examinations

The work for a course in FAS must be completed by the date on which the semester ends. Students who have completed all the course work but missed the final exam, or failed to submit papers or projects in lieu of the final exam (depending on the course requirements), may be granted an incomplete grade. The procedures related to such cases are as follows.

Incomplete course work is reported with an “I” followed by a numerical grade that reflects the evaluation of the student by the end of the semester. This evaluation is to be based on a grade of zero for all missed work and reported in units of five. Typically an incomplete grade ranges from 140 to 170. The grades “X”, “blank” or “I” without a numerical grade should not be reported. Only the Student Academic Affairs Committee can grant permission to make up for missed final exams, papers or projects in lieu of the final exam. To obtain permission to complete the work in a course, a student must submit a valid excuse to the instructor of the course. Medical excuses are considered valid only if issued by the University Health Services (UHS) or the AUB Medical Center (AUBMC). If the reason for the incomplete work is considered valid by the course instructor, the latter should then submit to the Student Academic Affairs Committee, a “Request for Make Up for Incomplete Work” (Form 1, downloadable from the FAS website under “Academic Forms”). This request must be submitted within two weeks of the scheduled date of the missed final exam. Late requests will not be entertained without a valid justification. The Student Academic Affairs Committee will promptly inform the course instructor whether the request is approved or not. If approved, the change of grade will be immediately reported to the Office of the Registrar. Failure to complete incomplete work within the period of four weeks will result in dropping the “I” on the reported course grade, and the available numerical grade becomes the final grade in the course. If Form 1 is not submitted in due time (see above), or if the request is turned down by the Student Academic Affairs Committee, the “I” on the reported course grade will be dropped, two weeks after the scheduled date of the missed final exam. The available numerical grade becomes the final grade in the course.

The procedure to be followed in requesting a change of a grade that was erroneously reported on the AUB SIS is as follows. The “Request for change of grade” Form 3 (downloadable from the FAS website under “Academic Forms”) should be completed by the course instructor immediately when the error is found. The form should then be signed by the Chair of the Department offering the course and submitted to the Student Academic Affairs Committee along with a copy of the original class list with all grades given and the detailed course grading scheme. The course instructor should specify on the form the nature of the error made. The Student Academic Affairs Committee will promptly inform the course instructor whether the request is approved or not. If approved, the change of grade will be immediately reported to the Office of the Registrar. Requests for change of grade will not be considered after a period of four weeks from the beginning of the next regular semester.

Academic Probation

Departmental Probation and Dismissal from a Department

Students will be placed on departmental probation if their average in major courses drops below 70 in their first two semesters in the major. Departments will drop students from their major in case they have an average below 70 in the major courses at the end of their third regular semester in the major.

Placement on Academic Probation

Students entering AUB at the freshman level are placed on academic probation if their overall average is less than 67 at the end of their second regular semester, if their semester average is less than 68 at the end of their third or fourth regular semester, 69 at the end of their fifth or sixth regular semester, or if it is less than 70 in any subsequent semester excluding the summer term.

Students entering FAS at the sophomore level are placed on academic probation if their overall average is less than 68 at the end of their second regular semester, if the semester average is less than 69 at the end of their third or fourth regular semester, or less than 70 in any subsequent semester excluding the summer term.

Students entering FAS as transfers at the junior level from other recognized institutions of higher learning are placed on academic probation if their cumulative average is less than 69 at the end of their second regular semester in FAS, or if their semester average is less than 70 in any subsequent semester excluding the summer term.

the student involved. It is the responsibility of the student to find out from his/her instructor the specific dates by which requirements must be fulfilled. After the work is done and evaluated by the instructor, the latter should report the new course grade on the “Authorized Change of Grade” (Form 2, downloadable from the FAS website under “Academic Forms”). This form should be sent along with the approved Form 1 to the Student Academic Affairs Committee within 72 hours after the student has completed the course work. The grade change will be considered by the Dean of the Faculty (upon the recommendation of the Student Academic Affairs Committee) and the new grade will be reported to the Office of the Registrar. Failure to complete incomplete work within the period of four weeks will result in dropping the “I” on the reported course grade, and the available numerical grade becomes the final grade in the course. If Form 1 is not submitted in due time (see above), or if the request is turned down by the Student Academic Affairs Committee, the “I” on the reported course grade will be dropped, two weeks after the scheduled date of the missed final exam. The available numerical grade becomes the final grade in the course.

The procedure to be followed in requesting a change of a grade that was erroneously reported on the AUB SIS is as follows. The “Request for change of grade” Form 3 (downloadable from the FAS website under “Academic Forms”) should be completed by the course instructor immediately when the error is found. The form should then be signed by the Chair of the Department offering the course and submitted to the Student Academic Affairs Committee along with a copy of the original class list with all grades given and the detailed course grading scheme. The course instructor should specify on the form the nature of the error made. The Student Academic Affairs Committee will promptly inform the course instructor whether the request is approved or not. If approved, the change of grade will be immediately reported to the Office of the Registrar. Requests for change of grade will not be considered after a period of four weeks from the beginning of the next regular semester.
It is to be understood that the semester in which the student is considered to be ‘on probation’ is the semester that immediately follows the semester in which the student has earned the grades leading to that placement.

For evaluation purposes, the minimum number of credits at the end of the second regular semester at the University should be 24 including all repeated courses, and 12 in each subsequent fall or spring semester including all repeated courses. Students carrying a reduced schedule of less than 12 credits are not subject to probation regulations until they have accumulated a minimum of 12 credits including the summer session.

Courses/credits taken during a summer term are counted toward the semester average of the next regular semester. If the number of credits taken in any one regular semester is less than 12 (for approved reasons), courses/credits taken during that semester are counted toward the semester average of the next regular semester (the highest grade for repeated courses is considered in computing the average).

Credit for incomplete courses will be included in the semester in which the incomplete courses were taken. The evaluation for that semester will be carried out as soon as the grades for the incomplete courses have been finalized.

If a student on probation drops the entire semester, then that semester is not counted for continued probation purposes.

Students who register in intensive English for one semester are not subject to probation during that semester.

Removal of Probation
Probation is removed when the student attains a semester average that exceeds the applicable averages indicated above. The student is off probation during the semester following the one in which such grades are earned.

Probation Duration: Probation should be removed within two regular semesters, excluding summer, after the student is placed on probation, or when the student completes his or her graduation requirements (see Graduation Requirements on pp. xxx-xxx). Students on probation are advised to repeat courses for which they have obtained failing or low grades.

Credit Load for Students on Academic Probation: The load of a student who is in his/her first semester on probation shall not be fewer than 12 or more than 17 credit hours. The load of a student who continues on probation beyond one semester shall neither be fewer than 12 nor more than 13 credit hours. During a summer session, all students on probation shall carry loads of not more than 7 credits.

Dismissal from the Faculty
A student is dismissed from the faculty for any of the following reasons:

- if the student’s overall average is less than 60 at the end of the second regular semester
- if the student fails to clear academic probation within two regular semesters, excluding the summer term, after being placed on probation
- if the student is placed on academic probation for a total of four regular semesters (a student can be dropped for this reason even if s/he is in the final year at AUB)
- if the student is deemed unworthy by the faculty to continue for professional or ethical reasons

Application for Readmission
When, in accordance with university regulations, a student is dropped, the implication is that s/he is not qualified to continue his/her education at AUB. Consideration for readmission is given only if, after spending at least one year at another recognized institution of higher education, the student is able to present a satisfactory record with no failure. The student must have achieved a grade equivalent to the AUB grade of 70 in each of the courses for which transfer credit is requested. Transfer credit is considered after departmental evaluation of a student’s coursework.

The foregoing regulations on readmission also apply to students dropped from other AUB faculties who apply for admission to the Faculty of Arts and Sciences.

Readmission of students dropped from the Faculty of Arts and Sciences by the Student Academic Affairs Committee requires the approval of the latter committee, whereas readmission of students dropped from other AUB faculties to Arts and Sciences requires the approval of the Arts and Sciences Undergraduate Admissions Committee. Before action is taken on any application for readmission, the committee concerned will seek the recommendation of the prospective department.

Students who withdraw voluntarily for more than two years are considered new applicants to the faculty.

Students who were dropped from the faculty for poor academic performance and who have spent one year at another University will be readmitted on strict academic probation on the following conditions: to take 12-13 credits and remove probation by achieving a semester average of 70 or more at the end of the semester in which they were readmitted. Failure to meet any of the conditions above will lead the student to be permanently dropped from the faculty.

Failure
If a student fails a course, no re-examination is permitted. If a course is required for graduation, a student failing the course must repeat it.

A student may not register for a course more than three times, including withdrawals; for the third registration, the permission of the student’s academic adviser, and the academic unit concerned, is required.

Occasionally the arts and sciences Student Academic Affairs Committee may consider a fourth registration under special circumstances.

A student who at the end of his/her senior year fails to attain a cumulative average of 70 in his/her major field is required to take additional courses in that field, or to repeat courses in which the student has scored low grades, provided s/he is permitted to continue at the University.

Summer Session
Maximum Load: The maximum academic load during a regular summer session is nine credits (seven credits for students on probation).

Degree Courses: The degree courses offered during the summer session are identical in standard and content to those offered during the fall and spring semesters.
Courses

FAS Numbers Preceding Course Titles

• Freshman Courses: numbered from 101 to 199 are ordinarily taken during the freshman year and may be counted toward graduation but only as part of the freshman program.
• Introductory Courses: are from 200 to 209 and may be counted toward graduation whenever taken but cannot be considered as part of the 30 credits above 210 required in the major field.
• Advanced Undergraduate Courses: are from 210 to 299 and may be counted as credits in the major field.
• Graduate Courses: are from 300 to 499 (available to undergraduate students with senior standing with an overall average of 80 or above and upon securing the consent of the department and the approval of the Student Academic Affairs Committee).

Odd-numbered courses are normally offered during the fall semester whereas even-numbered courses are normally offered during the spring semester.

Numbers Following Titles of Courses

• The first number following the title of a course indicates the number of class hours given each week.
• The second number indicates the laboratory or practice hours required each week. The third number indicates the number of credit hours applied toward graduation. The credit assigned to each course is stated for the semester. Each hour of laboratory is considered a 1/3 to 1/2 credit hour.
• Courses marked annually are offered at least once during each academic year. Other courses marked alternate years and each semester are given accordingly. When frequency of offering is not indicated, the course is offered at the discretion of the department.

Course Descriptions

For those requiring additional information, more detailed course descriptions are available in the individual department sections of this catalogue.

Courses Offered by Other Faculties

Students in Arts and Sciences may also take, for credit, elective courses offered in the Faculties of Medicine, Engineering and Architecture, Agricultural and Food Sciences, and Health Sciences. All prerequisites must be satisfied. Some courses may require prior approval from the faculty concerned.

FAS students cannot be given credits for the following courses: NFSC 220, AVSC 279, AVSC 280, and AGSC 288.
In addition to the BA degree in Arabic, the Department of Arabic and Near Eastern Languages provides service courses for all Arabic-speaking students at AUB. ARAB 101 and ARAB 102 must be taken in the freshman year; and, one more Arabic language or literature course (i.e., ARAB 201A, ARAB 201B, or any other course numbered ARAB 211 or above [ARAB 213, ARAB 214, ARAB 215, ARAB 216, ARAB 217, and ARAB 218 excluded]). ARAB 201A requires a placement test (see section on Admissions).

BA in Arabic

Mission Statement

The Department of Arabic and Near Eastern Languages has always possessed a leading role in its own field of learning in the Arab World, while being the only one maintaining a liberal tradition of education and research. The impressive number of diverse prominent scholars, writers and intellectuals who passed through the Department testifies to this remarkable historical achievement. The Department has always sought to train students in the basic tools of the discipline, namely language and research skills, while exposing them to the essentials of the field, and subjecting everything to the curiosity of the inquiring mind.

Requirements

Requirements for the BA degree in Arabic are as follows: ARAB 211, ARAB 212, ARAB 221, ARAB 231, ARAB 232, ARAB 233, ARAB 237, ARAB 239, ARAB 241, ARAB 243, and ARAB 245 (total 33 credits). In addition, the student must select one course from within the other courses in the department (grand total 36 credits).
Students choosing a minor in Arabic are required to take 15 credits of Arabic courses (ARAB 201A does not count as one of them). These courses should include ARAB 211 or ARAB 212 (or an equivalent language course), one course in classical Arabic literature, one course in modern Arabic literature, and any two courses in the department.

When a required course is not available, it may be replaced by another course within the department provided the student’s advisor gives consent.

**University Requirements**

University language requirements (English 6, Arabic 3).

University General Education requirements (Humanities 12 (Required) + 9 (Electives), Social Sciences 6, Natural Sciences 6, Quantitative Thought 3).

**ARAB 101/102 Readings in Arabic Heritage I and II** 3.0; 3 cr. (each)
A freshman level survey that traces the intellectual, literary, and cultural development of the Arabs from pre-Islamic times up to the age of Ibn Khaldun. Annually.

**ARAB 200 Special Arabic** 3.0; 3 cr.
A course designed for native speakers of Arabic who had limited pre-college formal study of the Arabic language in Lebanon or abroad. Open to students who are exempted from Arabic. Annually.

**ARAB 201A Basic Arabic Grammar and Syntax** 3.0; 3 cr.
A training course in the basic elements of Arabic grammar, syntax, and morphology, with special emphasis on oral and writing skills. Each semester.

**ARAB 208 Readings in Arabic Literature** 3.0; 3 cr.
A discussion and analytical study of a wide variety of selections from classical and modern Arabic literature and thought designed to evoke aesthetic and intellectual discussions of issues of Arab culture. Each semester.

**ARAB 203/204 Beginners’ Arabic as a Foreign Language I and II** 5.0; 5 cr. (each)
A thorough course in basic literary Arabic with emphasis on the vocabulary of modern literature, the press, and current affairs. This course teaches grammar and structure to enable students to read, understand, and translate, from and into Arabic, within a tightly controlled syntactical milieu. Annually.

**ARAB 205/206 Intermediate Arabic as a Foreign Language III and IV** 5.0; 5 cr. (each)
A careful graded approach begun in ARAB 203 and ARAB 204, culminating with the exposition of the derivation system. This course empowers students to use lexicography, and to read, understand, and translate, unhampered by any loopholes in their knowledge of basic Arabic syntax and morphology. Prerequisites: ARAB 203 and ARAB 204, or equivalent. Annually.

**ARAB 207/208 Advanced Arabic as a Foreign Language I and II** 3.0; 3 cr. (each)
The main goal for this level is to reach a superior level of proficiency. Reading texts that contain opinions, hypotheses, and intellectual discussions, in addition to selections from classical Arabic literature. Grammar consists largely of details, such as the full conjugation of irregular verb classes and fine points of complex sentence structure. Instruction is totally in Arabic. Prerequisites: ARAB 205 and ARAB 206, or equivalent. Annually.

**ARAB 211/212 Survey of Arabic Grammar** 3.0; 3 cr. (each)
A year-long course on Arabic morphology and grammar. It is comprised of readings from a classical grammatical text and training in sentence structure through 'Irab. Alternate years.

**ARAB 213/214 Introductory Biblical Hebrew** 3.0; 3 cr. (each)
A general survey of Biblical Hebrew grammar, with special emphasis on the relation between Arabic and Hebrew within the Semitic group of languages. Alternate years.

**ARAB 215 Introductory Syriac** 3.0; 3 cr.
The course provides students with a working knowledge of Syriac language and grammar. With the help of a lexicon, students will be expected to read and translate simple Syriac texts. Alternate years.

**ARAB 216 Introduction to Syriac Literature** 3.0; 3 cr.
The aim of this introductory course is to provide the student with an overview of Syriac literature from its origins to the present day. Alternate years.

**ARAB 217/218 Introductory Persian** 3.0; 3 cr. (each)
A year-long course introducing students to the Persian language. After surveying the grammar, students are given intensive training in reading Persian texts. Alternate years.

**ARAB 221 Arabic Stylistics and Metrics** 3.0; 3 cr.
A detailed study of stylistics balagha and metrics ‘arud. This course surveys the contribution of the Arabs to stylistic studies and introduces their theory of versification. Annually.

**ARAB 225/226 Translation** 3.0; 3 cr. (each)
A year-long course divided into a brief introduction and an extended segment in applied translation. In the introduction, theoretical problems and issues of translation are discussed; then the course is transformed into an extended workshop where students will be preoccupied with their own translation exercises from and into both Arabic and English. Annually.

**ARAB 227/228 Arabic Linguistics** 3.0; 3 cr. (each)
These two courses deal with various topics of Arabic linguistic sciences, mainly phonetics, semantics, and lexicology. Offered occasionally.

**ARAB 229 Background to the Study of Classical Arabic Literature** 3.0; 3 cr.
A course dealing with the impact of Greek culture on classical Arabic literature and thought, and the rise and development of Arab intellectualism. Alternate years.

**ARAB 230 Themes and Genres of Arabic Literature** 3.0; 3 cr.
A broad overview of Arabic literature throughout the ages. This course primarily emphasizes the literary production embodied in the works that give Arabic literature its unique character in different periods, while concentrating on the major themes and genres around which this literature revolves. Alternate years.

**ARAB 231 Arabic Poetry: The Heroic Age** 3.0; 3 cr.
A course highlighting characteristic elements of Arabian life in its heroic age prior to Islam, while considering its individual, tribal, and mythical codes. Main problems, sources, and strains of the poetry of this age are surveyed. The substantial component of the course is comprised of critical analysis of representative poems. Alternate years.

**ARAB 232 Arabic Poetry: The Age of Conquest, Love, and Nostalgia** 3.0; 3 cr.
A survey of new genres of poetry that blossomed when desert Arabs were deployed outside their peninsula following the conquests. This is examined through a compact probe of the economic, social, and political factors that affected Arabian life, from the advent of Islam to the end of the Arabian (Umayyad) era. The substantial component of the course is comprised of critical analysis of representative poems. Alternate years.
ARAB 233/234  Abbasid Poetry  3.0; 3 cr. (each)
A survey of Arab poetry during the Abbasid period while considering the historical, political, and social background. The first part of the course deals with the major poets of the early Abbasid era, which ends during the reign of al-Mu'tasim; while the second part surveys the poetry of the latter Abbasid age up to the fall of Baghdad. Alternate years.

ARAB 235  Andalusian Literature  3.0; 3 cr.
An introduction to Arabic literature in Islamic Spain. Students read and analyze Andalusian poetry and prose, with special emphasis on the new literary forms that appeared in al-Andalus. Alternate years.

ARAB 236  Qur'anic Studies  3.0; 3 cr.
An introduction to major Qur'anic issues, such as the collection of the Qur'an, Qur'anic imagery, and the various trends in Qur'anic exegesis. Alternate years.

ARAB 237/238  Modern Arabic Poetry  3.0; 3 cr. (each)
A year-long course studying the factors that shaped modern Arabic poetry, tracing the phases of its development, and analyzing in detail its various characteristics. Alternate years.

ARAB 239  Modern Arabic Novel  3.0; 3 cr.
A course on the development of the Arabic novel, along with a survey focusing on the main factors that led to the rise of the novel. Students will thoroughly analyze a number of works by prominent Arab novelists. Alternate years.

ARAB 240  Modern Arabic Drama  3.0; 3 cr.
A survey of the rise and development of the dramatic literary genre in modern Arabic, with a focus on the main factors that led to the rise of drama. Students will thoroughly analyze a number of selected works by prominent Arab playwrights. Alternate years.

ARAB 241  Literary Theory and Criticism  3.0; 3 cr.
A course on the development of Arab literary theory and criticism from the classical period to the present. This course is structured according to the main themes that concerned Arab critics throughout the ages, as well as the major critical trends and their prominent representatives. Alternate years.

ARAB 243  Classical Arabic Prose  3.0; 3 cr.
A course in which students read and analyze extracts from the works of major prose writers representing the main trends in classical Arabic prose, beginning with pre-Islamic times up to the age of al-Ma'arri. Alternate years.

ARAB 244  Muslim Schools of Theology  3.0; 3 cr.
A survey of the main doctrines, terms, and modes of expression that are peculiar to the major Muslim sects (firq) in the medieval age, and the impact they had on literature. Mu'tazila, Ash'ariyya, and Imamiyya, constitute the focal point of the course, which includes readings in selected representative texts. Alternate years.

ARAB 245/246  Background to the Study of Modern Arabic Literature  3.0; 3 cr. (each)
A two-semester course dealing with the Arab cultural renaissance of 1800–1940. Special emphasis is placed on the impact of the West on the making of the modern Arab mind. Annually.

ARAB 247  Arabic Classical Folk Literature  3.0; 3 cr.
A course covering the following topics: folktales, the novella in The Arabian Nights, and the hero sagas such as Sirat Bani Hilal. This course aims at studying the textual history of this special genre, its language, motifs, and structures. Students are also exposed to various methodological approaches of folk literature. Alternate years.

ARAB 249  Sufi Literature  3.0; 3 cr.
A course aiming to acquaint the student with Sufi literature as one of the major aspects in Arabic literature. Alternate years.

ARAB 251/252  Special Topics in Arabic Language and Literature  3.0; 3 cr. (each)
A course that varies in content and focuses on selected topics in language and literature. May be repeated for credit. Offered occasionally.

ARAB 290  Undergraduate Seminar on al-Mutanabbi  3.0; 3 cr.
A seminar on the times, life, and poetry of this major Arab poet. It combines the historical and the literary analytical-critical methodologies. Its substantial component comprises close textual analysis of poetry from the different phases of the poet’s intertwined private and public life. Alternate years.

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33 + 3 Credits in Arabic

<table>
<thead>
<tr>
<th>Modus of Analysis</th>
<th>English and Arabic (6)</th>
<th>Humanities (12 + 33 + 3)</th>
<th>Social Sciences (6)</th>
<th>Natural Sciences</th>
<th>Quantitative Thought</th>
</tr>
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<tbody>
<tr>
<td>Lecture courses:</td>
<td>6+12+33+3</td>
<td>1. Required Arabic course: ARAB 203A or any General Education Arabic communication skills (3)</td>
<td>1. Required credits in the humanities: 12 credits including 8 credits from CVSP (see pp. xxx–xx).</td>
<td>Electives (6)</td>
<td>6 (3 Recommended: a course in computer literacy)</td>
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<tr>
<td>6+12+33+3</td>
<td>3. One elective course from the following or a seminar course (3): ARAB 215(3), 221(3), 217(3), 212(3), 211(3), 226(3), 233(3), 230(3), 242(3), 245(3)</td>
<td></td>
<td></td>
<td>3. Electives: 9 credits in other humanities departments</td>
<td></td>
</tr>
<tr>
<td>6+12+33+3</td>
<td>4. Electives: 9 credits in other humanities departments</td>
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Department of Biology

Chairperson: Smith, Colin A.
Professors: Baydoun, Elias H.; Darwiche, Nadine D.; Gali-Muhtasib, Hala U.; Knio, Khuzama M.; Kreydiyyeh, Sawsan L.; Talhouk, Rabih S.
Associate Professors: Bariche, Michel J.; Saoud, Imad P.; Smith, Colin A.
Assistant Professors: Ghanem, Noel D.; Jaalouk, Diana E.; Kambris, Zakaria S.; Osta, Mike A.; Sadek, Riyad A.
Lecturers: Raizkallah, Hind D.; Sinno-Saoud, Nada; Taraf, Charbel G.
Instructor: Hajjar, Layane A.M.

BS in Biology

Mission Statement

The BS program in Biology prepares students for advanced study and careers in research, education, and service in Biology-related disciplines. Students will acquire descriptive, experimental, quantitative, and conceptual abilities spanning molecular, cellular, organismal, and ecological levels. Lecture and laboratory courses will emphasize model systems, the role of evolution, diversity of living systems, hypothesis-based reasoning, and communication skills. Science, social science, and humanities coursework will foster creativity, free thought, interdisciplinary skills, and commitment to ethical scholarship.

Requirements

All students admitted as sophomores are eligible to continue in the program provided they obtain, by the end of their third regular semester at AUB, a minimum average of 70 in their biology courses. Transfer to biology from other departments within the Faculty of Arts and Sciences requires departmental approval. Students can transfer to Biology provided they obtain a minimum grade of 70 in BIOL 201 and 70 in BIOL 202 and a passing grade in CHEM 201 by the end of their third regular semester at AUB.

The requirements for a BS degree in Biology are 90 credits for students entering the department at the sophomore level. The distribution of these courses is as follows:

University Language Requirements: 6 credits in English and 3 credits in Arabic.

University General Education Requirement: 12 credits in the humanities including six credits of CVSP. 6 credits in the Social Sciences. (37+15) credits in the Natural Sciences, 3 credits in Quantitative Thought; Stat 210.

Minor Requirements

37 credits of Biology: BIOL 201, 202, 220, 223; two of the following four courses: BIOL 224, 252, 260, 270; BIOL 293 or 294 (these courses are offered every semester); and a minimum of 13 credits in biology elective courses, including a minimum of one 4 credit course.

15 credits of Natural Sciences. CHEM 201, 210, 211, 212; PHYS 204 with PHYS 204L, or PHYS 205 with PHYS 205L.

The minor in biology requires 15 credits of BIOL courses. The courses are BIOL 201 (4 credits), BIOL 202 (4 credits), plus at least two courses (provided the prerequisites of these courses are satisfied) to complete the 15 credits required for the minor.

Unless otherwise stated, only senior undergraduate biology majors with an average of 80 or above can register in biology graduate courses with consent of instructor.

Students from any field can minor in aquatic and environmental sciences by completing, in addition to BIOL 202 or BIOL 203, a total of 15 credits chosen from the following three lists:

List 1: BIOL 252, BIOL 250, BIOL 256.
List 2: BIOL 266, BIOL 246, BIOL 267, BIOL 255.

Plant Sciences: AGSC 284, AGSC 295.
Landscape: LDEM 211, LDEM 215.
Ecosystem Management: LDEM 203.
Environmental Health: ENHL 220.
Civil Engineering: CIVE 350, CIVE 450.

One course from each of lists 1 and 2 is required. All students should take at least three of the total required courses in a field outside their major field of study, and these courses should be from at least two different disciplines. Only one of the courses taken from lists 1 and 2 by biology majors minoring in environmental and aquatic studies is counted toward the major.

BIOL 101 Basic Concepts in Biology 3.0; 3 cr.
A course that deals with the basic concepts in biology, and prepares students for BIOL 201 and BIOL 202. This course introduces the student to the forms and functions of plants and animals, and to the principles of genetics, evolution, and ecology. Each semester.

BIOL 105 Introductory Biology 3.3; 4 cr.
An introduction to the fundamental principles of biology. This course covers the basis of life, the structure and function of cells and systems, the general classification and diversity of plants and animals, as well as genetics and ecology. Occasionally.

BIOL 106 Contemporary Issues in Biology 3.0; 3 cr.
A course designed to provide freshman students with the scientific background to some of the current topics in biology today. The course introduces students to the general concepts of biology, including origins of life, evolution and organic building blocks. Moreover, the course will cover socially important contemporary topics such as human evolution, fresh water issues, ecology, environmental conservation, cloning, stem cell research, GMOs, diseases and nutrition. Topics will be added and removed as new discoveries are made and news changes. Each semester.
BIOL 200  Diversity of Life  3.3; 4 cr.
A course that deals with the basic aspects of cell structure and function, heredity, diversity, classification, evolution and interrelationships of living things, and briefly covers organs and systems in animals and plants. Laboratory activity reflects the contents of the course. Not open to biology majors. Sophomore standing is required. Each semester.

BIOL 201  General Biology I  3.3; 4 cr.
An integrated approach to the biology of organisms covering the organization of life, energy transfer through living systems, perpetuation of life, and diversity of life. Each semester.

BIOL 202  General Biology II  3.3; 4 cr.
A study of the anatomy and physiology of plants and animals covering their structure, growth, nutrition, transport, reproduction, development, and control systems. This course focuses also on the relationships between structure and function, and stresses the evolutionary adaptation and changes in the different systems of the major plant and animal groups. Prerequisite: BIOL 201. Each semester.

BIOL 209  Concepts and Connections  3.0; 3 cr.
A course that covers the basic aspects of cell structure and function. An overview of heredity, diversity and evolution. Interrelationships of living things and a brief coverage of organs and systems in animals. Sophomore standing is required. Each semester. Satisfies 3 credits of General Education Natural Science requirement.

BIOL 210  Human Biology  3.0; 3 cr.
A course that covers the fundamental principles of cell biology, genetics, and human biology, with emphasis on the morphology, physiology, and disorder of body systems. Not open to biology majors. Students cannot receive credit for all three of the following: BIOL 201, BIOL 202, BIOL 210. Each semester.

BIOL 220  Introductory Biochemistry  3.0; 3 cr.
An introduction to the structure-function relationships of biomolecules, cells, enzymes, and the metabolic reactions of living cells. Prerequisite: BIOL 202; Pre- or co-requisite: CHEM 211. Each semester.

BIOL 223  Genetics  3.3; 4 cr.
A course that deals with the basic principles of classical and modern genetics with emphasis on the analysis of genetic material and genetic processes at the molecular level. Prerequisite: BIOL 202. Each semester.

BIOL 224  Microbiology  3.3; 4 cr.
A course that deals with micro-organisms, especially bacteria, and in particular those of pathogenic and industrial importance. Basic knowledge on isolation, classification, and the various metabolic processes is included in this course. Prerequisite: BIOL 223. Each semester.

BIOL 225  Molecular Biology  3.0; 3 cr.
A course that introduces the different techniques of molecular biology and recombinant DNA technology, and discusses the most recent advances in the field. Prerequisite: BIOL 223. Occasionally.

BIOL 230  Plant Morphology  3.3, 4 cr.
A study of the form and structure of the different plant divisions on the basis of similarity of plan and origin. Both reproductive and non-reproductive organs are studied. Prerequisite: BIOL 202. Occasionally.

BIOL 233  Non-Vascular Autotrophs and Fungi  2.3; 3 cr.
A survey of the biology and classification of bacteria, algae, bryophytes, lichens, and fungi. Life cycles, anatomy, morphology, physiology, and ecology of each group are covered, and their role in diseases and production of food and antibiotics is emphasized. Prerequisite: BIOL 202. Occasionally.

BIOL 234  Vascular Plants  2.3; 3 cr.
A course that deals with the structure, life history, and classification of vascular plants, including psilophytes, club mosses, horsetails, ferns, conifers, and flowering plants, emphasizing their evolutionary relationships. Prerequisite: BIOL 202. Occasionally.

BIOL 235  Plant Anatomy  2.3; 3 cr.
A course that deals with the structure and function of tissues and organs of higher plants, their origin, and differentiation. Prerequisite: BIOL 202. Occasionally.

BIOL 236  Plant Systematics  2.3; 3 cr.
A course that deals with the relationships between and among vascular plants based on evolutionary principles as expressed by systematics. The underlying principles of systematics, including modern molecular technological approaches are provided. Students deal with plant identification, and classification of the major families of local vascular plants. Prerequisite: BIOL 202. Occasionally.

BIOL 240  Animal Behavior  3.0; 3 cr.
A course that covers the basic concepts of animal behavior including physiological, genetic, ecological, and evolutionary aspects, as well as exploration of the controversial ideas of sociobiology. Prerequisite: BIOL 202. Occasionally.

BIOL 241  Biology of Invertebrates  3.3; 4 cr.
A study of invertebrates, excluding insects, emphasizing their morphological and functional diversity, phylogenetic relationships, classification, development, and adaptation. Prerequisite: BIOL 202. Annually.

BIOL 242  Comparative Vertebrate Anatomy  3.3; 4 cr.
A comparative study of the structure and function of selected examples of chordate animals with a presentation of the history of structural organization and association of structural changes with functional adaptations. Prerequisite: BIOL 202. Occasionally.

BIOL 243  Behavioral Neuroscience  3.0; 3 cr.
An introduction to the neural basis of behavior. The course surveys the structure and organization of the human brain and how complex behavior arises from it. Prerequisite: PSYC 102 or 202. Annually.

BIOL 244  Introduction to Neurobiology  3.0; 3 cr.
A comprehensive introduction to neural signaling, brain development and regeneration in the adult brain. The course covers molecular to higher organizational level of neural functions. It emphasizes the fundamental principles and mechanisms associated with brain development and physiology including nerve communication, neurogenesis, patterning and regionalization as well as neural stem cells function. Prerequisite: BIOL 202. Annually.

BIOL 245  Environmental Physiology of Aquatic Organisms  3.0; 3 cr.
A course that describes the strategies used by aquatic animals to deal with environmental variations. Various animal physiological systems are covered with an emphasis on aquatic adaptations. Some topics such as air bladder control, electrical generation and reception, and gill excretion are specific to aquatic organisms and are introduced herein. Prerequisites: BIOL 200 or BIOL 202. Annually.

BIOL 246  Marine Biology  3.3; 4 cr.
A course that introduces the biology of life in the marine environment (microbial world, seaweeds and plants, marine animals) as well as the structure and function of the marine ecosystem (e.g., coral reefs, the ocean depths, estuaries). The impact of humans on the marine environment is also covered. Prerequisite: BIOL 202. Each semester.

BIOL 247  Animal Physiology  3.0; 3 cr.
A study of the fundamental principles and mechanisms that govern body functions in animals, with an emphasis on the molecular aspects. Prerequisites: BIOL 202 and senior standing. Annually.
BIO 249  Parasitology  3.3; 4 cr.
A general overview on the classification, morphology, development, and physiology of human and animal parasites. Prerequisite: BIOL 202. Annually.

BIO 250  Biosphere  3.0; 3 cr.
A course that focuses on defining global environmental problems such as global warming, acid rain, deforestation, and loss of biodiversity, and introduces methods that can help eliminate or reduce these problems. Prerequisite: BIOL 202. Annually.

BIO 252  Ecology  3.3; 4 cr.
A study of organisms in relation to their biotic and abiotic environment. This course deals with population growth and regulation, species diversity, succession, food chains, energy flow, and recycling of nutrients. Prerequisite: BIOL 202 or LDEM 209. Each semester.

BIO 254  Evolution  3.0; 3 cr.
A study of the processes that bring about evolutionary changes in organisms, evolutionary trends, patterns of adaptations, and principal factors that influence the patterns of speciation. Prerequisite: BIOL 223. Annually.

BIO 255  Marine Ecology  3.0; 3 cr.
An introduction to the ecology of marine and brackish water ecosystems, structures and processes, with special attention to the eastern Mediterranean Sea. Interrelationships among animals, plants, and chemical and physical aspects of the environment are studied, as well as the unique adaptations for survival in these habitats. Prerequisite: BIOL 200 or BIOL 202. Occasionally.

BIO 256  Conservation Biology  3.0; 3 cr.
A course that deals with various environmental issues in the world today; introduces the science of conservation; and describes typical methods of conservation, restoration, and restocking. Students are trained in proper research techniques, proper scientific writing, effective presentation delivery using PowerPoint, and are required to research a conservation topic of contemporary importance to the world and present their findings to the class. Prerequisite: BIOL 200 or BIOL 202. Annually.

BIO 258  Introduction to Aquaculture  3.0; 3 cr.
An introduction to the general concepts of aquaculture. Topics such as culture species, culture methods, water quality, filtration, feeding, and harvesting are discussed. Uses of aquaculture for food production, biomedical research, ornamentals, or restocking programs are also introduced. Prerequisite: BIOL 200 or BIOL 202. Occasionally.

BIO 258L  Aquaculture Laboratory  0.3; 1 cr.
The course will introduce students to the practical side of aquaculture. Students will get their hands wet. They will set up fish maintenance systems, evaluate progressive changes in water chemistry, evaluate effects of water chemistry on fish health and most importantly learn techniques used to maintain fish in healthy and sustainable environments. Students will be expected to keep a detailed log of their activities and that will be part of assessment. Prerequisite: BIOL 258. Annually.

BIO 259  Microbes and the Environment  3.0; 3 cr.
A course that explores the various habitats of micro-organisms in nature and the interactions within. Microbial metabolic activities and their impact on the environment are discussed. The course explores the role of microbes as pathogens, particularly environmentally transmitted ones. The beneficial role of microbes in the biodegradation of pollutants is also discussed, in addition to public health topics in microbiology. The course includes a substantial component of reading and analysis of primary research papers in environmental microbiology, in addition to presenting a poster session. Prerequisite: BIOL 202. Annually.

BIO 260  Cell Biology  3.3; 4 cr.
A course that provides an understanding of the structure and function of cellular organelles and components, and the functional interaction of the cell with its microenvironment. Prerequisites: BIOL 220 and BIOL 223. Each semester.

BIO 261  Biology of Cancer  3.0; 3 cr.
This course compares the basic biology of normal versus the malignant neoplastic state and provides a comprehensive overview of the basic biology of cancer. Prerequisite: BIOL 223. Annually.

BIO 262  Virology  3.0; 3 cr.
A general overview on the classification, biophysical, and biochemical characteristics of DNA- and RNA-containing bacterial, plant, and animal viruses. Prerequisite: BIOL 202. Annually.

BIO 263  Immunology  3.0; 3 cr.
An introduction to basic immunology, types of immune responses, and basic aspects of the specific and non-specific body defense mechanisms, as well as primary immunological diseases and disorders. Prerequisite: BIOL 202. Annually.

BIO 264  Biology of Retroviruses  3.0; 3 cr.
A course that provides an understanding of the composition, genomic organization, and life cycle of animal RNA-containing retroviruses, with special emphasis on HIV, the etiological agent of AIDS. An overview of other sexually transmitted diseases and of animal viruses of pathological significance is also provided. Prerequisite: BIOL 223. Annually.

BIO 266  Oceanography  3.0; 3 cr.
An introduction to the basic concepts of oceanography and marine science. The course focuses on the chemical, physical, and geological processes that affect life in the oceans and on planet earth in general. Additional topics such as environmental science, conservation, world fisheries, marine resources, and effects of coastal development on life in the oceans are discussed. Annually.

BIO 266L  Oceanography Lab  0.3; 1 cr.
A course that introduces students to the basic concepts of oceanographic science applications. The course focuses on the chemical, physical, and geological processes that affect life in the oceans and on planet earth in general. Methods of research used by oceanographers past and present are introduced and demonstrated. Annually.

BIO 267  Limnology  3.0; 3 cr.
A course that introduces students to the basic concepts of freshwater riverine and limnetic systems. The course focuses on the chemical, physical, and nutrient cycling processes that affect life in freshwater bodies. It introduces various freshwater life forms, including kingdoms and phyla, and gives examples of various families. Physiological adaptations of various animals are discussed. Additional topics such as environmental science, conservation, fisheries, aquatic resources, and effects of development on life in streams, rivers, and lakes are discussed when relevant. Annually.

BIO 268  Introduction to Biotechnology  3.0; 3 cr.
An introduction of both the principles and the applications of recombinant DNA technology to solve environmental problems and to cure human diseases. Prerequisite: BIOL 223. Annually.

BIO 270  Plant Physiology  3.3; 4 cr.
A study of the vital processes that occur in flowering plants, including biophysical and metabolic processes, with emphasis on photosynthesis, growth, and development. This course also deals with plant responses to the physical environment. Prerequisite: BIOL 220. Each semester.
BIOL 273  Economic Plants  3.0; 3 cr.
A course that deals with man's relationship to plants and their economic interest, including their diversity of use in industry and production of food and medicine. Prerequisite: BIOL 202. Each semester.

BIOL 280  Endocrinology  3.0; 3 cr.
A study of the role of chemical messengers in the control of physiological and metabolic processes. This course deals with the biosynthesis, chemistry, and secretion of hormones, as well as their mechanism of action. Prerequisite: BIOL 202. Annually.

BIOL 281  Ichthyology  3.0; 3 cr.
A study of the different types of fish, their natural history, and environmental and ecological adaptations. It also deals with methods of conserving and culturing fish of economic value, as well as the effect of pollution on fish fauna. Prerequisite: BIOL 202. Annually.

BIOL 283  Reproductive Physiology  3.0; 3 cr.
An examination of the mechanisms of all major aspects of male and female mammalian reproductive physiology. Emphasis is also given to species variation with regard to reproductive function and to a detailed examination of key reproductive events in both sexes. Prerequisite: BIOL 202. Annually.

BIOL 284  Developmental Biology  3.3; 4 cr.
A study of basic mechanisms, molecular basis, and environmental factors that control embryonic development in both plants and animals, with special emphasis on vertebrate animal systems. Prerequisite: BIOL 202. Occasionally.

BIOL 286  Entomology  3.3; 4 cr.
An introduction to the study of insects, their diversity, classification, morphology, biology, behavior; and their medical, ecological, and agricultural importance. Prerequisite: BIOL 202. Annually.

BIOL 290  Special Topics in Biology  1, 2, 3, or 4 cr.
Topics in biology that warrant an extensive coverage in a separate course not typically offered by the department. May be repeated for credit. Each semester.

BIOL 291/292 Undergraduate Tutorial  2 or 3 cr.
Prerequisites: senior standing, a minimum average of 80 in the major, and consent of instructor. Each semester.

BIOL 293/294 Undergraduate Seminar  1 cr.
Credit cannot be obtained for both 293 and 294. Prerequisite: senior standing. Each semester.

BIOL 295 Summer Undergraduate Research  4 cr.
A course intended to train and recruit well-prepared students for graduate work in biology at AUB. Students will conduct a research project during the summer term, and then present and defend their findings. Prerequisites: completion of 80/120 credits, a minimum average of 75 in the major, consent of instructor and approval of the department. Each summer.

37 Credits in Biology

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic (9)</th>
<th>Humanities (12)</th>
<th>Social Sciences (6)</th>
<th>Natural Sciences (37+15)</th>
<th>Quantitative Thought (3)</th>
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<tbody>
<tr>
<td>Lecture courses</td>
<td>1. Required Arabic course: 201A or any General Education Arabic communication skills (3) 2. Required English courses: 201(3), 220(3)</td>
<td>1. Required credits in the humanities: 12 credits from CUSP</td>
<td>1. Required biology(18): BIOL 201(4), 202(4), 220(3), and two from the following four courses: 224(4), 260(4), 270(4), 252(4)</td>
<td>1. Required biology(18): BIOL 201(4), 202(4), 220(3), and two from the following four courses: BIOL 224(4), 260(4), 270(4), 252(4)</td>
<td>1. Required mathematics (15): STAT 210(3)</td>
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<tr>
<td>Seminar (1)</td>
<td>Required: BIOL 293/4(1)</td>
<td></td>
<td>1. Required biology(9): BIOL 201(4), 202(4), 220(3), and two from the following four courses: BIOL 224(4), BIOL 260(4), 270(4)</td>
<td>1. Required biology(9): BIOL 201(4), 202(4), 220(3), and two from the following four courses: BIOL 224(4), BIOL 260(4), 270(4)</td>
<td>1. Required mathematics (15): STAT 210(3)</td>
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<tr>
<td>Laboratory (5+1+2+1)</td>
<td>Required biology(5): BIOL 201(4), 202(4), 220(3), and two from the following four courses: BIOL 224(4), BIOL 260(4), 270(4)</td>
<td>2. Elective biology(1): minimum of one 4-credit course</td>
<td>2. Elective biology(1): minimum of one 4-credit course</td>
<td>2. Elective biology(1): minimum of one 4-credit course</td>
<td>2. Elective biology (1): PHYS 204(3) or PHYS 205(3)</td>
</tr>
<tr>
<td>Research Project</td>
<td>(0, 2, or 3)</td>
<td>Elective biology courses (2–3): BIOL 291(2) or 292(3)</td>
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</tbody>
</table>

1 Plus 8 free elective credits
2 At least 37 credits in biology, and 15 credits in the sciences
3 These courses include 1-credit laboratory component and have been listed both under lecture and laboratory courses.
Department of Chemistry

Mission Statement
The Chemistry Department provides liberal arts and professional education in chemistry. The undergraduate program at the Department is dedicated to teaching, scholarship, research and creative endeavors. Through this program, the Department delivers a strong theoretical course of study and practical training in the chemical sciences to assure the success of its students in graduate schools, professional schools and employment. Undergraduate students are able to explain the essential facts, principles and theories across the four major areas of chemistry, i.e. analytical, organic, inorganic and physical, and are strongly encouraged to be engaged in research in these aforementioned areas. The program also plays a central role in the education of students of other majors, including students of Medicine, Health Sciences, Engineering, and Agriculture.

Students accepted as chemistry majors must maintain an average of 70 or above in their first three semesters in major courses, in order to remain in the program. The student must complete the following minimum requirements: CHEM 201, CHEM 211, CHEM 212, CHEM 215, CHEM 216, CHEM 217, CHEM 218, CHEM 220, CHEM 225, CHEM 228, and CHEM 230; at least two elective courses of the following four courses: CHEM 231, CHEM 232, CHEM 233, and BIOL 220; in addition to MATH 201, MATH 202, and CMPS 209 or CMPS 210; 6 credits in the Social Sciences.

The 90-credit requirements for a BS degree in Chemistry are distributed as follows:

Major Requirements

- Major courses: 40 credits in Chemistry courses (33 credits as required courses; 6 credits as elective courses; 1 credit seminar course).
- Natural Sciences courses: 4 credits of Physics.
- Quantitative Thought courses: 9 credits (6 credits in Math and 3 credits in CMPS).

University Requirements

- University Language requirements: 6 credits in English; 3-credit Arabic course.
- University General Education requirements that include 12 credits in the Humanities including 6 credits of CVSP; 6 credits in the Social Sciences.
- Elective courses: 10 credits in free electives.

Students who intend to major in chemistry should complete the following minimum requirements: CHEM 101 and CHEM 102, MATH 101 and MATH 102. PHYS 101 and PHYS 101L are useful science electives.

For a premedical chemistry student the core premedical chemistry courses are CHEM 201, CHEM 211, CHEM 212, CHEM 228, and one course from CHEM 217 or CHEM 218, for a total of 18 or 19 credits. MATH 201 is a prerequisite for a minor in chemistry.

CHEM 201, one course from CHEM 206 or CHEM 215, CHEM 211, CHEM 212, CHEM 228, and one course from CHEM 217 or CHEM 218, for a total of 18 or 19 credits. MATH 201 is a prerequisite for a minor in chemistry.

Students who intend to minor in chemistry should complete the following requirements:

CHEM 201, CHEM 206 or CHEM 215, CHEM 211, CHEM 212, CHEM 228, and one course from CHEM 217 or CHEM 218, for a total of 15 credits. The biology premedical courses are BIOL 201 and BIOL 202 (8 credits).

The physics requirements for a premedical chemistry student are any one of the following six combinations:

A. PHYS 211, PHYS 211L, PHYS 228, PHYS 228L (8 cr.)
B. PHYS 211, PHYS 211L, PHYS 210, PHYS 210L (8 cr.)
C. PHYS 210, PHYS 210L, PHYS 228, PHYS 228L (8 cr.)
D. PHYS 211, PHYS 210, PHYS 221L (8 cr.)
E. PHYS 228, PHYS 228L, PHYS 210, PHYS 221L (9 cr.)
F. PHYS 228, PHYS 228L, PHYS 211, PHYS 221L (9 cr.)

The chemistry core courses for non-chemistry major premedical students are CHEM 201, CHEM 206, CHEM 210, CHEM 211, and CHEM 212, for a total of 15 credits.

CHEM 101 General Chemistry I 3.0; 3 cr.

An introductory course that covers atomic structure, chemical reactions, stoichiometry, gas laws, thermochemistry, periodic relationships among the elements, chemical bonding, and other basic concepts. Each semester.

CHEM 101L General Chemistry Laboratory I 1.3; 1cr.

A laboratory course to accompany CHEM 101. The experiments explore some of the fundamental concepts which deal with measurements, percent composition, chemical reactions, stoichiometry, volumetric analysis, gas laws, and calorimetry. Pre- or co-requisite CHEM 101. Each semester.

CHEM 102 General Chemistry II 3.0; 3 cr.

A course that covers solutions, chemical equilibria, kinetics, acid-base and solubility equilibria, introductory thermodynamics and electrochemistry; surveys common groups in the periodic table; provides an introduction to organic chemistry and nuclear chemistry. Pre-requisite: CHEM 101. Each semester.

1 These requirements apply to students entering as of summer 2004.
CHEM 102L  General Chemistry Laboratory II  1.3; 1cr.
A laboratory course to accompany CHEM 102. The experiments explore some of the fundamental concepts which deal with physical properties of solutions, chemical equilibrium, acids and bases, solubility equilibria, kinetics and electrochemistry. Pre- or co-requisite: CHEM 102 and Pre-requisite: CHEM 101L. Each semester.

CHEM 200  Basic Chemistry and Applications  3.0; 3 cr.
Introduces basic chemical principles and concepts and uses them to discuss selected contemporary applications and problems from the areas of materials, environmental, medicinal or biological chemistry. Introductory topics include the electronic structure of the atom, bonding and molecular geometry, stoichiometry, and reaction energies. Selection of modern applications in Chemistry. Students cannot receive credit for both CHEM 200 and CHEM 201. Prerequisites: CHEM 101 and CHEM 101L or equivalent. Each semester.

CHEM 201  Chemical Principles  3.0; 3 cr.
A theoretical introduction to chemical principles, stressing atomic structure, bonding, stoichiometry, gases, solutions, acids and bases, solution equilibria. Designed for students with a background in chemistry equivalent to CHEM 101 and CHEM 101L. Students cannot receive credit for both CHEM 200 and CHEM 201. Each semester.

CHEM 202  Introduction to Environmental Chemistry  3.0; 3 cr.
An introduction to the fundamentals of physical, inorganic, and organic chemistry, with applications to environmental problems. This course surveys atomic and molecular structure, solutions, equilibrium, acids and bases, oxidation-reduction, reaction kinetics with emphasis on mechanisms of organic free radical reactions, and basic radioactivity. Students can receive credit for CHEM 201 and CHEM 202. Prerequisites: CHEM 101 and CHEM 101L or equivalent. Each semester.

CHEM 203  Introductory Chemical Techniques  1.3; 2 cr.
A laboratory course on the methods of quantitative analysis, physical chemistry measurements, and inorganic semi-micro qualitative analysis, with applications to environmental problems. Not open to chemistry majors. Pre- or co-requisite: CHEM 200, 201, or 202. Annually.

Chemistry 204  Physical Chemistry for Chemical Engineers  2.0; 2cr.
An introduction to the basic principles of chemical kinetics, surface phenomena and colloids: reaction rates and mechanism; theories of reaction rates; catalysis; photochemistry; colloids; adsorption on surfaces; surface analytical techniques. Pre-requisites: CHEM 102 and CHEM 102L. Not open to chemistry students. Each Summer.

CHEM 205  Introductory Chemistry Laboratory  1.4; 2 cr.
A laboratory course on the methods of quantitative analysis, physical chemistry measurements, and inorganic semi-micro qualitative analysis. Not open to chemistry majors. Pre- or co-requisites: CHEM 200, 201, or 202. Each semester.

CHEM 206  Quantitative Analysis  3.4; 4 cr.
A course that covers gravimetric and volumetric techniques; acid/base, complex formation, and redox titrations; electrochemistry and an introduction to chromatography and spectrophotometric analysis. This course is designed for biology majors. Not open to chemistry majors. Students cannot receive credit for both CHEM 206 and CHEM 215–216. Prerequisite: CHEM 201. Each semester.

Chemistry 207  Survey of Organic Chemistry and Petrochemicals  4.0; 4 cr.
A survey of organic chemistry which covers mainly spectroscopy, multi-step synthesis, properties and reactions of aliphatic and aromatic hydrocarbons, functional groups, including alky halides, alcohols and ethers, aldehydes and ketones, carboxylic acids and derivatives, amines, phenols and aryl halides. This course surveys polymers, petrochemicals and their general use in industry. Designed for chemical engineering students. Students cannot receive credits for both CHEM 208 and CHEM 207; CHEM 211 and CHEM 207. Pre-requisites: CHEM 102 and CHEM 102L or equivalent. Each Summer.

CHEM 208  Brief Survey of Organic Chemistry  3.0; 3 cr.
A brief survey designed for students majoring in agriculture or public health that covers the following topics: hydrocarbons, stereoisomerism, organo halogens, oxygen containing groups, carbonyl groups, carboxylic acids and their derivatives, amines, carbohydrates, and amino-acids. Students cannot receive credit for both CHEM 208 and CHEM 211. Prerequisites: CHEM 102 and CHEM 102L or equivalent. Each semester.

CHEM 209  Introductory Organic Laboratory  1.4; 2 cr.
A course of basic experiments in organic chemistry, including synthesis and techniques of separation and purification of organic compounds. Students cannot receive credit for more than one course among CHEM 209 and CHEM 210. Pre- or co-requisite: CHEM 208. Each semester.

CHEM 210  Organic Laboratory for Non-Majors  1.4; 2 cr.
Basic experimental techniques in organic analytical chemistry (melting and boiling point, chromatography, distillation, extraction, recrystallization), performing reactions in synthetic organic chemistry. Students cannot receive credit for more than one course between CHEM 209 and CHEM 210. Pre- or co-requisite: CHEM 212. Each semester.

CHEM 211  Organic Chemistry I  3.0; 3 cr.
An introduction to organic chemistry organized according to functional groups. This course covers synthesis, properties, and reactions of aliphatic and aromatic hydrocarbons and alky halides, with emphasis on mechanistic and stereochemical aspects of organic reactions. Designed for chemistry majors and premedical study. Students cannot receive credit for both CHEM 208 and CHEM 211. Prerequisite: CHEM 201. Each semester.

CHEM 212  Organic Chemistry II  3.0; 3 cr.
Synthesis, properties, and reactions of organic functional groups, including alcohols and ethers, aldehydes and ketones, carboxylic acids and derivatives, amines, phenols, and aryl halides; chemistry of difunctional compounds and of molecules of biological importance, including carbohydrates, proteins, and nucleic acids; and organic structure determination by spectroscopic methods. Emphasis is placed on reaction mechanism and stereochemistry, as well as on the design of multi-step syntheses. Designed for chemistry majors and premedical study. Prerequisite: CHEM 211. Each semester.

CHEM 215  Analytical Chemistry  3.0; 3 cr.
A course that covers fundamental analytical processes, including solution equilibria, titrations, electrochemical theory and applications, chromatography and spectrophotometric techniques. Students cannot receive credit for both CHEM 215 and CHEM 206. Prerequisite: CHEM 201. Annually.

CHEM 216  Analytical Chemistry Laboratory  1.4; 2 cr.
Experimental work in related areas of chemical analysis and instrumentation; acid/base titrations, pH measurements, complexometric analysis, electrochemical determination of electrode potentials and ion activities; ion-selective electrodes; spectrophotometric analysis. Pre- or co-requisite: CHEM 215. Annually.

CHEM 217  Thermodynamics and Chemical Dynamics  3.0; 3 cr.
A course that covers the basic principles of chemical thermodynamics and chemical dynamics; mathematical machinery of the laws of thermodynamics; heat, work, and energy; first, second and third laws of thermodynamics; thermodynamics of chemical reactions; thermodynamics of solutions; transport properties: diffusion, viscosity, ion transport, thermal conductivity; chemical kinetics; collision theory; activated complex theory. Prerequisites: CHEM 201 and MATH 201. Annually.
CHEM 218 Molecular Structure 3.0; 3 cr.
Failures of classical physics, quantum theory, Schrödinger equation, particle in a box, harmonic oscillator, rotational motion, hydrogen atom, atomic orbitals, spin, Pauli exclusion principle, complex atoms, term symbols, molecular structure, hybridization, Hückel theory, rotation, vibration, and electronic spectra. Students cannot receive credit for both PHYS 212 and CHEM 218. Prerequisites: CHEM 201 and MATH 201. Annually.

Chemistry 219 Analytical and Instrumental Chemistry for Chemical Engineers 3.0; 3 cr.
An introduction to chemical measurements and modern instrumental methods of chemical analysis: sample preparation; error analysis; chemical separations; chromatographic; spectroscopic; electrochemical, and surface analysis techniques. Prerequisite: Not open to chemistry students. Prerequisites: CHEM 102 and CHEM 102L. Annually.

CHEM 220 Physical Chemistry Laboratory 1.6; 3 cr.
Experiments in thermodynamics, kinetics, electrochemistry, spectroscopy, and exercise in computational chemistry. Prerequisite: CHEM 217, pre- or co-requisite: CHEM 218. Annually.

CHEM 225 Organic Structure Determination 1.6, 4 cr.
Experiments in the techniques of purification, separation, and synthesis of derivatives of organic compounds; theory and practice in the analysis of organic compounds by infrared, ultraviolet-visible spectrophotometry, mass spectrometry, and nuclear magnetic resonance; identification of pure compounds and of components of mixtures of organic compounds by chemical and spectral methods. Prerequisite: CHEM 212. Annually.

CHEM 227 Technical Analysis 1.4, 3 cr.
Applications of chemical analysis to the analysis of natural and industrial products such as water, milk, textiles, liquors, oils, petroleum. Industrial techniques such as sample preparation and preconcentration. Separation and identification techniques: extraction, chromatography, and spectroscopy. Prerequisite: CHEM 215. Alternate years.

CHEM 228 Inorganic Chemistry 3.0; 3 cr.
Atomic structure, molecular structure (VBT, MOT), molecular shape (VSEPR), symmetry and group theory, the structure of solids (metals, ionic), acids and bases (Bronsted, Lewis, HSAB, solvents). Prerequisite: CHEM 201. Annually.

CHEM 229 Coordination Compounds 3.0; 3 cr.
A course that covers d-metal complexes (structures and symmetries, bonding and electronic structure, reactions of complexes); electronic spectra of complexes; reaction mechanisms of d-block complexes (ligand substitution reactions in square-planar and octahedral complexes, redox reactions, photochemical reactions). Prerequisite: CHEM 228. Annually.

CHEM 230 Senior Seminar 1 cr.
A literature search of a specific topic in chemistry. A written report and oral presentation in a seminar form. Prerequisite: Senior standing. Each semester.

CHEM 231 Organic Synthesis 1.4; 3 cr.
Experiments in multistep synthesis of organic compounds, with an emphasis on methods used for synthesis and isolation, and characterization of intermediates and products. Pre- or co-requisite: CHEM 212. Annually.

CHEM 232 Inorganic Synthesis 1.4; 3 cr.
Experiments in synthesis, separation, purification, and characterization of inorganic main-group and transition metal compounds by IR, UV-Vis, NMR, and ESR spectroscopy. Prerequisite: CHEM 228. Annually.

CHEM 233 Topics in Physical Chemistry 3.0; 3 cr.
A course that covers a selection of topics in thermodynamics, advanced kinetics, and techniques in physical analysis; thermodynamics of phase transformation; theoretical and experimental aspects of rates of reactions; rate laws of complex reactions, catalysis, adsorption isotherms, spectroscopic techniques (e.g., laser spectroscopy, NMR, EPR); surface analysis and imaging techniques; X-ray crystallography. Prerequisite: CHEM 217, and pre- or co-requisite: CHEM 218. Annually.

CHEM 295 Special Topics in Chemistry 3.0; 3 cr.
Prerequisite: senior standing in chemistry. Alternate Years.

CHEM 299 Independent Study 3 cr.
Independent chemical research carried out under the direction of a faculty member, including presentation of the results in the form of a senior thesis. Offered to senior students in good standing, by arrangement with the project director. Each semester.

34 + 6 credits in Chemistry

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic (9)</th>
<th>Humanities (12)</th>
<th>Social Sciences</th>
<th>Natural Sciences (44-47)</th>
<th>Quantitative Thought (9)</th>
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<tr>
<td>Lecture courses (57-63)</td>
<td>1. Required Arabic course: 201A or any General Education Arabic communication skills (5) 2. Required English courses: 203(3), 204(3)</td>
<td>Required credits in the humanities: 12 credits including 6 credits from CVP (see pp. xxx-xx)</td>
<td>6 credits required</td>
<td>1. Chemistry courses (24-30) Core: CHEM 216(3), 211L(3), 212L(3), 215L(3), 217(3), 218L(3), 220(3), 220L(3) Electives: CHEM 233(3), BIOL 220(3) 2. Science courses (12 cr.): PHYS 211(3) or PHYS 220(3)</td>
<td>Math and Computer Science courses: MATH 201(3), PHYS 202(3), CMPS 209 or 210(3)</td>
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<tr>
<td>Laboratory (13–19)</td>
<td>1. Chemistry courses (9–15) Core: CHEM 216(2), 211L(3), 212L(3) Electives: CHEM 211L(3), 212L(3) 2. Science courses (12 cr.): PHYS 211L or 220L(3)</td>
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<tr>
<td>CMPS 209 or 210(3)</td>
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<tr>
<td>Research project (0 or 3)</td>
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<tr>
<td>CHEM 299(3)</td>
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</table>

The number of free elective credits totals 10. Students can fulfill the economics and social sciences requirements in the various modes of analysis from these credits.

2 Students take, in addition to the 34 credits of core chemistry courses and the seminar course (230) 6 credits of the following elective courses of chemistry or biochemistry: CHEM 211, CHEM 220, CHEM 223, BIOL 220.

3 CMPS 209 is counted only once in the science credits above (53-56). It is, however, included and counted in both lecture and lab modes of analysis.

4 Not a requirement, could be taken as part of the 10 credits.
Civilization Sequence Program (CVSP)

Director: Saumarez Smith, Richard W.
Professors: Bornedal, Peter H.; Jarrar, Maher Z.; Meloy, John L.; Moussalli, Ahmad S.; Saumarez Smith, Richard W.
Associate Professors: Genz, Hermann P.; Harb, Sirene H.; Hout, Syrine S.; Nassar, Christopher S.; Wilmsen, David W.; Wrisley, David J.
Assistant Professors: Du Quenoy, Paul, G.; Fugate, Courtney; Gallagher, Robert L.; Gonsalves, Joshua; Hartwiger, Alexander G.; Mejcher-Atassi, Sonja H.; Newson, Paul G.; Wick, Alexis N.
Senior Lecturers: ¹Amyuni, Mona T.; Shebaya, Peter H.
Lecturers: Bualuan, Hayat H.; ²Maktabi, Hadi; ³Rihan, Mohamed A.; ⁴Sabra, George F.; Sharif, Malek
Instructors: ¹Abou Zaki, Said; Arasoghi, Aida A.; ²Dibo, Amal G.; Hassan, Hani R.; Khoury, Samira N.; Merrifield, William D.; Samaha, Raed; ³Tomeh, Edmond J.
Visiting Instructor: Kuang, Yafeng

The Civilization Sequence Program (CVSP) at the American University of Beirut is a unique, interdisciplinary space for critical inquiry into ideas that inform civilization.

Mission Statement

The mission of the Civilization Sequence Program is to provide undergraduate courses in the humanities that support the American University of Beirut's goals in general education and the advancement of knowledge. CVSP is committed to engaging students from all the faculties of the University in the study of primary texts. The three major goals of the program are to develop critical skills and creative, flexible thinking; to promote an awareness of different civilizations; and to uphold dialogue as an essential skill of life.

Requirements

Old Program

Students who joined their major prior to October 2001 must take CVSP 201, 202, 203, and 204, sequentially. (That is, 201 is a prerequisite for 202, 202 for 203, and 203 for 204.)

New Program

According to the general education requirements at AUB, all students in the Faculty of Arts and Sciences are required to take a total of twelve credits in the humanities.

A minimum of six credits of those twelve must be taken from CVSP courses 201-208. Students must complete one course from each of the following two sequences; that is, one course from Sequence I followed by one course from Sequence II.

Sequence I

CVSP 201 (each semester): Ancient Near East and Classical Civilizations (3 hrs)
CVSP 202 (each semester): Medieval, Islamic, and Renaissance Civilizations (3 hrs)
CVSP 205 (annually): Ancient, Medieval, Islamic, and Renaissance Civilizations (3 hrs)
CVSP 207 (annually): Ancient, Medieval, Islamic, and Renaissance Civilizations (Thematic) (3 hrs)

Sequence II

CVSP 203 (each semester): Enlightenment and Modernity (3 hrs)
CVSP 204 (each semester): Contemporary Studies (3 hrs)
CVSP 206 (annually): Modern and Contemporary Studies (3 hrs)
CVSP 208 (annually): Modern and Contemporary Studies (Thematic) (3 hrs)

The remaining six credits may be taken by choosing any two courses from the approved list of General Education humanities courses offered in FAS departments/programs.

The following CVSP courses are included among the General Education humanities courses: CVSP 201, 202, 203, 204, 205, 206, 207, 208, 212, 215, 216, 275, and 251.

The following CVSP courses are not included among the General Education humanities courses: CVSP 230, 295, FREN 201,202, CHIN 201,202, 203.

Requirements

• Since the critical skills built into the Sequence I courses significantly help the student succeed in Sequence II, students are required to take a Sequence I course before taking a Sequence II course.

• Students must have sophomore status or above to take a Sequence I course, and late sophomore status or above to take a Sequence II course. Students have late sophomore status if they have at least 26 sophomore credits already on their record.

• Sequence I and Sequence II courses may not be taken simultaneously.

Restrictions

• CVSP 205 overlaps with 201 and 202. Thus, CVSP 205 cannot be taken if the student has taken either 201 or 202, and vice versa.
- CVSP 206 overlaps with 203 and 204. Thus, CVSP 206 cannot be taken if the student has taken either 203 or 204, and vice versa.

The above restrictions do not apply to CVSP 207 and 208, as they do not overlap with any other core course (201-206).

Prerequisites
- ENGL 102 or its equivalent is a prerequisite for all CVSP courses 200 and above.
- Freshman students who have not completed two semesters may not enroll in CVSP courses numbered 201–208. They will not receive credit for these courses. For all other CVSP courses numbered 200 and above, freshman students may enroll only with prior consent of the instructor.

Sequence I and Sequence II Course Offerings

CVSP 201 Ancient Near East and Classical Civilizations 3.0; 3 cr.
An introduction to fundamental elements of Ancient Mesopotamian, Greek, and Roman world views that continue to influence us today. Starting with the Epic of Gilgamesh, the course moves on to explore the Greek and Roman worlds through epic, drama, history, and philosophy, in some of the most influential texts from that period of human history. CVSP 201 cannot be taken if the student has taken 205. Each semester.

CVSP 202 Medieval, Islamic, and Renaissance Civilizations 3.0; 3 cr.
An introduction to fundamental elements of late Classical, Medieval, Islamic, and Renaissance worldviews that continue to influence us today. This course focuses particularly on Christian and Islamic thought as presented in texts such as those of Augustine, Al Ghazali, Ibn Tufayl, Ibn Rushd, Aquinas, Dante, Ibn Khaldun, and Luther. Selected texts from the Renaissance period round off the course. CVSP 202 cannot be taken if the student has taken 205. Each semester.

CVSP 203 Modernity and Enlightenment 3.0; 3 cr.
An introduction to fundamental elements of what has come to be termed the epochs of Modernity and the Enlightenment. This course explores the emerging elements of an age of exploration, scientific advancement, and radical new ideas, through selections from authors such as Shakespeare (The Tempest), Bacon, Descartes, Hobbes, Locke, Hume, Adam Smith, Diderot, Bentham, Kant, Goethe, Shelley, Marx, and Mill. CVSP 203 cannot be taken if the student has taken CVSP 206. Pre-requisite: any Sequence I course. Each semester.

CVSP 204 Contemporary Studies 3.0; 3 cr.
An introduction to some of the most seminal influences in thought that have shaped our contemporary world from the late 19th century to the present time. This course typically explores themes and developments such as evolutionary theory, Nietzschean radical critique, depth-psychology, astrophysics, philosophy of science, revolution, the absurd, existentialism, gender issues, and postcolonial literature and criticism, from both the Western and the Arab worlds. CVSP 204 cannot be taken if the student has taken CVSP 206. Pre-requisite: any Sequence I course. Each semester.

CVSP 205 Ancient, Medieval, and Renaissance Civilizations 3.0; 3 cr.
A composite of CVSP 201 and 202, covering selected works from the periods described above. CVSP 205 cannot be taken if the student has taken either 201 or 202 Annually.

CVSP 206 Modern and Contemporary Studies 3.0; 3 cr.
A composite of CVSP 203 and 204, covering selected works from the periods described above. CVSP 206 cannot be taken if the student has taken either 203 or 204. Pre-requisite: any Sequence I course. Annually.

CVSP 207 Ancient, Medieval, and Renaissance Civilizations (Thematic) 3.0; 3 cr.
Individualized courses designed to explore the periods covered in CVSP 201 and 202, utilizing a thematic approach. Examples of themes: Epics: Text and Context; Human Nature: Ancient, Medieval and Renaissance texts; Love: Human and Divine; Religion as Text and Tradition; Utopian Thought. May be repeated for credit on different topics. Annually.

CVSP 208 Modern and Contemporary (A, B, C) Studies (Thematic) 3.0; 3 cr.
Individualized courses designed to explore the periods covered in CVSP 203 and 204, utilizing a thematic approach. Examples of themes: Epics: Text and Context; Faith, Culture, and Modernity; Folly; Four Theories that Shaped the Twentieth Century; Gender and Cultural Production; Language, Imagination, and Poetry; Love in the Modern and Contemporary Worlds; Monstrosities in European Modernity: Science and Society; Utopian Thought. May be repeated for credit on different topics. Pre-requisite: any Sequence I course. Annually.

Courses Restricted To Freshman Students

CVSP 110 Gods and Creation: East and West 3.0; 3 cr.
A course that examines different literary understandings of the origins of the universe as found in texts from a variety of world cultures. Annually.

CVSP 111 Youth and Rebellion in Modern Literature 3.0; 3 cr.
An introduction to the themes and challenges of autonomy and independence as experienced by youth, studied through major literary works of the past centuries. Annually.

CVSP 112 Contemporary Arab Identity 3.0; 3 cr.
An examination of literary, historical, and socio-political texts that express contemporary Arab self-awareness. Annually.

Courses Supplementary to the Regular Offerings

CVSP 212 Modern and Contemporary World Theatre 3.0; 3 cr.
This course examines a number of plays from across different artistic, cultural and linguistic traditions. The focus will be on reading and analyzing these plays for an appreciation of aesthetic innovations; modes of theatrical expression; and their place within particular social or cultural contexts. Course materials may include filmed versions of the plays for comparison. Annually.

CVSP 215 A Survey of Nineteenth-Century French Literature in English 3.0; 3 cr.
A survey of the major French poets and novelists of the nineteenth century with selected readings from Hugo, Lamartine, Baudelaire, and Rimbaud to Stendhal, Balzac and Zola. Prerequisite: Junior status or consent of instructor. Annually.
CVSP 216  A Survey of Twentieth-Century French Literature in English
A survey of the major French poets and novelists of the twentieth century with an emphasis on the main artistic currents from Proust, Colette, Gide, Sartre, and Camus, to surrealism in poetry and the New Novel by Robe-Grillet, Nathalie Sarraute, and Marguerite Duras. Prerequisite: Junior status or consent of instructor. Annually.

CVSP 217  Modern Russian Literature
Russian short stories, novels and plays have had a major impact on world literature. The course offers a close readings of texts from authors such as Gogol, Dostoyevsky, Tolstoy, Chekov, Gorky and Solzhenitsyn that reflect socio-political and psychological changes undergone in Russia from the nineteenth century to our own times. Prerequisite: Junior status or consent of instructor. Every second year.

CVSP 230  Introduction to Feminist Theory
A course that examines feminism and its historical development through analysis and critique of the different feminist theories that have emerged during the twentieth century. Annually.

CVSP 250  Civilization Through the Arts I
An introduction to the appreciation of art. More of a cultural history than an art historical survey, this course aims to provide the student with general knowledge about how the understanding of art, artist and beauty/the aesthetic has changed in time and place. Annually.

CVSP 251  Civilization Through the Arts II
The course critically examines the terms ‘modern’ and ‘art’ and the association of modern art with Western art. It then focuses on non-Western modern art, taking Lebanon as an example. Annually.

CVSP 295  Special Topics in Cultural Studies
At the discretion of the program. May be repeated for credit on different topics. Prerequisite: Junior level and above, or by consent of instructor.

CVSP/ Elementary German I
German 201
Annually.

CVSP/ Elementary German II
German 202
Prerequisite: CVSP/German 201. Annually.

CVSP/ Intermediate German
German 211
Prerequisite: CVSP/German 202. Annually.

CVSP/ Elementary French I
French 201
Each semester.

CVSP/ Elementary French II
French 202
Prerequisite: CVSP/French 201. Each semester.
BS in Computer Science

Mission Statement

The department of Computer Science prepares students for advanced study and professional careers in the dynamically changing world of computing and information technology. The BS program aims to produce graduates with a solid foundation in computing at both the theoretical and practical levels, the ability to design, build, and deploy sophisticated systems using current technologies in a broad array of areas, and an appreciation of the transformative impact that computing has had on a wide variety of disciplines. Students are trained in quantitative reasoning, the use of fundamental principles and ideas (abstraction, modularity, data structures, algorithms, computability, calculus, logic) for analysis and problem solving, and disciplined development of modern software systems. The department has vigorous research programs in graphics and multimedia, networking, high-performance computing, and software engineering and is committed to providing opportunities for students to get engaged in research in these areas.

BS Degree in Computer Science

To graduate with a B.S. in computer science a student must finish:

University Requirements

- University language requirements (English 6 credits, Arabic 3 credits)
- University General Education requirements (Humanities 12 credits, Social Sciences 6 credits, Natural Sciences 6 credits, Quantitative Thought 3 credits).

Major Requirements

- Computer science: CMPS 200, CMPS 205, CMPS 212, CMPS 213, CMPS 253, CMPS 255, CMPS 256, CMPS 257, CMPS 258, CMPS 272, CMPS 277, CMPS 299, and nine additional credits in computer science courses numbered 220 and above
- Mathematics: MATH 201, MATH 211 (or CMPS 211), and one Math course to be chosen from MATH 218, MATH 219, STAT 230, STAT 233, and MATH 261.
- Sciences: Physics 228, 228L.
- Free elective: one course numbered 200 and above from outside the department.

All prospective computer science majors are expected to complete CMPS 200, CMPS 205, MATH 201, MATH 211 or CMPS 211, and CMPS 212, in the sophomore year. Computer science majors are expected to complete CMPS 213, CMPS 253, CMPS 255, CMPS 256, CMPS 257, CMPS 258, and CMPS 299 in the junior year, and maintain an average grade of at least 70 in computer science courses. Finally, students are encouraged to take ACCT 210 and PHIL 211 among their general/FREE elective courses.

A minor in computer science requires 18 credits: CMPS 200, CMPS 212, CMPS 255, and nine additional credits in computer science courses (CMPS) numbered 211 or above. A minimum of 9 credits must be taken in the department. [Note: This minor is not open to EECE students.]

Sample Study Plan

A typical study plan could have the following distribution of CMPS courses:

First Year
First Semester: CMPS 200, CMPS 205, CMPS 211, MATH 201
Second Semester: CMPS 212, CMPS elective

Second Year
First Semester: CMPS 213, CMPS 255, CMPS 256, MATH course
Second Semester: CMPS 253, CMPS 257, CMPS 258

Third Year
First Semester: CMPS 272, CMPS 277, CMPS elective
Second Semester: CMPS 299, CMPS elective
Undergraduate Courses

CMPS 101  Introduction to Computer Science  2.2; 3 cr
Introduces the skills, concepts, and capabilities needed for effective use of information technology (IT). Includes logical reasoning, organization of information, managing complexity, operations of computers and networks, digital representation of information, security principles, and the use of contemporary applications such as effective Web search, spreadsheets, and database systems. Also includes a basic introduction to programming and problem solving through scripting web applications. Every Semester.

CMPS 200  Introduction to Programming  3.3; 3 cr.
An introduction to a disciplined approach to computer programming and problem solving, utilizing a block-structured high level language, with an emphasis on procedural abstraction and good programming style. This course covers the basic repetition and selection constructs, procedures and functions, parameter passing, and scope of variables. Note: If EECE 230 is completed, students can get credit for only one of CMPS 200 or EECE 230. Each semester.

CMPS 205  Introduction to Computing Systems  1.2; 1 cr
This course provides a broad introduction to computer science. It is meant to expose students to some of the ideas of the field as well to develop fluency in the use of information technology. The course introduces operations of computers and networks, World Wide Web and standards, systems for representing and organizing information, management of complexity, security principles and algorithmic thinking. Annually.

CMPS 206  Computers and Programming for the Arts  2.2; 3 cr.
An introduction to computers and an illustration of their use. Common applications are considered in word processing, spreadsheets, and database systems. This course also includes an introduction to the Internet and the World Wide Web. This course is meant to be a computer literacy course open to Arts students only. No credit is given to computer science majors. Students can get credit for only one of CMPS 206, CMPS 209, or EDUC 219. Annually.

CMPS 209  Computers and Programming for the Sciences  2.2; 3 cr.
A computer literacy course covering all the topics in CMPS 206. Additionally, this course provides an introduction to programming using Visual Basic or a similar language. No credit is given for computer science majors. Students can get credit for only one of CMPS 206, CMPS 209, or EDUC 219. Each semester.

CMPS 211  Discrete Structures  3.0; 3 cr.
Logical reasoning, sets, relations and functions; mathematical induction, counting, and simple finite probability theory; molecular arithmetic in different bases; recurrence relations and difference equations; truth tables and switching circuits; graphs and trees; strings and languages. This course is equivalent to Math 211. Annually.

CMPS 212  Intermediate Programming with Data Structures  3.3; 3 cr.
A continuation of CMPS 200, this course consolidates algorithm design and programming techniques, emphasizing large programs. This course also provides a detailed study of data structures and data abstraction, and an introduction to complexity considerations and program verification. Note: If EECE 330 is completed, students can get credit for only one of CMPS 212 or EECE 330. Prerequisite: CMPS 200 or EECE 230. Each semester.

CMPS 213  C/C++-programming  1.2; 1 cr
This course exposes students to the C and C++ programming languages. The course covers basic syntax, defining structures and classes, I/O, pointers, arrays, memory management, references, overloading, templates, the Standard Template Library, inheritance and polymorphism. Annually.

CMPS 230  Digital Media Programming  3.0; 3 cr.
The class is an introduction to digital media programming and processing. The course explains the essential technology behind images, animations, sound, and video and how to write interactive programs that manipulate these media in creative ways. The class assumes basic knowledge in Java or a first course in programming. Prerequisite: CMPS 200.

CMPS 251  Numerical Computing  3.1; 3 cr.
Techniques of numerical analysis: number representations and round-off errors, root finding, approximation of functions, integration, solving initial value problems, Monte-Carlo methods. Implementations and analysis of the algorithms are stressed. Projects using MATLAB or a similar tool are assigned. Prerequisites: (CMPS 200 or EECE 230) and MATH 201. This course is equivalent to MATH 251. Annually.

CMPS 253  Software Engineering  3.0; 3 cr.
A course that introduces the fundamentals of software engineering, with emphasis on the requirements elicitation and specification, and analysis and design phases of the software life cycle. Specifications are given as a set of operations (with pre- and post-conditions), and using a generic data model, and the design as a module dependency diagram where both data and procedural decomposition are emphasized. The course also introduces verification and testing of a design with respect to its specification, and the use of modularity and decomposition to ensure tractability of the verification. Students will apply the concepts learned to develop a software system. Prerequisite: CMPS 212 or EECE 330. Annually.

CMPS 255  Computer Architecture  3.0; 3 cr.
A structured overview of the fundamentals of designing digital computer systems. Topics covered include digital logic and systems, machine level representation of data, assembly level machine organization, memory system organization and architecture, CPU implementation and virtual machines, and exposure to one or more micro/multi architectures. Prerequisite or co-requisite: CMPS 212 or EECE 330. Annually.

CMPS 256  Algorithms and Data Structures  3.0; 3 cr.
A systematic study of algorithms and their complexity. Topics include techniques for designing efficient computer algorithms, proving their correctness, and analyzing their complexity; as well as advanced searching, sorting, selection, graph and matrix algorithms. Prerequisites: (MATH 211 or CMPS 211) and (CMPS 212 or EECE 330) Annually.

CMPS 257  Theory of Computation  3.0; 3 cr.
A course that covers basic theoretical principles embodied in automata and grammars. Topics include regular expressions, finite automata, context-free grammars and parsing, pushdown automata, closure properties, Turing machines, Church’s thesis, reductions and decidability. This course also provides a quick introduction to complexity theory. Prerequisites: (MATH 211 or CMPS 211) and (CMPS 212 or EECE 330). Annually.

CMPS 258  Programming Languages  3.0; 3 cr.
A course on the principles and programming styles that govern the design and implementation of contemporary programming languages, a history and overview of programming languages, fundamental issues in language design, and an introduction to language translation. This course focuses on design issues in imperative, object-oriented, functional, and rule-based paradigms. This last paradigm will be used to introduce intelligent systems issues. Languages such as C, C++, Haskell, and Prolog are used to illustrate key concepts. Prerequisite: CMPS 212 or EECE 330. Annually.
CMPS 272  
Operating Systems  
3.0; 3 cr.  
An overview of operating systems and net-centric computing. Topics include operating system principles, scheduling and resource management, virtual memory, file systems, concurrent processing and synchronization, security and protections, the Internet, network structures, distributed operating systems, and Web technologies and operating systems (URL, HTML, HTTP, applets). A case study of a contemporary operating system like UNIX accompanies the course. Prerequisite: (CMPS 255 or EECE 321) and (CMPS 256 or CMPS 257). Each semester.

CMPS 273  
Systems and Network Programming  
3.0; 3 cr.  
This course focuses on the programming aspects of networking protocols. Topics include: designing and building programming applications that use computer networks, fundamental concepts required to build iterative and concurrent client/server networking applications using sockets. Then it moves to explain low level networking programming and other advanced socket topics. The course also presents the emerging peer-to-peer computing along with some tools needed to develop P2P applications. Prerequisite: CMPS 272. Annually.

CMPS 274  
Compiler Construction  
3.0; 3 cr.  
A course that covers syntax specifications of programming languages, parsing theory, top-down and bottom-up parsing, parser generators, syntax-directed code generation, symbol table organization and management, dynamic storage allocation, code optimization, dataflow analysis, and register allocation. Prerequisites: CMPS 255, CMPS 258 and CMPS 257. Biennially.

CMPS 277  
Database Systems  
3.0; 3 cr.  
An overview of the nature and purposes of database systems and an introduction to data modeling: entity relationship model, relational model with relational algebra, relational calculus and SQL; integrity constraints; file organization and index files; normalization. Prerequisite: CMPS 256 or EECE 330. Annually.

CMPS 278  
Web Programming and Design  
3.0; 3 cr.  
This course introduces the exciting world of WWW, the fundamentals needed to program on the Internet, and the state of the art technologies used in designing and developing rich multi-tiered web based applications. It presents the basics of client-side/server-side web programming and all the skills and tools needed to create dynamic Web-based applications. It provides in-depth coverage of various markup languages (XHTML, Dynamic HTML and XML) and their associated cascading style sheets, several client side and server side scripting languages (JavaScript, PHP) in addition to AJAX-enabled rich Internet applications, client-side technologies, web services, Web Servers, and multi-tiered applications using relational database systems. Prerequisite: CMPS 277. Annually.

CMPS 281  
Numerical Linear Algebra  
3.0; 3 cr.  
A course on direct and interactive methods for solving general and special systems of linear equations, covering LU decomposition, Choleski decomposition, nested dissection, marching algorithms; Jacobi, Gauss-Seidel, successive over-relaxation, alternating directions, and conjugate gradient iterative methods. This course is equivalent to MATH 281. Prerequisites: (MATH 218 or 219) and (MATH 251 or CMPS 211). Annually.

CMPS 282  
Advanced Software Engineering  
3.0; 3 cr.  
A course on state of the art software engineering for large distributed and concurrent systems. Fundamental principles and concepts for specifying, designing, analyzing, implementing, and testing such systems. Concurrent object oriented paradigms. Design patterns. Use of tools. Documentation using both formal and informal descriptions. Students will develop at least one large software system as part of the course. Prerequisite: CMPS 253. Annually.

CMPS 284  
Computer Networks  
3.0; 3 cr.  
An introduction to basic data communication, network architecture, protocols, local area networks, and wide area networks. Special emphasis is placed on the TCP/IP protocol suite. The BSD socket library is presented. Prerequisite: CMPS 255 or EECE 321. Annually.

CMPS 285  
Computer Graphics  
3.0; 3 cr.  
A course that covers the practice of, and underlying mathematical foundation for, interactive graphics programming. Topics include basic graphics systems, graphics primitives and attributes, windows and viewports, clipping, geometric transformations, color systems, 2D texture mapping, and introduction to 3D graphics. Programming in OpenGL will be used. Prerequisite: CMPS 212 or EECE 330. Annually.

CMPS 286  
Computer-Aided Geometric Design  
3.0; 3 cr.  
A course that discusses the representation of free-form curves and surfaces in modeling objects by computers, including curve approximation and interpolation, spline curves (Bezier and B-splines), visual smoothness of curves, geometric continuity, parameterization of curves, introduction to surface interpolation and approximation, and spline surfaces (Bezier and B-splines). Prerequisite: CMPS 212 or EECE 330. Biennially.

CMPS 287  
Artificial Intelligence  
3.0; 3 cr.  
An introduction to the principles and techniques that enable computers to behave intelligently. This course covers basic problem solving methods, knowledge representation, reasoning methods, learning from samples and from experience, expert systems and knowledge acquisition, machine learning, and neural networks. Several projects are given, some of which are in Prolog. Prerequisites: CMPS 256 and 258. Annually.

CMPS 288  
Internals of Database Management Systems  
3.0; 3 cr.  
A course on the internals of database management systems, especially relational DBMS. Topics include query processing and optimization, transaction processing, concurrency control, recovery, distributed transactions, database security, client-server, multi-tier architectures, and web deployed database systems. Prerequisite: CMPS 277. Annually.

CMPS 289  
Human Computer Interaction  
3.0; 3 cr.  

CMPS 296  
Computer Science Tutorial  
1–3 cr.  
Prerequisite: Senior standing.

CMPS 297  
Special Topics in Computer Science  
1–3 cr.  
A course on selected topics which change according to the interests of the instructors and/or students. Topics are chosen from state-of-the-art innovations in software and computer information systems. Prerequisite: Consent of instructor. Annually.

CMPS 299  
Software Graduation Project  
3 cr.  
A course to enhance students' skills with practical experience giving them the opportunity to integrate knowledge accumulated in different courses. In this course, students must deliver a software product, which passes through the design, analysis, implementation, testing, and evaluation stages. Prerequisite: Senior standing. Annually.
# 41 Credits in Computer Science

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic (9)</th>
<th>Humanities (12)</th>
<th>Social Sciences (6)</th>
<th>Natural Sciences (10)</th>
<th>Quantitative Thought (32+9+9+3)</th>
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<tbody>
<tr>
<td>Lecture Courses (9+12+6+10+53)</td>
<td>1. Required Arabic courses (3): ARAB 201 A or B, or any upper level course (3), as determined by placement</td>
<td>Required credits in the humanities: 12 credits including 6 credits from CVSP (see pp. xxx–xx)</td>
<td>Required Courses (6)</td>
<td>Required natural science courses (6)</td>
<td>1. Required CMPS courses (32): CMPS 200(3)+205(1), 212 (3)+213 (1), 253(3), 255(3), 256(3), 257(3), 258(3), 272(3), 277(3), 299(3)</td>
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<td>2. Required English courses (usually 6): ENGL 203(3), 204(3), as determined by placement</td>
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<td>2. Required CMPS electives (9): to be chosen from CMPS courses above 220</td>
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<td>3. Required mathematics courses (9): MATH 201(3), 211(3) and one Math course to be chosen from MATH 218, MATH 219, STAT 230, STAT 233, and MATH 261. Note: since MATH 251 is equivalent to CMPS 251, it cannot count as both a computer science elective and mathematics elective</td>
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<td>4. One free elective (3) numbered 200 and above from outside the department</td>
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Seminar (0)

Laboratory PHYS 228L CMPS 201, 205, 212, 213

Research Project (0)

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1 Natural science courses are numbered 200 and above and drawn from biology, chemistry, geology or physics, open to science students
Department of Economics

Chairperson: Neaime, Simon E.
Professor Emeritus: Makdisi, Samir
Professor: Neaime, Simon E.
Associate Professor: Marktanner, Marcus R.
Assistant Professors: Dagher Leila N.; Martin, Darius D; Ruble, Isabella H.; Sadaka, Richard A.; Salti, Nisreen I.
Senior Lecturer: Sirhan, Ghazi A.
Lecturers: El-Khalil, Youssef A.; El-Saghir, Sandra W.; Mabsout, Ramzi; Nasser, Yassar; Ramadan, Usamah H.
Instructors: Abboud, Montaha; Boghossian, Myrna G.; Bou Diab, Sarah M.; Elbaba, Nora; El-Khalil, Iyad A.; Jibai, Rania A.; Kanaan, Maya Z.; Khoury, Nicole M.; Majdalani, Joelle; Makk, Malak, Z.; Mecherkany, Rami R.; Nader, Pamela; Tabsh, Ghina; Tabsh, Hala M.; Wehbe, Layal

Undergraduate Program

BA in Economics

Mission Statement

The undergraduate program in Economics is a rigorous quantitative program which enhances students’ analytical skills and critical thinking. In addition to broader economic concepts, the understanding of economic issues pertaining to the Middle East and North Africa region is given special attention. The Department is committed to a liberal arts philosophy and the development of leadership skills in the field of economics. The Program develops its students’ professional competencies and responsible citizenship skills, and prepares them for a variety of careers in economic research, financial economics, and banking.

Students accepted in economics must attain an average of 70 or above in major courses during the first three semesters in order to remain in the program. In addition to these courses they must obtain a cumulative average of at least 70 in MATH 201 and MATH 202. Economics majors are expected to take ECON 213 during their sophomore year and ECON 214 during their junior year. They must also complete CMPS 209, or its equivalent; MATH 218 or MATH 219; and ACCT 210. Holders of the Lebanese Baccalaureate Philosophy section must complete MATH 101 and MATH 102 before MATH 201.

The program for a BA in economics, which consists of 36 credits of economics courses numbered 210 or above, includes ECON 211, ECON 212, ECON 213, ECON 214, ECON 217, and ECON 227.

P Part time
Economics majors whose economics average falls below 70 in their first two semesters in the major will be placed on departmental probation. Majors who have an average below 70 in their economics courses at the end of their third regular semester in the major will be dropped from the major.

The minor program in economics requires 18 credits: ECON 211, ECON 212, and ECON 214, plus three electives other than ECON 213, chosen from available economics offerings provided their prerequisites (or equivalent) have been satisfied.

The requirements for a BA degree in Economics are 90 credits for students entering the department at the sophomore level. The distribution of these courses is as follows:

**University Requirements**

- University Language Requirements: 9 credits of English and Arabic.
- University General Education Requirements: 12 credits in the humanities including 6 credits of CVSP, 3 credits in the social sciences, 6 credits in the natural sciences, and 12 credits in quantitative thought.

**Major Requirements**

- Major Courses: 36 credits of Economics courses including 18 credits as required courses, and 18 credits as elective economics courses.
- Electives outside the Department: 12 credits of free electives.

Transfers from other programs to a major in economics require a cumulative average of 70 or more; a minimum grade of 70 in each of ECON 211, ECON 212, and ENGL 203; and a minimum cumulative average of 70 in MATH 201 and MATH 202.

**ECON 101** Introduction to Microeconomics 3.0; 3 cr.
An introductory survey of the principles of microeconomics, designed primarily for freshman students. Annually.

**ECON 102** Introduction to Macroeconomics 3.0; 3 cr.
An introductory survey of the principles of macroeconomics, designed primarily for freshman students. Annually.

**ECON 203** Survey of Economics 3.0; 3 cr.
Elementary principles of microeconomics and macroeconomics and applications. No credit is given for students majoring in economics. Students cannot receive credit for both ECON 203 and ECON 211. ECON 212. Each semester.

**ECON 211** Elementary Microeconomic Theory 3.0; 3 cr.
General principles of microeconomics; includes elements of supply and demand, consumer behavior, costs, market structures, and income distribution. Students cannot receive credit for both ECON 203 and ECON 211. Each semester.

**ECON 212** Elementary Macroeconomic Theory 3.0; 3 cr.
General principles of macroeconomics; aggregate supply and demand framework is used to analyze overall movements in prices and national output, inflation and unemployment, and monetary and fiscal policies. Students cannot receive credit for both ECON 203 and ECON 212. Each semester.

**ECON 213** Economic Statistics I 3.0; 3 cr.
Measures of dispersion; elements of probability theory; sampling, sampling distribution, estimation and hypothesis testing, and simple regression. Students can receive credit for only one of ECON 213, STAT 201, STAT 210, STAT 230, BUSS 200, or EDUC 227. Each semester.

**ECON 214** Economic Statistics and Econometrics 3.0; 3 cr.
Classical linear regression model and the multiple regression model in matrix form; the criteria for estimators; multicollinearity, serial correlation, heteroskedasticity; identification and estimation of simultaneous equation models and applications. Prerequisites: ECON 211, ECON 212, ECON 213 or STAT 201, STAT 210, STAT 230, BUSS 200, EDUC 227, and MATH 201. Each semester.

**ECON 215** Applied Econometrics 3.0; 3 cr.
A comprehensive treatment of econometric techniques applied in time series models, stationary time series models, modeling economic time series; multi-equation time series models; cointegration; and applications. Prerequisite: ECON 214. Annually.

**ECON 217** Intermediate Price Theory 3.0; 3 cr.
Theory of allocation of resources; consumers’ choice and classical demand theory, exchange and welfare; theory of production and cost; price and output determination under alternative market structures; game theory and applications to oligopoly. Prerequisites: ECON 211 and MATH 201. Each semester.

**ECON 218** Income Distribution and Welfare Economics 3.0; 3 cr.
Factor markets and theories of income distribution, general equilibrium and input-output analysis, welfare economics. Prerequisite: ECON 217. Annually.

**ECON 219** Economics of Financial Markets 3.0; 3 cr.
A survey of capital markets and asset pricing models; determination of the links between financial markets, monetary policy, and economic growth. Prerequisites: ECON 214 and ECON 227. Annually.

**ECON 221** History of Economic Doctrines 3.0; 3 cr.
A survey of the history of economic thought, both theory and policy, with an emphasis on contemporary economic thought. Prerequisites: ECON 217 and ECON 227, or consent of instructor. Annually.

**ECON 222** Labor Economics 3.0; 3 cr.
A survey of the demand for and supply of labor, investment in human capital, market structure and efficiency of labor markets, collective bargaining, income distribution, and unemployment. Prerequisite: ECON 217. Annually.

**ECON 223/224** Economics of the Middle East 3.0; 3 cr.
A study of the resource endowment of the Arab Middle Eastern economies; their development experience, and the general outlook for growth and development. Prerequisites: ECON 211 and ECON 212. Occasionally.

**ECON 226** Intermediate Public Finance 3.0; 3 cr.
A study of public expenditures, public revenues, and public debts, principles of equity in the distribution of the tax burden. Prerequisite: ECON 217. Annually.

**ECON 227** Intermediate Macroeconomics 3.0; 3 cr.
A study of the aggregate approach to economics, including the determination of output, employment, the rise of interest rates, and the price level. Inflation and stabilization policies, budget deficits and the national debt, business cycles, theories of consumption, and investment behavior. Prerequisites: ECON 211 and 212, MATH 201 and 202. Each semester.
ECON 228  Intermediate Monetary Economics  3.0; 3 cr.
Central banking and instruments of monetary management, alternative theories of the demand for money, the balance of payments and the processes of its adjustment. Prerequisite: ECON 227. Annually.

ECON 230  Economic History  3.0; 3 cr.
Economic development of Europe and other areas up to 1914, with special emphasis on a number of distinct problems in different countries and historical periods. Prerequisites: ECON 211 and ECON 212. Occasionally.

ECON 232  Economic Policy in Developing Countries  3.0; 3 cr.
Economic policy in developing countries in the context of globalization, policy challenges facing developing countries, impact of regional blocs, and requirements for successful integration into the world economy. Prerequisite: ECON 227. Occasionally.

ECON 235  Intermediate International Trade Theory  3.0; 3 cr.
Classical trade model, the Heckscher-Ohlin theorem and subsequent theoretical developments, tariffs, domestic distortions, customs union, trade, and economic growth. Prerequisite: ECON 217. Annually.

ECON 236  Intermediate International Economic Policy  3.0; 3 cr.
Systematic analysis of policies in an open economy, the balance of payments, foreign exchange markets and adjustment under different exchange rate standards; basic policy issues in trade and development. Prerequisites: ECON 217 and ECON 227. Annually.

ECON 237  Economic Development I  3.0; 3 cr.
Introduction to development economics; topical issues in development, market-oriented reforms, impact of globalization, urbanization, and agricultural development; recent experiences in developing countries. Prerequisite: ECON 217 or ECON 227. Annually.

ECON 239  Introduction to Mathematical Economics  3.0; 3 cr.
Optimization problems, dynamic analysis, difference and differential equations, linear and non-linear programming; dynamic programming and game theory with economic applications. Prerequisites: ECON 217 and MATH 201. Annually.

ECON 240  Economic Development II  3.0; 3 cr.
Models of economic development and growth; macroeconomic planning; policy formulation and implementation in developing countries. Prerequisite: ECON 227. Annually.

ECON 241  Industrial Organization and Public Policy  3.0; 3 cr.
Application of microeconomics; analysis of factors affecting market structure, conduct and firm behavior in imperfectly competitive industries; survey of theories relating to intensity of competition and maintenance of market dominance; rationale for antitrust laws. Prerequisite: ECON 217. Annually.

ECON 242  The Economics of Petroleum  3.0; 3 cr.
An analysis of the factors determining the production and pricing of oil with reference to the Arab oil countries, the world oil market, and the role of OPEC. Prerequisite: ECON 217. Occasionally.

ECON 243  Introduction to Game Theory and Economic Behavior  3.0; 3 cr.
Basic concepts and methods of game theory with applications to economic problems, Nash equilibrium, mixed strategies, zero sum games, repeated games. Prerequisites: ECON 217 and MATH 201. Annually.

ECON 295/296 Senior Seminars in Economics  3.0; 3 cr.
ECON 297  Senior Research Seminar  3.0; 3 cr.

36 Credits in Economics (18 + 18)

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>Humanities (12)</th>
<th>Economics and Social Sciences (18+18)</th>
<th>Natural Sciences (Min. 6)</th>
<th>Quantitative Thought (Min 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture courses</td>
<td>Required credits in the humanities: 52 credits including 6 credits in ECON 227 (see pp. xxx-xx)</td>
<td>1. Required economics courses (18): ECON 211(3), 212(3), 213(3), 214(3), 217(3)</td>
<td>Electives (Min. 6)</td>
<td>Required mathematics courses: MATH 201(3), 202(3), 204(3), 210(3) or CMPS 100(3)</td>
</tr>
</tbody>
</table>

| Lectures courses (9+12+18+18 +3+12) | 1. Required Arabic course: ARAB 201A or B, or any upper level course (3) | 2. Required English courses: ENGL 203 (3), 204 (3) |

| 1. Required economics courses (20): ECON 211(3), 212(3), 213(3), 214(3) | 2. Six elective economics courses from the following and/or seminar courses (18): ECON 215(3) (Min. 12) |

Seminar Elective economics courses: ECON 295(3), 296(3), and 297(3)

Laboratory (0)
Research Project (0)
P Prerequisite
Department of Education

Chairperson: Ghaith, Ghazi M
Professors: Bashshur, Munir M.; BouJaoude, Saouma B.; Ghaith, Ghazi M.; Jurdak, Murad E.
Associate Professors: Khamis, Vivian E.; Vlaardingerbroek, Barend P.
Assistant Professors: Al-Hroub, Anies M.; Baytiyeh, Hoda M.; El-Mouhayar, Rabih R.; Karami-Akkary, Rima R.; Khishfe, Rola F.
Lecturers: "Abou Moussa, Richard A.; "Al-Amine, Adnan, M.; "Bachour, Najla A.; BouZeineddine, Amal R.; "Deeb, Reem A.; Mukallid, Samar H.; Shihab, Mahmud M.
Instructors: "Baassiri, Loulou, N.; Farah, Lynn G.; "Osman, Enja H.

The Department of Education offers programs at both the undergraduate and graduate levels. The undergraduate level program leads to a Bachelor of Arts degree. The post-BA Diploma Program leads to a Teaching Diploma, Diploma in Special Education, or Diploma in Educational Management and Leadership. The graduate program leads to a Master of Arts degree in education.

The Department of Education offers a program leading to the degree of Bachelor of Arts in Education/Elementary.

BA Education/Elementary

Mission Statement

The Bachelor of Arts in Education/Elementary Program aims at developing students' knowledge base for teaching and competence in professional practice as well as promoting a commitment to personal professional development and active participation in the professional community. Through fulfillment of coursework, field-based experiences, and professional community service activities students are prepared to enter the field of teaching and/or graduate studies in education as reflective practitioners, literate in information and communication technology, and critical thinkers committed to the human and moral values of lifelong learning, integrity, innovation, civic responsibility, and leadership.

The bachelor's degree in education/elementary aims at developing

- professional understanding of children and their learning needs at the elementary level
- broad-based competencies in methods and techniques of teaching to meet and develop learning needs
- adequate knowledge of subject matter taught in elementary schools

The program for the BA in elementary education is based on at least 90 credits as follows:

University language requirements (9 cr.)
ENGL 203, ENGL 204, ARAB 201A or any General Education Arabic communication skills course.

General Education Requirements (27 cr.):
- Humanities (12cr.) Group I CVSP (3 cr.), Group II CVSP (3cr.): Humanities I (3cr.)
- Social sciences (6 cr.): One course must be an approved General Education course from outside the major.
- Natural science (6 cr.)
- Quantitative thought (3 cr.).

Education Requirements (39 cr.):
Core Education Courses (21 cr.): EDUC 211 or EDUC 216, EDUC 215, EDUC 217, EDUC 219*, EDUC 223, EDUC 230, EDUC 231, and EDUC 271*

Specialization Courses (18 cr.):
- Methods Courses (6 cr.): one of the following pairs: EDUC 240 and EDUC 251 (Arabic and social studies), EDUC 228 and EDUC 229 (art and music), EDUC 245 and EDUC 251 (English and social studies), EDUC 252 and EDUC 257 (math and science).
- Seminar (6 cr.): EDUC 291 and EDUC 292
- Practicum (6 cr.): EDUC 267

Subject Matter Courses (24 cr.): These are from 200 and above. They include one course in each of math and natural science, and 12 credits to be selected from two related disciplines (Arabic-social studies, art-music, English-social studies, math-science). Special math and science courses designed for teaching in the elementary school are offered by the department (EDUC 271*, EDUC 272, EDUC 273*, and EDUC 274). EDUC 218 is required as a subject matter course for language arts concentrations (Arabic-social studies, and English-social studies).
Electives within Subject Matter (6 cr.): 3 credits* in either nutrition or environmental health, and 3 credits in art or music.*

General Electives (6 cr.)

Minor in Education

The department offers a minor which aims to provide a broad-based knowledge and understanding of the psychological, sociological/philosophical, and professional basis of education. The education minor consists of the following: EDUC 211 or EDUC 216, EDUC 215 or EDUC 225, EDUC 230, and one elective from the following courses: EDUC 219, EDUC 223, EDUC 221, plus a general elective in education (3 credits).

EDUC 215 or EDUC 225, EDUC 230, and one elective from the following courses: EDUC 219, EDUC 223, EDUC 221, plus a general elective in education (3 credits).

* These courses may overlap with General Education Requirements.
Diploma Programs

Teaching Diploma Programs

The Teaching Diploma Program prepares elementary and secondary schoolteachers. This requires specialization in a subject matter area that can be completed before or during professional preparation in the Department of Education. Once completed, this preparation culminates in a teaching diploma that qualifies a student to teach at either the elementary or the secondary level. The program is comprised of a total of 21 credit hours in education.

Teaching Diploma in Elementary Education

Education Course Requirements

• EDUC 215
• EDUC 230
• For students concentrating on teaching Arabic and Social Studies: EDUC 231, 240, 251, 268
• For students concentrating on teaching Art and Music: EDUC 231, 228, 229, 268
• For students concentrating on teaching English and Social Studies: EDUC 231, 245, 251, 268
• For students concentrating on teaching Math and Sciences: EDUC 231, 252, 257, 268
• An elective in education

Subject Matter Requirements

24 credit hours in courses numbered 200 or above distributed over two subject matter areas from the following combinations: a) Arabic and social studies, b) art and music, c) English and social studies, and d) math and sciences. The math and science courses offered by the Department of Education (EDUC 271, EDUC 272, EDUC 273, EDUC 274) may be considered to satisfy part of the subject matter requirement in mathematics and sciences. EDUC 218 may be used to satisfy part of the subject matter requirements for language arts concentrations (Arabic-social studies, and English-social studies).

Teaching Diploma in Secondary Education

Education Course Requirements

• EDUC 211 or 216
• EDUC 215
• EDUC 230
• Two methods courses from the sequence EDUC 237-256 plus one relevant course from the sequence EDUC 261-269
• An elective in education

Subject Matter Requirements

Students must complete the requirements for a bachelor’s degree in a subject matter area taught in elementary and/or secondary schools before they are granted this diploma. These areas include Arabic, English, health, informatics, math, science, and social studies. In case of a shift in major, students are required to complete a minimum of 24 credit hours in the new subject matter area in courses numbered 200 or above.

NOTE: Only courses that are in areas taught in intermediate and secondary schools qualify for subject matter courses for the purposes of the Teaching Diploma.

Methods Courses

Methods courses at the secondary level are subject matter oriented, i.e., they deal with teaching a subject matter that has been chosen by the student as a major field of specialization. The distribution is as follows:

EDUC 237, EDUC 238 Theories and Methods of Health Education
EDUC 241, EDUC 242 Teaching of Arabic
EDUC 243, EDUC 244 Teaching of English as a Foreign Language
EDUC 246–EDUC 248 Informatics Education
EDUC 249, EDUC 250 Teaching of Social Studies
EDUC 253, EDUC 254 Teaching of Math
EDUC 255, EDUC 256 Teaching of Sciences

In the case of students who are actual teachers in a recognized school, special arrangements may be made with the instructors of the methods courses to adjust the practical components of the course requirements for the methods courses and the practicums.

Admission to the Teaching Diploma Programs

New students should obtain an application from the Office of Admissions and apply as new students. Applications are reviewed by the department and, when accepted, students are classified as special students working for the teaching diploma. Completion of the bachelor’s degree is a requirement for admission of new students to the teaching diploma programs. AUB students working for their bachelor's degree at AUB have to apply to the department directly.

Qualifications for the Teaching Diploma and Official Recognition by the Lebanese Government

Teaching Diploma in Elementary Education

Students qualify for the teaching diploma upon completion of the program of study as detailed above, attaining a cumulative average of 70 or above in its courses, and receiving the recommendation of the Department of Education.
Official recognition of the diploma is granted by the government of Lebanon as equivalent to the License d’Enseignement in elementary education, if the person

• holds the Baccalaureate Part II or equivalent
• has completed a minimum of 111 semester credits
• has completed a minimum of 45 semester credits in the field of education

Teaching Diploma in Secondary Education

Students qualify for the teaching diploma upon completion of the program of study as detailed above, attaining a cumulative average of 70 or above in its courses, and receiving the recommendation of the Department of Education.

Official recognition of the diploma is granted by the government of Lebanon as equivalent to the License d’Enseignement, if the person

• holds the Baccalaureate Part II or equivalent
• has a bachelor’s degree in a subject taught at the secondary level (Arabic, English, informatics, math, science, and social studies)
• has completed the diploma requirements (21 semester credits in the field of education) over and above the total number required for a Bachelor’s degree

Diploma in Special Education

The purpose of this diploma is to provide knowledge and practical training in the area of special education for children with mild learning problems between the ages of three and fifteen years. Holders of such a diploma are expected to be able to deal with children who have learning/cognitive processing problems enrolled in special as well as in regular schools. They should be able to work as assistants to school psychologists (consulting teachers), and/or as teachers in self-contained special classes or resource rooms. Although the focus of this diploma is on methods and techniques for children with special learning needs, it has relevance to almost all educational settings, especially for children in their early stages of growth.

For admission to this program students may enroll as part of their bachelor’s degree program or after completing the bachelor’s degree. It is preferable if the undergraduate major is in education or in psychology, but students with other undergraduate majors may be considered.

For completion of this program 21 credit hours are required with a cumulative average of 70. The program is composed of the following courses:

Prerequisites (6 cr.)
PSYC 202 (or equivalent) General Psychology
EDUC 225 (or equivalent) Human Development and Special Education

Requirements (21 cr.)
Basic Courses (9 cr. hrs.) EDUC 215, EDUC 221, and EDUC 222
Methods Courses (12 cr. hrs.) EDUC 280, EDUC 281, and EDUC 283

Diploma in Educational Management and Leadership

The purpose of this diploma is to provide knowledge and practical training in the areas of educational management and leadership. Holders of this diploma are qualified to become managers of schools and educational training institutions and programs.

Requirements

Block A (15 cr.)
Block B (6 cr.)
May be taken concurrently with the bachelor’s degree Can only be taken after the bachelor’s degree
EDUC 211 or EDUC 216 EDUC 214 (Management in Practice)
EDUC 212 (Practicum) EDUC 224 Instructional Supervision
EDUC 213 
EDUC 226
EDUC 230

To be eligible for consideration for admission to the diploma program in educational management and leadership, applicants should have a bachelor’s degree from a recognized university. A minimum of one year of relevant professional experience in an educational setting is also required.

Students qualify for the Diploma in Educational Management and Leadership upon recommendation from the department and completion of the specified program of study with a cumulative average of 70 or above.

BA in Education

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<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic</th>
<th>Humanities</th>
<th>Social Sciences</th>
<th>Natural Sciences</th>
<th>Quantitative Thought</th>
</tr>
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<tbody>
<tr>
<td>Lecture Courses</td>
<td>9 + 15 + 18 + 6 + 6</td>
<td>1. Required Arabic course: ARAB. 201 A or any General Education Arabic communication skills (3) 2. Required English courses: ENGL 203 (3), ENGL 204 (3)</td>
<td>1. Required in the humanities (12 credits) Group I CVSP (3), Group II CVSP (3) Humanities I (3) Humanities II (3) 2. Elective (3) Art or Music*</td>
<td>Required Education Courses: EDUC 211 (3) or EDUC 216 (3); 215 (3); 217 (3) 223 (3); 230(3); 231(3); one social science must be an approved General Education course from outside the major</td>
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<tr>
<td>Seminar (6)</td>
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<td></td>
<td></td>
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<td>EDUC 291 (3); EDUC 292 (3)</td>
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<tr>
<td>Laboratory/Research Project (12)</td>
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<td></td>
<td></td>
<td></td>
<td>1. One pair of: EDUC 240/251 (8); 245/251 (8); 252/257 (6); 228/229 (8); 2. EDUC 267 (6)</td>
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</table>

* EDUC 290B and EDUC 290C are recommended for Education students.
Subject Matter Concentrations (12 cr.): one of the following four pairs

<table>
<thead>
<tr>
<th>Arabic-Social Studies</th>
<th>English-Social Studies</th>
<th>Math-Science</th>
<th>Art-Music</th>
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<tbody>
<tr>
<td>12 credits to be selected from 200 level courses in Arabic and social studies, excluding general education requirements. EDUC 218 is a required subject matter course.</td>
<td>12 credits to be selected from 200 level courses in English and social studies, excluding general education requirements. EDUC 218 is a required subject matter course.</td>
<td>12 credits to be selected from 200 level courses in math and the sciences. EDUC 271, 272, 273, and 274 count toward this requirement.</td>
<td>12 credits to be selected from 200 level courses in art and music.</td>
</tr>
</tbody>
</table>

• General Electives (6 cr.)

Course Descriptions

Undergraduate Courses

EDUC 211  The School and the Social Order  3.0; 3 cr.
A course on the importance of teaching as a profession in the larger context of social and cultural change; the manner in which teaching can influence the nature and direction of change; contrasts between advanced and developing countries. Annually.

EDUC 212  Educational Laws and Policies  3.0; 3 cr.
A course on the educational laws that govern public and private schools, including policies related to various educational levels, certification and equivalency issues, government approval, syllabi, book authorship, examinations, and educational plans. Annually.

EDUC 213  Introduction to Educational Administration  3.0; 3 cr.
A survey of various aspects of educational administration, with emphasis on leadership theories and organizational structure, functions, and responsibilities of educational administrators, and public control of education. Annually.

EDUC 215  Learning and Human Development  3.0; 3 cr.
An introduction to instructional theory, the nature of intelligence, child development, learning and behavior management, with an emphasis on the basic implications for classroom teaching. Annually.

EDUC 216  Philosophy of Education  3.0; 3 cr.
A review of the development of educational thought as expressed in the writings and ideas of major philosophers. This review endeavors to deal with thought in the context of the historical times. Arab thought is included. Annually.

EDUC 217  Measurement and Evaluation for Classroom Teachers  3.0; 3 cr.
An introduction to and practice in the construction, use, and interpretation of classroom tests. Prerequisite: EDUC 215. Annually.

EDUC 218  Children’s Literature  3.0; 3 cr.
A study of the diverse elements of ancient and modern children’s literature. Topics include poetry, fairy tales, epics, myths and legends, fantasy, fiction, and illustrated stories. The skill of using literature effectively with children is particularly stressed. Annually.

EDUC 219  The Use of Computer Applications in Education  2.2; 3 cr.
A course that focuses on general knowledge about the use of microcomputers in education, including the use of common computer applications such as word processing, spreadsheet, database, and presentation software in teaching/learning activities; evaluating the effectiveness of educational software in teaching/learning in various subject areas. Students can get credit for only one of CPMS 200 and CPMS 200L, CPMS 206, CPMS 209, or EDUC 219. Annually.

EDUC 220  Instructional Media and Techniques  2.2; 3 cr.
A course that discusses the selection and implementation of instructional strategies and media that enhance learners’ achievement through the use of projected materials and hypermedia technologies. A wide range of communication alternatives, especially the internet, is covered thoroughly, with special emphasis on practical work and projects. Annually.

EDUC 221  Introduction to Special Education  3.0; 3 cr.
An introduction to special education and the various categories of exceptionality, including nature, causes, educational characteristics of children with mental retardation, learning disabilities, emotional disturbance, speech impairment, visual impairment, hearing impairment, and giftedness. Annually.

EDUC 222  Introduction to Assessment in Special Education  3.0; 3 cr.
An introduction to theory and uses of assessment techniques and instruments in special education. Emphasis is placed on educational implications for learners with special needs. Annually.

EDUC 223  Introduction to Guidance and Counseling  3.0; 3 cr.
An introduction to the field of guidance and counseling. The role of the counselor in school and community settings is emphasized. Prerequisite: EDUC 215. Annually.

EDUC 225  Child and Adolescent Development  3.0; 3 cr.
A chronological study of typical and atypical cognitive, linguistic, emotional, and physical development from the prenatal period through adolescence. The relative influences and interactions of heredity and environment, and the impact of development on learning and school success are examined. Annually.

EDUC 226  Personnel Management and Development  3.0; 3 cr.
Personnel policies and procedures; recruitment, salary scales, benefits, promotions and pension plans; job description and evaluation; organizing the personnel department; training and development of human resource programs in educational institutions. Co-requisite: EDUC 213. Annually.

EDUC 227  Statistics in Education  3.0; 3 cr.
Descriptive statistics, correlation, prediction, and statistical inference as applied to educational situations. Students who receive credit for this course cannot receive credit for any other introductory statistics course, such as STAT 201, STAT 210, STAT 230, MATH 233, or ECON 213. Annually.

EDUC 230  Instructional Procedures  3.0; 3 cr.
An introduction to instructional planning, teaching strategies, classroom management, and evaluation procedures. Annually.

EDUC 231  Reading Instruction in the Elementary School  3.0; 3 cr.
Trends, theories, and practices in the teaching and evaluation of reading in the elementary school; alternative teaching/learning strategies for developing readiness, comprehension, and evaluation of progress in reading. Annually.
EDUC 247  Computer-Based Instructional Packages  2.2; 3 cr.
A course on the design and production of computer-based educational packages using multimedia and hypermedia techniques. Students are expected to use digital technology to produce applications that are deliverable through the internet, CD-ROMs, or other digital media. Annually.

EDUC 271  Mathematics for Elementary Teachers I  3.0; 3 cr.
An in-depth study of mathematical concepts and skills in pre-secondary mathematics curricula. Annually.

EDUC 272  Mathematics for Elementary Teachers II  3.0; 3 cr.
An in-depth study of mathematical concepts and skills in pre-secondary mathematics curricula. Prerequisite: EDUC 271. Annually.

EDUC 273  Science for Elementary Teachers I  3.0; 3 cr.
An in-depth study of science concepts and skills in pre-secondary science curricula. Annually.

EDUC 274  Science for Elementary Teachers II  3.0; 3 cr.
An in-depth study of science concepts and skills in pre-secondary science curricula. Annually.

EDUC 290  Special Topics  1-3 cr.
A course that deals with special issues and concerns not included in regular courses. The following examples are taken from topics given during the last few years: music for elementary teachers, visual arts for elementary teachers, and trends in early childhood education. May be repeated for credit. Annually.

EDUC 291  Senior Seminar (Issues in Elementary Education)  3.0; 3 cr.
A seminar intended for majors in elementary education that focuses on one or more current issues in elementary education. Annually.

EDUC 292  Senior Seminar (Education in Arab Countries)  3.0; 3 cr.
A seminar intended for majors in education that focuses on educational issues in one or groups of Arab countries. Annually.

Methods Courses

EDUC 214  Management in Practice  1.4; 3 cr.
Managing, planning and organizing, and personnel management; supervised training at AUB and practical experiences in schools and other institutions, such as hospitals, technical institutions, colleges, and universities under the supervision of the course instructor and professional practitioners. Prerequisite: EDUC 226. Annually.

EDUC 224  Instructional Supervision  1.4; 3 cr.
Workshops in supervision methods at AUB and practical skills in schools and other educational institutions, supervised by the course instructor and professionals in the field; approaches to instructional supervision for the generalist and specialist supervisor; communicating, motivating, evaluating, and monitoring of staff and professionals; promoting individual and group development, and overseeing curriculum development. Prerequisite: EDUC 226. Annually.

EDUC 228  The Teaching of Art in Elementary School  2.2; 3 cr.

EDUC 229  The Teaching of Music in Elementary School  2.2; 3 cr.
A course on the development of students’ basic skills in music (general vocal and instruments), combined with a study of source materials in the teaching of music. This course also includes observation and practice teaching in classrooms. Co-requisite: EDUC 230. Annually.

EDUC 237  Theories and Methods of Health Education I  2.2; 3 cr.
An introduction to the major theories of health behavior and health promotion. Emphasis is placed on the application of health behavior theories to health promotion and education practice. Students cannot receive credit for both EDUC 237 and HCPH 237. Co-requisite: EDUC 230. Annually.

EDUC 238  Theories and Methods of Health Education II  1.4; 3 cr.
An introduction to the assumptions we make about communication and key elements of the communication process. This course deals with factors that inhibit communication as well as some of the functions of communication as they relate to increasing positive health behavior and group effectiveness. This course aims at enhancing writing and oral presentation skills as well as effective interaction skills with peers and supervisors at work. Cross-listed as HCPH 203, Communication for Health Professionals. Students cannot receive credit for both EDUC 238 and HCPH 203. Prerequisite: EDUC 237. Annually.

EDUC 240  The Teaching of Arabic in Elementary Schools  2.2; 3 cr.

EDUC 241  The Teaching of Arabic I  2.2; 3 cr.

EDUC 242  The Teaching of Arabic II  1.3; 3 cr.
A practicum of classroom observation and supervised practice teaching of Arabic language and literacy at the secondary level. Prerequisite: EDUC 241. Annually.

EDUC 243  The Teaching of English as a Foreign Language I  2.2; 3 cr.
Theoretical background and approaches to the teaching of English as a foreign/second language; principles and techniques of teaching the basic language skills; includes classroom observation and micro teaching practices. Co-requisite: EDUC 230. Annually.

EDUC 244  The Teaching of English as a Foreign Language II  1.4; 3 cr.
Preparation and evaluation of teaching materials through individual and group projects; guided and supervised practice teaching in schools. Prerequisite: EDUC 243. Annually.

EDUC 245  The Teaching of English as a Foreign Language in Elementary School  2.2; 3 cr.
Theoretical background and approaches to the teaching of English as a foreign/second language; principles and techniques of teaching the basic language skills; includes classroom observation and micro teaching practices. Co-requisite: EDUC 230. Annually.

EDUC 246  Computer Programming at the School Level  2.2; 3 cr.
A course that explores computer programming techniques suitable for teaching Informatics and other subject matters at the school level. This course includes cognitive theoretical background and practical work. Special emphasis is placed on the use of programming as a means to promote thinking skills. Co-requisite: EDUC 219 or EDUC 220. Annually.
EDUC 248 Methods for Teaching Informatics 2.2; 3 cr.
Concepts, trends, and skills needed to design and teach curriculum materials for informatics education; analysis and evaluation of informatics curriculum; methods and techniques of teaching informatics at the school level; includes demonstrations and observation of actual computer lab sessions. Prerequisite: EDUC 246. Annually.

EDUC 249 The Teaching of Social Studies I 2.2; 3 cr.
Approaches to the teaching of history, geography, and civics; adaptation of social science concepts and generalizations to the secondary level. Co-requisite: EDUC 230. Annually.

EDUC 250 The Teaching of Social Studies II 1.4; 3 cr.
A practicum of classroom observation and supervised practice teaching of social science, or history, geography, and civics in neighboring schools. Prerequisite: EDUC 249. Annually.

EDUC 251 The Teaching of Social Studies in Elementary School 2.2; 3 cr.

EDUC 252 The Teaching of Mathematics in Elementary School 2.2; 3 cr.

EDUC 253 The Teaching of Mathematics I 2.2; 3 cr.
Pedagogical and mathematical basis of various approaches in mathematics teaching in middle and secondary schools; includes demonstrations, classroom observation, and applications. Co-requisite: EDUC 230. Annually.

EDUC 254 The Teaching of Mathematics II 1.4; 3 cr.
An analysis and preparation of teaching/learning materials, plans, and tests for mathematics teaching, including supervised practice teaching and individual and group meetings. Prerequisite: EDUC 253. Annually.

EDUC 255 The Teaching of Science I 2.2; 3 cr.

EDUC 256 The Teaching of Science II 1.4; 3 cr.
A review of various science curriculum projects and programs; curriculum planning, micro-teaching, and practicum in classroom observation and teaching. Prerequisite: EDUC 255. Annually.

EDUC 257 The Teaching of Science in Elementary School 2.2; 3 cr.

EDUC 261 Practicum in TEFL in Secondary School 0.6; 3 cr.
Observation and practice in classroom situations under the guidance of university course instructors and cooperating schoolteachers. Prerequisite: EDUC 243. Annually.

EDUC 262 Practicum in Teaching Math in Secondary School 0.6; 3 cr.
Observation and practice in classroom situations under the guidance of university course instructors and cooperating schoolteachers. Prerequisite: EDUC 253. Annually.

EDUC 263 Practicum in Teaching Science in Secondary School 0.6; 3 cr.
Observation and practice in classroom situations under the guidance of university course instructors and cooperating schoolteachers. Prerequisite: EDUC 255. Annually.

EDUC 264 Practicum in Health Education 0.6; 3 cr.
Observation and practice in classroom situations under the guidance of university course instructors and cooperating schoolteachers. Prerequisite: EDUC 237. Annually.

EDUC 265 Practicum in Teaching Arabic in Secondary School 0.6; 3 cr.
Observation and practice in classroom situations under the guidance of university course instructors and cooperating schoolteachers. Prerequisite: EDUC 241. Annually.

EDUC 266 Practicum in Teaching Social Studies in Secondary School 0.6; 3 cr.
Observation and practice in classroom situations under the guidance of university course instructors and cooperating schoolteachers. Prerequisite: EDUC 249. Annually.

EDUC 267 Practicum in Elementary School 0.12; 6 cr.
Observation and practice in classroom situations under the guidance of university course instructors and cooperating schoolteachers. Prerequisite: one of the following: EDUC 245, EDUC 251, EDUC 240, EDUC 252, EDUC 257, EDUC 228, or EDUC 229. Annually.

EDUC 268 Practicum in Elementary School 0.6; 3 cr.
Observation and practice in classroom situations under the guidance of university course instructors and cooperating schoolteachers. Prerequisite: one of the following: EDUC 245, EDUC 251, EDUC 240, EDUC 252, EDUC 257, EDUC 228, or EDUC 229. Annually.

EDUC 269 Practicum in Teaching Informatics 0.6; 3 cr.
Observation and practice in classroom situations under the guidance of university course instructors and cooperating schoolteachers. Prerequisite: EDUC 246. Annually.

EDUC 280 Methods and Materials for Children with Mild Learning Problems I 2.2; 3 cr.
Instructional strategies; organization and adaptation of material for teaching children with mild learning problems; academic and socio-emotional skills. Annually.

EDUC 281 Methods and Materials for Children with Mild Learning Problems II 4.4; 6 cr.
Training in instructional strategies and program development for students with mild learning problems at different maturational levels; organization, planning, adaptation of instructional materials in language, science, and math instruction. Prerequisite: EDUC 280. Annually.

EDUC 283 Practicum in Education of Children with Learning Problems 0.6; 3 cr.
The Department of English offers two undergraduate degree programs: the BA in English literature, and the BA in English language. The department also offers communication skills courses which are part of the general university requirements.

The department offers minors in English language, in English literature, and in Creative Writing. A minor in English literature requires 15 credits: two core courses from among ENGL 201, ENGL 205, ENGL 207, ENGL 212, ENGL 227, ENGL 229, ENGL 232, ENGL 237 or ENGL 238, ENGL 231 or ENGL 294, and three additional courses chosen from among those numbered ENGL 210 to ENGL 292, including creative writing courses.

The requirements for language majors are as follows: ENGL 227, ENGL 228, ENGL 229, ENGL 230 or ENGL 232, ENGL 237 or ENGL 238, ENGL 231 or ENGL 294, and three additional courses chosen from among the department’s language offerings; in literature, ENGL 212 and two courses chosen from ENGL 201, ENGL 205, and ENGL 207, and one additional course from among those numbered ENGL 210 to ENGL 292, including creative writing courses.

Both literature and language majors may also take courses leading to the teaching diploma. The requirements for the teaching diploma are specified under the catalogue section Department of Education.

The Department of English also offers the Intensive English Course for those students who have not met the English Language Proficiency Requirement (ELPR). The requirements for a BA degree in English language or English literature are 90 credits for students entering the department at the sophomore level. The distribution of these courses is as follows:

**University Requirements**

- **University language requirements**: six credits of English and three credits of Arabic.
- **University general education requirements**: 12 credits in the Humanities, including six credits of CVSP; six credits in Social Science; six credits in Natural Science; and three credits in Quantitative Thought (e.g., Computer Science or Mathematics from the approved General Education list).
- **Major courses**: 39 credits of English language and literature, with the possibility of having some of these courses in creative writing.
- **Electives outside the department**: nine credits in the humanities and six credits of free electives.

Students wishing to major in English are accepted provisionally until they have achieved a grade of 70 or more in ENGL 203 and ENGL 204 and in two of the four introductory courses: ENGL 201, ENGL 205, ENGL 207, and ENGL 227. Normally, the courses may be repeated only once.

The requirements for literature majors are as follows: ENGL 201, ENGL 205, ENGL 207, ENGL 212, ENGL 221, ENGL 229, ENGL 238, and two additional period courses chosen from ENGL 210, ENGL 211, ENGL 213, ENGL 214, and ENGL 215; two courses chosen from the three categories (literary genres, American literature, and comparative and world literature); and two additional courses chosen from among those numbered ENGL 210 to ENGL 292, including creative writing courses.

The requirements for language majors are as follows: ENGL 227, ENGL 228, ENGL 229, ENGL 230 or ENGL 232, ENGL 237 or ENGL 238, ENGL 231 or ENGL 294, and three additional courses chosen from among the department’s language offerings; in literature, ENGL 212 and two courses chosen from ENGL 201, ENGL 205, and ENGL 207, and one additional course from among those numbered ENGL 210 to ENGL 292, including creative writing courses.

The Communication Skills Program adheres to the philosophy that learning to write is a dynamic process, both social and individual, that takes place over time with continual guidance and practice. The program comprises courses designed to satisfy university requirements and to meet the diverse literacy needs of AUB students. It aims to educate students to use writing and reading for learning.

**Communication Skills Program**

**Mission Statement**

The Communication Skills Program adheres to the philosophy that learning to write is a dynamic process, both social and individual, that takes place over time with continual guidance and practice. The program comprises courses designed to satisfy university requirements and to meet the diverse literacy needs of AUB students. It aims to educate students to use writing and reading for learning.
critical thinking, and communication in academic and other social contexts. It seeks to foster a collaborative environment within the program and across the university.

The Communication Skills Program consists of three core courses (ENGL 102, ENGL 203, and ENGL 204) and two specialized courses (ENGL 206 and ENGL 208).

Entry into the program (except for the specialized courses, ENGL 206 and ENGL 208) is based on scores of the AUB-EN or TOEFL or SAT Writing. The program itself provides training in communication, both oral and written, with emphasis on the reading, writing, and research skills required of university students.

ENGL 102 Enrichment Course in English 3.0; 3 cr.
A course that offers instruction in the writing of short essays of various expository types (e.g., description, comparison and contrast, cause and effect). This course emphasizes communicative fluency and accuracy. Throughout the course students are involved in authentic communicative and academic tasks, such as class discussions, informal debates, and oral presentations. Prerequisite: 500-530 on the EEE or 573-587 on the TOEFL (230-240 on the CBT or 88-95 on the IBT) or English 100. Each semester.

ENGL 203 Academic English 3.0; 3 cr.
A course designed to develop critical thinking, reading, and writing at the sophomore level. Students compose essays based on their analysis of and response to thematic articles presented in class. Prerequisite: 531–569 on the EEE or 590–653 on the TOEFL (243–280 on the CBT or 96–99 on the IBT) or ENGL 102 or English 100. Each semester.

ENGL 204 Advanced Academic English 3.0; 3 cr.
A course designed to provide rigorous training in reading comprehension, synthesis, critiquing, and research skills. Although ENGL 204 builds on many of the skills learned in ENGL 203, it differs in that it encourages advanced independent research as well as writing and discussion in relation to a variety of issues across the curriculum. Prerequisite: 570+ on the EEE or 657+ on the TOEFL (283+ on the CBT or 99+ on the IBT) or ENGL 203. This course does not count toward graduation for students in FEA. Each semester.

ENGL 206 Technical English 3.0; 3 cr.
A course that introduces students to English used for communication in technical fields. This course focuses on reading, writing, oral communication activities, and preparation and presentation of technical reports. Prerequisite: 570+ on the EEE or 657+ on the TOEFL (283+ on the CBT or 99+ on the IBT) or ENGL 203. For students in FEA only. Each semester.

ENGL 208 English for International Business 3.0; 3 cr.
A course designed to increase the proficiency of students in English within the context of business affairs and needs. The focus of this course is on business and management data, as well as on using forms of communication familiar in business, including letters, memos, and reports. Prerequisite: ENGL 204. For Business majors only. Each semester.

English Literature Program

Mission Statement

The mission of the B.A. in Literature in the English Department is to provide a solid background in British, American, and other Anglophone literary texts, traditions, and cultures, as well as their continued relevance in a humanistic and liberal arts-based education. Cultivated by a community of teachers, scholars, and writers, undergraduate students engage with an ensemble of critical issues and develop individual interpretive theories and scholarly approaches. Upon graduation, students will be equipped to continue advanced study in English Literature, or other related disciplines, or to pursue a variety of career options in education, media, and communications.

The literature program in the Department of English has a dual purpose. It provides the humanistic discipline and training necessary for those who wish to obtain an education based on wide reading and literary study, and at the same time it provides a structure of courses useful to those who intend to pursue study in English literature. The literature program, while exposing students to the major authors, works, and movements of English and American literature through extensive class discussion and the writing of critical essays in each course, seeks also to teach students to become perceptive, critical and analytical readers.

ENGL 103 Introduction to English Drama 3.0; 3 cr.
An introduction for freshman students to drama in English. The focus of this course is on a selection of major playwrights from different periods. Eight to twelve plays are read. The plays selected may vary from year to year. Annually.

ENGL 104 Introduction to English Poetry 3.0; 3 cr.
An introduction for freshman students to poetry in English. The focus of this course is on major poets from various periods. This course may vary in content depending on the interest and expertise of the faculty available. Annually.

ENGL 105 Introduction to American Literature 3.0; 3 cr.
An introduction to selected American writing from the colonial period to the present. Students are exposed to some major writings of various American authors. This course may vary in content depending on the interests and expertise of the faculty available. Annually.

ENGL 106 Introduction to World Literature 3.0; 3 cr.
An introduction to selected non-British and non-American literature in English with an emphasis on fictional prose. This course may vary in content depending on the interests and expertise of the faculty available. Annually.

ENGL 201 Survey of American Literature 3.0; 3 cr.
An introduction to a broad range of major American writers and texts, most of which are drawn from the nineteenth and twentieth centuries. This course may vary in content depending on the instructor. Annually.

ENGL 205 Introduction to English Literature I 3.0; 3 cr.
A course that covers English literature from Anglo-Saxon times to the later eighteenth century. Specific texts by the principal writers of these periods will be examined against the social, historical, and philosophical background of the period. Annually.

1 For undergraduate students who were admitted to classes other than freshman, the grade of ENGL 102 will be calculated in the term average and its credits will be included with the term credits but not in the overall average (GPA) and overall credits.
ENGL 207  Introduction to English Literature II  3.0; 3 cr.
A course that continues the survey of English literature begun in English 205, moving from Blake to Eliot, through the examination of specific texts by major authors against the social, historical, and philosophical background of the period. Annually.

Period Courses

ENGL 210  Literature of the Middle Ages  3.0; 3 cr.
A study of selected texts including Beowulf, Sir Gawain and the Green Knight, and a number of Chaucer’s Canterbury Tales. Most texts are read in modern English translation. Attention is given to major literary forms, as well as the social and historical background of the period. Annually.

ENGL 211  Renaissance and Restoration  3.0; 3 cr.
A survey of non-dramatic literature from the early Tudors to the Stuart Restoration. Writers studied may include More, Spenser, Shakespeare, Donne, Jonson, Marvell, and Milton. Attention is given to salient features of the political, social, and philosophical background of the period. Annually.

ENGL 212  Introduction to Shakespeare  3.0; 3 cr.
A course in which students study representative comedies, histories, and tragedies by Shakespeare. The plays are read intensively and understood in the context of the theatrical conventions of the period and the culture of play going in early modern England, as well as the social, cultural, religious, and intellectual history of the period. Each semester.

ENGL 213  Neo-Classical and Romantic Age  3.0; 3 cr.
A course that looks at the neo-classical principles of literature as reflected in the work of such figures as Pope, Swift, and Johnson, and then shifts to a study of romantic poetry, which is in part a reaction against Neo-Classicism. Annually.

ENGL 214  Victorian Literature  3.0; 3 cr.
A course that emphasizes the major poets and prose writers of the Victorian period including Tennyson, Browning, Arnold, Dickens, Carlyle, and Wilde. Annually.

ENGL 215  Twentieth-Century Literature  3.0; 3 cr.
A course that concentrates on a close reading of selected and representative British and American texts of the modern period and goes on to consider literature of the later 1900s. Annually.

Genre Courses

ENGL 216  Drama  3.0; 3 cr.
A course that focuses on representative texts drawn from British and American literature. Attention is given to the theoretical definition of dramatic form, to changes in the conception of dramatic genres, and to the nature of genre as it shapes the expectations of the reader or audience. Annually.

ENGL 217  The Novel  3.0; 3 cr.
An introduction to the development of the novel as a new literary form through a close reading of a number of significant texts against a background of social and philosophical currents of the eighteenth, nineteenth, and twentieth centuries. Annually.

ENGL 218  Poetry  3.0; 3 cr.
A close reading of texts drawn from British or American literature, selected to elucidate the nature of poetic genres and forms, such as lyric, epic, and satire. Some attention is given to critical theory and to relevant aspects of social and political history. Annually.

ENGL 219  Film as Text  3.0; 3 cr.
Using the analytical methods of literary analysis, as well as those pertinent to the study of film, students will study a selection of influential twentieth-century film texts. Screening of films and practical analysis will form the core activities of this course. Annually.

ENGL 220  Travel Writing  3.0; 3 cr.
A course that exposes the heterogeneity of travel literature by identifying its overlaps with kindred literary (sub)genres, such as autobiography, letters, memoirs, the picaresque novel, and the Bildungsroman, as well as with scientific discourse, notably ethnography. Annually.

Critical Theory

ENGL 221  Introduction to Literary Theory  3.0; 3 cr.
Students are introduced to the history of literary theory and to the dominant schools of contemporary literary study, with an emphasis on the practical application of those schools. Annually.

ENGL 222  Literature and Culture  3.0; 3 cr.
A course that considers major works of literature, specifically in the context of twentieth-century cultural theory, including Marxism, post colonialism, national literatures, ethnic writings, and feminist theory. The primary intention of this course is to explore how various texts interact with their societies, or how those societies are influential in the construction of literary works. Annually.

ENGL 223  Literary Aesthetics  3.0; 3 cr.
A course that locates classical literary texts in the context of ideas and theories related to art, as espoused by major figures in literary history and philosophy. Annually.

American Literature

ENGL 224  American Literature to 1900  3.0; 3 cr.
A course that examines the major literary movements of the period (Romanticism, Transcendentalism, Realism, and Naturalism) as present in the works of writers including Longfellow, Irving, Poe, Hawthorne, Melville, Dickinson, Whitman, Twain, and James. Annually.

ENGL 225  American Literature from 1900 to 1960  3.0; 3 cr.
A course that looks at the development of American literature in the first half of the twentieth century, starting with Realism and Naturalism and ending with the works of the Beat Generation. Major figures whose works might be examined include Cather, Wharton, Anderson, Frost, O’Neill, Fitzgerald, Hemingway, Steinbeck, and O’Connor. Annually.

ENGL 226  Contemporary American Literature  3.0; 3 cr.
A course that examines recent and current trends and movements in American literature, such as Absurdism, Post-Modernism, and ethnic literatures of the United States. Authors studied might include Morrison, Walker, Vonnegut, Heller, and Carver. Annually.
Creative Writing

ENGL 236  Introduction to Creative Writing  3.0; 3 cr.
A course that acquaints students with the techniques involved in the writing of fiction, poetry, and drama. Student work is read in class and critiqued, and models of good writing are used to illustrate various techniques and forms. Prerequisite: ENGL 203 (or 570+ on the EEE, or 283+ on the CBT, or 99+ on the IBT). Each semester.

ENGL 237  Creative Non-Fiction  3.0; 3 cr.
This course will focus on the writing of memoir, biography, reportage, and reflective essays. Workshop discussions will be supplemented by exercises and readings selected from creative non-fiction texts. Students will be required to produce and develop a portfolio of their own original material. Prerequisite: ENGL 203 (or 570+ on the EEE, or 283+ on the CBT, or 99+ on the IBT). Each semester.

ENGL 239  Screenwriting  3.0; 3 cr.
In this course students will read and analyze screenplays, view films based on those screenplays, read theoretical texts on screenwriting and filmmaking and write screenplays. Students will also learn the technical terminology and format used in professional screenwriting, but the focus on the course will be on workshop readings and critiques of students’ scenes. Students will be required to write their own original screenplay. Prerequisite: ENGL 236. Annually.

ENGL 249  Fiction Writing  3.0; 3 cr.
This course offers students the opportunity to study and engage in the process of writing fiction. A variety of books will be examined from a practitioner’s perspective. They will be used as models for writing and to discuss the craft that informs them. Students will be required to produce and develop a workshop setting a portfolio of their own original material. Prerequisite: ENGL 236. Annually.

ENGL 250  Poetry Writing  3.0; 3 cr.
This course introduces students to a variety of traditional and experimental poetic composition techniques and philosophies through the reading and discussion of theoretical and literary texts. Students will be required to produce and develop within a workshop setting a substantial portfolio of poems in varying styles and formats. Prerequisite: ENGL 236. Annually.

ENGL 251  Playwriting  3.0; 3 cr.
In this course students will develop and enhance playwriting skills by reading and analyzing plays from various traditions, reading theoretical texts on theater and playwriting, and presenting in class and critiquing scenes written by students. The course will culminate in a public presentation of staged scenes written by students. Prerequisite: ENGL 236. Annually.

ENGL 252  Contemporary Writers  3.0; 3 cr.
In this course, students are introduced to the most up-to-date trends in contemporary writing in the genres of short fiction, poetry, and creative non-fiction. Through reading, discussion, writing, and literary readings, students explore the culture of literary journals and small magazines, web-zines, chapbooks, and non-commercial book publishers. Prerequisite: ENGL 203 (or 570+ on the EEE, or 283+ on the CBT, or 99+ on the IBT). Annually.

ENGL 253  Critical Review Writing  3.0; 3 cr.
In this course, students study review writing as a form of creative prose. Through reading published reviews, attending arts performances, and writing their own reviews, students learn advanced critical appreciation of performance and literary arts. Prerequisite: ENGL 203 (or 570+ on the EEE, or 283+ on the CBT, or 99+ on the IBT). Annually.

Comparative and World Literature

ENGL 240  Literature and Empire  3.0; 3 cr.
A course that focuses on nineteenth- and twentieth-century texts with explicit and/or implicit connections to the ideology of British imperialism. Authors may include Kipling, Forster, Orwell, Conrad, and Lawrence. Annually.

ENGL 241  Cultural Cross-Currents  3.0; 3 cr.
A course that examines literature selected works of twentieth-century modernism and post-modernism, which are considered against a cultural, historical, and artistic background. Major writers studied might include Joyce, Woolf, T.S. Eliot, Beckett, Nabokov, and Garcia Marquez. Annually.

ENGL 242  Modernism and Post-Modernism  3.0; 3 cr.
A course that examines selected works of twentieth-century modernism and post-modernism, which are considered against a cultural, historical, and artistic background. Major writers studied might include Joyce, Woolf, T.S. Eliot, Beckett, Nabokov, and Garcia Marquez. Annually.

ENGL 243  Post-Colonial Literature  3.0; 3 cr.
A course that focuses on texts “writing back” to the metropolis in the era of de-colonization. Novels by authors from Africa, the Middle East, Asia, and Latin America are studied in the contexts of neocolonialism, nationalism, and post-colonial cultures and politics. Annually.

ENGL 244  Special Topics in Literature  3.0; 3 cr.
A course that varies in content and focuses on varied topics such as women writers, black writers, the epic, Arabic literature in translation, and other similar topics. May be repeated for credit. Annually.

ENGL 290  Directed Study in English Literature  3–6 cr.
Directed reading and discussion in a selected topic, along with the writing of assigned papers. Prerequisite: an average of 80 or above in the major. Offered on demand.

ENGL 292  Seminar for English Majors in Literature  3.0; 3 cr.
This course offers opportunities for in-depth study in any aspect of Literary Culture. The course may be repeated for credit. Prerequisite: Senior standing. Annually.
BA in English Literature

39 Credits in English

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<tr>
<th>Modes of Analysis</th>
<th>English and Arabic (9)</th>
<th>Humanities (12+39)</th>
<th>Social Sciences (Min. 6)</th>
<th>Natural Sciences (Min. 6)</th>
<th>Quantitative Reasoning Thought (Min. 3)</th>
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<tr>
<td>Lecture Courses</td>
<td>1. Required Arabic course (3): ARAB 201A, or any General Education Arabic communication skills (based on placement results)</td>
<td>1. Required 12 credits in the humanities, including 6 credits from GESP (see list of approved GE humanities courses)</td>
<td>Electives (min. 6)</td>
<td>Electives (min. 6)</td>
<td>Electives (min. 3)</td>
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<td>2. Required English course (3): ENGL 203, 204</td>
<td>2. Electives (9)</td>
<td>3. Required English literature courses (24): ENGL 201, 205, 207, 221; two periods courses; two courses chosen from the three categories:</td>
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<td>I. Literary Genres: ENGL 216, 217, 218, 219, 220</td>
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<td>II. American Literature: ENGL 224, 225, 226</td>
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<td>III. Comparative and World Literature: ENGL 240, 243, 244, 246</td>
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<td>4. Required English language courses (3): ENGL 229</td>
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<td>Electives (6): two courses from among those numbered ENGL 210 to 292</td>
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<td>Seminar/Workshop</td>
<td>Elective English: ENGL 236, 237, 238, 240, 249, 250, 251, 282</td>
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<td>Laboratory (5)</td>
<td>Required English Language (3): ENGL 238</td>
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<td>Research Project</td>
<td>Required English Literature (3): ENGL 232</td>
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English Language Program

Mission Statement

The mission of the BA program in English Language is to promote a multifaceted approach to language. The program provides students with a foundational understanding of the principles and issues within current approaches to language and introduces them to various aspects of the structure, use, and learning of English. Through teaching and mentoring, the program encourages the students to apply their analytical skills to their experience outside the classroom, and prepares them for employment in areas related to English language teaching and publishing, and for the pursuit of advanced degrees in linguistics.

The language program gives the English language major the essential foundations of post-modern linguistic readings as well as contextual selections in literature. The language courses are intended to provide an appropriate linguistic background for prospective teachers of English and a preparation for those planning to pursue graduate work in linguistics.

ENGL 107 Language and Culture 3.0; 3 cr.
A study of language in the context of ethnology. Emphasis is on the effect of social variables on language use and on the role of paralanguage (e.g., Kinesics and Proxemics) in communication. Annually.

ENGL 108 Beginning Translation 3.0; 3 cr.
An introduction to theories of translation that helps students develop their skills in translation by having them translate texts representing various written and spoken genres from English to Arabic and vice versa. Typical problems involved in such translation are highlighted and discussed. Annually.

ENGL 227 Introduction to Language 3.0; 3 cr.
A survey of current areas in theoretical and applied linguistics including the different levels of structure, the nature of language acquisition, language variation and evolution, and language teaching. Annually.

ENGL 228 Phonetics 3.0; 3 cr.
A study of the articulatory, auditory, and acoustic description of the sounds of the English language. This course also includes descriptions of the sounds of other languages, chiefly colloquial Arabic of the Eastern variety. The practical component of this course involves practice in transcription and production of sounds in most languages. Annually.

ENGL 229 History of the English Language 3.0; 3 cr.
An introductory survey of the history of the English language from its earliest Indo-European origins to the present day. The nature and changes of the language are presented by reviewing the shifts that have occurred from Indo-European, Germanic, Old English, Middle English, up to Early Modern English. Annually.

ENGL 230 Language in Society 3.0; 3 cr.
An examination of language variations in English as they relate to geographic and social factors. This course covers such topics as dialect, accent, Standard English, lingua franca, pidgin, Creole, and jargon. Additionally, the course analyzes social discourse, socio-linguistic theories, diversity and uniformity, multilingualism, speech communities, and language planning. Annually.

ENGL 231 Modern English Grammar 3.0; 3 cr.
A study of grammar through exploration and analysis. A more detailed study of word and phrase formation, pragmatics, and critical analysis of descriptive uses of grammar are covered. Annually.

ENGL 232 Psycholinguistics 3.0; 3 cr.
An introduction to the fields of first and second language acquisition, highlighting such issues as stages of acquisition, order of acquisition, and theories of language learning. The practicum part of this course involves collecting and analyzing data from learners. Topics covered include formal cognitive mechanisms relevant to knowledge and use of language, with an emphasis on modal view of the mind and its consequences for L1 and L2 language acquisition. Annually.

ENGL 233 Introduction to Translation 3.0; 3 cr.
A course that familiarizes the student with basic translation theories and offers hands-on opportunities to practice the development of basic translation skills. This course covers topics such as comparative and contrastive linguistics between Arabic and English, computerized translating machines, semantics, registers, culture, rhetoric, and pragmatics.
ENGL 234  Gender and Language  3.0; 3 cr.
A course that explores sexism in language. This course also examines gender-based language differences in relation to status, age, historical context, and attitudes. *Annually.*

ENGL 235  Politics of Language  3.0; 3 cr.
An analysis of the forces that govern and shape language. Topics covered include the determinants of language use such as communicative context, power dynamics, social correctness, taboos, gender biases, and censorship. *Annually.*

ENGL 238  Advanced Academic Writing  3.0; 3 cr.
A course in which fluency and productivity in the forms and modes of academic writing are developed through selected readings and writing exercises. Students are taught to develop their style and proficiency in major academic writing genres. *Annually.*

ENGL 245  Journalistic Writing  3.0; 3 cr.
A course that exposes the student to the diverse styles of journalistic writings. Hands-on exercises in reporting, writing editorials, and conducting investigative research are components of the course. Lectures by journalists are typically integrated into the program. *Annually.*

ENGL 246  Applied Linguistics  3.0; 3 cr.
This course deals with the implications of the findings of theoretical and empirical research of language in all its aspects (language structure, language acquisition, and language variation and use) for the language learner and language teacher. *Annually.*

ENGL 247  Discourse Analysis  3.0; 3 cr.
A course that examines human discourse as a means of achieving better understanding of what language is and how it works. This course emphasizes the inter-relation between language forms and language functions culminating in the study of speech acts and the ethnography of speaking. Topics covered include registers, cultural aspects, gender referencing, and pragmatics. *Annually.*

ENGL 248  Special Topics in English Language  3.0; 3 cr.
This course changes in content from year to year and focuses on varied topics in English language. *May be repeated for credit.* *Annually.*

ENGL 291  Tutorial  3 cr.
Reading and discussion of selected topics in linguistics.

ENGL 293  Seminar for English Majors in Language  3.0; 3 cr.
Topics vary depending on the instructor. *Prerequisite: Senior standing.* *Annually.*

ENGL 294  Advanced English Grammar  3.0; 3 cr.
A course that aims to provide a linguistic perspective that can penetrate the surface differences of the major English grammars and reveal their most basic features: traditional, descriptive, and transformational grammars are examined. *Annually.*

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### BA in English Language

**39 Credits in English**

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic (9)</th>
<th>Humanities (12+9+39)</th>
<th>Social Sciences (Min. 6)</th>
<th>Natural Sciences (Min. 6)</th>
<th>Quantitative Thought (Min. 3)</th>
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<td>Lecture Courses</td>
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<td>1. Required credits in the humanities: 12 credits including 6 from CSPS (see list of approved GE humanities courses) 2. Electives (9) 3. Required English language (9): ENGL 229, 230 or 231, 294, or 231</td>
<td>4. Required English literature (6): six courses chosen from ENGL 201, 205, and 207</td>
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<tr>
<td>Seminar/Workshop</td>
<td>Elective English: ENGL 236, 237, 239, 249, 250, 251, 293</td>
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<tr>
<td>Laboratory (9)</td>
<td>Required English (3): ENGL 238</td>
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<tr>
<td>Research Project</td>
<td>Required English (9): ENGL 212, 227, 228, 230</td>
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**BA in English Language**

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Department of Fine Arts and Art History

Chairperson: Franses, Henri
Professor: Azoury, Pierre H.
Associate Professor: Franses, Henri
Assistant Professors: Assad Salha, Neville M.; Farhat, May A.; Kim, Thomas
Visiting Assistant Professor: Krafft, Cornelia N.
Senior Lecturers: Kurani, David H.; Shebaya, Peter H.
Lecturers: Deeb, Reem A.; Zurayk, Afaf C.
Instructors: Arsanios, Mirene; Freiha, Rabih; Jamal, Ghada M.; Mallat, Bernard; Meskaoui, Zeina M.; Samaha, Roy

Mission Statement

The Department of Fine Arts and Art History educates students in the arts in all their dimensions, believing that an understanding and appreciation of this area of human endeavor is an essential element in the formation of well-rounded individuals. To that end, we offer courses in the visual arts, music and theater. In the case of our courses aimed at training practitioners, our goal is to produce students with the skills to create meaningful statements in art. In the case of our historical and theoretical courses, we introduce students to great works of art of different cultures, and aim to equip them to deal with artworks critically, and with scholarship.

The department offers two degree programs: a BA in studio arts and a BA in art history.

The department also offers minors in studio arts, art history, music, and theater.

Studio Arts Program

The studio arts program seeks to train students in skills and concepts needed to develop as practicing artists and to make meaningful statements in the visual arts. It offers a core program with flexibility in the choice of studio concentrations in painting, sculpture, and ceramics.

The requirement for a BA degree in studio arts is ninety credits for students entering the department at the sophomore level. The distribution of these courses is as follows:

University Requirements

- University Language Requirements: 9 crs, ENGL 203, ENGL 204, ARAB 201A or any General Education Arabic communication skills.
- University General Education Requirements: Humanities, 12 crs, 3 credits from CVSP sequence I, 3 credits from CVSP sequence II, 6 credits from the list of approved courses in the humanities; Social Sciences, 6 crs; Natural Sciences, 6 crs; Quantitative Thought, 3 crs,
- Free electives outside the department (theater and music courses in the department may be allowed up to six credits): 15 crs. (18 crs. for students exempt from the Arabic requirement).

Major Courses: 39 credits in the department, as follows:

- FAAH 200, FAAH 205, FAAH 218, FAAH 219, FAAH 237
- One course from the following: FAAH 221, FAAH 222, FAAH 223.
- One course from the following: FAAH 224, FAAH 229A, B or C, or equivalent.
- One course from the following: FAAH 232, FAAH 235, FAAH 238, or equivalent.
- Two courses from one of the following concentrations: Painting - FAAH 209A, B or C, FAAH 202, FAAH 207; Sculpture - FAAH 210, FAAH 211, FAAH 212; or Ceramics - FAAH 215, FAAH 216, FAAH 217.
- Four courses from the following; at least three studio courses must be taken, two of which must fall outside of chosen concentration: Studio Courses - FAAH 201, FAAH 202, FAAH 206, FAAH 207, FAAH 208, FAAH 209A, B or C, FAAH 210, FAAH 211, FAAH 212, FAAH 215, FAAH 216, FAAH 217, FAAH 234, FAAH 239, FAAH 286, FAAH 292, Art History Courses - FAAH 221, FAAH 222, FAAH 223, FAAH 224, FAAH 225 A, B or C, FAAH 226 A, B or C, FAAH 227 A, B or C, FAAH 228 A, B or C, FAAH 229A, B or C, FAAH 232, FAAH 235, FAAH 238.

The minor program in studio arts requires fifteen credits: FAAH 200; FAAH 205; six credits taken from any studio course, and one course from FAAH 229A or FAAH 229B or FAAH 229C or FAAH 224 or equivalent, or FAAH 235 or FAAH 238 or equivalent.

Art History Program

The art history program seeks to train students in art history skills and concepts needed to develop capabilities in art theory, research, teaching, and criticism. It offers a core program with flexibility in the choice of art history concentrations in various periods and areas, notably the Middle East.

The requirement for a BA degree in art history is 90 credits for students entering the department at the sophomore level. The distribution of these courses is as follows:

University Requirements

- University Language requirements: 9 crs, ENGL 203, ENGL 204, ARAB 201A or any General Education Arabic communication skills.
- University General education requirements: Humanities, 12 crs, 3 credits from CVSP sequence I, 3 credits from CVSP sequence II, 6 credits from the list of approved courses in the humanities; Social Sciences, 6 crs; Natural Sciences, 6 crs; Quantitative Thought, 3 crs,
- Elective requirements: any one course (3 crs) from the following group PHIL 217, GRDS 231, SOAN 250, ARCH 033.
Department of Fine Arts and Art History

• Free electives outside the department (theater and music courses in the department may be allowed up to six credits): 12 crs. (15 crs. for students exempt from the Arabic requirement).

Major Courses: 39 credits in the department, as follows:

- FAAH 200 or FAAH 201 or FAAH 202, FAAH 218 or FAAH 219, FAAH 221, FAAH 222, FAAH 223, FAAH 224, FAAH 232, FAAH 235 (or approved alternate in philosophy or architecture), FAAH 238 (or approved alternate in philosophy or architecture)
- Three courses from any art history special topic group (Group 1—Ancient and Classical: FAAH 225A, FAAH 225B, FAAH 225C), (Group 2—Medieval: FAAH 226A, FAAH 226B, FAAH 226C), (Group 3—Middle Eastern and Islamic: FAAH 227A, FAAH 227B, FAAH 227C), (Group 4—Renaissance and Baroque: FAAH 228A, FAAH 228B, FAAH 228C), (Group 5—Modern and Contemporary: FAAH 229A, FAAH 229B, FAAH 229C), and one course from any remaining group.

The minor program in art history requires fifteen credits: nine credits chosen from FAAH 221, FAAH 222, FAAH 223, FAAH 224 or equivalents, and three credits from any Special Topics in Art History course (courses numbered FAAH 225A, FAAH 225B, FAAH 225C, FAAH 226A, FAAH 226B, FAAH 226C, FAAH 227A, FAAH 227B, FAAH 227C, FAAH 228A, FAAH 228B, FAAH 228C, FAAH 229A, FAAH 229B, FAAH 229C) and three credits from the following group FAAH 232, FAAH 235, FAAH 238.

Theater Program

The minor program in Theatre Arts seeks to acquaint students with basic theoretical and practical aspects of theatre performance and production. An overview of theatre past and present around the world is offered through a choice of interdepartmental courses encompassing relevant history, literature and criticism.

The minor program in Theatre requires fifteen credits: FAAH/Theatre 267, CVSP 212, FAAH/Theatre 265 or 270, FAAH/Theatre 283 or 284, and one course from the following group FAAH/Theatre 274, FAAH 286, ARAB 240, ENGL 212, ENGL 216, ENGL 251, or other theatre elective and approved by the Department.

Music Program

The minor program in Music seeks to train students in skills and concepts needed to develop as musicians, and to enhance their capacities as performers, analysts, and audience members. It offers the fundamentals of higher education in music, seeking to balance historical, theoretical, and performance aspects.

The minor program in Music requires fifteen credits: FAAH 242, FAAH 242A, FAAH 242B, FAAH 247, FAAH 262, FAAH 240 or FAAH 241; and one of the following: FAAH 240, FAAH 241, FAAH 244, FAAH 260, FAAH 261, or other music elective as approved by the Department.

FAAH 150 Introduction to Art History for Freshmen 3.0; 3 cr.
A course that offers a fundamental overview of art and its development in the Western world, providing the students with a chronology and brief description of the main art periods and movements in the West starting from prehistoric art all the way to contemporary art. Each semester.

FAAH 200 Foundations in Painting and Drawing 0.6; 3 cr.
Foundations in Painting and Drawing focuses on the development of basic art making skills and concepts by promoting an exploration of 2D media to interpret three-dimensional space. It is also an introduction to basic art materials, liquid and dry. Each semester.

FAAH 201 Drawing I 0.6; 3 cr.
A course in freehand drawing: various approaches to drawing are explored using both dry and liquid media. This course also deals with contours, proportions, forms, shading, and some perspective. Previously: CVSP/Art 220. Equivalent: ARCH 112. Each semester.

FAAH 202 Drawing II 0.6; 3 cr.
Emphasis is placed on draughtsmanship in various techniques and media with attention to expression, figure drawing, interpretation, and drawing as a basis for studies for other art forms. Prerequisite: FAAH 201 or consent of instructor. Annually (spring semester).

FAAH 205 Foundations in Sculpture and Ceramics 0.6; 3 cr.
This course focuses on the development of basic art making skills and concepts by working with materials “in the round.” It is also an introduction to basic 3D art materials, such as wood, clay, plaster and steel. Each semester.

FAAH 206 Painting I 0.6; 3 cr.
A beginning studio course introducing students to various painting media and subject matter aimed to develop basic skills. Previously: CVSP/Art 222. Each semester.

FAAH 207 Painting II 0.6; 3 cr.
A studio course in the handling of basic subject matter in pastel, wash, gouache and/or acrylic. Design and paint application are emphasized. Previously: CVSP/Art 223. Prerequisite: any one course from the following group: FAAH 201, FAAH 202, FAAH 206, FAAH 208, FAAH 274 or teacher’s approval. Each semester.

FAAH 208 Watercolor and Illustration 0.6; 3 cr.
A studio course introducing students to the procedure and materials of water color media, its various applications and techniques. Through a series of progressive painting assignments, this course aims to lay the foundations for personal expression as well as exposure to different styles and subject matter. Previously: CVSP/Art 226. Annually.

FAAH 209 Special Topics in 2D Art (A, B, C) 0.6; 3 cr.
Specialized courses in 2D studio arts. Annually.

FAAH 210 Sculpture I 0.6; 3 cr.

FAAH 211 Sculpture II 0.6; 3 cr.
A studio course that concentrates on general knowledge of modern sculpture, creating sculptures in the round, abstract forms with attention given to direct carving, and relating the sculpture to the environment and architecture. Prerequisite: Sculpture I or consent of instructor. Previously: CVSP/Art 234. Annually.
FAAH 212  Sculpture III  0.6; 3 cr.
Intermediate-advanced studio course emphasizing the refinement of personal technique, expression, and skill level. Attention is given to current developments in the field, and relating the sculpture to its environment. Prerequisite: FAAH 210 or FAAH 211, or consent of instructor. Occasionally.

FAAH 215  Ceramics I  0.6; 3 cr.
A studio course in basic handbuilding ceramics techniques; pinching, coiling, slab building, and glazing. The student potter is encouraged to create artistic functional pots, reflecting an understanding of the acquired basics. Previously: CVSP/Art 229A. Each semester.

FAAH 216  Ceramics II  0.6; 3 cr.
A studio course for the student potter who took Ceramics I. All basic techniques are fully developed and redefined to suit the student’s design. Design versus function is emphasized, as well as appreciation and criticism. Prerequisite: FAAH 215 or consent of instructor. Previously: CVSP/Art 229B. Annually.

FAAH 217  Ceramics III  0.6; 3 cr.
A studio course emphasizing skills in wheel-throwing and decorative projects, with attention to development of a personal idiom. Occasionally.

FAAH 218  Conceptual Studio I  0.6; 3 cr.
An idea-based and non-media-specific studio course. Review of contemporary art movements form a starting point for the creation of artworks that are explorative, interdisciplinary, with new notions of relating to culture and society. Technology and media work may be included by way of interaction and networking with existing resources in other departments. Annually (Fall Semester).

FAAH 219  Conceptual Studio II  0.6; 3 cr.
An idea-based and non-media-specific studio course. Course description as above in Conceptual Studio I, but with different emphases and projects. Annually (Spring Semester).

FAAH 221  Art History I: Ancient and Classical  3.0; 3 cr.
A survey and analysis of art, architecture, and the evolution of the city in antiquity. Equivalent: ARCH 121. Annually (Fall Semester).

FAAH 222  Art History II: Medieval  3.0; 3 cr.
A survey and analysis of art, architecture, and the evolution of the city from the fourth to the fourteenth century. Equivalent: ARCH 122. Annually (Spring Semester).

FAAH 223  Art History III: Renaissance/ Post-Medieval to Baroque  3.0; 3 cr.
A survey and analysis of art, architecture, and the evolution of the city from the fifteenth to the mid-eighteenth century. Equivalent: ARCH 223. Annually (Fall Semester).

FAAH 224  Art History IV: Modern  3.0; 3 cr.
A survey and analysis of art, architecture, and the evolution of the city from the mid-eighteenth century to the beginning of World War II. Equivalent: ARCH 224. Annually (Spring Semester).

FAAH 225  Special Topics In Art History/ (A,B,C) Ancient and Classical (or equivalent)  3.0; 3 cr. (each)
Specialized courses in ancient and classical art subjects. Occasionally.

FAAH 226  Special Topics In Art History/ (A,B,C) Medieval (or equivalent)  3.0; 3 cr. (each)
Specialized courses in Medieval art subjects. Occasionally.

FAAH 227  Special Topics In Art History/ (A,B,C) Middle Eastern and Islamic (or equivalent)  3.0; 3 cr. (each)
Specialized courses in Middle Eastern and Islamic art subjects. Occasionally.

FAAH 228  Special Topics In Art History/ (A,B,C) Renaissance to Baroque (or equivalent)  3.0; 3 cr. (each)
Specialized courses in Renaissance to Baroque art subjects. Occasionally.

FAAH 229  Special Topics In Art History/ (A,B,C) Modern and Contemporary Art (or equivalent)  3.0; 3 cr. (each)
Specialized courses in modern and contemporary art subjects. Occasionally.

FAAH 232  Methods in Art History  3.0; 3 cr.
A study in the tradition and methodology of art historical research. This pursues a discussion of the work of major theorists who have structured the discipline of art history; includes theories of the evolution of art, iconography, and art criticism. Prerequisite: at least one previous Art History course (or equivalent) or one Special Topics in Art History course (courses numbered FAAH 225A, FAAH 225B, FAAH 226A, FAAH 226B, FAAH 226C, FAAH 227A, FAAH 227B, FAAH 227C, FAAH 228A, FAAH 228B, FAAH 228C, FAAH 229A, FAAH 229B, FAAH 229C) or consent of instructor. Occasionally.

FAAH 234  Theories of Color/Composition/Design  3.0; 3 cr.
An analysis of the dynamic interaction of color and its implications for designers and artists. This course studies the physics of color, colored light, colored pigments, and the color wheel. Equivalent: GRDS 112. Annually.

FAAH 235  Theories of Modern Art  3.0; 3 cr.
A comparative study of the major theories of modern art: the meaning of the visual arts, aesthetics, and psychology of perception; includes theories forwarded by post impressionists and German expressionists as well as symbolist theories. Annually.

FAAH 236  Art Education  3.0; 3 cr.
Theory and practice in teaching visual art in the elementary school. Equivalent: EDUC 290B. Annually.

FAAH 237  Senior Project  0.6; 0 cr.
Students research, develop, and prepare a body of art in consultation with, but independent of, faculty members. Work in progress is shown to a jury during the course of the semester. At completion the work is displayed and judged by faculty members. No credit, but required of studio arts majors. On demand.

FAAH 238  Special Topics In Art Theory  3.0; 3 cr.
An advanced art theory course covering a broad spectrum of historical and/or specialized treatments of art. Occasionally.

FAAH 239  Advanced Studio Practice  0.6; 3 cr.
This course develops students’ abilities in relation to advanced studio art. By the end of the course, students should have acquired real expertise in at least one chosen medium/area. Prerequisite: at least two previous studio courses, or consent of the instructor. Occasionally.
FAAH/ Western Musical Traditions I 3.0; 3 cr
Music 240
An introduction to Western music from antiquity to the death of J.S. Bach, using readings and aural analysis of recorded performances. Annually. Restriction: Students taking this course may not take FAAH/Music 245.

FAAH/ Western Musical Traditions II 3.0; 3 cr.
Music 241
A continuation of readings and analysis of Western music from 1750 to the present day. Restriction: Students taking this course may not take FAAH/Music 245. Annually.

FAAH/ AUB Choir (applied music) 1 cr.
Music 242
Rehearsal and performance in ensemble of standard mixed choral repertoire. Prerequisite: Audition and consent of instructor. Each semester.

FAAH/ AUB Choir (applied music) 1 cr.
Music 242A
An expansion of repertoire and refinement of skills developed in 242. Prerequisite: FAAH/Music 242. Each semester.

FAAH/ AUB Choir (applied music) 1 cr.
Music 242B
An expansion of repertoire and refinement of skills developed in 242A. Prerequisite: FAAH/Music 242A. Each semester.

FAAH/ AUB Choir (applied music) 1 cr.
Music 243
Advanced rehearsal and performance of standard choral and vocal ensemble repertoire. Prerequisite: Audition and consent of instructor. Annually. Prerequisite: FAAH/Music 242B.

FAAH/ AUB Choir (applied music) 1 cr.
Music 243A
An expansion of repertoire and refinement of skills developed in 243. Prerequisite: FAAH/Music 243. Each semester.

FAAH/ AUB Choir (applied music) 1 cr.
Music 243B
An expansion of repertoire and refinement of skills developed in 243A. Prerequisite: FAAH/Music 243A. Each semester.

FAAH/ Introduction to Voice Performance 3.0; 3 cr
Music 244
A course on the fundamentals of singing technique and performance, including breath management, vocal registration, musical notation, and song repertoire. Prerequisite: Consent of instructor.

FAAH/ Music Appreciation; Historical Survey 3.0; 3 cr.
Music 245
A survey of western music from antiquity to modern times, from antiquity to jazz. Some musical basics are covered, ample illustrations are provided. Restriction: Students taking this course may not take FAAH/Music 240 and/or FAAH/Music 241. Annually.

FAAH/ Elements and Notation of Music 3.0; 3 cr.
Music 246
An introduction to the materials and notation of western music, with emphasis on musical performance, especially sight-singing. Annually.

FAAH/ Music Theory I 3.0; 3 cr.
Music 247
An introductory study of western music notation and theory. Prerequisites: FAAH/Music 246, or competence in music reading; and consent of instructor. Annually.

FAAH/ Music Theory II 3.0; 3 cr.
Music 248
A continuation of FAAH/Music 247; voice-leading in four parts through secondary, dominant, and leading-tone chords. Prerequisite: FAAH/Music 247. Annually.

FAAH/ Western Musical Traditions III 3.0; 3 cr.
Music 260
A focused survey of one style, period, genre, or composer of western music. Such titles as Romantic Music, The Symphony, or The Music of J.S. Bach may be included. At the discretion of the program.

FAAH/ An Introduction to the World of Opera 3.0; 3 cr.
Music 261
A survey of the history and development of opera from 1598 to the present. Emphasis is placed on the analysis and evaluation of recorded opera performances on film. At the discretion of the program.

FAAH/ Arabic and Middle Eastern music 3.0; 3 cr.
Music 262
A course introducing students to the history and key characteristics of Arabic and Middle Eastern music. No previous musical knowledge is required. Annually.

FAAH/ Introduction to Theater 3.0; 3 cr.
Theater 265
An introductory course on various types of theatrical presentations: realism, anti-realism, tragedy, comedy, and romance, with a view toward helping students appreciate current developments and experimentation in the theater. Annually.

FAAH/ Voice and Acting in the Theater 2.2; 3 cr.
Theater 267
A course covering the basics of clear speaking, vocal projection, and acting. Annually.

FAAH/ Theater History 3.0; 3 cr.
Theater 270
An overview of theater and related entertainment from ancient times to modern. Acting, production, stages, spectacle, audience control, and presentation styles are covered and illustrated with slides, videos, and anecdotes. Annually.

FAAH/ Design in Theater 2.2; 3 cr.
Theater 274
A course on the basics of design and drawing as applied to theater; specifically stage settings, costume design, and poster design. Annually.
BA in Studio Arts

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| Lecture Courses  | (9+12+6+4+6)         | 1. Required Arabic course: ARAB 201A or any General Education Arabic communication skills (3)  
2. Required English courses: ENGL 203(3), 204(3) | 1. Required credits in the humanities: 12 credits including 6 credits of CVSP 2,  
Three credits required from the following: FAAH 215 or ARDH 121 or FAAH 221 (or ARCHE 122) or FAAH 222 (or ARCHE 123) or FAAH 223 (or ARCHE 125) | Two courses approved General Education courses numbered 200 or above. 6 credits | Two approved General Education courses numbered 200 or above. 6 credits | Two approved General Education course. 3 credits. |

Lecture/ Laboratory (3)

Studio Work (18)

1. Twelve credits as follows: FAAH 200, 205, FAAH 218, FAAH 219.  
2. Two courses from one of the following three concentrations: FAAH 209 A, B or C, FAAH 200, FAAH 211, FAAH 212, or FAAH 213, FAAH 214, FAAH 215.

Studio/ Seminar (12)

Four courses from the following: at least three studio courses, two of which must fall outside of chosen concentration: FAAH 200, FAAH 205, FAAH 206, FAAH 207, FAAH 208, FAAH 209 A, B, or C, FAAH 210, FAAH 211, FAAH 212, FAAH 213, FAAH 214, FAAH 215, FAAH 216, FAAH 217, FAAH 218, FAAH 219, FAAH 220, FAAH 221, FAAH 222, FAAH 223, FAAH 224, FAAH 225 (A, B, or C), FAAH 226 (A, B, or C), FAAH 227, FAAH 228 (A, B, or C), FAAH 229 (A, B, or C), FAAH 230, FAAH 231, FAAH 232, FAAH 233, FAAH 234, FAAH 235, FAAH 236, FAAH 238.

Lecture/Performance: Free electives from outside the department (12 crs) (15 crs for those exempt from the Arabic requirement); can include up to 6 credits of FAAH/Theater and FAAH/Music courses even though these are within the department.)

Senior Project (8). Required Senior Project FAAH 237 (8)

BA in Art History

Mode of Analysis | English And Arabic (9) | Humanities | Social Sciences | Natural Sciences | Quantitative Thought |
|----------------|-----------------------|------------|----------------|-----------------|----------------------|
| Lecture Courses (9+12+6+4+6) | 1. Required Arabic course: ARAB 201A or General Education Arabic communication skills (3)  
2. Required English courses: ENGL 203(3), 204(3) | 1. 12 credits required in the humanities including 6 cr. of CVSP 2: 12 credits including: FAAH 221 (or ARDH 121), FAAH 222 (or ARCHE 122), FAAH 223 (or ARCHE 123), FAAH 224 (or ARCHE 124)  
3. 9 credits from one of the following concentrations: FAAH 225 A,B,C or FAAH 226 A,B,C or FAAH 227 A,B,C or FAAH 228 A,B,C or FAAH 229 A,B,C  
4. 15 credits distributed as follows: 3 credits from any of the remaining concentrations listed above; FAAH 232 or equivalent, FAAH 235 or 3 cr. in any equivalent course approved by the department, FAAH 236, or 3 cr in any equivalent course approved by the department, and 3 cr. from the following: PHIL 217 or GRDS 235 or SIGMA 250 or ARCH 033 | Two approved General Education courses numbered 200 or above. 6 credits | Two approved General Education courses numbered 200 or above. 6 credits | One approved General Education course. 3 credits. |

Lecture/ Laboratory (3)

Studio Work (6) | FAAH 200 or FAAH 201 or FAAH 202 | FAAH 218 or FAAH 219 |

Lecture/Performance: Free electives from outside the department (12 crs) (15 crs for those exempt from the Arabic requirement); can include up to 6 credits of FAAH/Theater and FAAH/Music courses even though these are within the department.)

Senior Project (8). Required Senior Project FAAH 237 (8)
Department of Geology

Chairperson: Abdel-Rahman, Abdel-Fattah M.
Professor: Abdel-Rahman, Abdel-Fattah M.
Assistant Professors: Elias, Ata R.; Haidar, Ali T.; Taborosi, Danko
Instructors: *Kallas-Bteish, Lara M.; *Khadera, Wisam M.; *Nassar, Philip E.; *Oueida, Raghida S.
Assistant Instructor: *Saghir, Reem

The Department of Geology offers programs leading to the degree of Bachelor of Science in Geology, and Master of Science degrees in certain areas of the vast field of geological sciences. It also offers a more broadly based program leading to the degree of Bachelor of Science in Petroleum Studies. Students wishing to major in geology or petroleum studies must secure the approval of the department. In addition, students must have a strong background in sciences and have taken the freshman science program or its equivalent.

The department also offers the following undergraduate elective courses: GEOL 101, GEOL 102, GEOL 103, GEOL 104, and GEOL 201 in the area of general geology, and GEOL 205 in environmental geology.

Field trips are required parts of most geology courses.

Mission Statement

The Department of Geology at the American University of Beirut is committed in providing the best Geoscience education in the Middle East, via its emphasis on excellence in teaching, and engaging students in research. The aim is to prepare our students to fulfill the needs of this region in terms of its geological nature, its petroleum and mineral resources, as well as groundwater resources, and their role in world economy and environmental implications. This is achieved within the context of learning about the occurrence, distribution and origin of natural resources worldwide. With the structure of our courses which include laboratory components, field components, term papers, oral presentations, and problem-solving assignments, we train our students to observe, analyze, critically evaluate, think independently, and derive their own conclusions. We emphasize the development of the conceptual apparatus, and the unbiased and accurate reporting of field and laboratory data (observation) and its significance in reaching a correct interpretation. In this manner, we promote high ethical professional standards, character, and scientific integrity. The program prepares our students to be life-long learners and well-rounded individuals, who can lead successful careers in the areas of energy and petroleum resources, hydrogeology, mining, geotechnical sciences and related fields.

BS in Geology

Geology majors must attain an average of 70 in major courses during the first three semesters in order to remain in the program. Majors must complete the following courses, in which a general average of 70 or more must be maintained: GEOL 201, GEOL 202, GEOL 203, GEOL 210, GEOL 211, GEOL 212, GEOL 213, GEOL 214, GEOL 219, GEOL 221, GEOL 222, GEOL 224, and GEOL 229, which is a total of 40 credits. In addition, three required elective courses - CMPS 209 and 200-level approved General Education economics and education courses (6 credits) - must be completed. No course may be taken without its prerequisite unless authorized by the departmental faculty. Students are encouraged to take additional geology courses such as GEOL 205, GEOL 207, GEOL 215 or GEOL 225, and also courses from the graduate level, provided other requirements permit.

The requirements for a BS degree in Geology are 90 credits for students entering the department at the sophomore level, including 40 credits in the major. The distribution of university requirements is as follows:

University Requirements

- University Language requirements: English (6 cr) and Arabic (3 cr)
- University General Education requirements: Humanities (12 cr), Social Sciences (6 cr), Natural Sciences (9 cr) and Quantitative thought (3 cr). Also note that one natural science must be an approved General Education course from outside the major (in PHYS, CHEM, or BIOL).

The core courses of the petroleum studies program (totaling 58 credits) are GEOL 201, GEOL 202, GEOL 203, GEOL 211, GEOL 212, GEOL 213, GEOL 214, GEOL 219, GEOL 221, GEOL 222, GEOL 225, GEOL 229; CHEM 201, CHEM 208; ACCT 210, MNGT 215, MKTG 210, and ECON (GE). In addition, a required elective course, CMPS 209 must be completed.

Petroleum studies majors must attain a grade of 70 or more in GEOL 201, and GEOL 203, and also pass the next two geology courses with a grade of 70 or more.

The requirements for a BS degree in Petroleum Studies are 90 credits for students entering the department at the sophomore level, including 37 credits of geology courses, 6 credits of chemistry courses, 9 credits of business courses and 3 credits in economics. The distribution of university requirements is as follows:

University Requirements

- University Language requirements: English (6 cr) and Arabic (3 cr)
- University General Education requirements: Humanities (12 cr), Social Sciences (6 cr), Natural Sciences (9 cr) and Quantitative thought (3 cr).

To obtain a minor in geology, students must complete the following core courses: GEOL 201, GEOL 202, GEOL 203, and GEOL 205, and two of the following elective courses: GEOL 210, GEOL 211, and GEOL 222 (for a total of 16 credits).

GEOL 101 The Earth, Present and Past 3.0, 3 cr.
A freshman level survey of the present day processes that shape the earth we live on, such as plate tectonic activity, rock formation and erosion, coupled with an overview of the origin and history of the earth and life. Each semester.

GEOL 102 Environmental Physical Geography 3.0; 3 cr.
An introduction to the structure, classification, physical processes and characteristics of the earth's atmosphere, hydrosphere and biosphere, dynamics of change, and associated environmental impacts. Each semester.
GEOL 103  Introduction to Marine Geology  3.0; 3 cr.
A freshman level survey of oceanic geological processes, wave dynamics, submarine springs, marine economic mineral resources, marine communities, pollution, global change, and marine-related environmental issues. Each semester.

GEOL 104  Natural Disasters  3.0, 3 cr.
A freshman level course covering events involving natural forces that have major devastating effects on humankind. These include mud flows, land slides and slope failure, earthquakes, tsunamis, explosive eruptions and volcanic hazards, meteoric impact and mass extinctions, hurricanes and tornadoes, flooding, and forest fires. Each semester.

GEOL 201  Physical Geology  3.0; 3 cr.
An introduction to minerals, igneous, sedimentary and metamorphic rocks, geological structures, and external earth processes, including the geologic work of streams, glaciers, groundwater, wind, and plate tectonic theory. Each semester.

GEOL 202  Historical Geology  2.2; 3 cr.
An introduction to earth history, including the principles of interpreting the past, origin, and development of the solar system. This course also provides an introduction to the systematic study of fossils, their classification, and identification. Prerequisites: GEOL 201, GEOL 203, or consent of instructor. Annually.

GEOL 203  Physical Geology Laboratory  0.2; 1 cr.
An introduction to the identification of rocks and minerals in hand specimen, geographic and geological maps, and basic interpretation of geological data. Prerequisite: GEOL 101, GEOL 102, GEOL 103, or GEOL 201, or consent of instructor. Each semester.

GEOL 205  Earth Resources and Energy  3.0; 3 cr.
A study of the main economic mineral resources and traditional and alternate energy resources, with an emphasis on the environmental impacts of their use and misuse. A special emphasis is given to regional issues. Open to both arts and sciences students. Each semester.

GEOL 207  Map Interpretation  2.2; 3 cr.
A course on the description, reading and interpretation of topographic and geological maps. This course also introduces stereographic projections, construction of cross-sections across geologic structures, and basic field mapping techniques. Prerequisites: GEOL 201, GEOL 203, or consent of instructor. Occasionally.

GEOL 210  Geomorphology  3.0; 3 cr.
An introduction to the study of land forms and the interaction of external geological forces and erosion agents with the structure and composition of their surface rocks. This course is also an examination of the interaction between the internal and external earth processes responsible for the development of land forms. Prerequisites: GEOL 201 and GEOL 203, or concurrently, with consent of instructor. Annually.

GEOL 211  Crystallography and Physical Mineralogy  2.2; 3 cr.
An introduction to the study and classification of crystals; properties of minerals as related to their crystal structure; identification, description, and classification of minerals. This course entails practical work with crystal models and hand specimens of common minerals. Annually.

GEOL 212  Optical Mineralogy  2.2; 3 cr.
An introduction to the theory of crystal optics, the polarizing microscope, and methods of mineral identification based on their optical properties. This course is also a systematic study of the common rock forming minerals in thin section. Prerequisite: GEOL 211 or consent of Instructor. Annually.

GEOL 213  Structural Geology  2.2; 3 cr.
Introduction to the study of rock deformation, the relationship between stress and strain, and the interpretation of structures and their significance to regional and global tectonics. Prerequisite: GEOL 201. Annually.

GEOL 214  Stratigraphy  2.2; 3 cr.
A course on the principles of interpretation of the sedimentary rocks and methods of correlation and an introduction to the stratigraphy of Lebanon in the context of the regional geology of the Middle East. Prerequisite: GEOL 222 or consent of instructor. Annually.

GEOL 215  Invertebrate Paleontology  2.2; 3 cr.
An introduction to the systematic study of invertebrate fossils, their classification and identification, using macro-specimens and thin sections. Prerequisite: GEOL 202. Annually.

GEOL 219  Geologic Field Methods  0.6; 3 cr.
An introduction to applied methods used in field geological mapping. This course also provides a description and interpretation of geological maps, and construction of cross-sections. Prerequisites: GEOL 201, GEOL 213, GEOL 222, or consent of instructor. Annually.

GEOL 221  Petrology  2.2; 3 cr.
A course on the origin, composition, occurrence, and classification of igneous and metamorphic rocks and their systematic identification in hand specimens and in thin section. Prerequisite: GEOL 211 or consent of instructor. Annually.

GEOL 222  Sedimentology  2.2; 3 cr.
A study of the characteristics and classification of sedimentary rocks using petrographic and field study methods, with some focus on diagenetic processes, depositional environments, and elementary basin analysis. Prerequisite: GEOL 202 and GEOL 212, or consent of instructor. Annually.

GEOL 224  Regional Geology  3.0; 3 cr.
A course on the geology of the Middle East region, with emphasis on its stratigraphy, structure, geological history, and tectonic evolution, and with reference to oil and mineral resources in the region. Prerequisites: GEOL 213 and GEOL 222, or consent of instructor. Annually.

GEOL 225  Petroleum Geology  3.0; 3 cr.
A course on hydrocarbon formation and occurrence as oil and gas fields, as well as exploration and extraction methods. Prerequisites: GEOL 213, GEOL 222, or consent of instructor. Annually.

GEOL 229  Individual Field Work Project  0.18; 6 cr.
A complete and independent geological investigation of a designated area and preparation of a detailed geological map, cross-sections, and report. For juniors and seniors. Pre- or co-requisite: GEOL 219. Annually.

GEOL 271/272  Directed Study in Geology  1–3 cr.
A tutorial that may be repeated for credit with different topics or may replace a required course. Occasionally.
### 40 Credits\(^1\) in Geology

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic ((\oplus))</th>
<th>Humanities (12)</th>
<th>Social Sciences (6=Unspecified)</th>
<th>Natural Sciences (40)</th>
<th>Quantitative Thought (3)</th>
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<tr>
<td>Lecture Courses</td>
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<td>1. Required: Geology</td>
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<td>ARAB 201 A or any General Education Arabic communication skills (3)</td>
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<td>2. Required: English courses: ENGL 201(3), 204(3)</td>
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<td>Required credits in the Humanities: 12 credits including 6 credits from CRSP</td>
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<td>Required elective courses: a 200-level approved GE language course (3), and a 200-level approved GE education course (3) from this list: EDUC 215, or 230</td>
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<td>Required elective course: a 200-level approved GE language course (3)</td>
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<td>2. Elective geology courses: GEOL 205(3), 225(3), 271(3), 272(3)</td>
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<td>3. One natural science must be an approved GE course from outside the major (in PHYS, CHEM, or BID)</td>
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<td>Seminar (24+12)</td>
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<td>Laboratory (25,3)</td>
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<tr>
<td>Research Project</td>
<td>(36+12)</td>
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1. Plus 50 required and elective credits  
2. Combined lecture, laboratory (field), and research project courses  
3. Combined lecture and seminar courses  
4. Combined lecture and lab courses

### 37 Credits\(^1\) in Petroleum Studies

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<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic ((\oplus))</th>
<th>Humanities (12)</th>
<th>Social Sciences (12)</th>
<th>Natural Sciences (37+6)</th>
<th>Quantitative Thought (3)</th>
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<tr>
<td>Lecture Courses</td>
<td>(3+12+4+3+3+4+3)</td>
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<td>1. Required: Petroleum Studies</td>
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<td>ARAB 201 A General Education Arabic communication skills (3)</td>
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<td>2. Required: English courses: ENGL 201(3), 204(3)</td>
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<td>Required credits in the Humanities: 12 credits including 6 credits from CRSP</td>
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<td>2. Elective geology courses: GEOL 205(3), 225(3), 271(3), 272(3)</td>
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<td>3. One approved General Education social science course (3)</td>
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<tr>
<td>Seminar (30+12)</td>
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<td>Laboratory (15,3)</td>
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<tr>
<td>Research Project</td>
<td>(30+12)</td>
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1. Plus 21 required credits in business, economics, and chemistry, in addition to 38 required and elective credits  
2. Combined lecture and research project courses  
3. Combined lecture and seminar courses  
4. Combined lecture and lab courses
Department of History and Archaeology

Chairperson: Sader, Helen S.
Professor Emeritus: Salibi, Kamal
Professors: Abu Husayn, Abdul Rahim A.; El-Cheikh, Nadia M.; Meloy, John L.; Sader, Helen S.; Seeden, Helga R.; Seikaly, Samir M.
Associate Professor: Genz, Hermann P.
Visiting Associate Professor: Du Quenoy, Paul G.; Newson, Paul G.
Visiting Associate Professor: Hamadeh, Shirine (Alfred H. Howell Chair)
Visiting Assistant Professor: Lamya R. Khalidy (Whilessey Chair)
Lecturers: Kaidbey, Naila A.; Sharif, Malek A.

The department offers programs leading to the BA, MA, and PhD in Arab and Middle Eastern History. The department also offers programs leading to the BA and MA in Archaeology. Requirements for transfer to the department include approval by the department, and a grade of 70 or more in any two humanities courses (excluding the communication skills requirements in Arabic and English). Students expecting to work in Arab history must also have knowledge of Arabic.

History

Mission Statement

By means of a broad and diversified curriculum, our undergraduate program introduces students to the richness and complexity of Arab and Middle Eastern history. That program is intended to develop not only essential knowledge of the past, but also awareness of the methodological and theoretical problematics involved in the study of history as a discipline in the humanities. Students are motivated to be reflexive, to read, research and write critically, analytically, and without prejudice or preconceptions. Courses in European and American history supplement the core offerings, fostering a comparative understanding of the enduring relevance of the past in multiple contexts. In line with the Faculty’s mission, the program maintains Major and Minor flexible requirements, leaving room for students to explore other fields of study.

BA in History

Students majoring in history must complete a minimum of 39 credit hours in the department, including HIST 286, HIST 287, HIST 291, and HIST 292. Detailed programs are determined by subcommittees of the department, which advise each student on courses in his/her major, related departments, and electives. In fulfillment of university requirements majors must also take the following: language requirements (English 6 crs.; Arabic 3 crs.); General Education requirements (Humanities 12 crs.; Social Sciences 6 crs.; Natural Sciences 6 crs.; Quantitative Thought 3 crs.)

Students choosing to minor in history must complete five courses numbered 200 and above. All minors, especially those considering graduate work in history, are encouraged to take HIST 287 as one of the five courses.

HIST 101/102 Survey of Modern Europe 3.0; 3 cr. (each)
A chronological and topical survey of the political and socio-economic forces that have shaped modern Europe and the rest of the world. Attention is given to teaching students how to tackle historical problems and how to initiate and conduct research. For freshmen students only. Annually.

HIST 200 Introduction to the History of the United States 3.0; 3 cr.
An introductory survey of the social and political development of the United States from its colonial origins through the early twentieth century. Principal themes include European settlement of the North American continent and the establishment of an independent United States; the tensions between North and South that culminated in civil war; and the social transformations brought about by the rise of a market-oriented, industrial society. Open to freshman students. Annually.

HIST 201 Introduction to the Study of History 3.0; 3 cr.
An introduction to some of the main themes and problems of the study of history such as the structures, aims, and methods of historical writing, and related questions such as causation, periodization, and style. The readings in this course are drawn mostly from modern texts in the methodology of history. Offered occasionally.

HIST 202 Introduction to the Modern History of the Arab East 3.0; 3 cr.
An introduction to the modern history of the Arab East from the Ottoman conquest until the outbreak of the Arab revolt. This course also uses case studies relating to the rise of local Arab rule and to Arab-Turkish relations in the late Ottoman period. Annually.

HIST 212 Islamic History: Origins and Empire, 600–750 3.0; 3 cr.
A course that focuses on the origins of Islam in Arabia, Islamic expansion, internal divisions, and the establishment of the Umayyad dynasty. This course emphasizes the themes of Arab expansion and adaptation, the historical roots of Shiism, institutional developments, problems of societal integration, and the factors of decline. Alternate years.

HIST 213 Islamic History: The Rise and Fall of the Abbasids, 750–1055 3.0; 3 cr.
A survey of the Abbasid Caliphate from its establishment in 750 to the Seljuk take-over of Baghdad in 1055. This course studies the origins, interpretation, and results of the Abbasid revolution, the militarization of the state, the emergence of specific institutions, the process of political decentralization, and the flourishing of cultural-scientific achievements. Alternate years.

HIST 214 Islamic History: Military Society in the Middle East, 1055–1500 3.0; 3 cr.
A course that completes the three-part survey of the central lands of Islam, covering the period from the Seljuk conquest in the eleventh century until the Ottoman expansion into the Middle East at the beginning of the sixteenth century. This course traces the fusion of societies that generated a new social and political order in the region. Alternate years.

HIST 216 History of the Fatimid Imamate, 909–1171 3.0; 3 cr.
A survey of the major stages of the Fatimid polity from the turn of the tenth century to its demise at the end of the twelfth century. Major themes include the political institutions of the Fatimid state, the intellectual trends of the Fatimid movement, and the social and economic ramifications of Fatimid rule. Offered occasionally.
HIST 217  Slaves and Soldiers: The Mamluk Sultanate, 1250–1517  3.0; 3 cr.
An investigation of the politics and society of Egypt and Syria during the regime of the Mamluk Sultanate by means of a chronological and thematic survey of the period from 1250 to 1517. Using all sources available—historical, archaeological, literary—students investigate the origins and nature of the Mamluk institution and its impact on society and politics in the Middle East. Alternate years.

HIST 218  The Abbasid Court  3.0; 3 cr.
A course that focuses on the Abbasid court in the ninth and tenth centuries. It seeks to define the terms court and courtiers within the Abbasid context and studies the structure that defined the court in a physical way, the Abbasid court culture; the role of ceremonial, the interpenetration of harem and court, and the understanding of particular functions of courtiers. Alternate years.

HIST 220  Local Histories 3.0; 3 cr.
A term-specific variety of courses that focus on provincial history and deal with the affairs, both urban and rural, of a particular region or locality. Courses may include such titles as Bilad al-Sham, 600–1097 and Rural Syria in Ottoman times. This course may be repeated for credit under different topics. Offered occasionally.

HIST 222  Byzantine Empire and Civilization, 330–900  3.0; 3 cr.
A survey of Byzantine history from the foundation of Constantinople in 330 to the end of the Iconoclast controversy and the establishment of the Macedonian dynasty in the later ninth century. Readings focus on doctrinal controversies, the reconstruction of the empire in the seventh century, and foreign relations, as well as artistic and cultural expression. Alternate years.

HIST 226  Byzantine Empire and Civilization, 900–1453  3.0; 3 cr.
A continuation of HIST 225, down to the fall of Constantinople. Topics include the encounter with the Crusades and the Italian maritime states, changes in Byzantine society, and the erosion and fragmentation of the empire in the thirteenth and fourteenth centuries. Alternate years.

HIST 227  Cultures in Contact: The Crusades  3.0; 3 cr.
A survey of the history of the Crusades from the beginning of the movement in the eleventh century until the demise of the Crusader states in the Middle East at the end of the thirteenth century. This course investigates the political and social conditions in the Levant that enabled the Crusaders' initial success and ultimate failure. Alternate years.

HIST 230  Iran: State, Society, and Religion, 1501–1722  3.0; 3 cr.
A course on the origin, expansion, and development of the Safavid state from the establishment of the dynasty as leaders of a Sufi order in the early fourteenth century until the fall of the Safavid dynasty and state in the eighteenth century. In addition to the political history of Persia during this period, this course examines the economic, social, and intellectual life in Persia under the Safavids. Offered occasionally.

HIST 233  History of the Arabs to 632  3.0; 3 cr. (in Arabic)
A course that covers Arabia before the coming of Islam, explaining in some detail the history of the various Arabian kingdoms of both Southern and Western Arabia. Particular importance is attached to the study of surviving epigraphy and the historical dimensions of Jahili poetry. Offered occasionally.

HIST 234  History of the Arabs, 632–750  3.0; 3 cr. (in Arabic)
A survey of the Rashidun and Umayyad period, with special emphasis on the politics and society of the Umayyad Caliphate and its place in early Arab Islamic civilization. Original texts are used in addition to modern studies. Offered occasionally.

HIST 235  History of the Arabs, 750–950  3.0; 3 cr. (in Arabic)
A course that covers the first two centuries of the Abbasid Empire until the arrival of the Buyids, the first dynasty openly to take the Abbasids under their wing. This course places particular emphasis on the culture of the period as well as on Abbasid institutions of government and society. Offered occasionally.

HIST 236  History of the Arabs, 950–1258  3.0; 3 cr. (in Arabic)
A course that covers Arab history from the Buyids to the Mamluks, also discussing other major dynasties such as the Seljuks, Zengids, and Ayyubids. Offered occasionally.

HIST 237  Ottoman State and Society, 1300–1600  3.0; 3 cr.
A course on the formation, consolidation, and expansion of the Ottoman state from its birth as a ghazi principality in northwestern Anatolia in the late thirteenth century until the end of the so-called Classical Age. This course emphasizes political and institutional developments. Alternate years.

HIST 238  Ottoman State and Society, 1600–1923  3.0; 3 cr.
A continuation of HIST 237 which traces the change and transformation of the classical Ottoman system and the responses to it. This course examines the Ottoman reform efforts from traditional reform in the seventeenth century through the Tulip Age and down to the Tanzimat (modernization) of the nineteenth century. Alternate years.

HIST 239  History of the Arab East and Egypt from 1516 to 1798  3.0; 3 cr.
A course that covers the expansion of Ottoman rule into the Arab East and the nature of Ottoman domination and its consequences. Selected case studies investigate the emergence of local Arab autonomies in the seventeenth and eighteenth centuries. Alternate years.

HIST 240  Confronting Modernity: The Arab East and Egypt from 1798 to 1920  3.0; 3 cr.
A course on the Arab provinces of the Ottoman Empire in the age of the Tanzimat, foreign intrusion into the region, and the Arab provinces' progressive incorporation into a developing global economy. Special attention is given to Egypt's bid for autonomy, the nahuḍa and the emergence of national sentiment in the Arab provinces of the Fertile Crescent. Alternate years.

HIST 242  A Social History of the Modern Middle East: 1800–1980  3.0; 3 cr.
Examines the historical trajectory and character of social groups—including peasants, workers, middle and upper classes—in the 19th and 20th century Middle East. Explores how the rise of modern interventionist states has transformed everyday social life. Considers the effects, characteristics, and limits of the region's integration into the world economy, and the effect of oil and inter-state warfare on state-society relations. Alternate years.

HIST 243  History of the Arab East and Egypt Since 1920  3.0; 3 cr.
The course focuses on the establishment of the mandate system, and other types of western control in the region, the struggle for Arab independence and the foundation of the post-colonial interventionist state. Alternate years.

HIST 244  Sociopolitical History of Modern Iran, 1800–1989  3.0; 3 cr.
Focuses on the interaction between various social forces and the state in modern Iran. Examines the transformation of the state from a weak 19th century patrimonial monarchy, via an autocratic monarchy, to a post-revolutionary populist hierarchy; and discusses the transformation of tribes, the clergy, merchants, the intelligentsia, peasants, and workers, throughout the modern period. Alternate years.
HIST 245  History of Lebanon from 634 to 1920 A.D.  3.0; 3 cr.
A study of the history of the regions which came to constitute Greater Lebanon. This course analyzes the factors that contributed to the development of a distinctive Lebanese identity. Annually.

HIST 251  History of North Africa and Spain in the Middle Ages  3.0; 3 cr.
A survey of North Africa and Andalusia from the Arab conquest until the eclipse of Muslim power in al-Andalus. Alternate years.

HIST 252  The Middle Ages in Europe  3.0; 3 cr.
A study of the history of the Western half of the Roman Empire during the crisis of the third century until the rise of the earliest nation states in Europe in the tenth and eleventh centuries. Offered occasionally.

HIST 253  History of Europe from 1350 to 1618  3.0; 3 cr.
A course that covers the transformation of Europe under the twin influences of the Renaissance and the Reformation. Attention is given to the political and socio-economic reorientations provoked by the voyages of discovery and the rise of European colonial empires. Offered occasionally.

HIST 254  History of Europe from 1618 to 1815  3.0; 3 cr.
A survey of the political and socio-economic evolution of Europe from the outbreak of the Thirty Years’ War to the Congress of Vienna. Special attention is devoted to the rise to primacy of England and France and to the revolutionary transformations that the latter experienced. Offered occasionally.

HIST 255  History of Europe from 1815 to 1871  3.0; 3 cr.
A survey of the failure of the Vienna Settlement to preserve the European political status quo, the transformation of Europe under the impact of industrialization, and the emergence of dynamic new states in Italy and Germany. Offered occasionally.

HIST 256  World History from 1871 to 1914  3.0; 3 cr.
An examination of the socio-political and economic transformations which culminated with World War I. Attention is paid to the phenomenon of European imperialism and to the failure of the European state system and diplomacy to maintain peaceful co-existence. Offered occasionally.

HIST 257  The Contemporary World Since 1914  3.0; 3 cr.
A survey of the attempts to reconstruct a new world order at Versailles, the revolutionary overturn of existing orders in Russia, Italy, Germany, and China, the slide into World War II, and its aftermath. Offered occasionally.

HIST 258  Special Topics in History  3.0; 3 cr.
A term-specific variety of in-depth courses involving a detailed and systematic analysis of a particular topic, region, or nation. Examples of courses offered include Palestine under Mandate, Middle Eastern Monarchies, 1920-1958, Revolution in the Middle East, the Sea in History, Islamic Cities and Urbanism in the Modern Middle East. Repeated for credit under different topics. Offered occasionally.

HIST 259  Imperial Russia  3.0; 3 cr.
A survey of the Russian state from its origins in the Middle Ages to its emergence as an empire up to the revolutionary year of 1917. Attention is given to diplomacy and statecraft, internal challenges, social and political change, reform, war and revolution. Offered occasionally.

HIST 260  Russia since the Revolution  3.0; 3 cr.
A survey of Russia’s history from the transformative moment of the Revolution of 1917. The course will offer a detailed review of the Soviet era, assess its problems and tragedies, address the collapse of communism in 1989-1991, and examine the recent history of post-Soviet Russia. Offered occasionally.

HIST 261  Modern Italy  3.0; 3 cr.
A consideration of the history of Italy emphasizing the period from Napoleon Bonaparte’s conquest and reorganization of the peninsula in the 1790s to the present. Particular attention is given to the development of Italian nationalism, the process of national unification between 1859 and 1870, the impact of World War I, Mussolini’s dictatorship and World War II, and Italy’s place in European integration. Social, cultural, and intellectual developments are also considered.

HIST 262  Women and Gender in Classical Islamic Society  3.0; 3 cr.
An investigation of the history of gender roles, perception, and experiences in the social, political, economic, and legal contexts of classical Muslim societies. Through a topical approach, emphasis is placed on the variety of Muslim women’s experience. Reading material includes translations of primary sources that will be at the center of class discussions. Alternate years.

HIST 271  Race, Class, Gender: Introduction to American Social History  3.0; 3 cr.
A course that begins with the notion of how the study of the American past has been revolutionized in recent decades by social history, which focuses on the experiences of everyday people, particularly those from subordinate social groups. Employing this approach, the course looks at the lives of African-Americans, immigrant workers, and women, and shows how this alters the traditional picture of American history. Offered occasionally.

HIST 272  Economic History of the United States  3.0; 3 cr.
A survey of the economic life of the United States from colonial times to the present. This course examines the development of the economy and business institutions and corresponding changes in public policy and cultural life. Topics addressed include the colonial economy within the mercantilist system, the economics of slavery, industrialization, the rise of large corporations, government regulation, the Great Depression, the recent decline of traditional manufacturing, and the emergence of a high-technology, service-oriented economy. Offered occasionally.

HIST 273  The United States and the Middle East  3.0; 3 cr.
An examination of the varying and complex relationship between the United States and the Middle East over the last two centuries. Subjects examined include images of the Middle East in early American political discourse, the activities of American missionaries and the founding of AUB, Arab immigration to the US, the role of American oil companies in the region and the rise of OPEC, Cold War diplomacy toward the Arab states and Israel, the Iran hostage crisis, US intervention in the conflict in Lebanon, and the Gulf War. Offered occasionally.

HIST 274  The United States in the Twentieth Century  3.0; 3 cr.
A survey of the social, political, and cultural development of the United States from the early twentieth century until recent times. This course emphasizes particular episodes of domestic political reform such as the New Deal, the changing social roles of African-Americans and women, the turmoil of the 1960s and its aftermath, and the role of the United States as a world power. This course is designed as a companion course to HIST 200, although HIST 200 is not a prerequisite for HIST 274. Annually.

HIST 278/279  Special Topics in United States History  3.0; 3 cr.(each)
A course emphasizing a particular subject, theme, period, or region in the history of the United States (e.g., Native Americans, US environmental history, Civil War and Reconstruction, the American West) to be offered by resident or visiting specialists with expertise in the field. May be repeated for credit. Offered occasionally. Equivalent to AMST 215/230.
HIST 286 Historical Interpretation 3.0; 3 cr.
An introduction to current theoretical trends and interpretations in history and archaeology, including postmodern interpretations. Alternate years.

HIST 287 Historical Writing 3.0; 3 cr.
An applied library course focusing on the conduct of historical and archaeological research and writing. Emphasis centers on historical and archaeological methodology in the identification and utilization of sources, analysis, synthesis, and exposition. Alternate years.

HIST 291/292 Senior Seminar in Arab and Middle Eastern History 3.0; 3 cr. (each)
A seminar in which students work in association on a select topic, report on their progress in class, and incorporate their findings in a detailed paper applying recognized historical methods of referencing and documentation. Alternate years.

### History

#### 39 Credits in History

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic (9)</th>
<th>Humanities (12-19)</th>
<th>Social Sciences (6)</th>
<th>Natural Sciences (6)</th>
<th>Quantitative Thought (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Course (9+19+4+3)</td>
<td>1. Required Arabic course: ARAB 201A or any General Education Arabic communication skills. Required English courses: ENGL 203(3), 204(3)</td>
<td>Required credits in the humanities: 12 credits including 6 credits from CSP (see pp. xxx-xx)</td>
<td>Two courses (6). The academic advisor will recommend particular courses in these disciplines.</td>
<td>Two courses (6). The academic advisor will recommend particular courses in these disciplines.</td>
<td>One course (3) in computer literacy.</td>
</tr>
</tbody>
</table>

| Seminar (6) | Required history courses: HIST 241(3), 250(1) |
| Laboratory (3) | Computer Lab (1) |

| Research Project (6) | Required history courses: HIST 286(3), 287(3) |

### Archaeology

#### Mission Statement

The undergraduate program in Archaeology provides students with a working knowledge and critical understanding of the methodological and theoretical principles of archaeological investigation and fieldwork. Its curriculum introduces students to the wealth and diversity of Mediterranean and Near Eastern archaeology. In addition to developing essential knowledge about the material and cultural roots of past societies, the program enhances student awareness about the value and relevance of Lebanon’s and the region’s archaeological heritage. In line with the Faculty’s mission, the program maintains Major and Minor flexible requirements, enabling students to explore other areas of academic interest.

### BA in Archaeology

Students majoring in archaeology must complete a minimum of 39 credit hours in the department, including HIST 286, HIST 287, AROL 233 or 234, and AROL 291 or AROL 292. Detailed programs are determined by subcommittees of the department, which advise each student on courses in his/her major, related departments, and electives. In fulfillment of university requirements majors must also take the following: language requirements (English 6 crs.; Arabic 3 crs.); General Education requirements (Humanities 12 crs.; Social Sciences 6 crs.; Natural Sciences 6 crs.; Quantitative Thought 3 crs.)

Students choosing a minor in archaeology must complete five courses numbered 200 and above, including one of the following courses: AROL 211, AROL 212, AROL 233, AROL 234, AROL 291, or AROL 292.

AROL 101 Introduction to Archaeology 3.0; 3 cr.
An introductory course on how the world’s archaeological resources are threatened and require rescue, protection, and management. Archaeology studies this cultural heritage and rediscovers human experience from its origins to the present. What is the nature of archaeological evidence, and how can it be saved? Each semester.

AROL 201 Archaeology in Lebanon 3.0; 3 cr.
A course that presents the archaeology of Lebanon: its history, institutional organization, the state of the evidence, and the problems Lebanon’s archaeological heritage is facing. Reports of the country’s main excavated sites and standing monuments are studied in combination with required site visits. Alternate years.

AROL 211/212 Methodology 3.0; 3 cr. (each)
A study of the methods of recovery, systematic description, integration, and presentation of archaeological material for the preservation and reconstruction of information from the human past. Special emphasis is given to cultural heritage preservation and education in Lebanon and the Near East. Alternate years.

AROL 213 The Human Story I: The Old Stone Age (up to ca. 10,000 BC) 3.0; 3 cr.
A course on the physical and cultural evolution of hominids and early humans subsisting on food gathering, hunting, and fishing in a Pleistocene environment. The cultural and functional significance of artifacts and lifestyles are investigated with the help of information gained from the paleoenvironment, experimental technology, and ethnography. Alternate years.
AROL 214  The Human Story II: The New Stone Age or Neolithic Period (tenth to fourth millennium BC)  3.0; 3 cr.
A course on the gradual domestication of plants and animals, leading to food production, and the development of socio-cultural systems with increasing differentiation of activities. Neolithic village communities are investigated for evidence of new technologies and arts and crafts, including exotic raw materials and luxury goods. Alternate years.

AROL 215/216  The Near East in the Bronze Ages (3500–1200 BC)  3.0; 3 cr. (each)
A course on the growth of small towns and larger urban centers in an essentially agricultural environment. The changes that occurred during the later second millennium and the breakdown of the Bronze Age urban palaces are investigated. Alternate years.

AROL 217  Phoenicia and the Phoenicians  3.0; 3 cr.
An investigation of the archaeology of the Levantine coast between 1200 and 300 BC, with special emphasis on recently excavated Iron Age sites in Lebanon. This course examines the organization of the Phoenician city-states, and their material culture. Alternate years.

AROL 218  The Phoenician Expansion In the Mediterranean  3.0; 3 cr.
A study of the Phoenician, mainly Syrian and Sidonian, expansion in the Mediterranean. Its causes, and the means by which it was achieved. This course also examines the material culture of the first millennium BC Phoenician settlements in Cyprus, North Africa, Italy, and Spain, and cultural and economic interaction with local populations. Offered occasionally.

AROL 219/220  Ancient Mesopotamia  3.0; 3 cr. (each)
A study of the major political, cultural, and technological achievements of Mesopotamian civilization from the fourth millennium BC to the fall of the Neo-Babylonian Empire. Specific archaeological sites are chosen to illustrate the material culture of the successive historical periods from Late Uruk to Neo-Babylonian times. Offered occasionally.

AROL 221/222  Archaeology of the Greek World  3.0; 3 cr. (each)
A course on the Greek Bronze and Dark Ages (221), covering the archaeology of Minoan Crete, the Cyclades, Helladic and Mycenaean Greece, and the development of the early Greek city states. Archaic and Classical Greece (222) explores the history and archaeology of Greece, Western Asia Minor, and the Greek colonies in Southern Italy, and Sicily, from the eighth to the fourth centuries BC. Alternate years.

AROL 223  Archaeology of the Hellenistic World  3.0; 3 cr.
A course on the history and archaeology of the empire of Alexander the Great and his successors, in Greece, Asia Minor, the Near East, Iran, and beyond from the fourth to first centuries BC. This course covers the spread of Greek culture and institutions, and their interaction with local cultures. Alternate years.

AROL 224  Introduction to the Roman World  3.0; 3 cr.
An introduction to society and culture of the Roman Empire. The focus of this course is on Rome and the provinces, imperial history, everyday life, and material culture between the second century BC and the fourth century AD, with special emphasis on the first and second centuries, when the Roman Empire was at its height. Alternate years.

AROL 225  The Roman and Byzantine Near East  3.0; 3 cr.
A study of the history and material culture of the Near East, from the first century BC to the seventh century AD, including archaeological sites, religion, art, and architecture. The emphasis is on local traditions and responses to Roman rule. Alternate years.

AROL 226  The World of the Philistines, Israelites, and Arameans  3.0; 3 cr.
An investigation of the material culture of Syria and Palestine from 1200–300 BC, with special emphasis on the origin and early settlement of Philistines, Israelites, and Arameans, the formation of their states, and the processes of urbanization. Alternate years.

AROL 231  Ancient Near Eastern Religions  3.0; 3 cr.
A study of ancient Mesopotamian, Canaanite, and biblical religious texts with emphasis on creation myths, divine beings, death and the afterlife, cults and rituals. This course also includes a complementary investigation of archaeological evidence for religious beliefs and practices. Offered occasionally.

AROL 233/234  Fieldwork in Archaeology  3.0; 3 cr. (each)
A course entailing participation in archaeological fieldwork to acquire practical experience of methods and techniques used in area surveys, excavation, building recording, post-excavation analysis, or ethnographic data collection related to archaeological fieldwork. Annually. Restricted to majors and minors in Archaeology.

AROL 235/236  Special Topics in Archaeology  3.0; 3 cr. (each)
A course on the archaeology of a particular area, region (e.g., Anatolia, the Arabian Peninsula, Egypt, Iran, etc.) or subject. Such courses are offered by resident or visiting specialists in their respective fields. May be repeated for credit. Offered occasionally.

AROL 291/292  Senior Seminar  3.0; 3 cr. (each)
A seminar on research methods in archaeology. Subjects include the study and identification of material culture and theoretical frameworks, or explanation in archaeology. Students are expected to research specific topics, present the results for discussion at workshop sessions, and submit their final analysis in research papers. Alternate years.

AROL 293/294  Ancient Texts  3.0; 3 cr. (each)
An introduction to West Semitic epigraphy, including the origin of the alphabet and development of alphabetic scripts, presentation of the various Semitic dialects, and palaeography and selected texts for illustration. This course may be repeated for credit under different topics. Offered occasionally.

Archeology

39 Credits in Archeology
Department of Mathematics

Chairperson: Abu-Khuzam, Hazar M.
Professors Emeriti: Hanna, Azmi; Kennedy, Edward S.; Muwafi, Amin; Yff, Peter
Associate Professor: Brock, Friedemann R.
Assistant Professors: Alhakim, Abbas M.; Azar, Monique E.; Egeileh, Michel Y.; El Khoury, Sabine S.; Raji, Wissam V.; Tlas, Tamer M.
Instructors: Abu-Diab, Sara A.; Fayyad, Dolly J.; Kobeissi, Mohammad A.; Makhoul, Ola S.; Yamani, Hossam A.

The Department of Mathematics offers programs leading to the degrees of Bachelor of Science (BS) and Bachelor of Arts (BA) in Mathematics, in Applied Mathematics, and in Statistics. It also offers programs leading to the degree of Master of Science (MS) in Mathematics.

Mission Statement

The Department of Mathematics subscribes to the view that “Mathematics as an expression of the human mind reflects the active will, the contemplative reason, and the desire for aesthetic perfection.” Through the different fields of Algebra, Analysis, Geometry, Number Theory, Statistics, and Applied Mathematics, the Department aims to train students in quantitative reasoning, in dealing with abstraction, in enhancing their sense of formalism, in tackling Mathematical problems, and in writing clear and rigorous proofs. The training will help the student acquire a sound balance between abstract generality and colorful individuality, and between the qualitative and quantitative aspects of Mathematics. It also will help the student master the theory through a clear comprehension of the theoretical aspects, but without losing sight of applications. Graduates of the Mathematics Department should be well placed to work in various professional areas of Education, Finance, Information Technology, or for pursuing graduate studies in Mathematics or a related area.

BA or BS in Mathematics

The department requires nine credits in courses numbered 200 or above in the sciences for the BS degree, and at least nine credits in courses numbered 200 or above in the arts (humanities or social sciences) for the BA degree. In both cases it is recommended that at least six of these nine credits be in disciplines that use quantitative methods, and be chosen in conjunction with the student's faculty adviser. In addition, the departmental requirements are as follows:

MATH 201, MATH 210, MATH 214, MATH 219, MATH 223, MATH 227, MATH 233, MATH 241, and at least one of MATH 220 or MATH 242 and 12 more credits chosen from MATH 202 and mathematics courses numbered 213 or above. In addition, students must take CMPS 200, which is a first course in programming.

University Requirements

- University language requirements: nine credits of English and Arabic.
- University General Education requirements: 12 credits In Humanities; six credits in Social Sciences (covered by the departmental requirements for BA); six credits in natural sciences (covered by the departmental requirements for BS); and three credits in Quantitative Thought (covered as a Math major).

A transfer student who has done well in MATH 218 can count it toward the mathematics major instead of MATH 219, subject to departmental approval. In such a case, the department will usually require the student to take MATH 220.

Students wishing to pursue graduate study in mathematics are strongly urged to take MATH 220, MATH 242, and MATH 213 or MATH 216. They may also want to consider taking one or more graduate courses in their senior year. Students with an interest in applied mathematics are urged to take MATH 202, MATH 220, MATH 224, MATH 251, and MATH 234, and to choose their additional courses from those that include a significant use of mathematical techniques. Students interested in high school teaching are encouraged to include MATH 202, MATH 213, MATH 251, and MATH 261 among their courses.

A minor in mathematics requires 18 credits: MATH 201, MATH 210; either MATH 218 or MATH 219; and nine more credits in mathematics courses numbered MATH 202, MATH 211 or above, or statistics courses numbered 230 or above.

BA or BS in Applied Mathematics

A student opting for the program in Applied Mathematics can earn either a BA or a BS degree. The science requirements for the BS are fulfilled by at least 2 science courses (or 6 science credits) chosen in departments in the FAS; the arts requirements for the BA are fulfilled by 2 courses (6 arts credits) chosen in departments in the FAS. The Mathematics requirements is the same for both degrees and consists of 39 credits in Mathematics courses as follows:

MATH 201, MATH 202, MATH 210, MATH 218, MATH 223, MATH 224, MATH 227, MATH 233, MATH 251, MATH 281, and 9 more credits chosen from Mathematics courses numbered 211 and above.
In addition, the student will choose 9 credits in one applied discipline or track from the following list:

1- Computer Science
2- Economics/Econometrics
3- Natural Sciences
4- Engineering and Health Sciences

University Requirements

• University language requirements: nine credits of English and Arabic.
• University General Education requirements: 12 credits in Humanities; six credits in Social Sciences (covered by the departmental requirements for BA); six credits in Natural Sciences (covered by the departmental requirements for BS); and three credits in Quantitative Thought (covered as a Math major).

A minor in Applied Mathematics requires 18 credits: MATH 201, MATH 210; either MATH 218 or MATH 219; and nine more credits in mathematics courses numbered MATH 202, MATH 211 or above, or statistics courses numbered 230 or above.

BA or BS in Statistics

The department requires nine credits in courses numbered 200 or above in the sciences for the BS degree, and at least nine credits in courses numbered 200 or above in the arts (humanities or social sciences) for the BA degree. In both cases it is recommended that at least six of these nine credits be in disciplines that use quantitative methods, and be chosen in conjunction with the student’s faculty adviser. In addition, the departmental requirements are as follows:

In statistics: STAT 233, STAT 234, STAT 235, STAT 236, STAT 237 and STAT 238, and nine more credits chosen from MATH 202 and from mathematics, statistics, and computer science courses numbered 212 or above, excluding STAT 230

In mathematics: MATH 201, MATH 210, and MATH 218 or MATH 219

In computer science: CMPS 200

Students planning to go for higher education in statistics are advised to take their electives in advanced mathematics courses such as MATH 223 and MATH 227. Other students are encouraged to choose among their electives MATH 251 and other computing-oriented courses.

University Requirements

• University language requirements: nine credits of English and Arabic.
• University General Education requirements: 12 credits in Humanities; six credits in Social Sciences (covered by the departmental requirements for BS); six credits in Natural Sciences (covered by the departmental requirements for BA); and three credits in Quantitative Thought (covered as a Math major).

It is to be noted that STAT 201, 210, and 230 are mainly service courses. STAT 201 is essentially equivalent to EDUC 227, and STAT 210 is essentially equivalent to ECON 213. Students can get credit for only one of the following: STAT 201, STAT 210, STAT 230, STAT 233, EDUC 227, ECON 213.

A minor in statistics requires 18 credits: MATH 201, MATH 210, and STAT 233, and nine more credits in statistics courses numbered 211 or above excluding STAT 230.

Undergraduate Courses

Mathematics

MATH 101 Calculus and Analytic Geometry I 3.1; 3 cr.
Limits, continuity, differentiation with application to curve plotting; Rolle’s theorem; integration with application to area, distance, volume, arc-length; fundamental theorem of calculus, transcendental functions. Each semester.

MATH 102 Calculus and Analytic Geometry II 3.1; 3 cr.
Methods of integration, improper integrals, polar coordinates, conic sections, analytic geometry in space, parametric equations, and vector functions and their derivatives. Prerequisite: MATH 101. Each semester.

MATH 201 Calculus and Analytic Geometry III 3.1; 3 cr.
Multivariable functions, partial derivatives, cylindrical and spherical coordinates, multiple integrals, sequences and series, and integration in vector fields. Prerequisite: MATH 102. Each semester.

MATH 202 Differential Equations 3.1; 3 cr.
Surface integrals, Stokes theorem, divergence theorem; first-order differential equations, linear differential equations, series solutions, Bessel’s and Legendre’s functions, Laplace transform, and systems. Prerequisite: MATH 201. Each semester.

MATH 203 Mathematics for Social Sciences I 3.0; 3 cr.
Polynomials, factoring, first- and second-degree equations, inequalities, absolute value, straight lines, Gaussian elimination, functions, graphs, exponential and logarithmic functions, and differentiation. Not open to students with prior credit in MATH 101 (or its equivalent) or MATH 201. Each semester.

MATH 204 Mathematics for Social Sciences II 3.0; 3 cr.
Matrix operations, inverses, determinants, set operations, permutations, combinations, probability, rate of change, techniques of integration, differential equations, graphs of multivariate functions, partial derivatives, and optimization. Prerequisite: MATH 101 or MATH 203. Each semester.

MATH 210 Introduction to Analysis 3.0; 3 cr.
The real numbers, completeness, sequences, some basic topology of the real line, compact sets, Heine-Borel theorem, continuous functions, intermediate value theorem, uniform continuity, extreme values, differentiation, mean-value theorem, Taylor’s theorem, and integration, sequences and series of functions. Prerequisite: MATH 201. Annually.

MATH 211 Discrete Structures 3.1; 3 cr.
Logical reasoning, sets, relations and functions; mathematical induction, counting, and simple finite probability theory; analysis of algorithms, complexity; recurrence relations and difference equations; truth tables and switching circuits; graphs and trees; strings and languages. This course is equivalent to CMPS 211. Annually.
MATH 212  Introductory Partial Differential Equations 3.0, 3 cr.
Partial differential equations as mathematical models in science, Fourier series, Fourier inversion, Gibbs phenomenon, applications of Fourier series to partial differential equations (heat equation, Laplace equation, wave equation), Sturm-Liouville Systems, Fourier and Laplace transforms and applications to partial differential equations, pointwise and uniform convergence of sequences and series of functions. Prerequisites: MATH 201, MATH 202. For non-Math majors. Students cannot receive credit for both Math 212 and 224. Each semester.

MATH 213  Higher Geometry 3.0; 3 cr.
Topics chosen from isometries of Euclidean space, inversion, elements of differential geometry, the Frenet frame, curvature, torsion, the pseudo-sphere, hyperbolic geometry, and affine and projective geometry. Biennially.

MATH 214  Topology I 3.0; 3 cr.

MATH 215  Topology II 3.0; 3 cr.
A senior level course covering more advanced topics in topology. Prerequisite: Consent of instructor. Biennially.

MATH 216  Elementary Linear Algebra with Applications 3.0; 3 cr.
An introduction to linear algebra at a less theoretical level than MATH 219. Systems of linear equations and Gaussian elimination, vectors in \( \mathbb{R}^n \), matrices, determinants, vector spaces, subspaces and dimension, orthogonal projection and least-squares approximation, eigenvalues, eigenvectors, and selected applications. Students cannot receive credit for both MATH 219 and MATH 218. Annually.

MATH 217  Linear Algebra I 3.0; 3 cr.
A rigorous introduction to linear algebra, with emphasis on proof and conceptual reasoning. Vector spaces, linear transformations and their matrix representation, linear independence, bases and dimension, rank-nullity, systems of linear equations, brief discussion of inner products, projections, orthonormal bases, change of basis, determinants, eigenvalues, eigenvectors, and spectral theorem. Students cannot receive credit for both MATH 219 and MATH 218. Annually.

MATH 218  Linear Algebra II 3.0; 3 cr.
A deeper study of determinants, inner product spaces, and eigenvalue theory. Adjoints and the spectral theorem, primary decomposition, quotient spaces, diagonalization, triangularization, rational and Jordan forms, connection with modules over a PID, dual spaces, bilinear forms, and tensors. Prerequisite: MATH 241 or consent of instructor. Biennially.

MATH 219  Advanced Calculus 3.0; 3 cr.
Metric spaces, normed vector spaces, the derivative as a linear transformation, chain rule, vector versions of mean-value theorem, Taylor's formula, inverse and implicit function theorems, divergence, curl, differential forms, Stokes's theorem, and notions of differential geometry. Prerequisites: MATH 230 or MATH 224, and MATH 18 or MATH 219. Biennially.

MATH 220  Fourier Analysis and Applications 3.0; 3 cr.
Uniform and absolute convergence of infinite series and integrals, Laplace's method and Stirling's formula, Sturm-Liouville systems, Gram-Schmidt orthogonalization, orthogonal polynomials, Fourier series, Fourier integrals, Parseval and Plancherel theorems, and some partial differential equations. Prerequisites: MATH 210 and MATH 218 or MATH 219. Annually. Students cannot receive credit for both Math 212 and 224.

MATH 221  Wavelets and Applications 3.0; 3 cr.

MATH 224  Applied Probability Models 3.0; 3 cr.
Topics chosen among: fields and Galois theory, group theory, ring theory, modules over a PID, orbit-stabilizer, statement of Sylow theorems, rings, ideals, homomorphisms and quotient fields, and Euclidean and principal ideal domains. Prerequisite: MATH 219 or MATH 218 with a good understanding of proof, or consent of instructor. Annually.

MATH 225  Topics in Algebra 3.0; 3 cr.
Topics chosen among: fields and Galois theory, group theory, ring theory, modules over a PID, and other topics as determined by the instructor. Prerequisite: MATH 241. Biennially.

MATH 226  Numerical Computing 3.1; 3 cr.
Techniques of numerical analysis: number representations and round-off errors, root finding, approximation of functions, integration, solving initial value problems, Monte-Carlo methods. Implementations and analysis of the algorithms are stressed. Projects using MATLAB or a similar tool are assigned. Prerequisites: CMPS 200 or EECE 230 and MATH 201. This course is equivalent to CMPS 251. Annually.

MATH 227  Numerical Linear Algebra 3.0; 3 cr.
Prime factorization, the Euclidean algorithm, congruences, quadratic reciprocity, some Diophantine equations, binary quadratic forms, and continued fractions. Prerequisite: MATH 219 or consent of instructor. Annually.

MATH 228  Linear Algebra II 3.0; 3 cr.
There are no prerequisites for this course.
BA in Mathematics

39 Credits in Mathematics

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic (9)</th>
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<tbody>
<tr>
<td>Lecture Courses</td>
<td>1. Required Arabic courses (3): ARAB 201 A or any General Education Arabic communication skills (3), as determined by placement. 1. Required English courses (usually 6): ENGL 203(3), and/or 204(3), as determined by placement. 1. Required mathematics courses (27): MATH 201(3), 210(3), 214(3), 221(3), 222(3), 223(3), 225(3), 241(3), and at least one of 220(3) or 242(3). 2. Required mathematics electives (12): MATH 202(3), and/or mathematics courses numbered 213 and above. 3. Required programming course (3): CMPS 200.</td>
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<tr>
<td>Seminar (0)</td>
<td>Laboratory (3)</td>
<td>Research (0)</td>
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BS in Mathematics

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<th>Natural Sciences (6)</th>
<th>Quantitative Thought (27+12+3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Courses</td>
<td>1. Required Arabic courses (3): ARAB 201 A or any General Education Arabic communication skills (3), as determined by placement. 2. Required English courses (usually 6): ENGL 203(3), and/or 204(3), as determined by placement. 1. Required mathematics courses (27): MATH 201(3), 210(3), 214(3), 221(3), 222(3), 223(3), 225(3), 241(3), and at least one of 220(3) or 242(3). 2. Required mathematics electives (12): MATH 202(3), and/or mathematics courses numbered 213 and above. 3. Required programming course (3): CMPS 200.</td>
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<tr>
<td>Seminar (0)</td>
<td>Laboratory (3)</td>
<td>Research (0)</td>
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</tbody>
</table>

BA in Applied Mathematics

39 credits in Mathematics

<table>
<thead>
<tr>
<th>English and Arabic (9)</th>
<th>Humanities (12)</th>
<th>Social Sciences (6)</th>
<th>Sciences (6)</th>
<th>Quantitative Thought (39+3)</th>
<th>Free Electives (9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Required Arabic courses (3): ARAB 201 A or any General Education Arabic communication skills (3), as determined by placement. 1. Required English courses (usually 6): ENGL 203(3), and/or 204(3), as determined by placement. 1. Required mathematics courses (27): MATH 201(3), 210(3), 214(3), 221(3), 222(3), 223(3), 225(3), 241(3), and at least one of 220(3) or 242(3). 2. Required mathematics electives (12): MATH 202(3), and/or mathematics courses numbered 213 and above. 3. Required programming course (3): CMPS 200.</td>
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BS in Applied Mathematics

39 credits in Mathematics

<table>
<thead>
<tr>
<th>English and Arabic (9)</th>
<th>Humanities (12)</th>
<th>Social Sciences (6)</th>
<th>Sciences (6)</th>
<th>Quantitative Thought (39+3)</th>
<th>Free Electives (15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Required Arabic courses (3): ARAB 201 A or any General Education Arabic communication skills (3), as determined by placement. 1. Required English courses (usually 6): ENGL 203(3), and/or 204(3), as determined by placement. 1. Required mathematics courses (27): MATH 201(3), 210(3), 214(3), 221(3), 222(3), 223(3), 225(3), 241(3), and at least one of 220(3) or 242(3). 2. Required mathematics electives (12): MATH courses numbered 211 and above. 3. Required Computer Science course (3): CMPS 250.</td>
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Statistics

STAT 201 Elementary Statistics for the Social Sciences 3.0; 3 cr. (Formerly MATH 207) Data organization and frequency distributions; measures of central tendency and dispersion; probability and random variables; binomial and normal distributions; correlation, regression, estimation, and hypothesis testing. Open only to arts students whose mathematical preparation does not allow them to take STAT 210. Students can get credit for only one of STAT 201, STAT 210, STAT 230, STAT 233, EDCU 227, or ECON 213. Each semester.
STAT 210  Elementary Statistics for the Sciences  3.0; 3 cr.  
(Formerly MATH 208) Populations, samples, and sampling error; types of data, frequency distributions, and graphical displays of data; empirical definition of probability and probability distributions; conditional probability, independence, Bayes' rule, and counting rules; discrete and continuous distributions, random variables, binomial, normal, and t distributions; point and interval estimation and hypothesis testing; linear regression and correlation. Computer packages may be used to illustrate methods. Students can get credit for only one of STAT 201, STAT 210, STAT 230, STAT 233, EDUC 227, or ECON 213. Each semester.

STAT 230  Introduction to Probability and Random Variables  3.0; 3 cr.  
Display of data, properties of probability, methods of enumeration, conditional probability, and independent events; discrete and continuous univariate distributions, generating functions, independent random variables, and the central limit theorem. Prerequisite: MATH 201. Students can get credit for only one of STAT 201, STAT 210, STAT 230, STAT 233, EDUC 227, or ECON 213. Each semester.

STAT 233  Advanced Probability and Random Variables  3.0; 3 cr.  
Axiomatic definition of probability, random variables, univariate and multivariate p.d.f. and c.d.f.; expectation; moment generating function; conditional distribution; families of discrete and continuous random variables; distribution of functions of random variables; stochastic convergence and convergence of distribution functions; the law of large numbers and the central limit theorem. Prerequisite: MATH 201. Students can get credit for only one of STAT 201, STAT 210, STAT 230, STAT 233, EDUC 227, or ECON 213. Annually.

STAT 234  Introduction to Statistical Inference  3.0; 3 cr.  
Sampling distribution; point and interval estimation; Neuman-Pearson theory of hypothesis testing; likelihood ratio test; sequential analysis; elementary decision theory. Prerequisite: STAT 233 or consent of instructor. Annually.

STAT 235  Applied Regression Analysis  3.0; 3 cr.  
Straight line regression, multiple regression, analysis of variance and analysis of covariance, multiple and partial correlation; hypothesis testing; confounding, interaction and regression diagnostics; discriminant and factor analysis. Prerequisite: STAT 234. Annually.

STAT 236  Sampling Techniques  3.0; 3 cr.  
Simple random, systematic, stratified, cluster, and two-stage sampling; estimation of parameters and properties of estimates; ratio and regression estimates; problem of non-response. Prerequisite: STAT 234. Annually.

STAT 237  Applied Nonparametric Methods  3.0; 3 cr.  
Order statistics; sign test, Wilcoxon signed-rank test, and Mann-Whitney test; run test and test for randomness; goodness of fit tests; efficiency. Prerequisite: STAT 234 or consent of instructor. Annually.

STAT 238  Applied Probability Models  3.0; 3 cr.  
Conditional probability and expectation; discrete and continuous time Markov chains; Chapman-Kolmogorov difference and differential equations; limiting probabilities; branching, Poisson, and birth and death processes; distribution of arrival times; queueing theory. Prerequisite: STAT 233 or consent of instructor. Annually.

BA in Statistics

36 Credits in Statistics/Mathematics

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic (9)</th>
<th>Humanities (12+3)</th>
<th>Social Sciences (6)</th>
<th>Natural Sciences (6)</th>
<th>Quantitative Thought (9+18+9+3)</th>
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<tbody>
<tr>
<td>Lecture Courses</td>
<td>(9+15+4=39)</td>
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<tr>
<td>1. Required Arabic courses (3): ARAB 201 A or any General Education Arabic communication skills (3) as determined by placement.</td>
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<td>2. Required English courses (usually 4 cr.): ENGL 203(3), 204(3) as determined by placement.</td>
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<td>3. Required credits in the humanities: 12 credits including 6 credits from CSFP</td>
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<td>4. Required courses (6):</td>
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<td>5. Required Electives (6):</td>
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<td>6. Required mathematics courses (9): MATH 201(3), 210(3), 219(3)</td>
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<tr>
<td>8. Elective MATH/STAT/CMPS (6): Courses numbered 210 and above, excluding STAT 230</td>
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<tr>
<td>9. Required programming course (6): CMPS 200(3)</td>
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Seminar (0)  
Laboratory (0)  
Research Project (0)  

CMPS 200

1 May be from the humanities.  
2 CMPS 200 is a 4-credit course with 3 lecture hours (3 credits) and 3–4 lab hours (1 credit) per week.

BS in Statistics

36 Credits in Statistics/Mathematics

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<th>Modes of Analysis</th>
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<td>1. Required Arabic course (3): ARAB 201 A or any General Education Arabic communication skills (3) as determined by placement.</td>
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<td>2. Required English courses (6 cr.): ENGL 203(3), 204(3) as determined by placement.</td>
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<tr>
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<td>4. Required courses (6):</td>
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<td>5. Required Electives (9):</td>
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<tr>
<td>6. Required mathematics courses (9): MATH 201(3), 210(3), 219(3)</td>
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<tr>
<td>8. Elective MATH/STAT/CMPS (6): Courses numbered 210 and above, excluding STAT 230</td>
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<td>9. Required programming course (6): CMPS 200(3)</td>
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</table>

Seminar (0)  
Laboratory (0)  
Research Project (0)  

CMPS 200
Department of Philosophy

Chairman: Brassier, Ray
Professor Emeritus: Fakhry, Majid
Professor: Haydar, Bashshar H.
Associate Professors: Nasr, Waddah N.; Brassier, Ray
Assistant Professors: Andresen, Joshua P.; Bashour, Bana M.; Johns, Christopher; Lewtas, Patrick K.; Muller, Hans D.
Lecturer: Barakat, Karim; Hassan, Hani; Kahlil, Rula; Mosley, Matthew; Saleh, Agha J.
Instructors: Samaha, Raed

The Department of Philosophy offers programs leading to the degrees of Bachelor of Arts and Master of Arts in Philosophy. Requirements for transfer to the department include approval by the department, and a grade of 70 or more in any two humanities courses (excluding the communication skills requirements in Arabic and English).

Mission Statement
The undergraduate program in Philosophy provides students with a knowledge of key historical and contemporary philosophers and philosophical problems, together with a range of answers to those problems. They promote respect for clarity, truth, critical reflection and rational argument. They promote independence and of thought rooted in a fair-minded understanding of opposing views. They strive to equip students with the knowledge and skills needed to navigate relevant portions of the contemporary philosophical terrain; competence at critical analysis; and the ability to write about abstract issues in a clear, nuanced and compelling manner. Both programs also seek to impart an awareness of the application of philosophical thought to other academic disciplines or to matters of public interest, encouraging students to apply their philosophical skills more widely.

BA in Philosophy
Students majoring in philosophy are required to take a total of at least 36 credits of philosophy courses, which must include PHIL 210 and PHIL 211, and two of PHIL 213, PHIL 214, and PHIL 225. Students should also choose, under the supervision of the department, a balanced program of systematic and historical courses. In fulfillment of university requirements majors must also take the following:

- Language Requirements: English 6 credits; Arabic 3 credits.
- General Education Requirements: Humanities 12 credits (including six credits of CVSP); Social Sciences 6 credits; Natural Sciences 6 credits; Quantitative Thought 3 credits.

Students choosing a minor in philosophy are required to take a total of fifteen credits in philosophy, including two of the following courses: PHIL 210, PHIL 211, PHIL 213, and PHIL 214.

PHIL 101 Applied Philosophy 3.0; 3 cr.
A course that deals with philosophical questions which have practical import; it aims to introduce students to the philosophical mode of analysis. Each semester.

PHIL 102 Philosophical Classics 3.0; 3 cr.
An introduction to the thought of some major figures in the history of philosophy. Each semester.

PHIL 201 Introduction to Philosophy 3.0; 3 cr.
An introduction to philosophy and its methods through an analysis of traditional issues in ethics, epistemology, metaphysics, and the philosophy of religion. Each semester.

PHIL 205 Bio-Medical Ethics 3.0; 3 cr.
A philosophical examination of a number of ethical topics in the field of biology and medicine, such as abortion, physician-assisted suicide, eugenics, genetic engineering, allocation of medical resources, experimentation on animals and humans, and so on. Annually.

PHIL 206 Business Ethics 3.0; 3 cr.
A philosophical examination of a number of ethical topics arising in the areas of business and management, such as fraud and corruption, product safety, insider trading, honesty in advertising, discriminatory hiring practices, and so on. Offered occasionally.

PHIL 209 Environmental Ethics 3.0; 3 cr.
An attempt to identify and discuss the major ethical and philosophical aspects of issues related to the environment and to determine the environment-related responsibilities and obligations incurred by people at the individual and collective levels. Annually.

PHIL 210 Ethics 3.0; 3 cr.
An introduction to some of the major normative ethical theories based on the study of the original writings of selected philosophers, including a section on applied ethics. Each semester.

PHIL 211 Introduction to Logic 3.0; 3 cr.
A first introduction to formal and informal logic, including argument analysis, informal fallacies, natural deduction methods in propositional and first-order predicate logic. Each semester.

PHIL 212 History of Ancient and Medieval Philosophy 3.0; 3 cr.
A survey of ancient and medieval philosophy from the pre-Socratics to Aquinas. Annually.

PHIL 213 History of Modern Philosophy 3.0; 3 cr.
A survey of early modern philosophy, from Descartes to Kant. Annually.

PHIL 214 Nineteenth Century Philosophy 3.0; 3 cr.
An introductory survey of post-Kantian philosophy, with emphasis on Fichte, Schelling, Hegel, Schopenhauer, Kierkegaard, and Nietzsche. Alternate years.

PHIL 216 Political Philosophy 3.0; 3 cr.
An examination of the main issues of political philosophy, such as political obligation, justice, political rights, and other issues. Students cannot receive credit for both PHIL 216 and PSIA 210. Prerequisite: One previous course in philosophy, or consent of instructor. Alternate years.

PHIL 217 Aesthetics 3.0; 3 cr.
An examination of the central problems and issues that arise in the interpretation, analysis, and evaluation of works of art. Prerequisite: One previous course in philosophy, or consent of instructor. Alternate years.
PHIL 218  Metaphysics and Epistemology  3.0; 3 cr.
An investigation of the most fundamental concepts involved in our thoughts about the world, including the nature of truth, knowledge, causality, substance, space, and time. Prerequisite: One previous course in philosophy, or consent of instructor. Alternate years.

PHIL 219  Existentialism  3.0; 3 cr.
An introduction to existentialist philosophy, within the context of nineteenth-century and twentieth-century philosophy. Prerequisite: One previous course in philosophy, or consent of instructor. Alternate years.

PHIL 220  Symbolic Logic  3.0; 3 cr.
A study of the axiomatization and the meta-theory of classical propositional and predicate logic, first-order theories, as well as related philosophical issues. Prerequisite: PHIL 211. Offered occasionally.

PHIL 221  Philosophy of Mind  3.0; 3 cr.
An introductory examination of contemporary accounts of the nature of the mental and of psychological explanation. Prerequisite: One previous course in philosophy, or consent of instructor. Alternate years.

PHIL 222  Philosophy of Science  3.0; 3 cr.
An introduction to the philosophical problems and issues that arise in the attempt to understand the nature of science. Prerequisite: One previous course in philosophy, or consent of instructor. Alternate years.

PHIL 223  Philosophy of Language  3.0; 3 cr.
An introductory examination of various contemporary accounts of the nature of language and meaning. Prerequisite: One previous course in philosophy, or consent of instructor. Alternate years.

PHIL 224  Philosophy of Religion  3.0; 3 cr.
An in-depth survey of the main philosophical questions connected to religion, including questions about religion as a feature of human experience, as well as questions connected to the nature of God, evil, free will, and so on. Prerequisite: One previous course in philosophy, or consent of instructor. Alternate years.

PHIL 225  History of Moral Philosophy  3.0; 3 cr.
A survey of some major historical traditions in moral philosophy, including at least one figure from ancient or medieval philosophy, and at least one figure from modern philosophy. Prerequisite: One previous course in philosophy, or consent of instructor. Alternate years.

PHIL 226  Ethical Theory  3.0; 3 cr.
An examination of some theories about the moral status of actions or character, or about the overall nature of morality itself. Prerequisite: One previous course in philosophy, or consent of instructor. Alternate years.

PHIL 230  Philosophy of Plato  3.0; 3 cr.
An introduction to some of Plato’s major dialogues. Prerequisite: One previous course in philosophy, or consent of instructor. Offered occasionally.

PHIL 231  Philosophy of Aristotle  3.0; 3 cr.
An introductory examination of the physics, metaphysics, logic, ethics, and politics of Aristotle. Prerequisite: One previous course in philosophy, or consent of instructor. Offered occasionally.

PHIL 232  Islamic Philosophy  3.0; 3 cr.
An examination of the philosophical and religious thought of the major philosophers of Islam. Offered either in Arabic or in English. Prerequisite: One previous course in philosophy, or consent of instructor.

PHIL 249  Philosophy of Feminism  3.0; 3 cr.
An examination of philosophical issues relating to gender relations and the foundations of feminist theory; issues addressed primarily involve the ethical or epistemological content of feminist theory. Prerequisite: One previous course in philosophy, or consent of instructor.

PHIL 250  Special Topics in Logic  3.0; 3 cr.
Prerequisite: Two previous courses in philosophy or consent of instructor. May be repeated for credit. Offered occasionally.

PHIL 251  Special Topics in Ethics  3.0; 3 cr.
Prerequisite: Two previous courses in philosophy or consent of instructor. May be repeated for credit. Offered occasionally.

PHIL 252  Special Topics in Political Philosophy  3.0; 3 cr.
Prerequisite: Two previous courses in philosophy or consent of instructor. May be repeated for credit. Offered occasionally.

PHIL 253  Special Topics in Aesthetics  3.0; 3 cr.
Prerequisite: Two previous courses in philosophy or consent of instructor. May be repeated for credit. Offered occasionally.

PHIL 254  Special Topics in Metaphysics  3.0; 3 cr.
Prerequisite: Two previous courses in philosophy or consent of instructor. May be repeated for credit. Offered occasionally.

PHIL 255  Special Topics in Epistemology  3.0; 3 cr.
Prerequisite: Two previous courses in philosophy or consent of instructor. May be repeated for credit. Offered occasionally.

PHIL 256  Special Topics in the Philosophy of Science  3.0; 3 cr.
Prerequisite: Two previous courses in philosophy or consent of instructor. May be repeated for credit. Offered occasionally.

PHIL 257  Special Topics in the Philosophy of Language  3.0; 3 cr.
Prerequisite: Two previous courses in philosophy or consent of instructor. May be repeated for credit. Offered occasionally.

PHIL 258  Special Topics in the Philosophy of Mind  3.0; 3 cr.
Prerequisite: Two previous courses in philosophy or consent of instructor. May be repeated for credit. Offered occasionally.

PHIL 260/261  Special Topics in the History of Philosophy  3.0; 3 cr.
Prerequisite: Two previous courses in philosophy or consent of instructor. Offered occasionally.

PHIL 262/263  Special Topics in Contemporary Philosophy  3.0; 3 cr.
Prerequisite: Two previous philosophy courses or consent of instructor. Offered occasionally.

PHIL 271/272  Directed Studies in Philosophy  3-6 cr.
Prerequisite: Consent of Instructor. Offered on demand.
### 24 + 12 Credits in Philosophy

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic (9)</th>
<th>Humanities (12+12+24)</th>
<th>Social Sciences (6)</th>
<th>Natural Sciences (6)</th>
<th>Quantitative thought (3)</th>
</tr>
</thead>
</table>
| Lecture Courses (9+12+36) | 1. Required Arabic course: ARAB 201 A or any General Education Arabic communication skills (5)  
2. Required English courses: ENGL 203(3), 204(3) | 1. Required credits in the humanities: 12 credits including 6 credits from CVSP (see pp. xxx–xx)  
2. Four required philosophy courses (12): PHIL 210(3), 211(3), two courses from the following: 213(3), 214(3) 225(3)  
Elective philosophy courses: PHIL 250(3), 251(3), 252(3), 253(3), 254(3), 255(3), 256(3), 257(3), 258(3), 259(3), 260(3), 261(3), 262(3), 263(3) | Electives (min 6) | Electives (min. 6): recommended is a course in computer literacy | Elective (min 6) |
| Seminar (33) | | | | | |
| Laboratory (0) | | | | Computer Lab (3) | |
| Research Project (93) | PHIL 210, 213–224, 230–232, 249–263 | | | | |
Department of Physics

Chairperson: Isber, Samih T.
Professors: Bitar, Khalil M.; Chamseddine, Ali H.; El Eid, Mounib F.; Isber, Samih T.; Klushin, Leonid I.; Sabra, Wafic A.; Tabbal, Malek D.; Touma, Jihad R.
Associate Professors: Antar, Ghassan Y.; Christidis, Theodore C.
Assistant Professor: Kazan, Michel J.
Lecturers: "Bodakian, Berjouhi H.; Ghamlouche, Hasan J; Roumieh, Mohammad A.; Said, Aurore J.

BS in Physics

Mission Statement

The program leading to the Bachelor of Science emphasizes the fundamental concepts and principles of physics and their roles in a variety of disciplines, in a liberal arts setting. The educational focus of the Physics Department is to provide the students with high quality instruction in theoretical and experimental Physics. Consequently, theoretical courses, together with computer modeling experience and a comprehensive set of laboratory experiments, introduce the students to various methods of inquiry and research in physics. The emphasis is not only on subject instruction, but also on the development of communication and teamwork skills, as well as critical and analytical thinking. The program is designed to graduate well-rounded, free-thinking individuals with inquisitive minds who are well prepared for further study in basic and applied research and are capable of pursuing professional careers in a variety of diverse fields.

The Department of Physics offers courses at the undergraduate level leading to a bachelor's degree in physics.

The requirements for a BS in Physics are 90 credits for students entering at the sophomore level. The distributions of these courses are as follows:

Department Requirements

- 36 credits in Natural Sciences (24 credits required Physics courses; 6 credits elective Physics courses; 6 credits required Physics Lab courses).
- 37 credits if PHYS 228 is chosen as an elective.
- 12 credits in Quantitative Thought (9 credits in Math; 3 credits in CMPS 200 or EECE 230).
- 15 credits in free electives
University Requirements

- Language Requirements: 9 credits in Language requirements (3 credits in Arabic; 6 credits in English - Eng. 203 and Eng. 204).

- General Education Requirements that include 12 credits in Humanities (including 6 credits in CVSP), 6 credits in Social Sciences. Also note that one natural science must be an approved General Education course from outside the major.

The program for the physics major includes the following required courses: PHYS 210, PHYS 210L, PHYS 212, PHYS 217, PHYS 220, PHYS 221L, PHYS 222, PHYS 235, PHYS 236, and PHYS 257L. Moreover, two elective courses must be selected from PHYS 223, PHYS 228/228L, PHYS 231, PHYS 232, PHYS 248, PHYS 249. Also required are the following courses in mathematics: MATH 101, MATH 102, CMPS 200, MATH 201, MATH 202, and MATH 212.

Physics majors whose physics average falls below 70 or whose cumulative average in Math 201 and 202 is below 70 after three semesters in the major, will be dropped from the department.

The minor in physics requires 17 credits: PHYS 210, PHYS 211, PHYS 212, PHYS 221L or (PHYS 210L and PHYS 211L) and six more credits in physics selected from the following: PHYS 217, PHYS 220, PHYS 223, PHYS 222, PHYS 231, PHYS 235, PHYS 236.

Physics majors whose physics average falls below 70 or whose cumulative average in Math 201 and 202 before they are allowed to proceed to junior level courses.

Students who wish to transfer to physics must obtain a cumulative average of at least 70 in the physics courses normally taken in the sophomore year (PHYS 210, PHYS 210L, PHYS 212) and a cumulative average of at least 70 in MATH 201 and 202.

Students shall receive credit for only one of PHYS 101 or PHYS 103.

PHYS 103 Physics for the Life Sciences 3.0; 3 cr.
Units and dimensions, scalars and vectors, kinematics in one and two dimensions, dynamics, work and energy, collisions, gravitation, and rotational motion. Each semester. Students shall receive credit for only one of PHYS 101 or PHYS 103.

PHYS 200 Understanding the Universe 3.0; 3 cr.
An introductory course in astronomy. Basic astronomical tools, properties of the earth, solar system, sun, electromagnetic radiation, properties and evolution of stars, and the Milky Way galaxy. Annually. Students cannot receive credit for PHYS 200 and PHYS 204 or 205 or 210 or 211 or 212.

PHYS 204 Classical Physics for Life Sciences 3.0; 3 cr.
Fluids, heat and heat engines, gas dynamics, wave phenomena, and sound and light. Prerequisite: PHYS 103 (or equivalent). Annually.

PHYS 204L Classical Physics for Life Sciences Laboratory 0.2; 1 cr.
Techniques of laboratory work, surface tension, coefficient of viscosity, gas thermometer, Boyle's law, adiabatic compression of gases, mechanical equivalent of heat, waves on a stretched string, standing waves in air columns, geometrical optics I: reflection and refraction, geometrical optics II: mirrors and lenses, Michelson interferometer, and interference and diffraction. Pre- or co-requisite: PHYS 204. Annually.

PHYS 205 Modern Physics for Life Sciences 3.0; 3 cr.
Electricity: electric field and electric potential, electrical current and circuits, and capacitance. Magnetism: magnetic field, magnetic materials, electromagnetic induction, electromagnetism applied to biological systems, introduction to special relativity, atomic and atomic structure, nuclear, and radioactivity. Prerequisite: PHYS 103 (or equivalent). Annually.

PHYS 205L Modern Physics for Life Sciences Laboratory 0.2; 1 cr.
Electric field mapping, capacitance and dielectric constants, basic oscilloscope operations, Wheatstone bridge, RC and RL circuits, measurements of magnetic induction fields, measurement of the charge to mass ratio of electrons, RC and RLC-circuits, Ohm's law, Planck's constant, atomic spectroscopy, and classical scattering. Pre- or co-requisite: PHYS 205. Annually.

PHYS 210 Introductory Physics I 3.1; 3 cr.
Review of classical mechanics, fluid statics, fluid dynamics, temperature, heat and first law of thermodynamics, kinetic theory of gases, heat engines, entropy and second law of thermodynamics, general properties of waves, sound waves and resonances, light and optics, interference, diffraction, and polarization. Pre- or co-requisite: MATH 201. Each semester.

PHYS 210L Introductory Physics Laboratory I 0.2; 1 cr.
Surface tension, gas thermometer, mechanical equivalent of heat, Boyle's law, adiabatic compression of gases, measurement of gamma for air and fluid gas, standing waves on a stretched string, standing waves in air columns, geometrical optics: law of refraction and prism, mirrors and lenses, interference and diffraction, the spectrometer, and polarization. Pre- or co-requisite: PHYS 210. Each semester.

PHYS 211 Electricity and Magnetism 3.0; 3 cr.

PHYS 211L Electricity and Magnetism Laboratory 0.2; 1 cr.
Electric fields, capacitance and dielectric constant measurements, construction and calibration of ammeter and a voltmeter, electrical circuits, Wheatstone bridge, potentiometer, Thomson's experiment, measurement of the force between two parallel current-carrying conductors, measurement of magnetic induction fields, basic oscilloscope operations, RL, RC, and RLC circuits. Pre- or co-requisite: PHYS 211. Each semester.
PHYS 212  Modern Physics  3.0; 3 cr.
Special theory of relativity, introductory quantum mechanics, atomic physics, nuclear physics, and introduction to elementary particles and cosmology. Pre- or co-requisite: MATH 201. Each semester. Students cannot receive credit for both PHYS 212 and CHEM 218.

PHYS 217  Mechanics  3.0; 3 cr.

PHYS 220  Electromagnetic Theory  3.0; 3 cr.
Electrostatics: electric potential, Gauss’ law, Poisson’s and Laplace’s equations, boundary conditions, electric currents, Faraday’s law, Lenz’s law, mutual inductance. Maxwell’s equations, and propagation of electromagnetic waves. Prerequisite: MATH 202. Annually.

PHYS 221L  Junior Laboratory  0.4; 2 cr.
A course of experiments selected from the topics of diffraction, e/m ratio, magnetic field, RL, RC, RLC circuits, ohmic and non-ohmic devices, atomic spectroscopy, Milikan’s experiment, Frank-Hertz experiment, speed of sound, gravitational acceleration, Planck’s constant, and physical optics. Prerequisite: Junior standing. Annually.

PHYS 222  Computational Physics  0.3; 3 cr.

PHYS 223  Physical Optics  3.0; 3 cr.
Wave theory of light, Maxwell’s equations, superposition and polarization, interference, interferometers, diffraction, coherence, lasers, and holography. Annually.

PHYS 225  Introduction to Astronomy and Astrophysics  3.0; 3 cr.
Observation and instruments, photometry and magnitudes, radiation mechanisms, celestial mechanics, stellar spectra and structure, stellar evolution, Milky Way, galaxies, cosmology. Pre or co-requisites: MATH 201, MATH 202, and PHYS 210. Annually.

PHYS 226  Solid State Physics  3.0; 3 cr.
Electrons in one-dimensional periodic lattice, vibrations in one-dimensional periodic lattice, geometrical description of crystals, free-electron theory in metals, excitons, plasmons, polarons, lattice dynamics, semi-conductors, magnetic ordering, superconductivity, and electron gas in a magnetic field. Prerequisites: PHYS 225 and PHYS 226. Annually.

PHYS 228  Electronics  3.0; 3 cr.
DC linear circuits, capacitors, inductors and transients, periodic waveforms, diodes, power supplies, operational amplifier, logic gates, timers, multiplexers, flip-flops, and counting circuits. Annually. Fall semester. Students may not get credit for this course unless they pass PHYS 228L.

PHYS 228L  Electronics Laboratory  0.3; 1 cr.
DC measurements, periodic waveforms, power supplies, transients, frequency and period measurements, operational amplifiers, and some digital circuits. Pre- or co-requisite: PHYS 228. Each semester.

PHYS 231  Special Topics  3.0; 3 cr.
May be repeated for credit. Prerequisite: Consent of department.

PHYS 232  Special Topics  3.0; 3 cr.
May be repeated for credit. Prerequisite: Consent of department.

PHYS 235  Statistical Physics  3.0; 3 cr.
Boltzmann distribution, Gibbs distribution, thermal radiation, heat and work, kinetic theory of gases, entropy and temperature, statistical mechanics of semiconductors; kinetics of chemical reactions, and phase transitions. Prerequisite: PHYS 210. Annually.

PHYS 236  Quantum Mechanics  3.0; 3 cr.
Fundamental concepts: Bras, Kets, matrix representation of operators, change of basis; quantum dynamics: time evolution of quantum mechanical systems, spin; translational and rotational symmetry: Schrödinger equation in one and three dimensions; spherical symmetric systems; three-dimensional oscillator, hydrogen atom; theory of angular momentum; rotation operator, addition of angular moments; time-independent perturbation theory, Zeeman effect, Stark effect, spin-orbit coupling, time-dependent perturbation theory, variational methods. Prerequisites: MATH 212 or MATH 224 (or equivalent) and PHYS 212. Annually.

PHYS 237  Introduction to Plasma Physics  3.0; 3 cr.

PHYS 248  Undergraduate Seminar  1.0; 1 cr.
Prerequisite: Senior standing. Annually.

PHYS 249  Nuclear and Elementary Particle Physics  3.0; 3 cr.
Introduction to scattering theory, nuclear phenomenology, nuclear models, nuclear radiation and fission and fusion, detectors and accelerators, properties of elementary particles, symmetries and transformations, and the standard model of elementary particles. Prerequisites: Senior standing or consent of department. Annually.

PHYS 257L  Advanced Laboratory  0.6; 3 cr.
A weekly lecture on instrumentation and a selection of six to eight experiments from the following list: transient and steady states of SH-oscillator, coupled oscillators bridge circuits, speed of sound in liquid, prism spectrometer, Frank–Hertz experiment, Planck constant, Currie temperature, magnetic susceptibility, measurement of gravitational acceleration, speed of light, Milikan’s drop oil experiment, the Hall effect, optics, the Faraday effect, and nuclear magnetic resonance. Prerequisite: PHYS 221L. Annually.

PHYS 228L  Electronics Laboratory  0.3; 1 cr.
DC measurements, periodic waveforms, power supplies, transients, frequency and period measurements, operational amplifiers, and some digital circuits. Pre- or co-requisite: PHYS 228. Each semester.
36 Credits in Physics

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic (9)</th>
<th>Humanities (12)</th>
<th>Social Sciences (6)</th>
<th>Natural Sciences (36)</th>
<th>Quantitative Thought (12)</th>
</tr>
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</table>
| Lecture Courses   | 1. Required Arabic courses: ARAB 201A or any General Education Arabic communication skills (3)  
2. Required English courses (6): ENGL 203(3), 204(3) | Required credits in the humanities: 12 credits including 6 credits from CVSP (see CVSP requirements under Civilization Sequence Program) | Two courses: The Department recommends that at least one of them is a level-200 Economics course | 1. Required physics courses (24): PHYS 210(3), 212(3), 217(3), 220(3), 222(3), 226(3), 235(3), 236(3)  
2. Two elective physics courses (6): PHYS 228 + 228L (3+1), 223(3), 231(3), 232(3), 249(3), or other selected topics in physics | Required mathematics and technology courses (12 or 13): MATH 201(3), 202(3), 212(3), CMPS 200(3), or EECE 230(3) |
| Seminar (1)       | PHYS 248(1)            |                 |                     |                       |                          |
| Laboratory (6)    | Required Physics Labs: PHYS 210L(1), 221L(2), 257L(3) |                 |                     |                       |                          |
| Research Project  | The following courses may include a research project: PHYS 222, 226, 231, 232, 235, 236, 249 |

1 Students may not get credit for this course unless they pass PHYS 228L
Department of Political Studies and Public Administration (PSPA)

Chairperson: Hamati-Ataya, Inanna
Professors: El Khazen, Farid E.; Khashan, Hilal A.; Moussalli, Ahmad S.; Waterbury, John
Visiting Professor: Hanf, Theodor
Associate Professor: Meho, Lokman I.
Assistant Professors: Frangie, Samer; Haase, Thomas W.; Hamati-Ataya, Inanna; Hazbun, Walied; Khodr, Hiba; Makdisi, Karim S.; Pison Hindawi, Coralie; Reiche, Danyel
Lecturers: Antoun, Randa D.; Geukjian, Ohannes; Kreidie, Lina; Masri, Shafic H.; Nakib, Khalil A.; Nizameddin, Talal
Instructors: Bluhm, Michael; Bitar-Ghanem, George N.; Geha, Carmen; Goksel, Timor M.; Hankir, Samer; Jurdi, Nidal; Kheir, Wael N.; Saade, Bechir

The Department of Political Studies and Public Administration (PSPA) offers courses covering four sub-disciplines and two major programs: one leading to the degree of Bachelor of Arts in Political Studies, and one leading to the degree of Bachelor of Arts in Public Administration. Students wishing to major in PSPA must secure and maintain the approval of the department and must satisfy the conditions detailed below. Acceptance to the department is subject to the availability of places.

Mission Statements

The mission of the BA program in Political Studies at AUB is to provide students with an understanding of the political ideas, institutions and processes that inform, shape, and regulate domestic and international politics. The core curriculum is designed to engage students in the critical analysis and assessment of the political world, and help them acquire the intellectual, practical and moral skills that are necessary for their development as future academics, civil servants, and responsible citizens. The program is committed to serving the university’s liberal arts model of higher education, and provides students with the intellectual means to understand and reflect on major political issues that define their individual and communal life.

The mission of the BA program in Public Administration is to educate students, and help them develop and enhance knowledge and skills in the discipline of public administration. This includes teaching students to become innovative leaders by developing their managerial and analytic skills, and thereby preparing them for professional success. The program is designed to provide students...
with in-depth knowledge and training that are geared towards the building of a generalist, academic, professional, and ethical background, and to enhance students’ decision-making, analytical and interpersonal skills. This is to prepare them to enter public, non-profit and related sectors. We aim at increasing students to carry out the political, constitutional, legal, economic, social, cultural, and organisational environments that influence the organizations within which they will work.

Graduation Requirements

Transfers to the PSPA major require a grade of 70 in PSPA 201 and PSPA 202, plus a minimum of combined grade average of 70 in ENGL 203 and ENGL 204.

University Requirements

Language requirements: six credits of English and three of Arabic.

General Education requirements: 12 credits in the humanities including six credits of CVSP; six credits in the social sciences; six credits in the natural sciences and six credits in quantitative thought.

Major Courses: 39 credits of PSPA courses, both for PS and PA majors.

Students majoring in Political Studies are required to complete 39 credits in the department, which must include PSPA 201, PSPA 202, PSPA 203, PSPA 210, PSPA 211, PSPA 213, and either PSPA 253 or PSPA 256. Six additional courses, including one senior seminar, are required.

Students majoring in Public Administration are required to complete 39 credits in the department, which must include PSPA 201, PSPA 202, PSPA 203, PSPA 212, PSPA 273, PSPA 276, and PSPA 277. Six additional courses are required, among which four courses should be taken in one of the sub-fields (Public Management or Public Policy) and the remaining two courses in the other sub-field. The Public Management courses are PSPA 257, 258, 259, 272, 275, 278 and 297. The Public Policy courses are PSPA 260, 261, 262, 263, and 298. One of these courses should be a senior seminar (PSPA 297 or PSPA 298).

All PSPA majors are required to complete PSPA 201, PSPA 202, and PSPA 203 by the end of their second semester in the program.

PSPA majors are required to take the following courses outside the department: one Economics course from the approved General Education list, CMPS 206 or 209, an introductory course in statistics: STAT 201, and one course from either SOAN 201 or PSYC 202. PSPA students may not take an introductory course in statistics until completing PSPA 203. All PSPA majors must complete the introductory course in statistics by the end of their fourth semester in the program. Majors are expected to choose, in consultation with their advisers, a number of electives from the humanities and social sciences. All PSPA students must take ENGL 203 before the beginning of their second semester in the program; and ENGL 204 by the end of their third semester in the program.

Minor in PSPA

Students choosing a minor in Political Studies are required to take a minimum of 15 credits. The requirements are PSPA 201; one of the following: PSPA 210, PSPA 211, or PSPA 213; and any three upper level courses from the following list: PSPA 214, PSPA 215, PSPA 216, PSPA 217, PSPA 218, PSPA 219, PSPA 221, PSPA 222, PSPA 223, PSPA 225, PSPA 228, PSPA 229, PSPA 231, PSPA 232, PSPA 233, PSPA 234, PSPA 235, PSPA 236, PSPA 237, PSPA 238, PSPA 239, PSPA 250, PSPA 251, PSPA 252, PSPA 253, PSPA 254, PSPA 255, or PSPA 256.

Students choosing a minor in Public Policy are required to take a minimum of 15 credits. The requirements are PSPA 201, PSPA 276, PSPA 298; plus two upper-level courses from the following list: PSPA 223, PSPA 225, PSPA 228, PSPA 229, PSPA 230, PSPA 235, PSPA 273, PSPA 276, PSPA 278, PSPA 293, PSPA 297, PSPA 298, or PSPA 299.

PS majors choosing to minor in Public Administration are required to take at least 15 credits from any upper-level course in public administration. PS majors choosing to minor in Public Policy are required to take PSPA 276, PSPA 298, plus three upper-level courses from the following list: PSPA 223, PSPA 225, PSPA 228, PSPA 229, PSPA 230, PSPA 250, PSPA 259, PSPA 260, PSPA 261, PSPA 262, PSPA 263, PSPA 266, or PSPA 277.

PA majors choosing to minor in Political Studies are required to take at least 15 credits from any upper-level course in Political Studies. PA majors choosing to minor in Public Policy are required to take PSPA 298, plus four upper-level courses from the following list: PSPA 223, PSPA 225, PSPA 228, PSPA 229, PSPA 230, PSPA 250, PSPA 259, PSPA 260, PSPA 261, PSPA 262, PSPA 263, PSPA 266, PSPA 277, or PSPA 278.

No courses taken for a major may be counted toward a minor; and vice versa.

PSPA 101 Issues in Contemporary Politics 3.0; 3 cr.
A course that examines the global context of politics, focusing on the changing world order in the twentieth century. Special attention is given to themes like democratization, civil society, ethnic conflict, human rights, and globalization. Each semester.

PSPA 201 Introduction to Political Science 3.0; 3 cr.
An introduction to the study of politics with emphasis on the basic concepts, ideas, and issues relating to the process of government in the modern state. Each semester.

PSPA 202 Introduction to Public Administration 3.0; 3 cr.
A course on the nature of public administration. Basic concepts, processes, and approaches in the field of public administration are introduced so that the student develops an appreciation for the role of public administration in modern society. Each semester.

PSPA 203 Research Methods 3.0; 3 cr.
A course that focuses on the problems involved in asking and answering questions about political science and public administration. This course presents the various analytical frameworks and methodological tools used for this purpose with emphasis on empirical approach, data collection, and analysis. Students cannot receive credit for both SOAN 210 and PSPA 203. Each semester.

PSPA 209 Politics of Language 3.0; 3 cr.
A course designed to explore the political aspects of language in a variety of different contexts such as politics, media, gender relations, and ethnicity. This course prepares students for writing and critical thinking activities in upper-level PSPA courses. Occasionally.
PSPA 210 Introduction to Political Thought 3.0; 3 cr.
An introduction to the main Western and Islamic traditions in political philosophy and political theory. This course will count as a humanities, not a social science course. Students cannot receive credit for both PSPA 210 and PHIL 216. Each semester.

PSPA 211 Introduction to Comparative Politics 3.0; 3 cr.
A survey of concepts and issues in comparative politics. This course acquaints the student with basic theoretical frameworks for the study and analysis of political phenomena, and establishes criteria for comparing political systems. This course also closely examines the application of these concepts, frameworks, and criteria in selected countries. Each semester.

PSPA 212 Contemporary Trends in Public Administration and Management 3.0; 3 cr.
A course that deals with the contemporary transformation of the public sector and its relationship with government and society. This course evaluates managerialism in the public sector, privatization, and entrepreneurial government. Each semester.

PSPA 213 Introduction to International Politics 3.0; 3 cr.
A survey of the basic forces and factors determining relations among states, with special emphasis on the international system, foreign policy, national power, the restraints on determinants of state action, contemporary problems and major issues faced by states, and the patterns of interaction that prevail among states. Each semester.

PSPA 214 Early and Mediaeval Islamic Thought 3.0; 3 cr.
The course is an introduction to early and classical Islamic political thought. It focuses on the history, origins, developments and objectives of Islamic political history, theology, jurisprudence and politics as they relate to the state, society, and relations with non-Muslims. The course analyzes the essential concepts and events that make the political core doctrines of Islam: a political system, a political theology and ideology, and a theory of international relations. Comparisons and contrasts between different Islamic schools are to be made and explored. This course will count as a humanities, not a social science course. Annually.

PSPA 215 Modern Islamic Thought 3.0; 3 cr.
The course is a survey that focuses on major political and ideological issues in the modern world of Islam and deals analytically with the major doctrines, movements, and trends that have been developed during the 19th and 20th centuries. The course starts with the discussion of the ideological and political doctrines of Islamic reformers, then moves to discuss the rise of Islamic movements and their ideologies. Issues like Islamic government, state, religion, revolution, nationalism, and relations with the West, are to be discussed. This course will count as a humanities, not a social science course. Annually.

PSPA 216 Western Political Thought from Antiquity to the Renaissance 3.0; 3 cr.
A survey of the main Western traditions, philosophies, and themes in political thought from Greek Antiquity to the Renaissance. The course will combine an in-depth analysis of the main philosophical concepts of the past that are still relevant to contemporary political thought and politics, with a historical analysis of the intellectual, social, and political context in which they emerged and for which they were constructed. Special focus will be given to the Greek polis and the emergence of a discourse on democracy, the relationship between politics and ethics, the search for good government and the just society, and the shift to early Realism in the context of the emergence of the modern state in Europe. This course will count as a humanities, not a social science course. Annually.

PSPA 217 Modern and Postmodern Western Political Thought 3.0; 3 cr.
A survey of the main Western traditions, philosophies, and themes in political thought from early European Modernity and the Enlightenment to the contemporary era, including Postmodern philosophies. The course will combine an in-depth analysis of the modern and postmodern paradigms in political philosophy, with a historical analysis of the intellectual, social and political context that led to the critique of the modern nation-state, nationalism, and democracy, and the search for new normative orders. This course will count as a humanities, not a social science course. Annually.

PSPA 218 Social Theories 3.0; 3 cr.
A survey of the main social theories that have contributed to an empirical understanding of the political at different levels of analysis and from different conceptual frameworks. The course will emphasize an interdisciplinary approach, through a comparison of theories produced in different disciplines (politics, sociology, anthropology, political psychology, economics) that focus on different objects of study (the state, the community, social classes, the individual). Annually.

PSPA 219 Arab Political Thought and Ideologies 3.0; 3 cr.
The aim of the course is to explore various intellectual and political debates in the modern Arab world. The course will provide an overview of the development of modern Arab political thought and will present some of the main political, intellectual, and academic debates in this domain. Topics covered in this course include Arab nationalism, Marxism and Liberalism, modernity and tradition, secularism and Islam, Orientalism and the West, and other topics. Annually.

PSPA 220 Globalization and Culture 3.0; 3 cr.
This course offers a critical exploration of the cultural dynamics of globalization and the politics of the globalization of culture. It also addresses the spread of (and reaction to) American popular culture abroad and the impact of globalization on American culture and identity. Occasionally.

PSPA 221 Theories and History of the State 3.0; 3 cr.
The aim of the course is to explore “the state” as a political construct and provide a comparative survey of experiences of state-building in the Middle East (including Lebanon). Topics covered include the history of state formation, state-society relations, authoritarianism and democratization, the impact of globalization on the state, and related issues. Occasionally.

PSPA 222 Democracy, Civic Engagement and Leadership 3.0; 3 cr.
The course will introduce students to the principles and processes of civic engagement and leadership within democratic and democratizing systems of governance, and will help them understand the theoretical and practical issues related to the practice of participatory democracy from a comparative perspective. The discussion of the main features of the democratic system will be complemented with an extensive review of specific cases that are relevant to understand the problems that face civic engagement and leadership in different socio-political and cultural contexts. Annually.

PSPA 223 Constitutional Law 3.0; 3 cr.
A course that examines the constitutions and the development of constitutional mechanisms and practices in selected countries, with a focus on the Lebanese constitutional system. Constitutional mechanisms in general and institutional variables are discussed as well as their impact on public policy, democracy, and political stability. Each semester.

PSPA 225 Public International Law I 3.0; 3 cr.
A course introducing the basics of public international law, including its origins, purpose, sources, subjects, and response to international wrongful acts. It explores case studies to illustrate key points. The aim of this course is to build students’ understanding of the modern international legal order and its most important principles, and to contextualize its relationship with international politics. Each semester.
PSPA 226 Public International Law II 3.0; 3 cr.
A course that, building upon PSPA 225's introduction, deals in more depth with some of the most important fields of public international law such as diplomatic relations, the law of the sea, the regulation of the use of force, international humanitarian law, human rights, international justice or the development of international criminal law. This course makes extensive use of recent case studies and contains an important research component as it deals with some of the most significant developments and debates in contemporary international law. Annually. Prerequisite: PSPA 225.

PSPA 228 International Security 3.0; 3 cr.
A course analyzing major issues in international security, including arms control, disarmament, terrorism and environmental degradation in both theory and practice. It covers both traditional and non-traditional security perspectives. Annually.

PSPA 229 Water Politics and Policy 3.0; 3 cr.
Water is the key to life, and yet it is a resource that is exploited unevenly across and within states. This course examines key issues of water conflict, cooperation, security and development in both international and domestic spheres. Alternate years.

PSPA 231 Palestinian and Israeli Politics 3.0; 3 cr.
A survey of Palestinian and Israeli politics – political systems, institutions, parties, and processes of governance – in the historical context of the partition of Palestine, the proclamation of the state of Israel, and the establishment of the Palestinian Authority. The course will cover contemporary issues pertaining to the functioning of both systems, to their relationship at the political, economic, (para)military, and territorial levels, as well as the impact of local, regional, and international negotiations on the future political and legal development of the region. Annually.

PSPA 232 Conflict and Conflict Regulation 3.0; 3 cr.
A course that contextualizes and explores domestic, regional, and international conflicts as well as the mechanisms for their management or resolution. It focuses on such issues as the linkages between internal and external sources of conflict, the contested nature of conflict resolution concepts, peacemaking, and peace-building. Each semester.

PSPA 233 International and Regional Organizations 3.0; 3 cr.
This course explores the theories, institutional structures, political processes, role and impact of international and regional organizations within the larger context of world politics. Each semester.

PSPA 234 Transnational Politics 3.0; 3 cr.
This course explores issues of global governance beyond the traditional intergovernmental framework. It focuses on the increasingly visible role of non-state actors (social movements, NGOs, global media, transnational corporations) and transnational politics in shaping contemporary global politics. The course investigates whether the process of contemporary globalization has given rise to global civil society. Annually.

PSPA 235 Human Rights and International Politics 3.0; 3 cr.
A course that examines the development and relevance of institutions and instruments concerned with human rights, and then considers problems of human rights issues in selected countries and their impact on regional and global actors. Each semester.

PSPA 236 The Arab-Israeli Conflict 3.0; 3 cr.
A survey of the conflict over Palestine since the 19th century up to the contemporary period. This course focuses on the origins and evolution of the Arab-Israeli conflict both in its regional and international dimensions, covering topics such as the colonial roots, the formation of the state of Israel, the PLO, the 1967 war, up to the second Intifada. Each semester.

PSPA 237 The Modern Middle East in International Politics 3.0; 3 cr.
This course examines the place of the "Middle Eastern" system of states in the international system and in relation to US foreign policy towards the region. It covers the legacies of Western colonialism, Arab nationalism, the Cold War and the continuing intervention of external powers (especially the US), the geopolitics of oil, and the rising influence of Islamist movements and non-state actors. Annually.

PSPA 238 International Political Economy: From Imperialism to Globalization 3.0; 3 cr.
This course examines the development of the modern world economic system, through an analysis of its main characteristics and an overview of the theories relevant to its understanding. Issues covered in this course include imperialism, colonialism, the international market, globalization, the influences of the world economic system on states and the North-South divide. Annually.

PSPA 239 International Environmental Politics 3.0; 3 cr.
This course serves as an introduction to the field of international environmental politics, exploring the relationship between global political forces and environmental change. A central goal is to critically analyze how environmental problems are framed and solutions found. The course examines the rise of environmentalism in both the North and the South; the emergence of liberal and radical environmental discourse; and the formulation, negotiation and implementation of international environmental regimes and sustainable development policies. Relevant case studies include the international trade in hazardous waste and endangered species; the politics of whaling, ecotourism, GMOs, and climate change; the management of biodiversity, fisheries, ocean and forest regimes; and the relationship between environment and security. Annually.

PSPA 250 Politics of Emerging Countries 3.0; 3 cr.
A survey of politics in key emerging economies such as the BRIC states (Brazil, Russia, India, and China) and others including South Africa and Mexico. The course examines the role of these emerging economies in world politics and their policy-making structures. Occasionally.

PSPA 251 Politics and Government: United States of America 3.0; 3 cr.
A survey of the main features of the American political system, including the foreign policy-making process. Annually.

PSPA 252 European Politics 3.0; 3 cr.
A course that examines contemporary European politics with an emphasis on the European Union, its governance structure, and external relations (particularly toward the Middle East). Alternate years.

PSPA 253 Politics and Government: Middle East 3.0; 3 cr.
A survey of political institutions and processes in the Middle East, with an emphasis on social and political development, the policy-making process and international affairs. Annually.

PSPA 254 Political Development and Social Change 3.0; 3 cr.
A survey of major issues and controversies in political development, theories of social change, and their relevance to developing countries. Topics covered by this course include modernization, state-building, democratization, revolutions, conflicts, authoritarianism, social movements and civil society. Annually.

PSPA 255 Islamic Political Institutions 3.0; 3 cr.
A survey that introduces the manner in which Islamic Shari'a was introduced into the political life of the nation-states in the Middle East. It focuses on the causes for its inclusion or exclusion in the constitutions, political institutions and processes, and courts in the Middle East, with an emphasis on legislative process, personal status code, criminal code, as well as social and political development, and their impact on policy-making processes and international relations. Occasionally.
PSPA 256  Politics in Lebanon  3.0; 3 cr.
An overview of Lebanese politics in Mount Lebanon from the mid-nineteenth century to the formation of the Republic of Lebanon. This course deals with the origins, evolution, and workings of the confessional system with emphasis on the period after independence, from the civil war to the present. In addition, it focuses on the main political and social movements that marked Lebanese politics. Each semester.

PSPA 257  Regional and Local Administration  3.0; 3 cr.
A course that deals with the legal aspects, organization, and theories of regional and local administration. This course examines issues of centralization-decentralization, central-regional-local government relations, and balanced development at the national level. Annually.

PSPA 258  Comparative Public Administration  3.0; 3 cr.
An introduction to the governmental, administrative, and political systems of both developed and underdeveloped countries with a focus on political systems and their manifestation in administrative systems. The objectives of this course center upon comparing and contrasting issues and concerns central to public administration systems within a selected set of countries worldwide. To attain these objectives the course will explore an array of interrelated questions and issues such as governance in contemporary societies, including administrative reforms, privatization, ‘empowerment’, the impact of globalization on state administrative structures and policies, devolution, and other concerns relevant to public sector administrators. Annually.

PSPA 259  Public Administration in Lebanon  3.0; 3 cr.
A course that examines the legal aspects, environment, scope, structure, and problems of public administration in Lebanon, with special emphasis on administrative reforms and their institutional products. Annually.

PSPA 260  Introduction to Policy Analysis  3.0; 3 cr.
This is an introductory course to policy analysis. Students should be familiar with the basic concepts and terminology of public policy and public administration. This course provides students with both essential and more advanced methods used in public policy analysis. It covers important components of the process of policy analysis such as identifying data sources and weighing the utility of data; establishing criteria for analyzing policies; assessing policy alternatives; choosing among policies; monitoring policy implementation; and evaluating policies. Annually. Prerequisite: PSPA 276.

PSPA 261  Applied Research Methods in Public Policy  3.0; 3 cr.
This course covers the fundamentals of research design in the social sciences in general. It introduces students to the several quantitative methods utilized in the field of public policy in addition to the use of computer resources in policy analysis. The students are assumed to have a prior basic knowledge of the scientific methodologies. Annually.

PSPA 262  Political and Agency Management Aspects of Public Policy  3.0; 3 cr.
The purpose of this course is to introduce the students to the different organizational and political factors that are involved in the policy making process. This course is interdisciplinary in nature. It draws upon different theoretical frameworks and empirical scholarly works from several disciplines, and includes case studies. The course focuses on organizational, communicative, and controlling techniques and relevant core competencies for the analysis and solution of problems. Annually.

PSPA 263  Public Policy and the Legal Framework  3.0; 3 cr.
This course introduces students to the legal framework of policy formulation and policy implementation. The students will become familiar with legal materials related to the different aspects of the public policy making process. In addition, the course focuses on the relationships among the lawmaking agencies on the one hand and their relation to the policy making entities. Specific case studies are included to explore these relationships. Annually.

PSPA 264  Administrative Ethics and Controls  3.0; 3 cr.
This course examines the values and virtues important to sustain ethical leadership, as well as strategies to build strong institutional cultures and support ethical practices in institutions. Students will learn how to identify moral issues in public life and public management. Occasionally.

PSPA 265  The Non-Profit Sector: Formation, Leadership and Governance  3.0; 3 cr.
This course focuses on the economic, social, and legal foundations of the nonprofit sector. The ways in which nonprofit organizations relate to the public and private sectors and the diversity and scope of the nonprofit sector are examined with primary focus on the functions performed by nonprofit organizations and on various patterns of community actions taken in different societies. Annually.

PSPA 266  Human Resources and Personnel Administration  3.0; 3 cr.
A course that examines theories, practice, and problems relating to human resources and personnel administration. This course focuses on key aspects of human resources, planning, and their implications on public policy. Annually.

PSPA 267  Administrative Ethics and Controls  3.0; 3 cr.
This course addresses the moral challenges facing leaders in the public sector. It analyzes the formal and informal means aiming at promoting responsiveness and responsibility in Public Administration. It examines the values and virtues important to sustain ethical leadership, as well as strategies to build strong institutional cultures and support ethical practices in institutions. Students will learn how to identify moral issues in public life and public management. Occasionally.

PSPA 268/267  Tutorial in Political Studies/ Public Administration  3.0; 3 cr.
This course is designed to allow PSPA students to pursue a course of directed study with PSPA faculty members. It may consist of independent research, original creative compositions, or directed reading, and includes the presentation of a report or thesis. A student with a general average of at least 83 at the beginning of the semester may petition the department for course approval. Annually.

PSPA 288/289  Special Topics  3.0; 3 cr. (each)
May be repeated for credit. Offered each semester.

PSPA 290  Senior Seminars in Social and Political Thought  3.0; 3 cr.
The seminar aims to explore specific schools of thought, theories, and paradigms that are relevant for empirical research, such as Critical Theory, Cultural Theory, Constructivism, Marxism, and others. Occasionally.

PSPA 290A  Senior Seminar in Political and Social Theory  3.0; 3 cr.
The seminar aims to explore specific schools of thought, theories, and paradigms that are relevant for empirical research, such as Critical Theory, Cultural Theory, Constructivism, Marxism, and others. Occasionally.

PSPA 290B  Senior Seminar in Western Political Thought  3.0; 3 cr.
A seminar that explores special topics and/or traditions in Western political philosophy. Occasionally.
This seminar provides an examination of the development, theoretical structure, major outlooks, and ideological trends in the US. It seeks to survey and explain the nature of American policy and the role of American non-state actors through an examination of media representations, changing strategic ideas and norms.

**PSPA 292 Senior Seminars in Comparative Politics**

This seminar explores the political, economic, and cultural relations between the United States and South, including the Arab region. The course will focus on contemporary issues and challenges, and analyze the political and socio-economic context facing policy-makers and the policy-making process. Occasionally.

**PSPA 293 Senior Seminars in International Politics**

This seminar analyzes the foreign policy of selected states with a focus on human decision makers, multiple levels of analysis, and an interdisciplinary approach. It explores the material and ideational determinates of foreign policy and state behavior in the international domain. Occasionally.

**PSPA 293A Senior Seminar in Foreign Policy**

This seminar analyzes the foreign policy of selected states with a focus on human decision makers, multiple levels of analysis, and an interdisciplinary approach. It explores the material and ideational determinates of foreign policy and state behavior in the international domain. Occasionally.

**PSPA 293B Senior Seminar in Public International Law**

This seminar explores energy and environment policies in selected countries in both the North and South, including the Arab region. The course will focus on contemporary issues and challenges, and analyze the political and socio-economic context facing policy-makers and the policy-making process. Occasionally.

**PSPA 293C Senior Seminar on the United Nations**

This seminar explores the link between international law and international relations, tackling the legal aspects of key areas within world politics such as the use of force, development of international human rights law, and international justice. Occasionally.

**PSPA 293D Senior Seminar on the US in the Middle East**

This seminar explores the political, economic, and cultural relations between the United States and the Middle East. It seeks to survey and explain the nature of American policy and the role of American non-state actors through an examination of media representations, changing strategic outlooks, and ideological trends in the US. Occasionally.

**PSPA 297 Senior Seminar in Organization Theory**

This senior seminar provides an examination of the development, theoretical structure, major concerns, areas of emphasis and debates in the field of organization theory, from its origins to the present. It takes an interdisciplinary approach and covers the body of empirical findings relevant to organization and management theory, practices and prescriptions. It puts emphasis on those ongoing findings and elements of theory that impact the contemporary study, research, and philosophy in the field of public administration. Annually.

**PSPA 298 Seminar in Public Policy and Administration**

This course focuses on particular public policy issues. It explores the major debates, both theoretical and applied that frame contemporary discussions about public policy. The seminar addresses several topics such as Human Rights policy, Poverty policy, Environmental policy, and Political advocacy. Annually.

**PSPA 299 Internship Program**

A practicum course that explores politics and public administration through a variety of work experiences, both governmental and nongovernmental. Students are expected to perform work for academic credit and submit, as part of their course requirements, written evaluative reports based on their experiences under the guidance of PSPA instructors, as well as an oral presentation at the end of the internship. Students with a general average of at least 78 at the beginning of the senior year may petition the department for internship approval. Annually.

### Major in Political Studies

**39 Credits in Political Studies**

<table>
<thead>
<tr>
<th>Mode of Analysis</th>
<th>English and Arabic (9)</th>
<th>Humanities (12)</th>
<th>Social Sciences (6-10)</th>
<th>Quantitative Thought (6)</th>
<th>Natural Sciences (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Courses</td>
<td>6(12+6)+4</td>
<td>Required Arabic courses: ARAB 201A or any General Education Arabic communication skills (3)</td>
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<td></td>
<td>(9)</td>
<td>1. Required English courses: ENGL 201(3), 204(3)</td>
<td>Required credits in the humanities: 12 credits including 6 credits from CIVP (use CIVP requirements under Civilization Sequence Program)</td>
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<td>(6)</td>
<td>2. Required English courses (4): ENGL 205(3), 206(3)</td>
<td>1. Required economics course from the approved General Education List (3): ECON 201(3), 202(3) or CIVP 201(3)</td>
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**Seminar (3) Laboratory (6)**

**Research Project**

PSPA 214-220, 221, 222, 225, 226, 228, 229, 231-239, 250-256, 290-293
## Major in Public Administration

### 39 Credits in Public Administration

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic (9)</th>
<th>Humanities (12)</th>
<th>Social Sciences (6+39)</th>
<th>Quantitative Thought (6)</th>
<th>Natural Sciences (6)</th>
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</thead>
<tbody>
<tr>
<td>Lecture Courses</td>
<td>(9+12+6+42+5)</td>
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<tr>
<td>1. Required Arabic courses: ARAB 201A or any General Education Arabic communication skills (3)</td>
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<td>Required CMPS 206(3) or CMPS 209(3)</td>
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<tr>
<td>2. Required English courses (6): ENGL 203(3), 204(3)</td>
<td>Required credits in the humanities: 12 credits including 6 credits from CVSP (see CVSP requirements under Civilization Sequence Program)</td>
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<td></td>
<td>Electives (min. 6)</td>
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<tr>
<td>Category B: 12 credits from PSPA 260(3), 261(3), 262(3), 263(3), 298(3) and 6 credits from PSPA 257(3), 258(3), 259(3), 272(3), 275(3), 278(3), 297(3)</td>
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Seminar (3)
Laboratory (0)
Research Project

PSPA 257, 260-263, 272, 273, 275, 277, 278, 297, 298
Department of Social and Behavioral Sciences

Chairperson: Dajani, Nabil H.
Professor Emeritus: Prothro, Edwin
Professors: Dajani, Nabil H.; Dietrich, Arne; Kazarian, Shahe S.; Khalaf Samir G.; Saumarez-Smith, Richard W.
Associate Professors: Hanafi, Sari; Harb, Charles W.
Assistant Professors: El-Jamil, Tima M.; Melki, Jad; Najjar, Nidal K.; Scheid, Kirsten L.; Serhan, Randa; Slobodenyuk, Nadia; Wick, Livia C.
Lecturers: "Awaida, May A.K.; "Tarabey, Lubna
Instructors: "Al Azar, Maha; "Ayanian, Arin; "Bassil, Margaret W.; "Bibi, Karma M.; "Bikhazi, Nadine; "Boyadjian, Maral; "Dbaiho, Dania S.; "Estefane, Karen; "Ghannoum, Hana K.; "Kanafani, Samar; "Nasser, Khaled; "Osman, Zeina

The Department of Social and Behavioral Sciences offers programs leading to a BA degree in either psychology or sociology-anthropology, and to an MA degree in psychology or sociology or anthropology.

BA in Psychology

Mission Statement

The discipline of psychology is dedicated to increasing the scientific understanding of behavior and mental processes at the intrapersonal, interpersonal and group level, and to the application of that understanding to enhance the functioning of individuals, groups, and society. In line with this mission, the Undergraduate Program in Psychology has a threefold mission: to advance and transmit knowledge related to the nature of psychological processes and functioning, to provide a strong foundation in the basic knowledge and skills necessary for research in psychology, and to sensitize students to the applications of psychology in the wider community. This mission embodies the main elements of AUB's mission which are to foster tolerance, freedom of thought, respect for diversity, critical thinking, personal integrity, and civic participation.

Admission to the psychology program requires a grade of 70 or more in PSYC 102 or PSYC 202, and a minimum grade of 70 in ENGL 203 and ENGL 204. For purposes of meeting departmental admission requirements, students are not permitted to take PSYC 102 or PSYC 202 more than twice. While completing PSYC 102 qualifies a student to meet one of the admission requirements to the major, 100 level courses will not be counted towards a major requirement. Prospective majors who obtain a grade below 60 in PSYC 102 or PSYC 202 will not be permitted to take the course a second time for
the purpose of meeting the departmental admission requirements. Requirements for majors include PSYC 102 or PSYC 202, PSYC 213, PSYC 223, PSYC 227, and PSYC 293. In addition to these required courses, the student must select eight courses from the following categories: Category 1 (3 out of 4 are required, but all can be taken for credit)(9): PSYC 211(3), 215(3) or 217(3),225(3), and 229(3); Category 2 (3 out of 4 are required, but all can be taken for credit)(9): 219(3), 221(3), 233(3) or 251(3), and 237(3); Category 3 (the remainder are elective)(6): PSYC 231(3), PSYC 235(3), PSYC 239(3), PSYC 241(3), PSYC 242(3), PSYC 243(3), PSYC 247(3), and courses in Category 1 and 2 not already chosen.

In addition to these required courses, the student must complete CMPS 206. If exempted from CMPS 206, students should take 3 credits in Quantitative Thought numbered 200 or above. Also required are 6 credits in natural sciences. A biology course is recommended.

The requirements for a BA degree in Psychology are 90 credits for students entering the department at the sophomore level, including 39 credits in the major. The distribution of university requirements is as follows:

**University Requirements**

**University General Education requirements:** Humanities (12cr) including 6 credits from CVSP, Natural Sciences (3cr), and Quantitative Thought (6cr). Also note that one social science must be an approved General Education course from outside the major.

A minor in psychology requires 15 credits: PSYC 102 or PSYC 202, PSYC 227, plus three electives from PSYC 211–251 except PSYC 213, PSYC 223, and PSYC 243.

A cognitive science minor requires 15 credits. PSYC 251 is required. PSYC 251 cannot be counted as a psychology course for the purpose of this requirement. The remaining 12 credits must be chosen from the following courses: PSYC 219, 221, 227, 233, 235, and 247; PHIL 221, 222, 223, 257, 258; ENGL 227, 230, 232, 246; EDUC 215, 221, 225, 290, 290F; CMPS 287; and BIOL 243, 290F, 290AF-1, 290T-1, on condition that the 12 credits chosen span three of the five disciplines. Only 3 credits of the 15 credits taken for the minor may count toward the student’s major.

**PSYC 102  Freshman Psychology  3.0; 3 cr.**

An introduction to the principles and concepts of psychology to prepare the student for majoring in psychology. Students who take this course may not get credit for PSYC 202. Each semester.

**PSYC 202  General Psychology  3.0; 3 cr.**

A course on the principles and findings of modern psychology with attention to their experimental foundations, utilizing reports of original research and other materials geared to prepare the student for majoring in psychology. A student who has received credit for PSYC 102 cannot receive credit for PSYC 202. Each semester.

**PSYC 211  Introduction to Social Psychology  3.0; 3 cr.**

A course on the scientific study of how individuals think, feel, and behave in regard to other people, and how individuals’ thoughts, feelings, and behaviors are affected by other people. Prerequisite: PSYC 202. Annually.

**PSYC 213  Research Methods and Statistical Analyses I  3.0; 3 cr.**

A course on basic research designs and statistical analyses in psychological research. The course combines both lectures and lab based sessions. Prerequisite: PSYC 202. Annually.

**PSYC 215  Child Abnormal Psychology  3.0; 3 cr.**

An introduction to the major theories and treatment perspectives of abnormal behaviors in children and adolescents including autism and schizophrenia, attention-deficit hyperactivity disorder, conduct disorders, phobias, and depression. Prerequisite: PSYC 202 or 102. Annually.

**PSYC 217  Abnormal Psychology  3.0; 3 cr.**

An introduction to the major theories and treatment perspectives of abnormal behaviors including phobias, eating disorders, depression, bipolar disorder, schizophrenia, substance-use disorders, and sexual disorders. Prerequisite: PSYC 202 or 102. Annually.

**PSYC 219  Sensation and Perception  3.0; 3 cr.**

A course that examines the physiological mechanisms of the primary sensory systems and explores their relationships to higher cognitive functions. Prerequisite: PSYC 202 or 102. Annually.

**PSYC 221  Psychology of Learning  3.0; 3 cr.**

A course that examines neurological, behavioral, and other current approaches to human learning. Prerequisite: PSYC 202 or 102. Annually.

**PSYC 223  Research Methods and Statistical Analyses II  3.0; 3 cr.**

A course on advanced research designs and statistical analyses in psychological research. The course combines both lectures and lab-based sessions. Prerequisite: PSYC 213. Annually.

**PSYC 225  Psychology of Personality  3.0; 3 cr.**

A course that examines methods of measuring personality, theories of personality, and biological and sociological factors that influence personality. Prerequisite: PSYC 202 or 102. Annually.

**PSYC 227  History and Systems of Psychology  3.0; 3 cr.**

A course on the historical development of scientific conceptions of human behavior in the context of contemporary psychological systems. Prerequisite: PSYC 202 or 102. Annually.

**PSYC 229  Psychology of Development  3.0; 3 cr.**

A course on psychological development from birth to adulthood. Students who receive credit for EDUC 225 cannot receive credit for PSYC 229. Annually.

**PSYC 231  Psychological Measurement and Scaling  3.0; 3 cr.**

A course on the principles and methods of measurement and scaling in psychology. Prerequisites: PSYC 202 or 102, and a course in statistics. Occasionally.

**PSYC 233  Cognitive Psychology  3.0; 3 cr.**

This course introduces students to the main areas of cognitive psychology, including the following: perception, neuroscience, attention, visual imagery, memory, language, concepts, problem solving, judgment, and cultural cognition. There is special emphasis on applying knowledge to everyday practice. Prerequisite: PSYC 202 or 102. Annually.

**PSYC 235  Special Topics in Psychology  3.0; 3 cr.**

A course that provides a general overview of an area of psychology that is not normally covered by the department’s offerings. Occasionally.
PSYC 237  Behavioral Neuroscience  3.0; 3 cr.
An introduction to the neural basis of behavior. The course surveys the structure and organization of the human brain and how complex behavior arises from it. Prerequisite: PSYC 102 or 202. Annually.

PSYC 239  Introduction to Clinical Psychology  3.0; 3 cr.
An introduction to the field of clinical psychology with a view to understanding the research, assessment, and intervention approaches considered by clinical psychologists and the theoretical, ethical, and professional issues confronting them. Prerequisite: PSYC 202 or 102 and pre or coreq: PSYC 215 or 217. Annually.

PSYC 241  Introduction to Health Psychology  3.0; 3 cr.
An introduction to the field of health psychology with a view to understanding psychological and lifestyle factors in a variety of major diseases such as heart attacks, cancer, and AIDS; and to considering best practices in the prevention of ill-health and the promotion of good health. Prerequisite: PSYC 202 or 102. Annually.

PSYC 242  Positive Psychology  3.0; 3 cr.
This course focuses on psychological principles and practices that relate to personal and collective flourishing and fulfillment in life. Specific topics include self-esteem, friendship, love, achievement, creativity, luck, spirituality, exercise, healthy sexuality, and humor. Prerequisite: PSYC 202. Annually.

PSYC 243  Applied Psychology Research Project  3.0; 3 cr.
This course requires students to plan, conduct, and write up a full study that addresses psychosocial issues in applied settings such as business, industry, hospitals, or public/private institutions. The course is meant to build upon and further develop the research and data analysis skills acquired in introductory research methods courses, and statistical analyses courses. Prerequisites: PSYC 213 and PSYC 223. A minimum grade of 75 in both PSYC 213 and PSYC 223 is required. Annually.

PSYC 247  Introduction to Culture and Psychology  3.0; 3 cr.
The course aims to sensitize students to the importance of culture in psychological processes, and focuses on indigenous, cultural, and cross-cultural psychological theories and findings. Prerequisites: PSYC 202 or 102. Annually.

PSYC 251  Introduction to Cognitive Science  3.0; 3 cr.
This course is an introduction to the interdisciplinary study of cognitive science which involves research about the workings of the mind from the fields of psychology, linguistics, philosophy, education, computer science, neuroscience, anthropology, engineering, and others. The course aims to provide students with an appreciation for the range of disciplinary perspectives and methods, and the applications of cognitive science to everyday life. Annually.

PSYC 291  Senior Tutorial  3.0; 3 cr.
Prerequisites: PSYC 213 and 223, senior standing, and a minimum average of 80 in the major. Offered on request.

PSYC 293  Undergraduate Seminar in General Psychology  3.0; 3 cr.
A review of significant research in major areas in psychology. Prerequisites: PSYC 213 and 223, and senior standing. Annually.

PSYC 299  Directed Study  3–6 cr.
A tutorial course offered to SBS students with an average of 85 or above in their major at the beginning of their senior year. This tutorial consists of independent research, original creative compositions, or directed reading, and includes the presentation of a report or thesis on the work. Students with averages lower than 85 may be admitted to directed study at the discretion of the department. Offered occasionally.

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**Sociology-Anthropology**

**BA in Sociology and Anthropology**

**Mission Statement**

The mission of the SOAN degree offered by the SBS department is to make students aware of the different contributions of anthropology, communication, and sociology. The aim is to train students in the conceptual, research, and applied tools of these three components. Through independent, critical, and advocacy fieldwork, attention is given to the historical and cross-cultural heritage of Arab society and its relation to the rest of the world.

Admission to the sociology-anthropology program requires a minimum grade of 70 in ENGL 203 and ENGL 204, and a grade of 70 or more in one of the following: SOAN 101, SOAN 201, SOAN 203, or SOAN 204. If admission to SOAN is based on SOAN 101, an additional SOAN or any social science course is required.
For purposes of meeting department admission requirements, students are not permitted to take SOAN 101 or SOAN 201 more than twice. While completing SOAN 101 qualifies a student to meet one of the admission requirements to the major, the 100 level courses will not be counted towards a major requirement. Prospective majors who obtain a grade below 60 in SOAN 201 are not permitted to take the course for a second time for the purpose of meeting the departmental admission requirements. Requirements for the BA program include SOAN 101 or SOAN 201 or SOAN 203 or SOAN 204, SOAN 228, SOAN 210, SOAN 211, SOAN 212, SOAN 213, SOAN 214, and a seminar from SOAN 240–245, 250–252, plus 15 additional credit hours, as well as a course in computer literacy (such as CMPS 206). If exempted from CMPS 206, students should take 3 credits in Quantitative Thought.

The requirements for a BA degree in Sociology-Anthropology are 90 credits for students entering the department at the sophomore level, including 39 credits in the major. The distribution of university requirements is as follows:

**University Language requirements:** English (6cr) and Arabic (3cr)

**University General Education requirements:** Humanities (12cr) including 6 credits from CVSP, Natural Sciences (6cr), and Quantitative Thought (3cr). Also note that one social science must be an approved General Education course from outside the major.

The sociology-anthropology program offers three areas of specialization: anthropology, communication, and sociology. For a minor in anthropology the requirements are SOAN 203 or SOAN 212, SOAN 222 or SOAN 225, and SOAN 221 or SOAN 227, plus two electives from SOAN 212, SOAN 214, SOAN 220–227, SOAN 232, SOAN 240–245 and 250–252. For a minor in communication, the requirements are SOAN 205, SOAN 228, and SOAN 229, plus two electives from communication courses including the following: SOAN 204, SOAN 206, SOAN 207, SOAN 230, SOAN 231, SOAN 233, SOAN 234, SOAN 235, SOAN 236, SOAN 239 and SOAN 243. For a minor in sociology the requirements are SOAN 101 or SOAN 201, SOAN 213, and SOAN 214, plus two electives from the following: SOAN 210, SOAN 220, SOAN 222, SOAN 223, SOAN 224, SOAN 225, SOAN 232, and SOAN 240–242. Students who wish to undertake a master's degree in sociology are strongly advised to take SOAN 210 as an elective in their minor. The SOAN program, in collaboration with the departments of Philosophy and PSPA, offers a minor in Human Rights and Transitional Justice. For this minor, the requirements are: SOAN 245, SOAN 240 or PSPA 235, and three electives from the following: SOAN 221, SOAN 230, SOAN 231, SOAN 232, SOAN 242, PSYC 211, PHIL 216, PHIL 252, PSPA 222, PSPA 232 and any special topic in SOAN, PSYC, PHIL, or PSPA, which will fit with the minor topic, upon the approval of the respective department chair and the minor coordinator. Students majoring in sociology-anthropology should take at least three courses outside the SOAN program.

**SOAN 101 Freshman Sociology** 3.0; 3 cr.

An introduction to the principles and concepts of sociology to prepare students for majoring in sociology. Students who take this course cannot receive credit for SOAN 201. Each semester.

**SOAN 103 Reading Other Cultures** 3.0; 3 cr.

An introduction to the study of other cultures drawing on film, ethnographic case studies, and topical debates. This course presents basic concepts in the comparative study of culture, methods of observing and interpreting other cultures, a sense of how knowledge about other cultures is constructed, and tools to develop a critical awareness of one's own cultural traditions. Note that this course is classified as a humanities, not as a social science course. Students may take it to fulfill the university's humanities requirement but not the University's social sciences requirement. Annually.

**SOAN 201 Introduction to Sociology** 3.0; 3 cr.

An introduction to the study of social phenomena. Basic concepts, principles, and methods common to the study of society are employed for the analysis of structure and change in society. This course includes the structure and origin of some basic human institutions such as family, kinship, religion, and language. A student who has received credit for SOAN 101 cannot receive credit for SOAN 201. Each semester.

**SOAN 203 Introduction to Anthropology** 3.0; 3 cr.

An introduction to anthropology encompassing the traditional subfields of cultural, physical, linguistic, and archaeological anthropology. The course prepares students for further study in anthropology. Each semester.

**SOAN 204 Introduction to the Communication Process** 3.0; 3 cr.

An introduction to the study of human communication processes. The course draws upon relevant concepts in social psychology and depends heavily on class group projects, usually in the form of simulations of communication situations. Annually.

**SOAN 205 Basic News Reporting** 3.0; 3 cr.

An introduction to basic news writing and editing for newspapers and magazines. This course teaches students the fundamental elements of the simple news story such as headlines, leads, and body. It also covers reporting techniques and processes relevant to the coverage of political, economic, social, and cultural developments. Annually.

**SOAN 206 Advanced News Reporting** 3.0; 3 cr.

The course introduces the student to simple and complex journalistic investigations of the role of government and business in society as well as their interrelationships. Annually.

**SOAN 207 Digital Media Literacy** 3.0; 3 cr.

Introduces digital information literacy or the ability to effectively access, analyze, evaluate and create digital media. Examines how media messages shape politics, culture and society, and explores new media production skills, including blogs, podcasts, photo and video manipulation. Annually.

**SOAN 210 Research Methods** 3.0; 3 cr.

A survey of the basic techniques and designs of social research, including both quantitative and qualitative methods, the relationship between micro and macro approaches to society, and the interplay between theory and research. Alternate years.

**SOAN 211 Analysis of Social Data** 3.0; 3 cr.

A survey of basic statistical techniques used in analyzing social and behavioral data. Students participate in the analysis of research data by applying various analytical techniques using computer packages. They will also interpret research findings and write a research report. Annually.

**SOAN 212 Social Anthropology** 3.0; 3 cr.

A general introduction to the theories and methods of anthropology with special attention to the transformation of traditional society; this course examines the primary institutions of family, economy, religion, and politics in relation to technological change and modernization. Annually.

**SOAN 213 Sociological Theory** 3.0; 3 cr.

A survey of some of the major theoretical perspectives and critical issues of classical and contemporary sociological theory. Special focus is placed on four interrelated dimensions: 1) the nature of sociological theory and its intellectual sources, 2) its classic tradition, particularly the legacies of Marx, Durkheim, and Weber, 3) an exploration of salient contemporary perspectives, 4) the emergence of new theories and/or directions, such as post-modernity and global sociology. Alternate years.
SOAN 214 Arab Culture and Society 3.0; 3 cr.
A study of contemporary Arab society: its complexity, diversity, and internal dynamics. This course considers social structures, social groups, cultural patterns, and processes and agents of social and cultural change, and examines current debates on major issues in Arab culture and society. Annually.

SOAN 215 Anthropology of America 3.0; 3 cr.
A critical examination of conceptions of “mainstream” or “dominant” American culture. Using ethnographic case material, the course explores cultural systems and social structures in the contemporary United States, offering an introduction to anthropological approaches to the study of complex societies. Note that this course is classified as a humanities, not as a social science course. Students may take it to fulfill the university’s humanities requirement but not the University’s social sciences requirement. Alternate years.

SOAN 216 Hands-On Anthropology 3.0; 3 cr.
An introduction to the techniques, theories, and debates concerning ethnographic fieldwork. What do anthropologists actually do and what is unique about anthropological research? This course explores the politics and ethics of research, kinds of observation, effective interviewing strategies, note-taking, ways of ‘coding’ or indexing information, data analysis, and approaches to writing. Alternate years.

SOAN 217 Anthropology of the Body 3.0; 3 cr.
An examination of cultural and historical variations in perceptions and experiences of the human body. The course focuses on the ways the human body is culturally constructed and socially experienced, through case studies of labor, sport, health, illness, sexuality, gender, display, and religious ritual. Note that this course is classified as a humanities, not as a social science course. Students may take it to fulfill the university’s humanities requirement but not the University’s social sciences requirement.

SOAN 220 City and Society 3.0; 3 cr.
An introduction to some of the leading conceptual and methodological perspectives for the study of transformations in human settlements. The course explores issues associated with the evolution of cities, their spatial and cultural features, and the social production of informal space and the gendering of space. Changing trends and patterns in Third World urbanization are explored with special focus on the Arab World, global, and post-modern cities. Alternate years.

SOAN 221 Political Anthropology 3.0; 3 cr.
A course examining concepts of power and authority and the evolution of the state from a comparative point of view. A special focus is placed on studies of leadership, law, bureaucracy, and state formation in both traditional and modern systems. Alternate years.

SOAN 222 Family and Kinship 3.0; 3 cr.
The course examines, from a comparative perspective, different forms of family and kinship organization, their relation to production and systems of exchange. Special focus is placed on processes of initiation and reproduction, and cultural expression of relatedness. Alternate years.

SOAN 223 Social Inequality: Conflict and Consensus 3.0; 3 cr.
The course explores theories of social inequality. It addresses issues such as class, status, and gender inequalities and points to sources of conflict and consensus. Arguments for and against equality are canvassed. Alternate years.

SOAN 224 Sexuality and Society 3.0; 3 cr.
The course provides a comparative conceptual framework to explore the changing nature of sexuality in society. Special focus is placed on the social construction of sexual identities, sex and the body, the place of desire and the changing form of romantic love, erotica and pornography, the commodification of intimacy, sexual ethics and sexual prolics in a globalized world. The course also focuses on the dynamics of male-female relations in Arab society. Alternate years.

SOAN 225 Gender and Culture 3.0; 3 cr.
An examination of gender holistically and cross-culturally from a social-anthropological perspective. This course examines how meanings of sex variation are constructed and gender is performed by individuals and groups in different societies. It studies the roles of women and men in ritual, in economic and political systems, and in other social arenas. Note that this course is classified as a humanities, not as a social science course. Students may take it to fulfill the University’s humanities requirement but not the University’s social sciences requirement. Alternate years.

SOAN 226 Religion and Society 3.0; 3 cr.
A course that examines the relationship between society and religion, including both formal institutions and informal processes, which deal with the supernatural. This course studies the origin and development of ritual and religious functions for both the individual and society. Alternate years.

SOAN 227 Cultural Boundaries and Identities 3.0; 3 cr.
Analysis of cultural boundaries and identities. A comparative study of ethnicity and other identity categories and related issues such as cultural hybridity and nationalism with emphasis on the Middle East. Alternate years.

SOAN 228 Mass Media and Society 3.0; 3 cr.
A survey of mass media institutions and an examination of the role of the mass media in society, including an introduction to basic principles and concepts as developed in the West and as applied in the Middle East. Annually.

SOAN 229 Communication Theory 3.0; 3 cr.
An overview of the ways in which mass communication has been viewed by social scientists and by practitioners, with a focus on the range of issues studied and questions raised, and the schools, approaches, and trends in the field. Annually.

SOAN 230 Public Opinion 3.0; 3 cr.
A general study of the nature of public opinion, and the interplay between psychological and socio-cultural processes in the formation and dissemination of public opinion. An attempt is also made to explore the impact of public opinion on media and socio-cultural change. Measurements of public opinion are also explored. Alternate years.

SOAN 231 Communication Campaigns 3.0; 3 cr.
A course that seeks to give students the opportunity to apply, in a strategically integrated manner, the concepts and procedures used in advertising and marketing research. Working in groups, students are required to plan and develop comprehensive marketing communications campaigns to promote social ideas or commercial items using numerous media and research techniques. Annually.

SOAN 232 Conflict Analysis and Resolution 3.0; 3 cr.
An overview of the field of conflict analysis and resolution. This course covers the history of conflict studies, theories of conflict, and methods of dispute resolution. Annually.
The course explores the nature of persuasion today and examines strategies for critically evaluating persuasive communication, stressing the importance of adapting persuasive messages to society’s cultural beliefs and values, as well as to the economic and social structures that govern the society. It aims at moving beyond traditional theories to improve the student’s understanding of how to respond to and evaluate persuasive communication in the era of communication technology. Alternate years.

**SOAN 236** Broadcast Media 3.0; 3 cr.
The course introduces the student to the world of public relations through a strong emphasis on fundamentals, such as history, and research. Emerging issues, such as technology, ethics, and the international aspects of public relations are considered through examining PR strategies, tactics, and case studies. Alternate years.

**SOAN 235** Advertising 3.0; 3 cr.
The course introduces the student to the core concepts and practices of advertising. It examines the impact of new media and research methods, with an emphasis on integrated communications and the role of ad agencies. Students learn how to assess the effectiveness of advertising, and how to create a successful ad campaign. Alternate years.

**SOAN 234** Public Relations 3.0; 3 cr.
The course introduces the student to the world of public relations through a strong emphasis on fundamentals, such as history and research. Emerging issues, such as technology, ethics, and the international aspects of public relations are considered through examining PR strategies, tactics, and case studies. Alternate years.

**SOAN 233** Persuasion in the Media Age 3.0; 3 cr.
The course explores the nature of persuasion today and examines strategies for critically evaluating persuasive communication, stressing the importance of adapting persuasive messages to society’s cultural beliefs and values, as well as to the economic and social structures that govern the society. It aims at moving beyond traditional theories to improve the student’s understanding of how to respond to and evaluate persuasive communication in the era of communication technology. Alternate years.

**SOAN 232** Special Topics 3.0; 3 cr.
A course that provides a general overview of an area in anthropology, communication, or sociology that is not normally covered by the department’s offerings. May be repeated for credit. Occasionally.

**SOAN 231** Seminar in Anthropological Thought 3.0; 3 cr.
An investigation of the major theories guiding anthropological thinking today, through a historically contextualizing overview. This course introduces students to a range of theoretical propositions concerning such topics as agency, structure, subjectivity, power, and the politics of representation by reading primary texts from landmark figures in sociocultural anthropology. Occasionally.

**SOAN 230** Seminar in Human Rights and Cultural Differences 3.0; 3 cr.
a seminar that provides students with an introduction to the history, concepts, institutions, and applications of human rights. Although drawn mainly from a Western perspective, applications are canvassed from the Middle East as well. Discussions cover philosophical foundations of human rights law; discrimination, xenophobia, and racism; civil, political, social, and economic rights; women’s rights; children’s rights; rights of minorities and indigenous people; and migrant workers’ rights. Alternate years.

**SOAN 229** Seminar in Art and Culture 3.0; 3 cr.
A cross-cultural exploration of art as an idea, an object, a history, and a way of interacting with the world. How is art a universal category? This course applies anthropological theories to the study of art and art theories to the study of human society. Particular attention is paid to local resources and archives. Note that this course is classified as a humanities, not as a social science course. Students may take it to fulfill the University’s humanities requirement but not the University’s social sciences requirement. Occasionally.

**SOAN 228** Seminar in Transnational Media 3.0; 3 cr.
An investigation of the role of communication in society. The content areas may change. May be repeated for credit. Annually.

**SOAN 227** Seminar in Communication 3.0; 3 cr.
The seminar explores the role of leading theoretical perspectives for understanding the changing meanings, nature, and forms of deviance in a cross-cultural context. Primary concern is to identify conceptual, methodological, moral, and political issues in the study of substantive social problems such as violent crime, alcoholism and drug abuse, prostitution, homosexuality, suicide, mental disorders, corporate crime, and other emerging forms of global deviance. Alternate years.

**SOAN 226** Broadcast Media 2.2; 3 cr.
Introduces the role and impact of TV and broadcast news on society and covers political, commercial, legal and ethical issues in broadcasting. Covers basic skills in radio and TV broadcast news gathering, writing, editing and producing. Prerequisite: SOAN 205 or Instructor permission. Annually.

**SOAN 225** Seminar in Human Rights and the Media 3.0; 3 cr.
A seminar that provides students with an introduction to the history, concepts, institutions, and applications of human rights. Although drawn mainly from a Western perspective, applications are canvassed from the Middle East as well. Discussions cover philosophical foundations of human rights law; discrimination, xenophobia, and racism; civil, political, social, and economic rights; women’s rights; children’s rights; rights of minorities and indigenous people; and migrant workers’ rights. Alternate years.

**SOAN 224** Seminar in Globalization and Migration 3.0; 3 cr.
An introduction to a range of issues related to theories of migration with particular emphasis on the peculiarities of contemporary globalization. Theoretical considerations include assumptions and case studies from sociology, economics, political economy, and anthropology. Concepts such as network theory, transnationalism, and the international division of labor are used to illuminate issues such as citizenship and identity, refugees, forced migration, nationalisms, and ethnicities as they relate to the migratory experience. Alternate years.

**SOAN 223** Seminar in Communication 3.0; 3 cr.
The seminar explores the role of communication in society. The content areas may change. May be repeated for credit. Annually.

**SOAN 222** Seminar in the Sociology of Deviance 3.0; 3 cr.
The seminar explores the role of leading theoretical perspectives for understanding the changing meanings, nature, and forms of deviance in a cross-cultural context. Primary concern is to identify conceptual, methodological, moral, and political issues in the study of substantive social problems such as violent crime, alcoholism and drug abuse, prostitution, homosexuality, suicide, mental disorders, corporate crime, and other emerging forms of global deviance. Alternate years.

**SOAN 221** Seminar in Research Methods 3.0; 3 cr.
The seminar explores the role of leading theoretical perspectives for understanding the changing meanings, nature, and forms of deviance in a cross-cultural context. Primary concern is to identify conceptual, methodological, moral, and political issues in the study of substantive social problems such as violent crime, alcoholism and drug abuse, prostitution, homosexuality, suicide, mental disorders, corporate crime, and other emerging forms of global deviance. Alternate years.

**SOAN 220** Special Topics Seminar 3.0; 3 cr.
A seminar that provides students with an introduction to the history, concepts, institutions, and applications of human rights. Although drawn mainly from a Western perspective, applications are canvassed from the Middle East as well. Discussions cover philosophical foundations of human rights law; discrimination, xenophobia, and racism; civil, political, social, and economic rights; women’s rights; children’s rights; rights of minorities and indigenous people; and migrant workers’ rights. Alternate years.

**SOAN 219** Seminar in Cultural Anthropology 3.0; 3 cr.
A seminar that provides students with an introduction to the history, concepts, institutions, and applications of human rights. Although drawn mainly from a Western perspective, applications are canvassed from the Middle East as well. Discussions cover philosophical foundations of human rights law; discrimination, xenophobia, and racism; civil, political, social, and economic rights; women’s rights; children’s rights; rights of minorities and indigenous people; and migrant workers’ rights. Alternate years.

**SOAN 218** Seminar in Anthropological Thought 3.0; 3 cr.
An investigation of the major theories guiding anthropological thinking today, through a historically contextualizing overview. This course introduces students to a range of theoretical propositions concerning such topics as agency, structure, subjectivity, power, and the politics of representation by reading primary texts from landmark figures in sociocultural anthropology. Occasionally.

**SOAN 217** Seminar in the Sociology of Deviance 3.0; 3 cr.
The seminar explores the role of leading theoretical perspectives for understanding the changing meanings, nature, and forms of deviance in a cross-cultural context. Primary concern is to identify conceptual, methodological, moral, and political issues in the study of substantive social problems such as violent crime, alcoholism and drug abuse, prostitution, homosexuality, suicide, mental disorders, corporate crime, and other emerging forms of global deviance. Alternate years.

**SOAN 216** Broadcast Media 2.2; 3 cr.
Introduces the role and impact of TV and broadcast news on society and covers political, commercial, legal and ethical issues in broadcasting. Covers basic skills in radio and TV broadcast news gathering, writing, editing and producing. Prerequisite: SOAN 205 or Instructor permission. Annually.

**SOAN 215** Seminar in Human Rights and Cultural Differences 3.0; 3 cr.
a seminar that provides students with an introduction to the history, concepts, institutions, and applications of human rights. Although drawn mainly from a Western perspective, applications are canvassed from the Middle East as well. Discussions cover philosophical foundations of human rights law; discrimination, xenophobia, and racism; civil, political, social, and economic rights; women’s rights; children’s rights; rights of minorities and indigenous people; and migrant workers’ rights. Alternate years.

**SOAN 214** Seminar in Anthropological Thought 3.0; 3 cr.
An investigation of the major theories guiding anthropological thinking today, through a historically contextualizing overview. This course introduces students to a range of theoretical propositions concerning such topics as agency, structure, subjectivity, power, and the politics of representation by reading primary texts from landmark figures in sociocultural anthropology. Occasionally.

**SOAN 213** Seminar in Research Methods 3.0; 3 cr.
The seminar explores the role of leading theoretical perspectives for understanding the changing meanings, nature, and forms of deviance in a cross-cultural context. Primary concern is to identify conceptual, methodological, moral, and political issues in the study of substantive social problems such as violent crime, alcoholism and drug abuse, prostitution, homosexuality, suicide, mental disorders, corporate crime, and other emerging forms of global deviance. Alternate years.

**SOAN 212** Seminar in Communication 3.0; 3 cr.
The seminar explores the role of communication in society. The content areas may change. May be repeated for credit. Annually.
Diploma Program in Media Communication

The SBS Department offers a diploma program in media communication. Courses in this program are elected to include a balance of practical and theoretical courses. Two are practical journalism courses (SOAN 205 Basic News Reporting and SOAN 206 Advanced News Reporting or SOAN 236 Broadcast Media), two are a combination of theoretical and practical courses (SOAN 234 Public Relations and SOAN 235 Advertising or SOAN 231 Communication Campaigns), and the remaining three courses deal mainly with the role of media in society, media regulations and ethics.

The Diploma Program in Media Communication prepares students to pursue professional careers in media and public relations institutions. This requires specialization in the subject matter of communication in the Department of Social and Behavioral Sciences that could be completed before or during professional preparation in the Faculty of Arts and Sciences. Once completed, this preparation culminates in a diploma in media communication which prepares a student for careers in media and public relations institutions. The program comprises a total of 21 credit hours in the subject of communication.

Admission to the Diploma Program in Media Communication

For admission to this diploma program, students in any major may enroll as part of their bachelor's degree program or after completing the bachelor's degree. Holders of this diploma will be capable to handle professional tasks in media institutions (journalism, public relations and advertising), as well as government and public institutions.

New students should obtain an application from the Admission's Office and apply as new students. Applications will be reviewed by the Department of Social and Behavioral Sciences and, when accepted, students will be classified as special students working for the diploma in media communication. Completion of the bachelor's degree is a requirement for admission of new students to the diploma programs. AUB students working for their bachelor's degree at AUB have to apply to the SBS department directly.

Qualifications for the Diploma in Media Communication

Students qualify for the diploma in media communication upon completion of the program of study, attaining a cumulative average of 70 or above in its courses, and receiving the recommendation of the Department of Social and Behavioral Sciences. The purpose of this diploma is to provide knowledge and training in the area of media communication. Holders of such a diploma are expected to be up to date on the role of the media in society and proficient in media regulations, ethics, and practices. For completion of this program 21 credit hours are required with a cumulative average of 70.

The program is composed of the following courses (5 required, 2 electives):

Required Courses: Students are required to take all these courses
SOAN 204: Introduction to Communication

<table>
<thead>
<tr>
<th>Mode of Analysis</th>
<th>English and Arabic (9)</th>
<th>Humanities (12)</th>
<th>Social Sciences (39)</th>
<th>Natural Sciences (6)</th>
<th>Quantitative Thought (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Courses</td>
<td></td>
<td>Required credits in the humanities: 12 credits including 4 credits from LVSP</td>
<td>Required (24)</td>
<td></td>
<td>Required 6 credits</td>
</tr>
<tr>
<td>(6+12+39+6+3)</td>
<td>1. Required Arabic course: ARAB 201A or any General Education Arabic communication skills (3)</td>
<td>1. Required (24)</td>
<td>SOAN 101(3) or 201A(3) or 203(3), 204(3) or 228(3), 230(3), 231(3), 232(3), 234(3), 240(3) or 242(3) or 243(3) or 245(3), 2. Electives (15) from SOAN 205 and SOAN 236-299 3. One social science must be an approved General Education course from outside the major</td>
<td>CMPS 208(3)</td>
<td></td>
</tr>
<tr>
<td>Seminar (3)</td>
<td>Required (3)</td>
<td>SOAN 210(3), 211(3), 212(3), 220(3), 221(3), 222(3), 223(3), 224(3), 240(3), 241(3), 243(3), 245(3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratory (6)</td>
<td>SOAN 211(3)</td>
<td>CMPS 208(3)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

1 Plus 21 free elective credits
2 SOAN courses count towards the SOAN major as well as the Anthropology and Sociology minors as described on pp. xxx.
Social and Behavioral Sciences (Six Minors)

**Anthropology:** three core courses (SOAN 203 or SOAN 212, SOAN 222 or SOAN 225, and SOAN 221 or SOAN 227) and two electives from the following: SOAN 212, SOAN 214, SOAN 220–227, SOAN 232, SOAN 240–242 and 250–252.

**Communication:** three core courses (SOAN 205, SOAN 228, SOAN 229) and two electives from the following: SOAN 204, SOAN 206, SOAN 207, SOAN 230, SOAN 231, SOAN 233, SOAN 234, SOAN 235, SOAN 236, SOAN 239, and SOAN 243

**Psychology:** two core courses (PSYC 102 or PSYC 202, PSYC 227) and three electives from PSYC 211–251 except PSYC 213, PSYC 223, and PSYC 243

**Sociology:** three core courses (SOAN 101 or SOAN 201, SOAN 213, SOAN 214) and two electives from the following: SOAN 210, SOAN 220, SOAN 222, SOAN 223, SOAN 224, SOAN 225, SOAN 232, and SOAN 240–242

**Cognitive Science:** PSYC 251 is required. PSYC 251 cannot be counted as a psychology course for the purpose of this requirement. The remaining 12 credits must be chosen from the following courses: PSYC 219, 221, 227, 233, 235, and 247; PHIL 221, 222, 223, 257, 258; ENGL 227, 230, 232, 246; EDUC 215, 221, 225, 290, 290F; CMPS 287; and BIOL 290AF-1, 290T-1, on condition that the 12 credits chosen span three of the five disciplines. Only 3 credits of the 15 credits taken for the minor may count toward the student’s major.

**Human Rights and Transitional Justice:** The requirements are: SOAN 245, SOAN 240 or PSPA 235, and three electives from the following: SOAN 221, SOAN 230, SOAN 231, SOAN 232, PSYC 211, PHIL 216, PHIL 252, PSPA 232. Students majoring in sociology-anthropology should take at least three courses from other than the SOAN courses.
The Anis Makdisi Program in Literature (AMPL)

Director: Jarrar, Maher
Advisory Committee: Dallal, Ahmad (Provost); Harb, Sirene; Khairallah, As’ad; Makdisi, Saree (UCLA)

The Anis Makdisi Program in Literature (AMPL) was inaugurated in October 2002.

Objectives
The AMPL promotes and supports interdisciplinary dialogue and different approaches in the study of literature following the tradition initiated by Anis K. Makdisi. The aim of this program is to encourage and develop scholarly interest in the humanities in general and in literature in particular, and to foster intellectual exchange among members of different departments, students, and visiting scholars.

Activities
The AMPL activities include

• an annual Anis K. Makdisi memorial lecture by a leading scholar in literature or a noted author of poetry or prose. All lectures are published by the program.
• a series of seminars on various issues and topics in literature and cultural studies offered by local, regional, and international scholars, novelists, and artists. The primary aim of the seminars is to enrich the study and the teaching of literature at AUB by providing wide discussion forums.
• informal gatherings (lectures, discussions, colloquia) as a venue for scholarly debate for the academic community in Beirut.

Scholarships
The AMPL offers two scholarships every year:

• The Anis K. Makdisi Graduate Fellowship to support graduate studies in literature at AUB
• The Anis K. Makdisi Scholarship in Literature for undergraduate studies

Website: http://www.aub.edu.lb/fas/ampl/Pages/index.aspx
The Prince Alwaleed Bin Talal Bin Abdulaziz Alsaud Center for American Studies and Research (CASAR)

Director: Lubin, Alex

CASAR aims to promote dialogue about issues in American studies through teaching, research, and outreach. The center offers a minor in American studies and sponsors conferences, seminars, and public lectures. It also promotes research activities particularly in the area of American encounters with the Middle East.

Students pursuing CASAR’s minor in American Studies are required to complete a minimum of 15 credit hours. All CASAR students are required to take the core course, AMST 215, in addition to one course from AMST 220, 230, 265/266, 298, HIST 200, 271, 272, 273, 274, 278/279, PSPA 251; SOAN 215 plus one course from AMST 275/276, 299, CVSP 260AM, ENGL 201, 224, 225, 226; plus two additional courses chosen from any of the above or from the following (with the stipulation that no more than one from this list may be counted): ARCH 023, CVSP 208E, ENGL 215, 216, 218, 219, 222, 241, 242, PHIL 249, 263A, PSPA 234, 237. All AMST courses carry humanities credit except AMST 265/266 and AMST 298.

Courses Offered

**AMST 215**  
Introduction to American Studies  
3.0; 3 cr.  
This course begins with the question: What is America? Its approach is to explore the complex encounters that have shaped the cultures of the United States, beginning with the colonial juxtaposition of Europeans, Native Americans, and Africans. Subsequent encounters with Latinos, Asians, and Arabs reveal the connections between foreign and domestic concerns. Cultural fictions and cultural exclusions have helped to sustain unity among many Americans, but sub-national and transnational identities call this into question. Annually. Equivalent to HIST 278/279.

**AMST 220**  
Shock of Modernity in America  
3.0; 3 cr.  
Examines how Americans dealt with the first onslaught of commercial capitalism, industrial technology, and new modes of communication in the decades before the Civil War. A surge of nationalism and social tension fueled an orgy of expansion that created a continental super-state. The wrenching economic, social, and cultural changes of this era continue to resonate in the United States and in societies confronting modernity today. Annually.

**AMST 230**  
Cultural Geography of North America  
3.0; 3 cr.  
An examination of the geography of cultures in the United States and Canada through multiple frameworks including regions, languages, religions, ethnicity, and gender. This course explores the roots and implications of these cultural patterns and considers cultural dynamics at several scales: the household, the city, the region, the nation, and the continent. It also investigates the economic and industrial evolution of cities and regions, the dynamics of public versus private space, the effects of mobility, the dynamics of border zones, diasporic communities, and globalization. Annually. Equivalent to HIST 278/279.

**AMST 265/266**  
Special Topics in American Society  
3.0; 3 cr.  
A term-specific interdisciplinary course focusing on some aspect of American society. May be repeated for credit. This course carries social science credit. Offered occasionally.

**AMST 275/276**  
Special Topics in American Humanities  
3.0; 3 cr.  
A term-specific interdisciplinary course focusing on some aspect of American arts. May be repeated for credit. This course carries humanities credit. Offered occasionally.

**AMST 298**  
Tutorial in American Society  
3.0; 3 cr.  
A tutorial course offered to seniors completing the minor in American Studies who have an overall average of at least 80 and at least an 85 in the minor courses. This tutorial consists of independent research or directed reading in some aspect of American society, and includes the preparation of a report or thesis on the work. This course can be taken for 3 or 6 credits. This course carries social science credit. Offered on request.

**AMST 299**  
Tutorial in American Humanities  
3.0; 3 cr.  
A tutorial course offered to seniors completing the minor in American Studies who have an overall average of at least 80 and at least an 85 in the minor courses. This tutorial consists of independent research or directed reading in some aspect of American arts and includes the preparation of a report or thesis on the work. This course can be taken for 3 or 6 credits. Offered on request.
Center for Behavioral Research (CBR)

Director: Khalaf, Samir G.
Executive Committee: Dietrich, Arne; El-Cheikh, Nadia; Jarrar, Maher

The center encourages, coordinates, and sponsors interdisciplinary research in the behavioral and social sciences and the humanities. It also promotes dissemination of research findings through special workshops, seminars, and publications.

Programs and activities of the CBR include international lecture series, bi-weekly discussions, and visiting fellowships to facilitate contacts with innovative and regional world scholars. The center also sponsors collaborative research and symposia with other universities and foundations, and provides stipends to graduate students.
Center for English Language Research and Teaching (CELRT)

Director: Choueiri, Lina G.
Professors: Ghaith, Ghazi M.; Shaaban, Kassim A.
Associate Professor: Choueiri, Lina G.
Assistant Professor: Zenger, Amy A.

The center has five main functions:

• In cooperation with the Departments of English and Education, it sponsors a program leading to an MA degree in the Teaching of English as a Foreign Language (TEFL).

• It maintains a state-of-the-art computer-assisted language learning facility and a Materials Center comprising a collection of textbooks, journals, MA theses, reports, and visual aids.

• In cooperation with the Office of the Vice President for Regional and External Programs (REP), it offers consultation services and assistance in Lebanon and the region in all aspects of English language teaching, including program evaluation, curriculum design, materials development, developing and administering assessment tools, and teacher training.

• It engages in research in language learning problems and produces materials for specialized English language programs.

• In cooperation with the Department of Education, it sponsors TEFL workshops for elementary and secondary school teachers.
Science and Mathematics Education Center (SMEC)

Director: BouJaoude, Saouma
Professors: BouJaoude, Saouma; Jurdak, Murad
Associate Professor: Vlaardingerbroek, Barend
Assistant Professors: El-Mouhayer, Rabih; Khishfe, Rola

The overall mission of the Science and Mathematics Education Center is four-fold:

• to conduct and support quality research on the teaching and learning of science and mathematics at the pre-school, elementary, and secondary levels;
• to contribute to the development of quality science and mathematics teaching and research professionals;
• to design and provide ongoing professional development for science and mathematics teachers in Lebanon and abroad;
• to effect a positive influence on the quality and status of school science and mathematics education locally, regionally, and internationally.

The center currently accomplishes its mission through the performance of a variety of functions including, but not limited to:

• designing and teaching science and mathematics education courses for pre-service teachers and master’s level graduate students in cooperation with the Department of Education
• designing and conducting research on teaching, learning, and teacher professional development in science and mathematics
• designing and developing instructional materials in science and mathematics for students and teachers
• maintaining a current science and mathematics curriculum library for use by pre-service and in-service teaching professionals
• providing outreach consultation in science and mathematics education for schools, institutions, and governments regarding curriculum design, the design of instructional environments, methods of evaluation, and professional development for teachers
• providing in-service professional development for teachers and subject-matter coordinators through special courses, workshops, institutes, conferences, or through participation in professional development initiatives sponsored by AUB or other institutions and organizations.
University Preparatory Program (UPP)

Director: Rashash-Shaaban, Reem G.
Instructors: Batatu, Toufic; El-Harake, Rima G.; Harkous, Samar A.; Rashash-Shaaban, Reem G.; Ashkar, Nicholas; Nasr, Rima

The University Preparatory Program (UPP) is a unit within the Faculty of Arts and Sciences. Its main objective is to address the specific English language needs of students who have completed high school with strong academic records but are unprepared to function in all-English curricula at the university level. The program also aims to develop the science and mathematics content competencies and computer skills of its students, as well as develop the requisite academic literacy, study skills, and information library skills needed for success in university studies.

UPP is a one year program at the rate of 25 contact hours per week. Its curriculum follows an integrated approach to the teaching of language skills (listening, speaking, reading, writing,) and a student-centered approach to the teaching of science and mathematics. Furthermore, the curriculum incorporates study skills, pronunciation training, and conversational English, depending on individual needs. The development of computer literacy, preparation for the critical reading part of the SAT reasoning test, and cultural orientation, are also emphasized.

Applicants must have completed at least twelve years of schooling, or the equivalent, before beginning the program, and must submit a UPP application with all supporting material. Completed applications are reviewed, and students are notified of their acceptance or non-acceptance to UPP in due course.

Accepted applicants to UPP are assigned to a learning level based on their performance on a special English language test. This test measures the English language proficiency of learners and is used to place students into three proficiency levels. Other diagnostic tests specifically prepared for the program are used to determine the mastery level of various language skills and elements (listening, speaking, reading, writing, grammar, and vocabulary). In addition, applicants receive developmentally-appropriate instruction based on their performance on science, math, and computer skills tests.

Promotion to a higher level is not automatic; learners must demonstrate that they have successfully met the instructional objectives set for the current level. The placement test might be administered again to serve as an indicator of the progress made by the learners over the period of one semester. Exit out of the program and into Sophomore is on the basis of passing the UPP sequence of courses and attaining the scores on the TOEFL and SAT tests needed for admission to regular AUB programs. However, students wishing to join the Freshman year will need to attain the minimum average required for admittance. Furthermore, all UPP applicants to AUB must present a letter of good performance from the Program Director. They should also maintain a good attendance record. Students who miss more than one-fifth of the sessions of any section in the first ten weeks of the semester (five weeks in the case of the summer term) will be dropped from the program.
It is important to stress that students need to complete the program, even if they attain the needed TOEFL and SAT scores before the semester is finished. Failing to complete the program jeopardizes students’ chances of admission to AUB.

UPP Courses

UPEN 001 0 credits
This course is designed for beginning UPP students who have little or no knowledge of English. It provides learners with basic listening, speaking, reading, and writing skills, enabling them to understand and take part in English conversations, in addition to reading simple stories and responding to them in writing.

UPEN 002 0 credits
This course is designed for low-intermediate UPP students who possess limited language skills but can initiate conversations and read and/or write a paragraph or several paragraphs. Word-building and study skills, in addition to more sophisticated reading and writing skills, are introduced to enable these college-bound students to cope with the tasks required of them in the future. There is also emphasis on orientation to the American model of education, and to living in a diverse ethnic and cultural environment.

UPEN 003 0 credits
This course is designed for high intermediate UPP students who can communicate well both in conversation and in writing. It serves as a transition from intensive English courses to regular academic study. Students read various texts, give oral presentations, receive cultural orientation, and practice their academic writing and basic research skills.

UPEN 004 SAT Writing and Critical Reading 0 credits
This course prepares students for the writing and critical reading sections of the Scholastic Aptitude Test (SAT Reasoning) required of all undergraduate students joining AUB. Emphasis is placed on critical reading skills, college writing skills, vocabulary building, and standardized test-taking strategies.

UPMA 001A SAT Math 0 credits
This course prepares students for the math section of the Scholastic Aptitude Test (SAT Reasoning) required of all undergraduate students joining AUB. Emphasis is placed on mathematical terminology, arithmetic skills and concepts, word problems, geometric concepts and reasoning, in addition to standardized test-taking strategies.

UPSC 001A Science 0 credits
This course is a science literacy course that introduces students to major concepts in the physical and life sciences and their applications in everyday life. It emphasizes in-depth conceptual understanding of science concepts by using a variety of teaching approaches. Additionally, the course introduces students to scientific terminology in English to prepare students to take science courses at the university level.

UPIT 001A Information Technology 0 credits
This course is a computer literacy course that introduces students to computers and their importance in society. It provides essential acquaintance for students with no previous background in computers. The course covers the basic terminology in terms of hardware, software, communication, and the Internet. In addition, a great part of the course is dedicated to the practical use of basic application software (Microsoft Word, Excel, PowerPoint).
The Writing Center

Director:   Zenger, Amy A.

The Writing Center aims to enhance writing at AUB by conducting research and by supporting student writers and teachers of writing. The center promotes the many uses of writing: as a tool for thinking, as a way to demonstrate learning and as a means of expression. It seeks to maintain professional affiliations with writing centers in this region and internationally.

The Writing Center works with administrators, faculty members, and students to support writing in courses in each of the majors, in accordance with General Education guidelines.

The Writing Center also offers free, one-hour writing consultations to members of the AUB community. All undergraduate and graduate students, faculty, and staff are welcome to discuss their writing with a tutor. Writing projects may include academic essays, research papers, reading responses and critiques, fiction, letters and memos, resumes and curriculum vitae, personal statements for graduate school, thesis proposals and theses, and many other tasks. Tutors are trained to respect each writer's level of achievement and to focus on the writer's understanding of how to write well. In a Writing Center session, tutors and writers may discuss developing and connecting ideas, documenting sources, composing a thesis statement, and revising a piece of writing. Tutors also make resources available to writers in the form of writing handbooks, documentation guides, and handouts on a range of specific issues.

The Writing Center is located in West Hall, room 336. It is open 9 am to 5 pm, Monday through Friday. Contact the center by phone at AUB extension 3157 or by e-mail at writing@aub.edu.lb.
The Zaki Nassif Music Program (ZNMP)

Academic Committee: Jarrar, Maher; Jureidini, Wadi; Hurani, David; Meers, Paul; Nassif, Nabil (Chairperson), Sabra Ramzi
The Zaki Nassif Music Program (ZNMP) was inaugurated in December 2004.

Objectives

The Program aims to preserve and promote the musical heritage of Zaki Nassif and to foster excellence in the teaching of music by contributing to its advancement through a variety of activities that include:

- Reinstating and sustaining musical studies programs and music curricula at AUB.
- Recruiting scholars and new faculty members to initiate music courses and programs at the department of Fine Arts and Arts History (FAAH) in AUB Faculty of Arts and Sciences.
- Organizing competitions, concerts, conferences and seminars.
- Inviting professional musicians and academics to the University.
- Awarding prizes, scholarships, and fellowships to students in the name of Zaki Nassif.

Activities and Plans

One of the first achievements of the Program was completed on January 10, 2008 through a deed of gift by the family of Zaki Nassif that facilitated the transfer to the Jafet Library of the composer’s archives, granting AUB all legal title and intellectual property rights. The archival material is being cataloged according to international library standards, and transferred, documented and conserved in electronic form. This pioneering project to conserve the cultural heritage of an oriental composer constitutes a model that could be replicated to preserve the work of other musicians.

The establishment in 2009 of an annual competition “A Choir from Every School”, is another important accomplishment designed to encourage Lebanese elementary and secondary schools committed to developing a music curriculum and related activities.

Plans are under way to revive a Music degree program in FAAH. Both graduate and undergraduate courses will be offered. The range of courses will be new to Lebanon and the Middle East, including encouraging research in the field of Lebanese-Oriental music. The intention is to educate new generations of musicians and musicologists well versed in the composition and performance of Middle Eastern music in particular along with world music in general.

Publication of scholarly editions of Zaki Nassif’s extant contributions to Middle Eastern music, including scores, lyrics, compositions, recordings, writing and correspondence is also planned.
Suliman S. Olayan
School of Business (OSB)
Suliman S. Olayan School of Business (OSB)

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Provost, ex-officio
George K. Najjar
Dean
Assem Safieddine
Associate Dean for Academic Programs and Faculty Affairs
Ibrahim Osman
Associate Dean for Research
Hanin Abdallah
Assistant Dean for Student Services
Mohamad Zeidan
Assistant Dean for Corporate Programs
Mouene Salameh
Registrar, ex-officio
Salim Kanaan
Director of Admissions, ex-officio
Lokman Meho
University Librarian, ex-officio

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Internship and Placement Officer
Hala Azar
Assistant to the Dean
Antoine Feghali
Director of Corporate Relations
Carla Sayegh Hilton
Director of Continuous Improvement
Fida Kanaan
Director of Executive Education
Rula Karam
EMBA Officer
Elias Khater
Institutional Research Officer
Antoine Sabbagh
Senior Financial Analyst
Maya El Helou Shaib
IT Officer

Program Directors

Salim Chahine
Director of the MBA Program
Riad Dimechkie
Director of the Executive MBA Program

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To date, AUB has graduated over 6,500 students from its undergraduate business programs and over 1,300 from its graduate business programs. Since its formal establishment as a distinct school, OSB has grown its full-time faculty complement from 13 in the academic year 2000-01 to 56 today. It now graduates approximately 350 students from its undergraduate program and 60 students from its graduate programs every year.

OSB currently offers four degree programs: an Executive Master of Business Administration (herein referred to as the “Executive MBA”), a Corporate Executive Master of Business Administration (herein referred to as the “CEMBA”), a Master of Business Administration (herein referred to as the “MBA”) and a Bachelor of Business Administration (herein referred to as the “BBA”).

Accreditation

The degree programs of OSB are accredited by the Association to Advance Collegiate Schools of Business (AACSB International). Requiring rigorous quality audits and adherence to best academic practices, AACSB accreditation, which is attained by less than five percent of business schools worldwide, is the international quality-assurance standard for business education programs.

Vision

The vision of OSB is to become universally and unequivocally globally recognized as the foremost business school between Europe and South Asia, equally excelling in teaching, research and professional service.

Mission

Building on over a century of prominence in business education, the Suliman S. Olayan School of Business is committed to providing quality undergraduate and graduate programs aimed at developing and enhancing global managerial leadership in the Middle East region and beyond. The school’s undergraduate program accentuates a liberal arts-based operational focus, whereas the Executive MBA has a distinct strategy orientation. The MBA program is designed to provide a dynamic balance

The Finance, Accounting, and Managerial Economics Track

Convenor: Safieddine, Assem
Professor: Safieddine, Assem
Associate Professor: Chahine, Salim
Visiting Associate Professor: Tabelsi, Samir
Assistant Professors: Dbouk, Wassim; Ghanem, Abdel Jalil; Jamali, Ibrahim; Khalil, Samer; Manassara, Armond; McNamara, Steven; Rkein, Ali; Saade, Sama; Safar, Walid
Visiting Assistant Professor: Termos, Ali
Instructors: El-Hajj, Sana; Hout, Bassima; Tannir-Fawaz, Lina; Uwaydah-Mardini, Rania

The Management, Marketing, and Entrepreneurship Track

Convenor: Jamali, Dima
Professor: Najjar, George K.
Visiting Professor: Darley, William
Associate Professors: Jamali, Dima; Rebeiz, Karim; Sidani, Yusuf
Assistant Professors: Affouni, Fida; Bastian, Bettina; Daouk, Lina; Kamel, Yehia; Karam, Charlotte; Khakhar, Priyan; Koskal, Mehmet Haluk; Khouyry, Hailtham; Leigh, Laurence; Showaiq, Sammy; Zbib, Imad; Zeidan, Mohamad-Jamal; Zghieb, Philip
Senior Lecturers: Dimcheckie, Klad; Kettaneh, Tarek
Lecturer: Thornberry, Jon
Instructors: Kfouri, Michael; Khourina-Hanna, Leila; Standen, David

Business Information and Decision Systems Track

Convenor: Osman, Ibrahim, H.
Professors: Hindi, Khalil; Osman, Ibrahim, H.
Associate Professor: Fleszar, Krzysztof
Assistant Professors: Arakji, Reina; Araman, Victor; Azad, Bijan; Beyrouthy, Camille; Bo Hamad, Imad; Feghal, Antoine; King, Nelson; Moussawi, Lama; Nasser, Walid; Yorke-Smith, Neil
Lecturer: Majdalani, Elias
Instructors: Geutcherian, Rita; Salamoun Sioufi, Randa

History and Overview

Business education at AUB started in 1900 and was provided either by a department or a semi-autonomous school under the University’s Faculty of Arts and Sciences for approximately one hundred years. In celebration of the hundred-year anniversary of offering business programs, AUB established in September 2000 an Independent School of Business (later named the Suliman S. Olayan School of Business, “OSB”) as the sixth faculty of the University.

The First AUB Faculty to Be Named

In June 2003, the AUB School of Business was named the Suliman S. Olayan School of Business, in honor of the late international Saudi businessman and AUB trustee whose family has always been a major supporter of AUB.

This watershed event triggered a series of major developments intended to broaden and deepen the delivery of quality undergraduate and graduate business programs at AUB. An entirely new curriculum was introduced for the BBA and MBA degrees in the fall of 2001. Both degrees were redesigned to follow leading trends in international business education. In the spring of 2004, OSB launched the Executive MBA program in response to the professional development needs of senior corporate leaders in the region. In 2009, a corporate version of the Executive MBA program was introduced.

* On leave
undergraduate program

OSB currently offers a bachelor’s degree in business administration (the “BBA”).

the BBA program

philosophy

The BBA program is for university entrants focused on translating their thinking and interests into career opportunities in business. The program combines business and arts and sciences in a rigorous learning environment to help students gain a holistic understanding of the social, cultural and economic environment in which they operate. The curriculum’s liberal arts-based operational focus is deeply grounded in analytics, while emphasizing soft skill areas such as leadership, decision-making and ethical reasoning.

admission to the program

Normally, there are two admission deadlines a year; in February, for enrollment in the following fall, and in November, for enrollment in the following spring.

criteria for admission to the BBA program

Students are admitted as sophomores to the BBA program either through direct admission, through transfer from other Faculties at AUB or through transfer from other universities. Students may also be admitted as junior transfers from other Faculties at AUB or from outside AUB.

direct admission

These students are normally admitted directly from secondary school into the sophomore class at OSB. For complete and detailed information regarding admission to the University, see the Admissions section of this catalogue. All direct admissions are decided by the University Unified Admissions Committee.

transfer into OSB

As per OSB’s bylaws, all transfer decisions are made by the school’s Admissions Committee.
Transfer from the Freshman Class of the Faculty of Arts and Sciences

Eligibility conditions are:

- successful completion of at least 24 credits
- a minimum cumulative average of 77
- a minimum grade of 70 in MATH 101, MATH 102 or MATH 203

All final admissions decisions depend on the overall quality of the eligible applicant pool and the number of available places for the term in question.

Transfer from other Faculties at AUB

Non-OSB students at AUB, other than those from the freshman class of the Faculty of Arts and Sciences, may apply for a transfer to OSB in order to pursue a BBA degree. To be eligible for an internal transfer, the applicant must:

- have completed at least 24 sophomore credits (or 54 credits including freshman credits)
- not be on probation
- have achieved a minimum overall cumulative average of 77

All final admissions decisions depend on the overall quality of the eligible applicant pool and the number of available places for the term in question.

Transfer from Outside AUB (Other Universities)

Students currently pursuing an undergraduate degree at another university in Lebanon or abroad may apply for transfer to the OSB sophomore or junior class. To be eligible for admission to AUB and to OSB's business program, the applicant must:

- be transferring from an appropriately accredited university or institution of higher education recognized by AUB
- have completed at least 30 sophomore credits (or 60 credits inclusive of the freshman year)
- have achieved a minimum overall cumulative average equivalent to the AUB average of 77

All final admissions decisions depend on the overall quality of the eligible applicant pool and the number of available places for the term in question.

It is important to note that:

- transfer of credit is considered only for courses completed in the five-year period preceding the proposed date of joining the BBA program
- the student must have achieved a grade equivalent to 77 or higher at AUB in each of the Business courses for which transfer of credit is sought
- the Administrative Committee reserves the right to require the student to sit for an exemption test prior to the approval of transferred courses. Exemption tests are available for a non-refundable fee of $100 per test. An exemption test may be taken only once.

Business as a Second Degree

The OSB Admissions Committee evaluates all applications for the BBA as a second degree and makes recommendations to the Dean. To be eligible for admission, the student must have a first degree from an appropriately accredited institution of higher education recognized by AUB with a cumulative average of no less than 75 (or its equivalent).

All final admissions decisions depend on the overall quality of the eligible applicant pool and the number of available places for the term in question.

Dual Degree

Students may, upon approval of the Faculty concerned, complete the requirements for a second degree while registered in another Faculty at AUB. In such a case, a student will be granted two degrees at the same time upon graduation. If tuition differs, students will pay the higher of the tuitions. To be eligible for a dual degree with OSB, the applicant must:

- have completed at least 24 sophomore credits (or 54 credits including freshman credits)
- not be on probation
- have achieved a minimum overall cumulative average of 77

All final admissions decisions depend on the overall quality of the eligible applicant pool and the number of available places for the term in question.

Information about deadlines and applications are available on the following link:


Business as a Minor Field of Study

Students who wish to obtain a minor in business are required to complete 18 credit hours in the following business courses: ACCT 210 (Financial Accounting, 3 cr.), DCSN 200 (Operations Management, 3 cr.), FINA 210 (Business Finance, 3 cr.), INFO 200 (Foundations of Information Systems, 3 cr.), MKTG 210 (Principles of Marketing, 3 cr.) and MNGT 215 (Fundamentals of Management and Organizational Behavior, 3 cr.). In addition, they must attain a cumulative grade average of at least 77 across these courses.
It is important to note that:

• no business courses required by the Faculty in which the student is pursuing his/her major field of study (the “major Faculty”) may be counted toward the business minor. In cases where a student has taken business courses as a requirement by the student’s major Faculty, the student must take additional business electives to achieve the total 18 credits required for the minor. In all cases, course prerequisites, as stipulated in OSB’s curriculum, apply and are strictly enforced.

• computer science and engineering students must obtain approval from the Business Information and Decision Systems (“BIDS”) track convenor prior to registering for DCSN 200 or INFO 200. If these students have taken comparable courses as part of their major Faculty degree requirements, equivalency may be granted, subject to the approval of the OSB Admissions Committee. In such cases, the student must take additional business electives to achieve the total 18 credits required for the minor.

### Academic Policies

For more information on registration requirements, categories of students, class attendance, correct use of language, cross registration, course (and credit) loads, dean’s honor list, directed study, disclosure of student records, English proficiency, grading system, graduation with distinction and high distinction, and policy on transfer within the University, refer to the General University Academic Information section of this catalogue.

Other OSB-specific academic rules and regulations follow.

### Academic Advisers

Each BBA student is assigned an academic adviser who plays the role of a mentor. The adviser communicates the culture of the institution, mainly as it relates to “life-long learning, personal integrity and civic responsibility and leadership” (AUB Mission Statement), and plays an important role in guiding students through a curriculum that balances broad liberal arts exposure with deep knowledge of business fundamentals. In addition, the adviser helps the students in assessing future graduate studies opportunities and career choices.

### Classification of Students

A BBA student shall be considered to have completed a class level (i.e. freshman, sophomore, junior or senior) when s/he has successfully completed 30 or more credits beyond the requirements for the previous class. A student may be granted a certificate stating that s/he has completed a class only when s/he has completed the specified courses in the regular program for that class and has acquired the requisite number of credits.

### The credit requirements are as follows:

<table>
<thead>
<tr>
<th>Class</th>
<th>Credits Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman class</td>
<td>30 credits</td>
</tr>
<tr>
<td>Sophomore class</td>
<td>60 credits (cumulative)</td>
</tr>
<tr>
<td>Junior class</td>
<td>90 credits (cumulative)</td>
</tr>
</tbody>
</table>

### Credit Load

Students may register for up to 17 credit hours in a regular academic semester (e.g. fall or spring) and 10 credit hours in the summer term. Junior and senior, but not sophomore, students who wish to increase their credit load to 18 credit hours in a semester must have completed ENGL 203 and ENGL 204 and then petition the OSB Administrative Committee for permission to do so. Normally, junior and senior students with an overall average of at least 80 or an average of at least 80 in the last two semesters are given such permission.

The credit load of a student who is in his/her first semester on probation (P1) shall not be fewer than 12 credit hours and shall not exceed 17 credit hours. The load of a student who continues to be placed on probation (P2) shall not be fewer than 12 credit hours and shall not exceed 13 credit hours.

Students who are registered in the BUSS 245 course (the internship) may register for no more than 3 other credit hours, provided that the other course(s) taken do not conflict with the working hours of the summer internship. Honor students may petition to be allowed to register for a maximum of 7 credit hours, including the internship.

### Internship Requirements

All BBA students must successfully complete the internship requirement (BUSS 245). Normally, the internship takes place in the summer term directly following the completion of the junior year. Students must register for the summer internship (through an on-line application on the OSB website) by March 31, and provide the school with an employer’s acceptance by April 31. All students applying for the internship program must:

• be juniors;

• have completed: FINA 210, MNGT 215, MKTG 210, and INFO 200;

• have completed by the end of the fall semester:

a) at least 38 credit hours if they were admitted to the University as sophomores

b) or at least 68 credit hours if they were admitted to the University as freshmen.

Normally, internships are assigned and/or allocated by the internship and placement officer. However, students may solicit their own internships.
Internship guidelines

- The internship is normally two months in duration and takes place during the summer term (i.e., any two months between June 15 and August 31).
- The student must comply with the policy of the host company regarding working days and working hours.
- The work week must not be less than 5 working days.
- Working hours are according to host company policies.
- The student will be supervised by a faculty member from OSB and the work supervisor at the company throughout the internship period.
- The internship is graded. The grade is based on the evaluations of both the direct work supervisor and the OSB faculty supervisor.
- The internship grade is included in the computation of the student’s overall average.

Academic Probation

Placement on Academic Probation

University regulations apply; refer to the General University Academic Information section of this catalogue.

In addition, note that:

- Students who are attending 4 courses including BUSS 211 i.e. with a load of 11 credits are subject to probation regulations.
- If a student on probation drops the whole semester, then that semester is not counted for continued probation purposes.

Removal of Probation

University regulations apply; refer to the General University Academic Information section of this catalogue.

Dismissal

University regulations apply; refer to the General University Academic Information section of this catalogue.

Readmission

University regulations apply; refer to the General University Academic Information section of this catalogue.

Transfer credits are considered after evaluation of a student’s coursework. The student must have achieved a minimum grade equivalent to the AUB average of 77 in each of the courses for which transfer of credits may be granted.

Regulations on readmission also apply to students who are dropped from other AUB Faculties and apply for admission to OSB.

Readmission of students dropped from the school by the Administrative Committee requires the approval of that Committee, whereas readmission of students dropped from other AUB Faculties requires the approval of the OSB Admissions Committee.

Failing and Repeating Courses

University regulations apply; refer to the General University Academic Information section of this catalogue.

A student who at the end of the senior year fails to fulfill the graduation requirements pertaining to cumulative grade averages and is not dismissed must repeat the courses with low grades, in order to raise the overall averages to the required minimums.

Incompletes

A student who, at the end of a term, receives an incomplete grade for missing a major requirement of a course (e.g., final examination, term project or paper) must present a valid excuse in order for him/her to apply for permission to complete that course. Medical reports and/or qualified professional opinions issued by an AUB employee, AUBMC doctor or by the University Health Services are normally accepted. Should there be a question about the validity of an excuse, the OSB Administrative Committee may not allow the student to sit for a makeup.

In order to receive permission to complete a course, the student must, within two weeks of the end of term, submit to the OSB Administrative Committee a makeup request (form available at the OSB Student Services Office) approved by the instructor, along with evidence of a valid excuse. If granted permission, the makeup must be completed within one month of the start of the next regular semester. In rare and exceptional circumstances, the OSB Administrative Committee may grant the student additional time. A student who has already sat for a final examination may not re-take that examination.

Incomplete course work is reported as an “I” followed by a numerical grade reflecting the evaluation of the student, based on available information. The evaluation is based on a grade of zero on all missed work and is reported in units of five. If the work is not completed within the period specified, the “I” is dropped and the numerical grade becomes the final grade.

Internship guidelines

Readmission

Failing and Repeating Courses

Incompletes

Academic Probation

Placement on Academic Probation

Removal of Probation

Dismissal
Examinations and Quizzes

Undergraduate business courses, other than tutorial and seminar courses, have final examinations, unless otherwise authorized by the OSB Academic Committee. In all courses in which final examinations are given, a student would not receive a passing grade without taking a final examination. Even though final examinations are not required in tutorial and seminar courses, the instructor may choose to give a final examination.

At the beginning of each semester, the instructor announces the examinations and quizzes policy that s/he intends to follow. The instructor assumes final responsibility for dealing with students missing an examination or a quiz during the term. Normally, students who miss an announced examination or quiz during the term must present an excuse considered valid by the instructor. Only then may the instructor allow the student to take a makeup.

Cross-Registration

A business student who wants to register for a course at another recognized institution must meet all requirements for cross-registration as stipulated in the General University Academic Information section of this catalogue.

Study Abroad

A business student who started his/her undergraduate program at AUB and wishes to study abroad may seek prior approval from the OSB Academic Committee to spend up to one year and earn up to 30 credits at another university. However, the student must spend his/her last semester at AUB. The student must achieve a grade equivalent to the AUB average of 77 in each of the courses for which transfer credits may be granted.

Graduation Requirements

Graduation requirements for the Bachelor of Business Administration (BBA) are as follows:

• A minimum of six semesters beginning with the sophomore class is required.
• A maximum of six calendar years is allowed for graduation of students who begin with the sophomore class, four calendar years for juniors and two calendar years for seniors. A student who fails to complete his/her degree program within these specified times must petition the OSB Administrative Committee for an extension.
• A student transferring to AUB from another recognized institution of higher learning must register in the final three regular semesters and must complete at least 45 credits at AUB, of which a minimum of 24 credits must be in business before s/he is allowed to graduate with a BBA. For purposes of this requirement, two summer sessions shall be considered equivalent to one semester.
• A transfer student from within AUB must meet the residency requirement before s/he graduates with a BBA degree. The residency requirement stipulates that a student must spend a minimum of one regular semester (i.e. fall or spring) and one summer session in the school, during which s/he must complete a minimum of 24 credits, 12 of which are business credits. During this period, the student must meet all minimum academic standards set forth by the school.
• Completion of a minimum of 90 credits for students who enter as sophomores. With the approval of the OSB Academic Committee, tracks may establish programs that exceed these minimum credit requirements.
• Completion of 48 credits in business courses comprising 39 credits of core courses and 9 credits of business electives in a concentration area. Students must achieve a cumulative average of at least 70 in these 48 credits as well as a cumulative average of at least 70 in the 39 credits of core business courses.
• For students to graduate with a concentration, the 9 credits in the concentration area must be completed with a cumulative grade average of at least 70. Normally a maximum of one course completed outside OSB may count toward the concentration upon the approval of the track convenor.
• Completion of three required zero-credit business workshops.
• Successful completion of the Assurance of Learning Requirements.
• When a student repeats a course, the highest grade obtained in the course is used in computing the student’s average for graduation purposes. The student may repeat any course s/he chooses.
• Grades of 70 or more in at least 50 credits numbered 200 or above.
• All Arabic-speaking business students (except those officially exempted) must satisfy the Arabic language requirements and all students entering at the sophomore, junior or senior level must take one Arabic course.
• All business students must take English communication skills courses as determined by placement upon matriculation, and these required courses may be taken immediately on matriculation and must be continued without interruption until completed through ENGL 208. For example, a student entering at the lowest level may take five semesters of English (Intensive ENGL 100A or 100B if required 102, 203, 204, and 208): a student entering at the third level must take 3 semesters (203, 204, and 208); i.e., nine credits). A student who enters at ENGL 204 must take, in addition to this course, ENGL 208 and any other elective course from the offerings of other AUB faculties.
• All business students must take MATH 203, MATH 204, and CMPS 209. A student who is exempted from MATH 203 must take, in addition to MATH 204 and CMPS 209, any other non-business elective course from offerings at other AUB faculties.
• All business students must take ECON 211 and 212.
• All business students must take one of CVSP 201, 202, 205, or 207, and one of CVSP 203, 204, 206, or 208. Students who elect CVSP 205 for credit may not enroll in CVSP 201 or 202 and vice versa. Likewise, students who elect to take CVSP 203 or CVSP 204 for credit may not enroll in CVSP 206 or vice versa. In addition, apart from BUSS 215 which is designated as a humanities course for the General Education requirements, a student must take three credits from the humanities series listed in the General Education Humanities courses. ENGL 102 or its equivalent is a prerequisite to all CVSP 201-208 courses.
• All business students must take two Natural Sciences from the General Education Natural Sciences courses.
• All Business students must satisfy the General Education requirements as specified for all AUB students.
• Students already holding a bachelor’s degree outside business and wishing to obtain a BBA must complete, after admission, 48 business credit hours. However, students who have completed a minor in business or have taken 18 or more business credit hours prior to applying for the BBA as a second degree must take no fewer than 30 business credit hours. All second-degree students must also fulfill other non-business graduation requirements.

• All senior-level BBA students must complete an online survey (through the OSB website) in order to be cleared for graduation.

Program Outline
The undergraduate program, leading to a BBA degree, requires students to complete 120 credit hours for those beginning at the freshman level and 90 credit hours for those joining the University as sophomores. Of the total required credit hours, the BBA program requires that 48 credit hours, including a one credit internship program, be satisfactorily completed in business courses, with the remainder allocated to liberal arts/non-business courses. In addition and as a condition for graduation, all students are required to complete successfully three zero-credit pass/fail workshops designed to enhance their soft skills.

Assurance of Learning Requirements
To comply with AACSB Assurance of Learning guidelines and standards, all students are required, as a condition for graduation, to complete successfully during their last semester work assigned by the school for this purpose.

Business Requirements
Of the total required credit hours, 48 must be satisfactorily completed in business courses. Of these 48, a general business core comprising 39 credit hours is common to all business students. In addition to this general business core (which includes the three zero-credit workshops mentioned above), the student must complete 9 additional credit hours of business electives in one of the following concentration areas: accounting, finance, management, marketing, entrepreneurship and business information and decision systems. All courses qualifying as business electives must be offered by OSB. Students who do not opt for a concentration must complete the 39 core credit hours in addition to at least 9 credit hours in free business electives.

A student may also choose a second concentration by taking an additional 9 credit hours. Thus a business student who chooses to pursue two concentrations must complete 9 credits in each concentration. A BBA student is allowed to graduate with a maximum of two concentrations, and the student must declare concentration(s) (or lack thereof) no later than the end of the junior year.

Required Core Business Courses (39 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 210</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 215</td>
<td>Management Accounting</td>
<td>3</td>
</tr>
<tr>
<td>BUSS 200</td>
<td>Business Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>BUSS 211</td>
<td>Business Law</td>
<td>2</td>
</tr>
<tr>
<td>BUSS 215</td>
<td>Business Ethics</td>
<td>3</td>
</tr>
<tr>
<td>BUSS 230</td>
<td>Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>BUSS 239</td>
<td>Business Communication Skills Workshop</td>
<td>0</td>
</tr>
<tr>
<td>BUSS 240</td>
<td>Strategic Career Planning Workshop</td>
<td>0</td>
</tr>
<tr>
<td>BUSS 245</td>
<td>Internship/Practicum</td>
<td>1</td>
</tr>
<tr>
<td>BUSS 248</td>
<td>Developing Business Plans Workshop</td>
<td>0</td>
</tr>
<tr>
<td>BUSS 249</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>DCSN 200</td>
<td>Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>DCSN 205</td>
<td>Managerial Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>FINA 210</td>
<td>Business Finance</td>
<td>3</td>
</tr>
<tr>
<td>INFO 200</td>
<td>Foundations of Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>MNGT 215</td>
<td>Fundamentals of Management and Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>MKTG 210</td>
<td>Principles of Marketing</td>
<td>3</td>
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<tr>
<td>Required Electives</td>
<td>Business Courses</td>
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</tr>
<tr>
<td>Total Business Credits</td>
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</tr>
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</table>

Non-Business, General Education Requirements
Starting at the sophomore level, of the required 90 credit hours of the BBA program, 42 credit hours must be satisfactorily completed in non-business courses. These include 8 credit hours of English, 6 credit hours of economics (social sciences), 12 credit hours of civilization sequence and humanities including BUSS 215 (humanities), 6 credit hours of mathematics (quantitative thought), 3 credit hours of computer science (quantitative thought), 3 credit hours of Arabic and 6 credit hours of Natural Sciences. For a list of specific required non-business courses, refer to the next section.

Students who have taken required non-business courses in their freshman year are exempted from them in the sophomore year. These students must, however, take additional free electives to fulfill the credit hour minimum of 42 required for graduation.
Program Delivery

A proposed study plan for the BBA program is presented next.

Year I
Freshman Year Total Credits 30
Refer to the Admissions section of this catalogue.

Year II
All the below courses are required of every student unless otherwise indicated.

<table>
<thead>
<tr>
<th>Semester 1 (Fall)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 203</td>
<td>Academic English</td>
</tr>
<tr>
<td>MATH 203</td>
<td>Mathematics for Social Sciences I</td>
</tr>
<tr>
<td>ACCT 210</td>
<td>Financial Accounting</td>
</tr>
<tr>
<td>Two of the following three courses:</td>
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</tr>
<tr>
<td>ECON 211</td>
<td>Elementary Microeconomic Theory</td>
</tr>
<tr>
<td>ECON 212</td>
<td>Elementary Macroeconomic Theory</td>
</tr>
<tr>
<td>CMPS 209</td>
<td>Computers and Programming for the Sciences</td>
</tr>
<tr>
<td>Total 15</td>
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<table>
<thead>
<tr>
<th>Semester 2 (Spring)</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 204</td>
<td>Advanced Academic English</td>
</tr>
<tr>
<td>BUSS 239</td>
<td>Business Communication Skills Workshop</td>
</tr>
<tr>
<td>MATH 204</td>
<td>Mathematics for Social Sciences II</td>
</tr>
<tr>
<td>DCSN 200</td>
<td>Operations Management</td>
</tr>
<tr>
<td>FINA 210</td>
<td>Business Finance</td>
</tr>
<tr>
<td>One of the following three courses:</td>
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</tr>
<tr>
<td>ECON 211</td>
<td>Elementary Microeconomic Theory</td>
</tr>
<tr>
<td>ECON 212</td>
<td>Elementary Macroeconomic Theory</td>
</tr>
<tr>
<td>CMPS 209</td>
<td>Computers and Programming for the Sciences</td>
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<table>
<thead>
<tr>
<th>Semester 3 (Fall)</th>
<th>Credits</th>
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<tbody>
<tr>
<td>INFO 200</td>
<td>Information Systems Design and Development</td>
</tr>
<tr>
<td>MNGT 215</td>
<td>Fundamentals of Management and Organizational Behavior</td>
</tr>
<tr>
<td>DCSN 205 or ACCT 215</td>
<td>Managerial Decision Making or Management Accounting</td>
</tr>
<tr>
<td>MKTG 210</td>
<td>Principles of Marketing</td>
</tr>
<tr>
<td>CVSP 201, 202, 205 or 207</td>
<td>Civilization Sequence</td>
</tr>
<tr>
<td>Total 15</td>
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</table>

<table>
<thead>
<tr>
<th>Semester 4 (Spring)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSS 200</td>
<td>Business Data Analysis</td>
</tr>
<tr>
<td>BUSS 215</td>
<td>Business Ethics</td>
</tr>
<tr>
<td>DCSN 205 or ACCT 215</td>
<td>Managerial Decision Making or Management Accounting</td>
</tr>
<tr>
<td>Natural Sciences</td>
<td>Natural Sciences</td>
</tr>
<tr>
<td>ENGL 208</td>
<td>English for International Business</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Year III Summer Session</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSS 245</td>
<td>Internship/Practicum</td>
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<td>Total 15</td>
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</table>

<table>
<thead>
<tr>
<th>Semester 5 (Fall)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARAB</td>
<td>Basic Arabic Grammar and Syntax, or Readings in Arabic Literature or any higher level Arabic course based on the Arabic placement test</td>
</tr>
<tr>
<td>BUSS 211</td>
<td>Business Law</td>
</tr>
<tr>
<td>BUSS 230</td>
<td>Managerial Economics</td>
</tr>
<tr>
<td>BUSS 240</td>
<td>Strategic Career Planning Workshop</td>
</tr>
<tr>
<td>Business Elective</td>
<td>For Concentration Students: Business Elective from the area of concentration For Generic Students: Any Business Elective</td>
</tr>
<tr>
<td>Humanities or Natural Sciences</td>
<td>Humanities or Natural Sciences</td>
</tr>
<tr>
<td>Total 14</td>
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</tbody>
</table>
Undergraduate Business Course Prefixes

BBA courses all have a prefix labeled after the discipline name: ACCT (accounting), DCSN (Business Decision Systems), ENTM (Entrepreneurship), FINA (Finance), INFO (Business Information Systems), MKTG (Marketing), and MNGT (Management). A detailed description of courses under each discipline is available in its respective track section. Interdisciplinary and integrative courses that do not belong to a particular discipline are labeled by the prefix BUSS.

BUSS Courses

**BUSS 200 Business Data Analysis** 3 cr.
This course covers basic statistical concepts and introduces some advanced concepts and tools that are useful for decision-makers in business and management. Topics include descriptive statistics, probability distributions, statistical inference (hypothesis testing and analysis of variance) from small and large samples of data, correlation and regression, non-parametric statistics. An emphasis will be given to the understanding and applicability of statistical analysis, and interpretation of the output of analyses using Excel spreadsheet tools and short real-life cases. Business majors only; Prerequisite: MATH 204, CMS 209.

**BUSS 211 Business Law** 2 cr.
The main objective of the course is to help business students understand the Lebanese and American legal aspect of common business activities and the formation and functioning of commercial companies along with the related ethical principles. Business majors only; Prerequisite: MNGT 215.

**BUSS 215 Business Ethics** 3 cr.
This is an introductory course that provides students with an overview of business ethics at the individual, organizational, and societal level. Issues such as corruption, sexual harassment, fair trade, fraud, whistle-blowing, corporate social responsibility, ethical norms, ethical values, environmental responsibility and many more will be examined both in the international as well as local Lebanese context. Ultimately, the course is designed to not only introduce students to a wide array of current ethical issues in business but to also foster skills related to critically analyzing the ethical and social dimensions of business-related problems in order to build more ethically-informed rationales for decision making. Business majors only; Prerequisite: MNGT 215.

**BUSS 230 Managerial Economics** 3 cr.
Managerial Economics is the use of economic theory and mathematical and statistical techniques in order to examine how a firm can make economic decisions given the constraints it faces. Topics covered include: goals of the firm, marginal analysis, demand theory and estimation, time series and forecasting, theory of production and estimation, cost theory and estimation, pricing and output determination under different market structures, game theory, and pricing in practice. Business majors only; Prerequisites: ECON 211, BUSS 200.

**BUSS 235 Macro Business Analysis** 3 cr.
A course that combines theory with cases that require group work and discussions. The theoretical part of this course covers monetary, fiscal, and exchange rate policy, and an overview of economic development strategies. Cases are used to train students in developing rigorous arguments to analyze interactions between firms in domestic as well as global economic scenarios. Business majors only; Prerequisite: ECON 212.
BUSS 239  Business Communication Skills Workshop  0 cr.
A ten-hour workshop designed to introduce students to the various communication skills needed in a typical work environment. Mastering these skills plays a profound role in shaping and advancing professional careers in all types of industries and work scopes. The workshop introduces specific guidelines for the effective use of a variety of communication skills in the workplace, in an interactive manner simulating the work environment. Business majors only.

BUSS 240  Strategic Career Planning Workshop  0 cr.
A ten-hour workshop designed to build awareness of changing career patterns and major personal and professional influences that impact future careers. Issues such as preparing for joining the labor market, basic career guidance, and understanding career stages, and practicing self-assessment are emphasized. Business majors only; Co-requisite: BUSS 245.

BUSS 245  Internship/Practicum  1 cr.
A summer period of guided work experience under faculty supervision by a mentor, and corporate guidance by a preceptor, designed to acquaint students with the world of work and help them acquire core values and basic skills necessary for an understanding of the global economy. Business majors only; Prerequisites: FINA 210, MKTG 210, INFO 200 and business junior standing.

BUSS 246  Honors Seminar in Business  3 cr.
A tutorial research course that can be counted for any undergraduate concentration. This course involves directed readings and emphasizes individual original and independent research in any business-related area. This course requires, among other things, that the student prepare an honors research paper under the supervision of one or more faculty members in the particular area of concentration. The honors paper is normally presented at a school seminar. Prerequisite: approval of track convenor.

BUSS 247  Project  3 cr.
A practicum course that can be counted for any undergraduate concentration. This course focuses on analysis of contemporary business issues and problems. The project requires, among other things, that the student works on a problem faced by one of the local or regional businesses, and recommends a set of possible solutions under the supervision of one or more faculty members in the particular area of concentration. The results of the project are normally presented in a meeting in the presence of representatives from the business subject to the consulting assignment. Prerequisite: approval of track convenor.

BUSS 248  Developing Business Plans Workshop  0 cr.
A ten-hour workshop focusing on starting your own business from inception to IPOing, passing through the stages of feasibility study, VC financing, launching, and operating. Business majors only; Prerequisites: ACCT 215, FINA 210, MKTG 210, BUSS 200, BUSS 215, INFO 200, DCSN 205.

BUSS 249  Strategic Management  3 cr.
A course that exposes students to the strategic management process of local, regional, and multinational corporations. Emphasis is placed on identifying the tools needed for strategic analysis of the firm and the industry, and on comprehending the key strategic issues that managers face in managing corporations. Business majors only; Prerequisites: ACCT 215, FINA 210, MKTG 210, BUSS 200, BUSS 215, INFO 200, DCSN 200.

FAME Track Courses

In addition to the 42 credit general undergraduate requirements from outside the school (listed earlier) and the 39 credits required in the business core (ACCT 210, ACCT 215, BUSS 200, BUSS 211, BUSS 215, BUSS 230, BUSS 239, BUSS 240, BUSS 245, BUSS 248, BUSS 249, DCSN 260, DCSN 205, FINA 210, INFO 200, MKTG 210, MKTG 215), the track requires students wishing to follow one of its general concentrations, either Accounting or Finance to take 9 credits of any course in the concentration area.

Accounting Courses

ACCT 210  Financial Accounting  3 cr.
An introduction to financial accounting that covers the use, interpretation, and analysis of the principal financial statements and other sources of financial information from a national and international perspective.

ACCT 215  Management Accounting  3 cr.
A course that covers the use, interpretation, and analysis of management accounting information for management decision-making, planning, and control of operations. The focus is on cost behavior, cost measurement, budgeting, performance measurement and evaluation, responsibility accounting, and product costing. Business majors only; Prerequisite: ACCT 210.

ACCT 217  Strategic Managerial Accounting  3 cr.
In-depth coverage of topics such as value chain analysis, activity-based costing, JIT systems, analysis of firm’s cost structures, and the provision and use of information for strategic decisions. A rigorous analysis of some widely-used financial and non-financial measures, such as Return on Investment, EVA, and the balanced scorecard is also undertaken. Business majors only; Prerequisite: ACCT 215.

ACCT 221  Intermediate Financial Accounting I  3 cr.
This is the first of two professional courses in this area. This course covers concepts and standards of external financial reporting, systems to record and prepare financial accounting information, contents and presentation of basic financial statements, and financial reporting issues of assets. Business majors only; Prerequisite: ACCT 210.

ACCT 222  Cost Accounting  3 cr.
A course on accounting in manufacturing operations; cost concepts and classifications; cost accounting cycle; accounting for materials, labor, and burden; process cost accounting; budgeting; standard costs; cost reports; direct costing and differential cost analysis; cost-volume-profit analysis and gross profit analysis. Business majors only; Prerequisite: ACCT 215.

ACCT 223  Intermediate Financial Accounting II  3 cr.
Continuation of ACCT 221. This course covers financial reporting issues relating to liabilities, ownership equity, selected financial reporting issues, and financial reporting disclosure. Business majors only; Prerequisite: ACCT 221.

ACCT 230  Introduction to External Auditing  3 cr.
An introduction to auditing and the professional responsibilities of a career in accounting. Topics include the legal and ethical responsibilities of accountants; professional auditing standards; international auditing standards; the acquisition, evaluation, and documentation of audit evidence; reports on the results of the engagement, evaluation in internal control, compliance testing, substantive testing, and statistical sampling and auditing EDP. Business majors only; Prerequisite: ACCT 221.

ACCT 231  Fraud Examination and Internal Audit  3 cr.
A course on fraud examination and internal audit. This course covers concepts and topics of fraud detection, deterrence, and prevention; types of financial statement and occupational fraud; and investigation and interviewing techniques. It also covers functions of internal audit, audit committees and corporate governance, planning and performing the internal auditing engagement, and coordination of internal auditing and external auditing. Business majors only; Prerequisite: ACCT 215.
ACCT 232  Accounting Information Systems  3 cr.
A course that explores in detail several typical Accounting Information System (AIS) application subsystems, such as order entry/sales, billing/receivables/cash receipts, inventory, purchasing/accounts payable/cash disbursements, payroll, and materials planning/production. This course includes understanding, documenting, designing, using, and auditing these application subsystems. Business majors only; Prerequisite: ACCT 210, INFO 203.

ACCT 235  Taxation  3 cr.
A study of the Lebanese Tax Code and its application as it relates to individuals and business entities. This course includes the laws governing direct taxation (Income tax), indirect taxation (stamp duty and VAT), and the basic principles of the National Social Security Fund (NSSF). Business majors only; Prerequisite: FINA 210.

ACCT 240  Fund Accounting  3 cr.
A course that provides an alternative perspective of accounting that meets the needs of not-for-profit and governmental organizations. This course involves the interpretation and use of fund accounting as a means of reporting and controlling activities. Business majors only; Prerequisite: ACCT 215.

ACCT 241  Profit Planning and Budgeting Control  3 cr.
A broad view of profit planning and control. Topics covered include sales planning and control, planning production, materials purchase and usage, planning and controlling direct labor costs and overhead, planning expenses, planning and controlling capital expenditures, and completion and application of the profit plan. Business majors only; Prerequisite: ACCT 215.

ACCT 246  International Accounting  3 cr.
A course on selected topics faced by professional accountants in international business, including financial reporting standards, foreign currency, budgeting, management control, and performance evaluation. Business majors only; Prerequisite: ACCT 215.

ACCT 250  Special Topics  1, 2, or 3 cr.
A course that deals with special issues and concerns in accounting not included in regular courses. This course may be repeated for credit when the topics vary. Prerequisites vary with the topic and are noted in the course schedule. Credits depend on the course offered. Prerequisite: approval of track convenor.

ACCT 251  Accounting Tutorial  0.5-3 cr.
Tutorials provide opportunities for students to pursue directed study readings and preliminary research relevant to their concentration where existing courses do not offer the required subject matter. Tutorials include a presentation of a report on the work. Prerequisite: Approval of track convenor.

Finance Courses
FINA 210  Business Finance  3 cr.
This course teaches the tools that determine and analyze the major decisions a financial manager has to make, including identification of the firm's goals, time value of money, use of discount cash flow models, capital budgeting under certainty, capital structure as it relates to cost of capital, dividend policy, and ethics in finance. Prerequisite: ACCT 210.

FINA 215  Financial Markets and Institutions  3 cr.
A study of the functions and operations of financial institutions. This course covers analysis of existing financial systems, money and capital markets, banks and non-bank financial intermediaries, term structure of interest rates, and securities markets including the stock and bond exchanges. Business majors only; Prerequisite: FINA 210.

FINA 218  Risk Management in Financial Institutions  3 cr.
This course covers the role of risk management in the financial institutions industry, use of insurance in risk management, quantitative and qualitative measures of risk, management of interest rate fluctuations, credit risks and policies, gap analysis, management of market risks and foreign exchange risk, management of operational and sovereign risks, portfolio analysis, the role of asset and liability management, and risk control processes. Business majors only; Prerequisite: FINA 210.

FINA 220  Investment Management  3 cr.
A study of the operations of securities markets, investment policies, valuation of individual securities, and techniques of investing in securities. This course also introduces students to analysis of investment information, evaluation of risks and returns, and principles of portfolio selection in investment decisions. Business majors only; Prerequisite: FINA 210.

FINA 222  Valuation Methods  3 cr.
This course covers techniques used by investment bankers and analysts for enterprise valuation. The techniques used are divided into intrinsic valuation and relative valuation. Intrinsic valuation includes dividend discount models, free cash flow to equity, free cash flow to firm. Relative valuation measures are price-to-earnings, price-to-sales, price-to-book, price-to-cash flow. The focus is on applications and insights as to when and why we use one measure versus another. Business majors only; Prerequisite: FINA 210.

FINA 225  Commercial Bank Management  3 cr.
Defines functions, operations, and objectives of commercial banks as compared to other financial institutions. The course studies the management aspects of commercial banks, financial analysis of bank statements, liquidity management, assets and liability management, profitability, capital adequacy, credit analysis, trade finance, and banking regulations. Business majors only; Prerequisite: FINA 210.

FINA 227  Insurance  3 cr.
An operational approach to risk management in business and personal affairs. The major thrust of this course is to introduce students to the various types of insurance contracts including life, health, property, and liability insurance, and how to measure and manage risk. This course also covers reinsurance and the know-how to make the best use of insurance contracts and coverage. Business majors only; Prerequisite: FINA 210.

FINA 228  Credit and Risk Analysis  3 cr.
The goal of this course is to learn to focus on “Risk” as a basic income-generating product of banks and financial institutions. The aim is to have the student acquire the tools used by financial institutions to identify, review, analyze, and measure risk. The student will learn to establish adequate pricing and structuring of bank credit facilities and of third party financing. The course will introduce risk concepts, risk ratings, and risk review procedures. It will concentrate on financial spread sheet and ratio analysis and will allow the assessment of various risk aspects of corporations. Business majors only; Prerequisite: FINA 210.

FINA 230  International Financial Management  3 cr.
An analysis of the opportunities, problems, and financial decisions confronting multinational companies. The focus of this course is on understanding international regulatory and environment differences, access to money and capital markets, use of derivatives to hedge exchange rate risk, exposure to political risk and other types of risk, and international diversification. Business majors only; Prerequisite: FINA 210.
FINA 232/ENTM 232 
Real Estate Management 3 cr.
This course is designed to give the student a general overview of the real estate space. Topics include an introduction to real estate markets (sources of demand), real estate finance, project evaluation, elements of real estate law, appraisals, property development and property management. Business majors only; Prerequisite: FINA 210.

FINA 234 
Real Estate Finance and Investment 3 cr.
This course examines selected issues in real estate finance and investment: Techniques for analyzing financial decisions in property development and investment; property income streams, pro forma analysis, equity valuation, taxes, risk types, and sensitivity analysis. It also introduces the fundamentals of mortgage securitization and public markets in real estate securities. Business majors only; Prerequisite: FINA 210.

FINA 235 
Personal Financial Planning 3 cr.
A course that deals with planning and managing personal finance. This course focuses on topics such as the financial planner’s role and environment, cash flow budgeting, consumer credit, debt management, insurance, taxation and financial planning, retirement planning, estate planning and wills, personal bankruptcy and insolvency, and preparation of financial plans. Business majors only; Prerequisite: FINA 210.

FINA 240/DCSN 220 
Financial Simulation Modeling 3 cr.
This course introduces elements of computerized simulation, including modeling deterministic and stochastic systems, generation of random numbers and variables, and probability and statistics related to modeling, validating, running, and interpreting computer simulations. Simulation projects on corporate finance issues, and investment and portfolio analysis form an integral part of the course. Prerequisite: BUSS 200 or equivalent.

FINA 241/ENTM 241 
Venture Capital Management 3 cr.
This course provides students with an understanding of the approaches and techniques used by Venture Capitalists to: assess the prospects of success of a venture; develop and negotiate investment terms including valuation; monitor the investee and understand exit routes such as trade sale and IPO. It also provides the student with conceptual and practical knowledge about key operating and strategic aspects of an entrepreneurial business, from the pre-commercial stage to IPO. Business majors only; Prerequisite: FINA 210.

FINA 242/ENTM 242 
Advanced Venture Capital and Private Equity 3 cr.
This course covers special types of financing for capital investment proposals. The course will use the case approach to assess the organization and strategies of the private equity industry, the use of financial and economic tools in Leveraged Buyout and venture capital investing, types of private equity transactions, study of transactions with options and hybrid financing structures, financing of IPOs, incubators, and corporate venture capital. Business majors only; Prerequisite: FINA 210.

FINA 243 
Private Banking 3 cr.
This course offers students the opportunity to learn how to manage high net worth client relationships. It tackles client approach techniques as well as the financial know-how, knowledge of markets' functioning, products, and services. Business majors only; Prerequisite: FINA 210.

FINA 247 
Case Studies in Finance 3 cr.
This course provides a deep understanding of the financing issues that firms must deal with, using the case approach. The topics covered include cost of capital for a multidivisional firm, capital structure and estimation of debt benefits, pricing Initial Public Offerings (IPOs), Leveraged Buyout (LBO), mergers and acquisitions, warrants and convertibles, and financial distress. Business majors only; Prerequisite: FINA 210.

FINA 250 
Special Topics 1, 2, or 3 cr.
A course that deals with special issues and concerns in finance not included in regular courses. This course may be repeated for credit when the topics vary. Prerequisites vary with the topic and are noted in the course schedule. Credits depend on the course offered. Prerequisite: approval of track convenor.

FINA 251 
Finance Tutorial 0.5-3 cr.
Tutorials provide opportunities for students to pursue directed study readings and preliminary research relevant to their concentration when existing courses do not offer the required subject matter. Tutorials include a presentation of a report on the work. Prerequisite: approval of track convenor.

MM&E Track Courses

In addition to the 42 credit general undergraduate requirements from outside the school (listed earlier) and the 39 credits required in the business core (ACCT 210, ACCT 215, BUSS 211, BUSS215, BUSS 230, BUSS 239, BUSS 240, BUSS 245, BUSS 248, BUSS 249, DCSN 205, FINA 210, INFO 200, MKTG 210, MGT 215), the track requires students following one of its concentrations, either Management, Marketing or Entrepreneurship, to take 9 credits of any course in the concentration area. Students may choose to pursue an HR focus within management by taking MGT 220 and two of the following: MGT 218, MGT 225, MGT 229, and any HR-designated MGT 250 course. MKTG 222 is a required course for all marketing concentration students.

Entrepreneurship Courses

ENTM 220 
Managing a Small Business for Growth 3 cr.
An identification of the management, organization, and operational issues critical to the growth of small business enterprises. This course emphasizes the resolution of managerial problems from the perspective of small business focusing mainly on marketing, finance and HR areas. It is targeted at junior and senior students who expect to hold senior management positions in SMEs. Prerequisite: MGT 215.

ENTM 225 
Business Environment of the Firm 3 cr.
A course that focuses on how to analyze the impact of the environment on small firms, the growing role of NGOs and stakeholders in shaping strategies, with special emphasis on the role of government policy. Prerequisite: MGT 215.

ENTM 230 
Decision making Skills for Entrepreneurs 3 cr.
This course will introduce the theories, processes, skills, and techniques relating to effective decision-making at the individual and group level. Good decision makers know how to recognize decision situations, how to represent the essential structure of the situations, and how to analyze them. This course will move back and forth between formal models and behavioral, descriptive models to help students understand and improve their native decision making abilities. Prerequisite: MGT 215.
ENTM 232/ Real Estate Management 3 cr.
FINA 232
This course is designed to give the student a general overview of the real estate space. Topics include an introduction to real estate markets (sources of demand), real estate finance, project evaluation, elements of real estate law, appraisals, property development and property management. Business majors only; Prerequisite: FINA 210.

ENTM 235 Family Business: Issues and Solutions 3 cr.
A course that focuses on family businesses: their importance, structure, governance, management, challenges; issues of succession, inheritance, family versus non-family management, and rivalry between siblings, cousins, or across generations. Prerequisite: MNGT 215.

ENTM 241/ Venture Capital Management FINA 241 3 cr.
This course provides students with an understanding of the approaches and techniques used by Venture Capitalists to: assess the prospects of success of a venture; develop and negotiate investment terms including valuation; monitor the investee and understand exit routes such as trade sale and IPO. It also provides the student with conceptual and practical knowledge about key operating and strategic aspects of an entrepreneurial business, from the pre-commercial stage to IPO. Business majors only; Prerequisite: FINA 210.

ENTM 250 Special Topics 1, 2, or 3 cr.
A course that deals with special issues and concerns in entrepreneurship not included in regular courses. This course may be repeated for credit when the topics vary. Prerequisites vary with the topic and are noted in the course schedule. Credits depend on the course offered. Prerequisite: approval of track convenor.

ENTM 251 Entrepreneurship Tutorial 0.5-3 cr.
Tutorials provide opportunities for students to pursue directed study readings and preliminary research relevant to their concentration where existing courses do not offer the required subject matter. Tutorials include a presentation of a report on the work. Prerequisite: approval of track convenor.

ENTM 270 Launching a New Venture 3 cr.
This course focuses on the founding and development of new business organizations. It identifies the prerequisites for successful new ventures, the threats to their survival, and the practical actions entrepreneurs may take to overcome them and successfully grow their venture. Prerequisites: MNGT 215 and FINA 210.

Management Courses

MNGT 215 Fundamentals of Management and Organizational Behavior 3 cr.
A course that focuses on the management of the modern organization and the employees within, preparing students for their role as future managers and leaders. It explores essential management concepts, processes and techniques from an organizational behavior perspective. Main topics covered include management history and evolution, motivation, decision-making, leadership, power and politics, learning and perception, communication, managing groups and teams, and human resource management. Prerequisite: ENGL 204.

MNGT 220 Human Resource Management 3 cr.
This course introduces the principles of human resource management. It helps students acquire the basic HRM concepts and equips them with the tools necessary for the effective management of people in organizations. Main topics covered include strategic HRM, planning and staffing, training and development, performance management, compensation, career management and global HRM. Prerequisite: MNGT 215.

MNGT 225 Employee Development 3 cr.
This is a senior level, seminar style course that is designed to expose students to employee training and development within an organization. Specifically, it is designed to help students develop skills that will enable them to effectively design, implement, and evaluate training systems from an applied perspective. The course also sheds light on career planning and development as essential functions in maintaining competency, motivation, and commitment. Prerequisites: MNGT 215, MNGT 220.

MNGT 229 Contemporary Issues in Human Capital Management 3 cr.
This course addresses contemporary issues in human resource management theories and practices in terms of their ability to have a positive impact on organizational results and to encourage desired employee attitudes and behaviors. Main topics examined pertain to organizational culture, international HRM, diversity and work life balance, downsizing, employee participation, knowledge management, employment ethics, emotions at work, flexibility and workplace bullying. Prerequisite: MNGT 215.

MNGT 230 International Management 3 cr.
A course on the management function in a global economy. Topics covered include substantive and stylistic challenges for senior and middle management in international cross continent corporations and conglomerates, standardization and diffusion of authority and operations, mobility and self reinvention, and integration and differentiation. Prerequisite: MNGT 215.

MNGT 250 Special Topics 1, 2, or 3 cr.
A course that deals with special issues and concerns in management not included in regular courses. This course may be repeated for credit when the topics vary. Prerequisites vary with the topic and are noted in the course schedule. Credits depend on the course offered. Prerequisite: approval of track convenor.

MNGT 251 Management Tutorial 0.5-3 cr.
Tutorials provide opportunities for students to pursue directed study readings and preliminary research relevant to their concentration where existing courses do not offer the required subject matter. Tutorials include a presentation of a report on the work. Prerequisite: approval of track convenor.

Marketing Courses

MKTG 210 Principles of Marketing 3 cr.
An overview of marketing activities including marketing inputs in strategic planning, global marketing, marketing research, analysis of buyer behavior, market segmentation and positioning, and development of the marketing mix elements. Prerequisite: ENGL 204.

MKTG 215 Services Marketing 3 cr.
An overview of the process of marketing services. This course includes a study of the characteristics of services and their marketing implications, developing marketing strategies, creating value, pricing and promoting the service performance, and ensuring a positive customer experience. Business majors only; Prerequisite: MKTG 210.
MKTG 220/ INFO 220
E-Commerce/ Electronic Marketing 3 cr.
An overview of electronic marketing development and its impact on marketing transactions and management of organizations. Topics covered include e-marketing as an economic and strategic approach; business to business and consumer e-commerce and e-marketing; management of an e-marketing project; and financial, legal, and security issues. Business majors only; Prerequisites: MKTG 210, INFO 200.

MKTG 222
Marketing Research 3 cr.
A course that provides thorough coverage of various marketing research tools along an applied orientation, including a systematic analysis of the steps comprising the marketing research process, starting with research problem definition and terminating with data collection, analysis, and presentation. Business majors only; Prerequisites: MKTG 210, BUSS 200.

MKTG 225
Marketing Communications 3 cr.
An overview of promotion management and integrated marketing communications. Topics covered include behavioral foundations of marketing communications, environmental influences on marketing communications, and the promotion management process and its execution. Business majors only; Prerequisite: MKTG 210. Students cannot receive credit for both SOAN 231 and MKTG 225 or for both SOAN 235 and MKTG 225.

MKTG 230
Sales Management 3 cr.
An overview of selling and sales management. Topics covered include sales management functions and strategies, developing the selling function, sales goals and structure, building a sales program, and leading and motivating the sales force. Business majors only; Prerequisite: MKTG 210.

MKTG 235
Retailing and Merchandising 3 cr.
This course examines the opportunities and problems faced by marketers in contemporary retail formats. The principle issues involved in retailing are explored, including store location and layout, merchandise planning, buying and selling, category management, and coordination of store activities. Overall the course allows students to develop appropriate skills and knowledge for effective and efficient decision making in the contemporary retail environment. Business majors only; Prerequisite: MKTG 210.

MKTG 238
Public Relations 3 cr.
This course focuses on the communication between an individual or organization and the public to promote stakeholder acceptance and approval. Students explore traditional and emerging components of the public relations process through mass media, as well as the needs of different types of businesses, such as corporations, non-profit organizations, and government offices. Business majors only; Prerequisite: MKTG 210. Students cannot receive credit for both SOAN 234 and MKTG 238.

MKTG 240
Consumer Behavior 3 cr.
A course that focuses on the customer as the key to market success. Topics covered include the roles of a customer, market values, customer seeks, determinants of customer behavior, the customer's mindset, customer decision-making, and customer-focused marketing. Business majors only; Prerequisite: MKTG 210.

MKTG 245
International Marketing 3 cr.
An overview of the scope and challenge of international marketing. Topics covered include the cultural environment of global markets, assessing global market opportunities, and developing and implementing global marketing strategies. Business majors only; Prerequisite: MKTG 210.

MKTG 250
Special Topics 1, 2, or 3 cr.
A course that deals with special issues and concerns in marketing not included in regular courses. It may be repeated for credit when the topics vary. Prerequisites vary with the topic and are noted in the course schedule. Credits depend on the course offered. Prerequisite: approval of track convenor.

MKTG 251
Marketing Tutorial 0.5-3 cr.
Tutorials provide opportunities for students to pursue directed study readings and preliminary research relevant to their concentration when existing courses do not offer the required subject matter. Tutorials include a presentation of a report on the work. Prerequisite: approval of track convenor.

**BIDS Track Courses**

In addition to the 42 credits of general undergraduate requirements from outside the school (listed earlier) and the 39 credits required in the business core (ACCT 210, ACCT 215, BUSS 200, BUSS 211, BUSS 215, BUSS 230, BUSS 239, BUSS 240, BUSS 245, BUSS 248, BUSS 249, DCSN 200, DCSN 205, FINA 210, INFO 200, MKTG 210, MGT 215), the track requires all students concentrating in Business Information and Decision Systems to take INFO 205, and any combination of elective courses totaling 6 credits from the Decision Systems courses (denoted by DCSN) and the Information Systems courses (denoted by INFO).

**Decision Systems Courses**

DCSN 200
Operations Management 3 cr.
This course offers an overview of how operations managers make strategic decisions in operating a production or service system, thereby giving their firms a sustainable competitive advantage in a global marketplace. It focuses on the systematic planning, design, and operations analysis of the main processes required for the production of goods and the delivery of services. Specific topics include operations strategy framework; product and service design; customer order management; process design and management; capacity and material planning; statistical quality control and management; inventory and supply chain. Prerequisite: CMPS 209.

DCSN 205
Managerial Decision Making 3 cr.
This course is a spreadsheet-based introduction to the tools and techniques of modern managerial decision making. It addresses formulation of models that can be used to analyze complex problems taken from various functional areas of management, including finance, marketing, operations, and human resources. The goal is to understand how business decisions are reached, what tradeoffs are made, and how outcomes depend on the underlying data. A broad range of analytical methods is covered to address decision making: under certainty (linear, integer and non-linear programming; network flows; project management; and multi-objectives); under uncertainty (decision analysis and decision trees) and under risk (simulation). Decision making software tools like MS Excel, Tree Plan, Crystal Ball, @Risk and MS Project will be used for hands-on experiences. Business majors only; Prerequisite: Math 204 and CMPS 209.

DCSN 210
Business Logistics 3 cr.
This course addresses the planning, organizing, and controlling of such activities as transportation, inventory management, facility location, order processing, purchasing, warehousing, materials handling, packaging, customer service standards, and product scheduling. It is specifically designed to help managers analyze and resolve challenges encountered in the real business world and a competitive environment.
DCSN 215  Advanced Managerial Decision Making Models  3 cr.
This course addresses advanced models from functional areas of management, including finance, marketing, operations, and human resources, through case studies and use of applications software. Prerequisite: DCSN 205.

DCSN 220/ FINA 240  Financial Simulation Modeling  3 cr.
This course introduces elements of computerized simulation, including modeling deterministic and stochastic systems, generation of random numbers and variables, and probability and statistics related to modeling, validating, running, and interpreting computer simulations. Simulation projects on corporate finance issues, and investment and portfolio analysis form an integral part of the course. Prerequisite: BUSS 200 or equivalent.

DCSN 225  Enterprise Systems Design and Implementation  3 cr./INFO 225
This course introduces the problems of coordination in business caused by low/no integration of systems and processes. It offers solutions through a combination of enterprise systems (enterprise resource planning) and enterprise application/data integration. A semester-long project requires students working in teams to develop a business integration solution through the application of systems integration principles based on use of software. Prerequisites: INFO 205, DCSN 205.

DCSN 250  Special Topics  1, 2, or 3 cr.
This course deals with special issues and concerns in business decision systems not included in regular courses. This course may be repeated for credit when the topics vary. Prerequisites vary with the topic and are noted in the course schedule. Credits depend on the course offered. Prerequisite: approval of track convenor.

DCSN 251  Decision Systems Tutorial  0.5-3 cr.
Tutorials provide opportunities for students to pursue directed study readings and preliminary research relevant to their concentration where existing courses do not offer the required subject matter. Tutorials include a presentation of a report on the work.

Management Information Systems Courses
INFO 200  Foundations of Information Systems  3 cr.
This course introduces information systems that raise productivity, create customer value and sustain competitive advantage. It shows how the integration of information technology and information systems in the organization's work processes adds value for the business and its customers. It focuses on the following topical areas: competitiveness, functional information systems, e-commerce and supply chain systems, business intelligence systems, and systems development. Prerequisite: CMPS 209 or equivalent

INFO 205  Information Systems Design and Development  3 cr.
This course emphasizes the issues facing business and management in the design and development of information systems: properly formulating business problems; targeting the appropriate processes and functions; delineating the planned data needs and user groups; estimating the value of the solution; and the requisite design and implementation processes, phases, and timeframe. Cases will underscore these issues and problems in the context of practical design and development projects. Prerequisite: INFO 200. Next time this course is offered in Spring 2013.

INFO 210  Business Database Systems  3 cr.
This course introduces the central role of database management systems (DBMS) and their applications in the business IT/IS environment, including an overview of database design, implementation, query and use based on using features of a commercial structured query language-based (SQL) DBMS. The course includes a case study that requires a basic information model (conceptual/physical design) and the development of a multiple table database satisfying a real business need. Prerequisite: INFO 200. Next time this course is offered in Fall 2011.

INFO 215  Managing Information Technology Resources  3 cr.
This course introduces the management of IT/IS as a critical business resource. It examines information economics and business strategy; IS strategies; data resources; IS support provided to business processes and decisions; technical (hardware/network/telecommunication) infrastructure of IS; IS maintenance policies and procedures; staffing and funding approaches for IS services; and IS security measures. Prerequisite: INFO 200. Next time this course is offered in Spring 2012.

INFO 220/ MKTG 220  E-Commerce/ Electronic Marketing  3 cr.
An overview of electronic marketing development and its impact on marketing transactions and management of organizations. Topics covered include e-marketing as an economic and strategic approach; business to business and business to consumer e-commerce and e-marketing; management of an e-marketing project; and financial, legal, and security issues. Prerequisites: MKTG 210, INFO 200. This course is offered every Fall.

INFO 230  Knowledge Management  3 cr.
This course addresses capturing, transferring, sharing, and managing knowledge. Topics include understanding knowledge; knowledge management systems life cycle; knowledge creation; capturing knowledge; knowledge transfer and knowledge sharing; learning from data; data mining; and ethical and legal issues. Prerequisite: INFO 200.

INFO 250  Special Topics  1, 2, or 3 cr.
This course deals with special issues and concerns in business information systems not included in regular courses. This course may be repeated for credit when the topics vary. Prerequisites vary with the topic and are noted in the course schedule. Credits depend on the course offered. Prerequisite: approval of track convenor.

INFO 251  Information Systems Tutorial  0.5-3 cr.
Tutorials provide opportunities for students to pursue directed study readings and preliminary research relevant to their concentration where existing courses do not offer the required subject matter. Tutorials include a presentation of a report on the work. Prerequisite: approval of track convenor.
Faculty of Engineering and Architecture (FEA)

Officers of the Faculty

Peter F. Dorman  President of the University
Ahmad Dallal  Provost, ex-officio
Fadl Moukalled  Acting Dean
Moueen Salameh  Registrar, ex-officio
Salim Kanaan  Director of Admissions, ex-officio
Lokman Meho  University Librarian, ex-officio

Faculty Administrative Support

Ghada Kamar Najm  Executive Officer
Alia Kazma Serhal  Student Services Officer
Lara Touma  Financial Officer

Historical Background

As early as 1913 the University recognized the need for engineering education and training in the Middle East, and courses in this field were offered in the School of Arts and Sciences. By 1944 sufficient additional courses had been added to permit the granting of the degree of Bachelor of Science in Civil Engineering. The last class in this program graduated in June 1954. In 1951 a separate School of Engineering was established and curricula were initiated in civil engineering, mechanical engineering, electrical engineering, and architectural engineering. The years from 1951 to 1954 were a transitional period of continuous development toward the new curricula, established in 1954. In 1963 a program leading to the degree of Bachelor of Architecture was introduced, replacing the bachelor of architectural engineering program, the last class of which graduated in June 1966. In that year the school was renamed the Faculty of Engineering and Architecture. Since then curricula have been under constant review with changes introduced as necessary to keep pace with modern technology, to conform to sound developments in engineering and architecture education, and to meet the evolving needs of the region. In 1986 a new undergraduate major in computer and communications engineering was added within the Department of Electrical and Computer Engineering. In 1992 a new major in graphic design was added within the Department of Architecture and Design. In 2006 the name of the degree was changed to Bachelor of Fine Arts in Graphic Design. In 2006 the name of the Electrical Engineering degree was changed to Electrical and Computer Engineering. In 2009 two new programs offering BS degrees were added to the FEA. A Construction Engineering Program in the CEE department and a Chemical Engineering Program currently housed in the Mechanical Engineering Department.

Accreditation

The American University of Beirut, Bachelor of Engineering (BE) programs in civil engineering, computer and communications engineering, electrical and computer engineering, and mechanical engineering have been accredited by the Engineering Accreditation Commission of ABET, Inc. This is one of the most respected and internationally renowned accreditation organizations in the USA. ABET accreditation demonstrates a program’s commitment to providing its students with a quality education.

Vision

The Faculty of Engineering and Architecture is a world-class professional school that attracts eminently qualified faculty of international caliber and outstanding students. The FEA contributes to the development of Lebanon and the region by providing undergraduate and graduate education of the highest quality, promoting strong research programs, and rendering expert services to the community.

Mission

The Faculty of Engineering and Architecture (FEA) at the American University of Beirut is a leading professional school in the Middle East. The FEA offers educational programs of the highest standards, promotes research and creative scholarly activities of its faculty and students, and provides services to the community at large, while addressing the needs of Lebanon and the region. The FEA undergoes continuous improvement to maintain a challenging and intellectually stimulating environment, and prepares its students to be life-long learners, innovators, and professionals capable of being leaders in their chosen careers, committed to personal integrity and civic responsibility.

Undergraduate Programs

The Faculty of Engineering and Architecture offers programs of study leading to the degrees of Bachelor of Architecture (BArch), Bachelor of Fine Arts in Graphic Design (BFA), and the degree of Bachelor of Engineering (BE), with majors in civil engineering, computer and communications engineering, electrical and computer engineering, mechanical engineering, and chemical engineering. The curriculum of the BArch degree extends over 14 terms (ten 16-week semesters and four eight-week summer terms), totaling 192 weeks. Although the program is completed in five calendar years, it is equivalent to a program of six academic years that does not include summers. The curriculum of the BE degree and that of the BFA degree is each divided into 11 terms (eight 16-week semesters and three eight-week summer terms), totaling 152 weeks. This duration is equivalent to a program of six academic years, without summers, but the program is completed in four calendar years. There is a short break after each term and a one-month vacation between summer and fall terms. The Faculty also offers a Bachelor of Science (BS) degree in Construction Engineering and a Bachelor of Science (BS) degree in Chemical Engineering. The curriculum of both BS degree programs require the completion of 110 credit hours, after the freshman year, of course work over three years, including two summer terms.

The Faculty reserves the right to make changes in the curriculum, course content, and regulations as it deems appropriate, and without prior notice.
Admission to First Year

Admission is by the selection of a limited number of the most promising, eligible applicants. All candidates for admission to the Faculty of Engineering and Architecture must have completed the pre-professional educational requirements of the candidate’s country and the approved freshman program in the Faculty of Arts and Sciences of this University as described in this catalogue, or a program recognized as equivalent. The certificates, recognized for admission to the first year in the Faculty of Engineering and Architecture, are listed under Secondary Certificates in the section on Admissions in this catalogue. Holders of the technical baccalaureate (BT) are eligible for admission only to the same major as that of the BT.

More specifically, to be eligible for admission to the first year in the Faculty of Engineering and Architecture, a candidate must

- Demonstrate an acceptable level of proficiency in English, as specified under Admissions in this catalogue
- Sit for the required SAT I tests as specified in the relevant section, Admissions, in this catalogue
- Satisfy the Faculty of Engineering and Architecture requirements on character recommendation, as well as academic grounds

Students admitted to the first year are required to take all the major engineering, architecture, or graphic design courses specified in their respective programs.

Admission of Transfer Students

Students attending recognized institutions of higher learning, including AUB, may apply for transfer to any of the engineering, architecture, or graphic design majors in the FEA. These students are eligible for consideration for admission to any of Terms I through VI (Term VIII for architecture) depending on availability of places and subject to the following conditions. Normally, students will not be admitted to the architecture or graphic design programs in the middle of the academic year.

Students must

- Have completed the equivalent of the sophomore class at the college or university from which they are transferring
- Have attained a minimum cumulative average of 2.7 out of 4.0 (75 out of 100 for AUB students)
- Have taken at least 12 credits of math and basic science courses at the sophomore level or higher and attained a total average in these courses of at least 3.0 out of 4.0 (77 out of 100 for AUB students) This applies to engineering and architecture majors only
- Have satisfied the university English requirements for admission
- Students from outside AUB applying for transfer to the architecture or graphic design majors are required to submit portfolios of their work; students from within AUB applying for transfer to the architecture or graphic design majors are encouraged to submit portfolios of their work.

Applications of transfer students are evaluated and approved by the departments and the Admissions Committee of the Faculty. The term in which the student is placed, and the complete program of study in the major in which s/he is admitted, are determined by the department concerned depending on the number of credits completed at the institution from which the student is transferring.

Special Students Not Working for a Degree

Refer to p. xx in this catalogue.

Students may, upon approval of the faculty concerned, complete the requirements for a second degree while registered in another faculty at AUB. In such a case, a student will be granted two degrees at the same time of graduation. If tuition differs, students will pay the higher of the tuitions. Information about deadlines and applications are available on the following link: http://www.aub.edu.lb/registrar/Documents/pdfdoc/dualdegree.pdf

Residence Requirements

Students of the Faculty of Engineering and Architecture must meet the following minimum residence requirements:

- Engineering or Graphic Design Majors: A student must register in residence at the Faculty of Engineering and Architecture for the last four regular semesters and should complete at least 50 credits during this period.
- Architecture Major: A student must register in residence at the Faculty of Engineering and Architecture for the last five regular semesters and should complete at least 65 credits during this period.

General Education Program Requirements

Students in the CCE, ECE and ME departments are expected to satisfy the following distribution requirements of humanities/social sciences courses:

- Two English courses, one of them English 206 - (6 credits)
- One Arabic course as determined by the Arabic Placement Test - (3 credits).
- One course on ethics - (3 credits)
- Three humanities courses - (9 credits)
- Two social sciences courses - (6 credits)

FEA students must select humanities/social science elective courses from the approved GE program course list on the Registrar’s homepage.

Graduation Requirements

To be eligible for graduation with the bachelor’s degree, a student must have passed all the required courses and the approved experience

- attained a minimum cumulative course average of 70
- attained a cumulative average of 70 or more in major courses as specified by the department
- met the residence requirements
- satisfied the faculty as to the adequacy of the student's professional development and conduct
Academic Rules and Regulations
For information on Categories of Students, Correct Use of Language, Grading System, Graduation with Distinction and High Distinction, and Placement on the Dean’s Honor List, see pp. xx–xx in this catalogue.

Class Status
The class status of students is as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>I and II</td>
</tr>
<tr>
<td>Second Year</td>
<td>III, IV, and V</td>
</tr>
<tr>
<td>Third Year</td>
<td>VI, VII, and VIII</td>
</tr>
<tr>
<td>Fourth Year</td>
<td>IX, X, and XI</td>
</tr>
<tr>
<td>Fifth Year</td>
<td>XII, XIII, and XIV</td>
</tr>
</tbody>
</table>

A student’s status is changed to that of a higher year if his/her cumulative number of failed, withdrawn or unregistered credits from the regular credit hour requirements does not exceed seven.

Change of Major within the Faculty
All changes of major are subject to approval by the department to which the change is requested. The receiving departments will determine the new study plans for students accepted to a new major.

Minor in Applied Energy
The minor in applied energy is open to all FEA students who are interested in the energy domain and in renewable energy applications. Students seeking professional careers that will focus on energy, the environment, sustainable applications in buildings, and energy systems may find this minor attractive. The minor in applied energy is offered by the Faculty of Engineering and Architecture rather than by an individual department.

Students who have completed at least 60 credits at the sophomore level and higher, and who have a cumulative average of 70 or more, may apply by completing a minor application form available in the Dean’s Office. The minor will be indicated on the transcript of the student who completes all the requirements described below. A minimum grade of 70 is required for a course to count toward the fulfillment of the minor.

Applied Energy Minor Program Structure
The applied energy minor has two components. The first is a core of courses that provides a foundation for the understanding of energy science and technology. The second component is a customized series of electives and labs, selected by each student in close consultation with a special faculty advisor for the applied energy minor. A student wishing to complete the minor is required to complete a minimum of 20 credits from a list of core courses (9 credits) and elective courses (11 credits) to fulfill the minor requirements.

Required Core Courses (9 credits)
The core courses include courses from three domains related to energy studies: one course in fundamental energy science, one course in energy technologies, and one course in energy management and economy as follows:

**Fundamental Energy Science Course**
MECH 310 Thermodynamics I, or CIVE 340 Fluid Mechanics and Laboratory, or CHEM 217 Thermodynamics and Chemical Dynamics 3 cr.

**Energy Technologies Course**
EECE 675 Renewable Energy Systems 3 cr.

**Energy Management and Economy Course**
ECON 333 Energy Economics and Policy 3 cr.

Elective Courses (Minimum of 11 credits)
Elective courses are selected from two lists. List A includes technical courses from chemical, mechanical, and electrical engineering majors at the undergraduate and master’s levels. List B includes courses in management, sciences, and the social sciences. The student must take a minimum of five credits from list A and a minimum of three credits from List B.

**List A: Energy in Engineering Context**
- CHEN 417 Kinetics and Reactor Design I 3 cr.
- CHEN 411 Heat Transfer 3 cr.
- CHEN 470 Chemical Process Design 3 cr.
- CHEN 570 Process Synthesis and Optimization 3 cr.
- CHEN 671 Chemical Product Design 3 cr.
- CIVE 450 Water and Wastewater Treatment and Laboratory 3 cr.
- CIVE 654 Solid Waste Management I 3 cr.
- CIVE 656 Air Pollution and Control I 3 cr.
- CIVE 658 Industrial/Hazardous Waste Management 3 cr.
- CIVE 659 Environmental Impact Assessment 3 cr.
- EECE 471 Fundamentals of Power Systems Analysis 3 cr.
- EECE 471L Power Systems Lab 1 cr.

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The applied energy minor has two components. The first is a core of courses that provides a foundation for the understanding of energy science and technology. The second component is a customized series of electives and labs, selected by each student in close consultation with a special faculty advisor for the applied energy minor. A student wishing to complete the minor is required to complete a minimum of 20 credits from a list of core courses (9 credits) and elective courses (11 credits) to fulfill the minor requirements.
Major | CEE | CHEN | ECE and CCE | MECH
---|---|---|---|---
**Domain**<br>**Credits in Major**<br>**Credits Outside Major**<br>**Credits in Major**<br>**Credits Outside Major**<br>**Credits in Major**<br>**Credits Outside Major**
Core<br>MECH 310 or CIVE 340 | 3 | 3 | 3 | 3 |<br>EECE 675 | 3 | 3 | 3 | 3 |<br>ECON 333 | 3 | 3 | 3 | 3 |<br>**Electives**<br>List A<br>CEE | 5-9 | 5-9 | 5-9 | 5-9 |<br>CHEN | 5-9 | 5-9 | 5-9 | 5-9 |<br>ECE | 5-9 | 5-9 | 5-9 | 5-9 |<br>MECH | 5-9 | 5-9 | 5-9 | 5-9 |<br>List B<br>3-6 | 3-6 | 5-9 | 3-6 | 3-6 |<br>**Total Credits** | 20-21 | 20-21 | 20-21 | 20-21 |
For biology students, the requirements are as follows:

- EECE 401 [1 cr.]
- BIOL 201 [4 cr.]
- BIOL 202 [4 cr.]
- (EECE 210 [3 cr.] or equivalent, and EECE 601 [3 cr.]) or (CIVE 210 [3 cr.] or equivalent, and MECH 634 [3 cr.])
- One elective course from list A or B below [3 cr.]

Minimum number of credits: 18

For all other students, the requirements are as follows:

- EECE 401 [1 cr.]
- BIOL 201 [4 cr.]
- BIOL 202 or PHYL 246 [4 cr.]
- (EECE 210 [3 cr.] or equivalent, and EECE 601 [3 cr.]) or (CIVE 210 [3 cr.] or equivalent, and MECH 634 [3 cr.])
- One elective course from list A, B, or C below [3 cr.]

Minimum number of credits: 18

Elective Courses

List A: EECE 601, EECE 602, EECE 603 (unless the student takes EECE 694, in which case either EECE 694 or 603 counts toward the minor), EECE 604, EECE 605, MECH 633, MECH 634

List B: MECH 532, MECH 606, MECH 607, MECH 624, MECH 631, MECH 641/EECE 661, EECE 693, EECE 694 (unless the student takes EECE 603, in which case either 694 or 603 counts toward the minor)

List C: BIOL 202, BIOL 223, BIOL 225, BIOL 244, BIOL 263, BIOL 268, PHYL 202, PHYL 246

Minor in Chemical Engineering

The minor in chemical engineering, currently offered in the Mechanical Engineering Department, is open to all engineering students in majors other than chemical engineering.

Minor Program Requirements (21 credits)

Student taking the minor are required to complete 21 credits of course work: 15 credits of core courses, and six credits of elective courses from the list given below.

Required Core Courses (15 credits)

- MECH 310 Thermodynamics I 3 cr.
- CHEN 311/MECH 314 Fluid Flow Operations 3 cr.
- CHEN 312 Separation Processes 3 cr.

Elective Courses (6 credits) selected from the following courses

- CHEN 411 Heat and Mass Transfer Operations 3 cr.
- CHEN 417 Kinetics and Reactor Design I 3 cr.

Minor in Engineering Management

The Engineering Management Program offers a minor in engineering management that can be pursued by undergraduate engineering and architecture students, as well as by students from related majors, starting as early as the fall semester of their third year of enrollment. To satisfy the requirements of the minor, a student must earn 18 credits of course work from the engineering management course offerings.

- At least nine of the total requirement of 18 credits must be fulfilled from the six undergraduate courses offered by the program, which must include ENMG 400—Engineering Economy. (ENMG 400, ENMG 500, ENMG 501, ENMG 502, ENMG 503, ENMG 504)
- The other nine credits can be satisfied by taking courses either from the list of undergraduate courses, or from the elective graduate courses.

A minimum grade of 70 is required for a course to count toward the fulfillment of a minor in engineering management.
The Department of Architecture and Design offers programs at both the undergraduate and graduate levels. The undergraduate level programs are in architecture and graphic design. The architecture program leads to the professional degree of Bachelor of Architecture (BArch). The graphic design program leads to the professional degree of Bachelor of Fine Arts in Graphic Design (BFA).

**Architecture**

**Mission Statement**

The program of architecture is committed to playing a leading role in architecture practice both in Lebanon and in the region through a critical discourse of architectural inquiry. It strives to maintain a prominent and active community searching for continuous excellence in teaching, research, and professional practice. Central to the curriculum, design is addressed as a research-oriented activity that engages critical thinking, that aims to bridge theory and practice, and that responds to the responsibilities of an architect towards the public. The goal of the program is to enable a supportive, diverse and professional environment that fosters the creative development of all faculty and students.

**Program Description**

The architecture program comprises a total of 174 credit hours typically taken over five years. The curriculum is structured as follows: 1) Two foundation years, first and second, with core requirements in design, technical, and history courses which offer students basic skills and knowledge in design and related areas. 2) Two advanced years, third and fourth, with core requirements in advanced design, technical, history and theory courses, reinforced by the distribution electives. The design studios at this level are thematic vertical studios. 3) Final year, fifth year, with a one-year design thesis and project and advanced electives.

The degree requirements in architecture consist of the following:

- 129 credit hours of mandatory core courses
- 18 credit hours of approved ArD/FEA field electives
- 3 credit hours in Category A: Representation
- 6 credit hours in Category B: History and Theory
- 9 credit hours in Category C: Technology, Engineering, and Professional Practice
- 6 credit hours of free electives in consultation with the academic adviser

To meet the General Education Requirements of AUB:

- 6 credit hours of English including ENGL 206
- 3 credit hours of Arabic as per placement test
- 6 credit hours of approved electives in humanities
- 3 credit hours of an approved elective in social sciences
- 3 credit hours of an approved elective in natural sciences
- 3 credit hours of an approved elective in quantitative thought

**Curriculum for the Degree of Bachelor of Architecture**

### First Year

**Fall Semester**

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<td>ARCH 223</td>
<td>History of Post-Medieval Art and Architecture</td>
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<td>ARCH 242</td>
<td>Building Construction I</td>
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<td>ARCH 325</td>
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<td>ARCH 261</td>
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* *b. stands for billing*
Course Descriptions

Mandatory Core Courses

Each of the following courses is required for the degree in architecture. Students should pay careful attention to the prerequisite structure, which must be observed. There is a grade average requirement for: ARCH 202, 304, 406, and 508; an average of 70 must be attained in the two preceding design courses in each case. Non-majors must secure the approval of the department and the instructor concerned to enroll in any of the courses listed below.

ARCH 100  Basic Design  4 cr.
Basic Design is an introductory studio course that provides an initial practical involvement in issues pertaining to design and architecture. The student is introduced and called upon to engage in thinking through applied practices about various questions concerning pictorial space, urban space, representation, physical gesture, objects and structures of organization. The aim of the projects is to expose students to basic design principles and train them in foundation studio skills.

ARCH 101  Architecture Design I  7 cr.
This course is the first architecture design studio in which students are introduced to the fundamentals of architectural design and conception. The studio focuses on the development of analytical and technical skills for perceiving, understanding, and manipulating spatial definitions and relationships. Prerequisite: ARCH 100.

ARCH 111  Technical Drawing  4 cr.
This is a course in descriptive geometry and graphic communication in architecture. Students learn to use drawing tools. They acquire techniques of representation of 3D and space on 2D surfaces, including orthogonal (plans, sections, and elevations), paraline (axonometrics and isometrics), and perspective drawings. Applications cover construction of shades and shadows.

ARCH 112  Descriptive Drawing  3 cr.
This studio course is an introduction to the visual representation of the built environment. Students learn the skills of pictorial conventions and are introduced to the historical specificity and theoretical assumptions that underlie them.

ARCH 121  History of Ancient Art and Architecture: From Caves to Catacombs  3 cr.
The first course in the History of Art and Architecture sequence surveys the origins and development of architecture, artifacts, and urbanism from prehistoric times to the end of the third century CE. We question meanings of the term art through objects associated with the activities of daily life and with the practices of kingship and religion, especially beliefs and rituals surrounding death and burial. While considering formal development, we also look at artifacts in their cultural context, relating them to myth, literature, and the development of technology. Local field trips are an important component of the class.

ARCH 122  History of Medieval Art and Architecture  3 cr.
This course is the second in the History of Art and Architecture sequence required for students in Architecture and Graphic Design. It covers medieval art and architecture from the fourth to the fourteenth centuries, including Byzantine, Ummayyad, Abbasid, Fatimid, Romanesque, Gothic, Ayyubid, and Mamluk art. The course is an analytic study of major developments, artists, and monuments. It emphasizes processes of cultural productions, their ideological framework, and socio-political significance. Prerequisite: ARCH 121 or consent of instructor.

ARCH 123  History of Post-Medieval Art and Architecture  3 cr.
The course is a study of art and architecture during the post-medieval period with a special emphasis on the fifteenth and sixteenth century Mediterranean world. It is the third in the history of art and architecture sequence required for students in architecture and graphic design. The post-Medieval period covered by the course includes the Italian Renaissance and the Ottoman Empire with emphasis on cultural encounters and exchange between East and West. Prerequisites: ARCH 121, ARCH 122 or consent of instructor.

The last course of the History of Art and Architecture sequence surveys the development of Western art and architecture from 1760 to 1945. Thinking beyond the established canon, the course critically addresses the political, aesthetic, institutional, and cultural forces that have contributed to shaping this canon. Problems we encounter when we acknowledge that art is a cultural product include the uneasy fit of style-period categories or the isms of art, gender, historical definitions of the avant-garde, the consumption and display of art; and the status of the artist in society. Prerequisites: ARCH 121, ARCH 122 and ARCH 223 or consent of instructor.

ARCH 201  Architecture Design II  7 cr.
This design studio has emphasis on structural concepts and construction materials as a major design determinant; manipulation of architectural elements and space; and observation of freehand and technical representation. Prerequisites: ARCH 101 and a combined grade average of 70 in ARCH 100 and ARCH 101.

ARCH 202  Architecture Design III  7 cr.
This design studio introduces projects that deal with complex architectural programs and the development of conceptualization related to developing design work. This develops the student’s response to design challenges through projects that deal with different environments, scales, and venues (level and sloping sites, new construction, renovation, urban, and rural). The studio stresses a variety of representation tools (sketching, collage, texts, 2D and 3D drawings, models) and emphasizes architectural representation in plan, section, and elevation. Prerequisite: ARCH 201.

ARCH 224  History of Modern Art and Architecture: 1760–1945  3 cr.
The course is an introduction to vector forces and moments; equilibrium of rigid bodies in 2-D and 3-D; free body diagrams; frames and machines; centers of gravity and moments of inertia; design of trusses, beams with shear and moment diagrams; introduction to material properties; stresses, strains, and their relationship; normal, shearing stresses. The course also provides an introduction to indeterminate structures.

ARCH 225  Analysis and Design of Structures I  4 cr.
Review of normal and shearing stresses and combined stresses; an introduction to column design and buckling; cable design; physical properties of various materials used in construction: timber, steel, aluminum, copper, and others. Deformation of structural elements under loads using moment area and conjugate beam method. Indeterminate structures by approximate methods and Moment Distribution method; design and selection of the structural elements according to loads applied with practical assignments: selection of materials and pre-dimensioning the structure elements. Prerequisite: ARCH 151.

ARCH 241  Surveying Regional Architecture  6 cr.
Fieldwork is applied to surveying, documentation, and the analysis of factors contributing to the distinctive aspects of Lebanese regional architecture: vernacular, traditional, and modern. Prerequisite: ARCH 111.
### Elective Courses

The elective courses in the architecture program, offered within the Department of Architecture and Design, are distributed in three main categories and are subject to change as new electives are introduced every year.
ARCH 022 Building the Colonies: Colonialism, Imperialism, and Local Modernities 3 cr.  
Colonialism and imperialism can be interpreted as part of larger ideological and sociopolitical systems that continue to inform changing cultural values today. This seminar uses sites of colonial urbanism to investigate ways that spatial organization produces historical knowledge. We consider alterations made to pre-existing cities as well as new city plans, both built and projected, in the Americas, in Asia, and around the Mediterranean Rim.

ARCH 023 From Urban Design to Landscape Urbanism 3 cr.  
The distinction between urban, suburban and rural is increasingly blurred. New patterns of physical urbanization and growing environmental concerns are challenging the conventional approach of urban design in thinking about and shaping city space. Emerging disciplines such as landscape design and landscape urbanism are providing alternative ways of conceptualization that stress ecology over morphology, network surface over urban form, and the confluence of architecture, landscape, city and infrastructure. This course explores the changing conception of city space examining the shifts in urban design theory and practice. The course will appeal to students in architecture, landscape architecture and urbanism who are interested in crossing the boundaries between disciplines and exploring new potentialities in design thinking.

ARCH 024 Hybrid Beirut: Morphogenesis of the Contemporary City 3 cr.  
Subjected to colonialism, Beirut was able to develop its own response to early modernization through the assimilation and domestication of Western urban and architectural trends. The resulting cultural hybridity and townscape diversity is understood by exploring the transitional years from a Medieval Arab-Islamic town in the 1840s to a showcase of the French Mandate in the 1920s and 30s. This course is an attempt to read the contemporary city through its recent colonial past and to trace the continuity and change in its social, economic and cultural conditions as mirrored in building typologies and spatial urban structure.

ARCH 025 House and Home: Histories of Domesticity 3 cr.  
This seminar/practicum takes two contrasting but complementary approaches, historical understanding and phenomenological experience, to explore definitions of what we mean by the word home. Both planned and informal domestic architecture in the region are investigated as central case studies.

ARCH 026 The Cities of Delhi: Urban Form and the Transmission of Meaning 3 cr.  
New Delhi, capital of the Republic of India, encompasses the vestiges of many older cities, built over a thousand-year period by disparate cultural groups. In this course, case histories of buildings and neighborhoods are used as a way of reading the processes of hybridization that result from the overlay of city upon city.

ARCH 027 Museum/Store 3 cr.  
This course will offer a critique of the role and practices of the Museum of Modern Art (MoMA) in New York City at a time when the institution is seeking to redefine itself. MoMA, the first major institutional collector of 20th-Century art, now has what is arguably the most important concentration of modern painting and sculpture, film and media art in the world. This will be used as a focal point and a case study for exploring the evolution and history of museum architecture and museum practices as they change in the emerging 21st Century. Within a seminar format, students will explore the histories of a range of topics that relate to the role of museums today.

ARCH 029 A History of the Artist 3 cr.  
This course offers an historical and critical reading of the category artist as it has been written and deployed in biographies, films, and art theory. Through a close analysis of four different historical moments in Western art, the course traces the development of the social persona of the artist and its refraction with artistic practice.
ARCH 030  Writing the Manifesto 3 cr.
Writing the manifesto is a workshop and seminar open to architecture, graphic design and other students. Class meets once a week. If we want the practice of design to be engaged socially and politically, it needs to part from the superficial or the formal and stem from a strong passionate attitude. This course aims at developing this attitude through reading and interacting with engaged authors and through developing a manifesto piece. In this process, every student will write his/her own manifesto and present it to others. Prerequisite: Advanced standing.

ARCH 031  Theories of Conservation and Reconstruction 3 cr.
The course explores different theories of architectural conservation and reconstruction. In addition to the conservation of ancient monuments, students will also be introduced to theories of post-war reconstruction and urban conservation. Topics will include: memory in architecture, authenticity, historical consciousness and the conservation of modern architecture. These themes will be presented through a series of case studies, many of which focus on Lebanon and the Middle East.

ARCH 032  Research by Design and the Process of Architecture 3 cr.
The course looks at how architectural research can be produced through the processes of design. The seminar poses the hypothesis that the actual making of architecture can contribute by providing ways to synthesize information or data coming from neighboring disciplines. Design is a way to give physicality to abstract notions and theories thus proposing differentiations in our perception and experience of the built environment which can contribute to our understanding of what we do as architects, and hopefully contribute to the advancement of the discipline.

ARCH 033  Art and Interpretation 3 cr.
This theory seminar is designed to introduce students to a range of methods of interpretation of works of art grounded in the discipline of art history or drawn from related fields such as analytic aesthetics, hermeneutics and phenomenology. The theoretical models include iconography, post-structuralist semiotics, psychoanalysis, feminist, and post-colonial theory.

The course will investigate cinema's unique power of montage, which creates a multi-subjective space and time that may not exist in objective reality. Students will be encouraged to develop a critical understanding of cinema through writing, photographic storyboards, and artistically challenging video projects.

ARCH 035  Geographies of Exclusion 3 cr.
This course investigates the idea of geographies of exclusion through a multi-disciplinary inquiry which locates space and spatial production at its center. It cross-thinks issues of exclusion across cities in the Global North and the Global South. Gender, class, religion, and race are the main fault lines that we will use to study how certain populations in our cities are left "outside" (through gated communities, "mean" streets, security barriers, segregated parks, etc.), or kept "inside" (refugees in camps, locked-in domestic workers, prisoners, etc.).

ARCH 036/ URPL 637  Illegal Cities 3 cr.
The seminar is designed as an introduction for students enrolled in architecture, urban planning and policy, and urban design to the ongoing debates about the relationship between law and the building process, specifically by looking at its actual materialization in illegal/informal settlements. It is based on a combination of lecture/seminar sessions in which various theorizations of the city/law nexus are explored and on field studies/class discussions in which the applications of these theories are investigated using a local case study.

ARCH 037  Sociology of Cultural Production 3 cr.
An introduction to the basic terminology used in all sociological analysis of cultural phenomena combined with the relation between art and reality (society, politics and history, myth, and ideology). This course then investigates the role and power of cinema and initiates a comparative analysis of media concerning key issues such as nation, identity, race, and “the other.”

ARCH 039  The Politics of Building 3 cr.
This course examines how architecture and urban design redistribute political power in the built environment and how their narratives incorporate and represent political ideas that condition and shape individual and collective experiences in/of the city and society. The course highlights the spatiality of politics and how the urban is a political (and economic) process of spatial production. Students learn: to define politics and political power as analytical categories; to identify the political features determining the building process, as well as the spatial implications of political choices across contexts; to understand how politics determine their roles as professional architects and designers and how to position themselves accordingly.

Category C: Technology, Engineering, and Professional Practice

Technology
ARCH 040  “Making It”: Models and Prototypes of Complex Structures 3 cr.
Design and technology studies in schools of architecture are based on the making of things, how they perform in the environment, the experience of the results, and its cognitive interpretation. The scientific knowledge and technical expertise available for architecture are extensive and their rate of change is substantial. The course seeks to develop the ability to learn how to learn, a vital necessity for innovation. The teaching focus is on craftsmanship, innovation, conceptual and lateral thinking, new technologies, construction, interdisciplinary work, and collaboration with industries.

ARCH 045  Building Systems Technology 3 cr.
This course provides an introduction to building systems technology. The course will focus mainly on the behavior of buildings as systems, and where possible will provide additional material for the design of buildings against extreme conditions such as fires, explosions, rare earthquakes and wind. All the above concepts will be introduced with minimum (if any) recourse to mathematical equations, as emphasis will be placed on understanding the behavior of different structural systems under various loading scenarios.

Engineering
(Refer to the Engineering Management Program section)

Professional Practice
ARCH 060  Beyond Green: Seeking Sustainability in the Environment 3 cr.
The past decade has seen an incredible evolution of architecture and design adapting to the issue of climate change. Greening ourselves and the cities we live in has been widely discussed in the media, while legitimized in regional building codes and master plans. The course structure will guide students to expose the underlying processes, multi-scalar systems, and diverse forces of socio-cultural and political flows that impact the lens of sustainable design.
ARCH 061  Architectural Programming  3 cr.
The course deals with Architectural Programming as a design process that does not precede design, but works with it. The intent is to delineate a design methodology based on academic research and practical knowledge to synthesize and translate a project brief – client requirements, legal regulations, spatial needs etc – to design strategies and solutions, through the collaboration of multiple participants and decision-makers. The course is envisioned to be given in close collaboration with design studios to strengthen the bridge between theory and practice.

ARCH 062/ URPL 665  Development and Planning Policies  3 cr.
The course examines development and spatial planning projects and policies. It investigates policy governance and institutional setup, the role of professional expertise, and the spatial impacts on the built and un-built environments, as well as the social and environmental impacts. Using case-study analysis of selected cities and towns, the course investigates how policies are elaborated through the use of chosen models, approaches, strategies, and tools; privileging certain sectors; and for specific ends.

ARCH 063  Algorithm and Iteration  3 cr.
Using Grasshopper/Rhino3d as the main software platform, the course explores the concepts, tools and ways in which parametric programming can lead to greater integration of concept and execution in architectural design.

ARCH 064  Code Green: A Survey of Environmental Building Policy  3 cr.
The course explores regional building codes and policy from major centers of green building activity. Students will research the role, responsibilities, and opportunities of the practice of sustainability through the use of codes, guidelines, and policies. With Lebanon still without any significant code relating to environmental issues, students explore the relevance of applying their ne-found knowledge, of green codes and policies found globally, to Lebanon, while questioning its legitimacy, effectiveness, and identity.

ARCH 065  Climate Responsive Design  3 cr.
This course addresses the subject of climate-responsive architecture. The course’s content starts with an introduction to the broad issue of sustainability, continues with the analysis of vernacular examples in architecture and moves on to develop the subjects of climate, people and buildings. The course consists of a series of lectures and short design applications that will enhance the students’ understanding of the subject matter.

ARCH 066  Law and the Built Environment  3 cr.
This is a course exploring the relations between the rules that govern the production of the built environment, building practices, and the shape of the city. Rules include the complex set of state legislated regulations (e.g. building law, zoning regulations, urban planning law) as well as socially sanctioned norms (e.g. privacy regulations). Investigated building practices are mostly those of the professional architectural practice and should inform the future role of the students as designers. The course is based on a critical approach to the understanding of law, how it is legislated, how it is actualized, how it intersects with other norms in the context where it is implemented, and how it affects building practices.

Graphic Design

Mission Statement
The Graphic Design Program answers to the developments and needs of Lebanon and the region as it strives to meet globally required proficiency. The curriculum focuses on a solid training in the theoretical, practical and technical aspects of Graphic Design. It is the goal of the program to help students to perceive and adapt to the changing demands of culture and therefore to the continuous change in the design field. Students develop an intellectual background, critical thinking and contribute to the continuum of aesthetic and technological innovations by generating ideas and solutions to a wide range of design problems. The program is committed to its involvement in the Arab world: its multitude of languages and cultures. It is the Program's mission to address these issues in a challenging creative teaching and learning environment.

Program Description
The Graphic Design Program is comprised of a total of 139 credit hours normally taken over four years. The curriculum is structured as follows: 1) Two foundation years, first and second, with core requirements in design, typography, representation techniques, digital media, history and theory courses which offer students basic skills and knowledge in design and related areas. 2) One advanced year, third year, with core requirements in advanced design, digital media, history and theory courses, reinforced by the field/free electives and general education requirements. 3) Final year, fourth year, with a one-year design thesis and advanced electives.

The degree requirements in Graphic Design consist of the following:

- 97 credit hours of mandatory core courses
- 12 credit hours of approved ArD/FEA field electives
- 3 credit hours in Category A: Representation
- 6 credit hours in Category B: History, theory, and methodology
- 3 credit hours in Category C: Digital media, typography, and professional practice
- 3 credit hours of free electives in consultation with the academic adviser

To meet the AUB General Education Requirements:

- 6 credit hours of English including English 204
- 3 credit hours of Arabic, as per placement test
- 6 credit hours of approved electives in humanities
- 3 credit hours of approved electives in social sciences
- 6 credit hours of approved electives in natural sciences
- 3 credit hours of approved electives in quantitative thought
Curriculum for the Degree of Bachelor of Fine Arts in Graphic Design

First Year

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<tr>
<td>GRDS 202</td>
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</tr>
<tr>
<td>ARCH 223</td>
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<tr>
<td>GRDS 251</td>
<td>Typography I</td>
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<tr>
<td>GRDS 242</td>
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<tr>
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<td>GRDS 252</td>
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<td>GRDS 231</td>
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Third Year

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Fourth Year

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<td>Interactive Media Design</td>
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* b. stands for billing
Course Descriptions

Mandatory Core Courses

GRDS 101  Graphic Design I  6 cr.
This is an introductory studio on graphic design methods and processes where fundamentals of visual communication are addressed. The studio starts with basic investigations in the development of visual form, and gradually moves on to cover more complex components of graphic design dealing with the construction of meaningful visual messages and the organization of information. Prerequisite: ARCH 100.

GRDS 111  Drawing  3 cr.
This studio course is an introduction to visual representation. Students learn drawing skills and pictorial conventions, and consider the historical specificity and contemporary relevance of such skills and conventions.

GRDS 112  Color  3 cr.
A study of the dynamic interaction of color and its applications for designers and artists. This course includes an introduction to the physics of color, color composition and the three dimensions of color, hue, value, and chroma, as well as the color wheel.

GRDS 113  Photography  3 cr.
A course aimed at providing graphic design students with a thorough understanding of the basic techniques and aesthetics of both black and white and color photography, through hands-on assignments and darkroom practice.

GRDS 141  Computer Graphics I  3 cr.
This course is divided into three sections. The first introduces students to the Macintosh platform and the MacOS, covering all aspects such as file management, activating fonts, accessing network, and printing. The second section deals with the basic features of Adobe Illustrator®, the industry-standard and most professional vector-based illustration software; the last part covers the basic features of Adobe Photoshop®, where students learn basic image creation and manipulation.

GRDS 202  Graphic Design II  6 cr.
This studio focuses on the development of corporate identity through investigation of abstraction and symbolic representation; logo design; and visual identity systems and their basic applications using various modes of image making and typography. Prerequisites: GRDS 101 and a combined grade average of 70 in ARCH 100 and GRDS 101.

GRDS 203  Graphic Design III  6 cr.
This studio addresses graphic design as a cultural practice. It focuses on processes of visual communication where issues of meaning, production and exchange are emphasized and critically examined in their relation to particular social contexts and localities. Methodologies of arriving at meaningful graphic solutions—image-text relationships, visual narratives, typography, and complex information organization—are explored through diverse theme-based projects and printed formats of public dissemination. Prerequisite: GRDS 202.

GRDS 204  Graphic Design IV  6 cr.
The course covers the design of printed publications in their various formats and audiences, ranging from mass media (newspapers, magazines etc.) to special interest publications (fanzines, limited edition books etc.), where processes of art direction and the design of layout systems for multi-page prints will be covered. While learning to materialize editorial concepts and content into graphic form, students also develop advanced skills in organizing complex information, and devising appropriate compositional, typographic and image solutions. Prerequisites: GRDS 203 and a combined grade average of 70 in GRDS 202 and GRDS 203.

GRDS 242  Computer Graphics II  3 cr.
This course is the second in the series following the first computer course (GRDS 212). It is also divided into three sections. The first deals with the advanced features of Adobe Illustrator®. Advanced Adobe Photoshop® constitutes the second section of the semester, where students learn advanced image creation and editing techniques for print and web applications. The last section covers Adobe InDesign®, the professional electronic desktop publishing software for the creation of any form of publication, from simple single page to complex multicolor documents. In addition, cross-compatibility issues between the above-mentioned software are tackled at the end of the semester. Prerequisite: GRDS 141.

GRDS 251  Typography I  3 cr.
In this course students develop a clear understanding of the usage of typography in all its forms. They explore the different components of type, the way it is used, when and where, procedures and methods. The purpose is for the student to develop sensitivity toward type and to deal with it as a form versus a way to get a message read.

GRDS 252  Typography II  3 cr.
In this course students address text. New components are investigated: texture, direction, flow, space. Text is formed from paragraphs made of words made of letters. Text is used for information, for support, and sometimes as an entity. Projects are distributed throughout the semester covering all these aspects. Prerequisite: GRDS 251.

GRDS 214  Illustration  3 cr.
This course introduces students to illustration techniques and styles with the aim of strengthening their representation and visualizing skills to enrich the graphic design process and its outcomes. Assignments cover various themes while exploring a wide range of media. Prerequisites: GRDS 111 and 112.

GRDS 231  Introduction to Visual Theory  3 cr.
An introduction to the various debates concerning visual representation aimed towards an investigation of the visual as a social practice and as part of an aesthetic discourse.

GRDS 304  Graphic Design V  6 cr.
The course covers the design of printed publications in their various formats and audiences, ranging from mass media (newspapers, magazines etc.) to special interest publications (fanzines, limited edition books etc.), where processes of art direction and the design of layout systems for multi-page prints will be covered. While learning to materialize editorial concepts and content into graphic form, students also develop advanced skills in organizing complex information, and devising appropriate compositional, typographic and image solutions. Prerequisites: GRDS 203 and a combined grade average of 70 in GRDS 202 and GRDS 203.

GRDS 305  Graphic Design VI  6 cr.
The course covers package design, installation art, and an interactive process between them. Research and analysis are conducted in each individual project. Projects are distributed into experimental and commercial ‘real’ situation types. Students will develop an understanding and ability to manipulate two-dimensional graphics to three dimensional objects or spaces; understand the needs of the market through market research; apply regulations where appropriate; carry the given projects from concept development to a final stage [real situation scenario]; and experiment with acquired [design] language and vocabulary. Prerequisites: GRDS 203 and a combined grade average of 70 in GRDS 202 and GRDS 203.
GRDS 325  History of Graphic Design  3 cr.
Starting with Gutenberg’s 42 line bible as the first specimen of movable type printing, the course will cover a period of time from the 15th century till today. The course is conceived of thematically with the intention to address the conceptualization of Graphic Design as a discipline directed by various interpretative inquiries into the History and Theory of graphic communication. The course is formulated in a way that enables the students to take part in the current debate around graphic design theory and practice. Prerequisite: ARCH 224.

GRDS 343  Motion Graphics  3 cr.
Motion Graphics is an advanced course in computer-related design, introducing students to multimedia design. The student explores the process of designing in relation to time and motion, and learns to adapt graphic knowledge to explore concepts of movement in time, sequential imagery, and motion graphics through animation. Projects involve the use of various animation techniques including 2D cell animation, claymation, and stop motion animation. It includes an overview of 3D modeling and animation. Prerequisite: GRDS 242.

GRDS 344  Interactive Media Design  3 cr.
An advanced course in multimedia, exploring the various areas where interactivity is used ranging from interactive CDIs to web design and interactive touch screens. Students concentrate on design theory and practice through by designing for interactivity. Prerequisites: GRDS 242; GRDS 343.

GRDS 361  Professional Practice  3 cr.
This course prepares students to face the REAL WORLD. Students learn to present themselves properly for interviews both in the materials/documents they provide and in the way they present themselves. The course addresses the professional aspects of the graphic design practice through CV writing and the preparation of a portfolio, pre-press production and production. Prerequisite: GRDS 203.

GRDS 406  Final Project Design and Research I  6 cr.
A research-oriented studio in which students are expected to critically explore issues of personal interest and of general importance to the discipline of graphic design. The research should lead towards the articulation of a design/visually-rooted hypothesis that sets up the theoretical paradigm and the concept directing the design investigation to be carried out in the project implementation phase (GRDS 407). The outcome is presented in a research document that includes a preliminary design proposal supported by the research findings. Students work independently and in consultation with a chosen adviser from the faculty. Work in progress is presented and discussed with a panel of advisers in the course of the semester. Prerequisites: GRDS 305 and GRDS 304, and a combined grade average of 70 in GRDS 304 and GRDS 305.

GRDS 407  Final Project Design and Research II  6 cr.
This is the second half of a year-long design thesis and the culmination of the design studio training. Students integrate and synthesize acquired knowledge and skills, and elaborate, through concrete design experimentations and implementations, the hypothesis proposed in GRDS 406, with the aim of arriving at a completed project that materializes a full-fledged design thesis. Students work independently and in consultation with a chosen adviser from the faculty. Work in progress is presented and discussed with a panel of advisers in the course of the semester. At the end of the semester the completed projects are presented for evaluation to a jury of faculty members and invited professionals. Prerequisite: GRDS 406.

GRDS 462  Approved Experience  1 b.
This is an eight-week professional training period at a recognized graphic design studio or graphic design department within a web design, television station, advertising agency, publishing house, or other approved workplace in Lebanon or abroad. The training should ensure that the student applies his/her knowledge and acquires professional experience in the field of graphic design.

For other mandatory core courses such as ARCH 100, ARCH 121, ARCH 122, ARCH 223, and ARCH 224 please refer to the architecture core course descriptions.

Elective Courses

The elective courses in the Graphic Design Program are offered within the Department of Architecture and Design and some are open to students in all faculties. They are distributed into three categories:

Category A: Representation Skills (01); Category B: History (02), Theory and Methodology (03); Category C: Digital Media (04), Typography (05), and Professional Practice (06). Electives are chosen in consultation with the assigned adviser, and in accordance with the load distribution (mentioned earlier under program description).

The following list of courses is subject to change as new electives are introduced every year.

Category A: Representation Skills

GRDS 010  Photographic Expression: Problems in Practice and Criticism  3 cr.
The course is structured as a mixture of photograhic theory and practice. It discusses the history of the medium including photographic genres/practices and exposes students to contemporary and historical photographers. Students pursue their own photography through practical assignments inspired by class lectures and weekly readings. Prerequisite: GRDS 113 or Arch 010.

GRDS 011  Contested Land: New Landscapes of Lebanon  3 cr.
Following WJT Mitchell’s claim that ‘landscape is not simply an object to be seen or a text to be read, but a central tool in the creation of national and social identities’, students learn how to dig under the surface of landscape and to critically use it as an effective representational tool. Students are asked to produce a series of landscapes of Lebanon and to use them to create a set of posters that will be exhibited and collected in a book at the end of the semester. Prerequisite: GRDS 203, or ARCH 203; or permission of instructor.

GRDS 012  Silkscreen  3 cr.
This course teaches students the fundamental principles of silkscreen printing and to be creative in their approach to printmaking. Silkscreen, one of the most versatile and widely used methods of printmaking, will be fully explored in this studio class through demonstrations and self-initiated projects. Students will be encouraged to experiment with multiple techniques and combinations of traditional and contemporary methods of serigraphy and search for solutions that best translate the nature of their work to the medium. Prerequisite: GRDS 214, or ARCH 112, or FAAH 202 and FAAH 234.

GRDS 013  Advanced Illustration  3 cr.
This elective, following up on the Illustration class in the required curriculum (or the various Illustration Workshops given previously), is an exploration of the popular and public nature of illustration working with a selection of techniques which historically have fulfilled this purpose - photographic collage, Japanese woodcut, colored stencil, and mural painting. Prerequisite: GRDS 214 or permission of instructor.

GRDS 014  Engraving and Etching  3 cr.
This course is an introduction to the fundamentals of intaglio printmaking processes. It covers the non-acid methods such as engraving, dry point and mezzotint and acid methods like etching (hard and soft ground) and aquatint. This studio art course covers the needed technical information; however emphasis will not only be placed on the technical production of art works but also on the content and concepts of printmaking. Prerequisite: GRDS 214, or ARCH 112, or FAAH 202.
GRDS 016  Advanced Photography  3 cr.
The Advanced Photography course takes the student one significant leap further in the understanding and use of the medium in both the analog and digital format. It addresses the aesthetics of picture making at a more advanced level of technical, artistic, and creative development. Major emphasis is placed on developing a thoughtful approach toward the seeing and making of meaningful photographs that communicate with the viewer. Prerequisite: GRDS 113 or ARCH 101.

Category B: History, Theory, and Method

GRDS 020  Signs of Conflict and Resistance  3 cr.
The course addresses the deployment of political rhetoric in graphic design, historically and in contemporary practice. It examines those particular moments of political conflict - war, resistance, and revolt - where visual artifacts in different print formats become important vehicles through which ideological constructions are materialized and diffused. The course uses a case study of the graphic production by Lebanese political parties and movements during the civil war (1975-1990) while covering other significant cases that enrich and inform this main investigation.

GRDS 030  Proximity and Imminence  3 cr.
The course is open to all senior undergraduates across AUB departments with no prerequisites. This elective course approaches texts written at the limit of representation when the pressing onslaught of the here and now precludes any access to reflective and contemplative thought. It also proposes a close reading of texts written after the event, when a catastrophe has occurred but can only later be experienced as contemporary.

GRDS 031  Voice Manifest: The Theory and Practice of Collective Expression  3 cr.
The course focuses on communal and activist voice. It proposes an overview of the full range of cultural manifestations that maintain an activist stance, and poses questions as to their perceived and actual validity. Research along economic, political, social, and cultural lines will feed into the discussion. Commissions will be made of the historical precedence of such groups and their work. Mapping out how this study feeds back into a way of working—indeed, being—that drives our own efforts along these lines.

GRDS 032  Mediated Spectacles (new theories and cases)  3 cr.
A seminar course that engages students in the activity of analysis and critical assessment of the role of mediated images in modern everyday life. It takes as case studies the production and circulation of images in Arab popular culture and media, ranging from modern leisure and commodity poster advertisements to contemporary music videos and other image-potent cultural forms. It addresses the paradoxical relation between a cosmopolitan openness brought by increasingly global cultural flows, and an alterity negotiated in and through the production of cultural localities and social identities. The seminar is directed through theoretical approaches and methodological tools of investigation that address the mechanism of the ‘image’, in terms of its signifying practices, social imaginaries and power relations in which it is embedded.

GRDS 034  The Valley of the Shadow of Death  3 cr.
Through close readings of texts, monuments, artworks, and films; the seminar invites students to grapple with the lingering consequences of unfinished violence, with the aftermath, namely - and in following the etymology of that term - the second crop that follows a first violently mowed.

GRDS 036  Seeing Rude and Eрудite  3 cr.
This seminar proposes an investigation of seeing, understood both as an authoritative discourse and as an embodied physical sensation. The aim and ambition of this seminar is to question the authority of the visual and to identify what is unrecognized in the act of seeing.

Category C: Digital Media, Typography, and Professional Practice

Digital Media

GRDS 040  3D Animation  3 cr.
3D animation is an advanced course designed for students who are well versed in both concepts and technical research. The course builds the fundamental understanding of 3D computer modeling, texture mapping, lighting, and camera rendering in order to develop 3D animated sequences. The course then introduces students to advanced character modeling, rigging, and animation. Student projects combine 3D animation and different output formats, like interactive techniques and motion design. Prerequisite: GRDS 343 or permission of instructor.

GRDS 042  Rough Cuts: An Introduction to Video  3 cr.
Filmmaking is used here as an umbrella term, rather than referring to the actual process of shooting on film, and is used to connote the mixed media bag of filmic narrative, including video, sound, animation and stills. All of these can come together in the making of a film. With the democratization of audio/video editing from an elite, exclusive and expensive art to a popular and commonplace tool, the art of filmmaking has become within reach of everyone with a computer. Filmmaking itself has mutated into a variety of different forms depending on the vessel, be it YouTube, cell phone video and soap operas, CCTV surveillance footage, webcams, satellite imagery, video installations, etc. The ubiquity of footage is a testament to our current audio/visual culture and the digital revolution gives everyone the access to produce work within this culture. Prerequisite: GRDS 203 or ARCH 203.

GRDS 044  Pattern, Rhythm, Meter: Programming Design  3 cr.
This elective examines aspects of students' design vocabulary - pattern, rhythm, time, language, etc. - through the use of computer programming and applied algorithms to create visuals. Through this exploration, they will gain a greater insight into the "internal workings" of the computer and their software applications, an awareness of the overlap between science and art, and pro-active tools that they can readily apply in their design work. Prerequisite: GRDS 305, or permission of instructor for students in architecture and engineering.

GRDS 045  If Walls Could Talk/ Talking Walls: Urban Graffiti Animations  3 cr.
A course offered to Architecture and Graphic Design students covering the techniques, principles and processes of stop motion animation, particularly focusing on painting on walls and urban surfaces. Students are encouraged to explore the relationship of the method of expression and techniques employed with the concepts, themes and issues, using alternate interpretations beyond the literal and classical narrative constraints. Students will be examining motion, tempo, rhythm, depth, color, texture, form, matter and spatial representation and relation. By the end of the course the students will produce a complete edited stop motion animation short film that will be publicly screened in the original setting. Prerequisite: GRDS 305, or permission of instructor for students in architecture.

GRDS 046  Um Kalthoum: A Study of Kinetic Type  3 cr.
The course seeks to expand the student's typographic vocabulary through time based composition, sound, and animation. Students will examine the role of kinetic type in message making, considering the choreographic, musical, painterly, sculptural, architectural, metamorphic, and liquid roles that letterforms may assume in two and three dimensional time based situations. Prerequisite: GRDS 252 or permission of instructor for students in architecture.
GRDS 049  Move Me, Freeze Me, Shoot Me  3 cr.
This is an elective course covering Stop Motion Animation techniques, principles and processes. Students are exposed to, and experiment with various stop motion animation mediums and types; examining: motion, tempo, rhythm, orientation, color, texture, form, and matter. They are encouraged to evaluate different processes of animation and to develop problem-solving methods through their assignments, and the analysis of screened features, to enhance the skills gained in visual art training and to integrate visual vocabulary with conceptual and creative procedures. Prerequisite: GRDS 305, or permission of instructor for students in architecture.

Typography

GRDS 053  Advanced Arabic Typography  3 cr.
In addition to a new and summarized historical overview, the study of Arabic calligraphy involves dealing with the problems facing this traditional art in its efforts at modernization, innovation, and adaptation to new technologies. This consists of two approaches to the subject, one that looks at the Arabic script as an art by itself: calligraphy; and the other that ponders its reformist and media function, or its applications in modern life. Prerequisite: GRDS 252.

Professional Practice

GRDS 060  Critical Mapping  3 cr.
The course aims to introduce students to the possibilities of mapping as a research method and a tool of visual representation. A critical understanding of the history of cartography and mapping practices combined with a theoretical positioning of the map as a socio-political product supports and informs the practical dimensions of the course. Prerequisite: GRDS 203 or ARCH 203.

GRDS 061  GraFix in the Environment  3 cr.
We are bombarded daily with visual clutter, noise, buildings, people, beggars, cigars, clothes, shops, garbage, cars, horns, broken sidewalks you name it! Then there are signage, posters, and billboards! All are components of our GraFix in the Environment! This course is based on research, presentations, and a series of small projects illustrating the various aspects of ‘GraFix.’ Prerequisite: GRDS 203 or permission of instructor for architecture students.

GRDS 062  The Illustrated Narrative  3 cr.
The course aims to establish an expansive and holistic approach to working within the concept of the illustrated book. It includes an emphasis on research that touches on related disciplines, references various levels of culture, and engages students in a full analysis of the mediation, potential, and substance of their work, audience, and media in order to manifest a narrative of their authoring. Prerequisite: GRDS 214.

GRDS 063  Personal Expression through Serial Media: Zines, Comix, and Art Books  3 cr.
Printed matter has historically provided a means for artists to express themselves. This course studies alternative media and builds upon the lessons learned in the publication design class. These lessons are applied to a variety of specialized publications allowing students to focus on their content while developing their form. Using printing methods, high and low-end, high and low-tech, students explore ways in which serial media provide an outlet for personal expression. Prerequisite: GRDS 304.
Department of Civil and Environmental Engineering

Chairperson: Sadek, Salah
Professors: Ayoub, George; Basha, Habib; El-Fadel, Mutasem; Hamad, Bilal; Harajli, Mohamed; Kaysi, Isam; Mabsout, Mounir; Sadek, Salah
Professor Emeritus: Iliya, Raja
Associate Professor: Inglessis, Constantine
Assistant Professors: Abou Zeid, Maya; Chehab, Ghassan; El-Khoury, Hiam; Najjar, Shadi; Saad, George; Saikaly, Pascal
Senior Lecturer: Azar, Kamal
Lecturers: Basha, Hisham; El Khatib, Helmi; El Khatib, Ibrahim; Fawwaz, Youssef; Hatem-Musallem, Manal; Karnib, Ali; Kasti, Fuad; Nader, Halim; Nasreddine, Khaldoun; Sadeck, Salah El-Dinn; Semerjian, Lucy
Instructors: Abboud, Antoine; Haroun, Akram; Hasbini, Hayssam; Nehme, Elias

Undergraduate Programs

The Department of Civil and Environmental Engineering (CEE) offers the degrees of Bachelor of Engineering (BE): major, Civil Engineering (CE); and Bachelor of Science (BS): major, Construction Engineering (ConsE).

The mission of the undergraduate programs of the CEE department is to provide a stimulating and supportive environment for high-standard education; to prepare graduates for a lifelong productive career in addressing problems in a rapidly-changing world, while instilling in them an appreciation of leadership qualities, professionalism, and ethics; to provide professional services of the highest quality to the community; and to contribute to expanding the knowledge and technological base in civil and environmental engineering.

Bachelor of Engineering (BE), Specialization: Civil Engineering (CE)

Program Educational Objectives

The objectives of the CE program are to see our graduates move on to become:

- Engineers who hold central positions in various sub-disciplines of civil engineering in local, regional, and international practice.
- Graduates who are admitted and successfully completing advanced degrees in leading universities around the world.
- Leaders in their profession and in the service of their community.
Curriculum

Term I (Fall) Credits
CIVE 200 Introduction to Civil Engineering 2
EECE 230 Introduction to Programming 3
MATH 201 Calculus and Analytical Geometry III 3
PHYS 210 Introductory Physics II 3
PHYS 210L Introductory Physics Laboratory II 1
Arabic Elective 3
Total 15

Term II (Spring) Credits
CIVE 210 Statics 3
EECE 210 Electric Circuits 3
MECH 220 Engineering Graphics 3
MATH 202 Differential Equations 3
ENGL 206 Technical English 3
Ethics Elective (An Approved General Education Humanities Course) 3
Total 16

Term III (Summer) Credits
CIVE 360 Surveying 2
STAT 230 Introduction to Probability and Random Variables 3
Humanities Elective 3
Total 8

Term IV (Fall) Credits
CIVE 310 Mechanics of Materials 3
CIVE 320 Construction Materials and Technologies 2
CIVE 350 Environmental Engineering 3
CIVE 370 Introduction to Information Technology 3
MATH 251 Numerical Computing 3
Humanities Elective 3
Total 17

Term V (Spring) Credits
CIVE 311 Structures I 3
CIVE 340 Fluid Mechanics and Laboratory 3
CHEM 202 Introduction to Environmental Chemistry 3
CHEM 203 Introductory Chemical Techniques 2
Biology Elective or CIVE 351 Environmental Microbiology 3
Humanities Elective 3
Total 17

Term VI (Summer) Credits
CIVE 430 Engineering Geology 3
ENMG 400 Engineering Economy 3
English Elective 3
Total 9

Term VII (Fall) Credits
CIVE 410 Structures II 3
CIVE 420 Concrete I 3
CIVE 440 Hydraulics and Laboratory 3
CIVE 460 Highway Engineering 3
Math Elective (MATH 212, MATH 218, MATH 281, or an approved math course) 3
Total 15

Term VIII (Spring) Credits
CIVE 421 Concrete II 3
CIVE 431 Soil Mechanics and Laboratory 3
CIVE 441 Engineering Hydrology 3
CIVE 450 Water and Wastewater Treatment and Laboratory 3
CIVE 461 Transportation Engineering and Laboratory 3
Total 15

Term IX (Summer) Credit
CIVE 500 Approved Experience 1b

Term X (Fall) Credits
CIVE 501 Final Year Project I 1
CIVE 530 Foundation Engineering 3
CIVE 580 Construction Management 3
Technical Elective I 3
Technical Elective II 3
Social Science Elective 3
Total 16

Term XI (Spring) Credits
CIVE 502 Final Year Project II 3
Technical Elective III 3
Technical Elective IV 3
Free Elective 3
Social Science Elective 3
Total 15
Total = 143 credit hours

* b. stands for billing
Technical Electives of Term X and Term XI
- CIVE 503 Special Topics in Civil and Environmental Engineering
- Undergraduate (500 series) or graduate (600 series) courses in Civil and Environmental Engineering
- Approved courses from other departments

Bachelor of Science (BS), Specialization: Construction Engineering (ConsE)

Program Educational Objectives
The objectives of the ConsE program are to see our graduates move on to become:
- Engineers who hold central positions in local, regional, and international construction engineering practice;
- Engineers who are involved in landmark projects and who contribute to the advancement of the local and regional construction industry;
- Leaders in their profession and in the service of their community.

Curriculum

<table>
<thead>
<tr>
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<tr>
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<td>CIVE 210 Statics</td>
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<td>PHYS 210 Introductory Physics II</td>
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<td>MATH 201 Calculus and Analytical Geometry III</td>
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<td>ENGL 203 Academic English</td>
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<table>
<thead>
<tr>
<th>Term II (Spring)</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>CIVE 310 Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>CIVE 220 Construction Drawing</td>
<td>2</td>
</tr>
<tr>
<td>EECE 210 Electric Circuits</td>
<td>3</td>
</tr>
<tr>
<td>CIVE 371 Introduction to Information Technology</td>
<td>3</td>
</tr>
<tr>
<td>ARAB 2nn Arabic Elective</td>
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</tr>
<tr>
<td>2nn Humanities Elective</td>
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</table>

Term III (Summer)
- CIVE 361 Surveying for Construction Engineering | 3 |
- STAT 230 Introduction to Probability and Random Variables | 3 |
- ENGL 206 Technical English | 3 |
| **Total** | **9** |

Term IV (Fall)
- CIVE 311 Structures I | 3 |
- CIVE 321 Construction Materials and Quality Control | 3 |
- CIVE 350 Environmental Engineering | 3 |
- CHEM 202 Introduction to Environmental Chemistry | 3 |
- CHEM 203 Introduction Chemical Techniques | 2 |
| 2nn Math/Science Elective | 3 |
| **Total** | **17** |

Term V (Spring)
- CIVE 340 Fluid Mechanics and Laboratory | 3 |
- CIVE 420 Concrete I | 3 |
- CIVE 580 Construction Management | 3 |
- CIVE 582 Construction Methods and Safety | 3 |
- CIVE 460 Highway Engineering | 3 |
| Social Science Elective | 3 |
| **Total** | **18** |

Term VI (Summer)
- CIVE 583 Supervised Internship | 1 |
| **Total** | **1** |

Term VII (Fall)
- CIVE 440 Hydraulics and Laboratory | 3 |
| 2nn Humanities Elective | 3 |
- CIVE 584 Construction Systems Integration | 3 |
- CIVE nnn Free Construction Engineering Elective | 3 |
- ECON 212 Elementary Macroeconomic Theory | 3 |
| An Ethics Course Approved for GE Humanities Credit | 3 |
| **Total** | **18** |

Term VIII (Spring)
- 2nn Math/Science Elective | 3 |
- CIVE 431 Soil Mechanics and Lab | 3 |
- CIVE 585 Construction Planning and Scheduling | 3 |
- CIVE nnn Free Construction Engineering/CEE Elective | 3 |
| 2nn Humanities Elective | 3 |
| **Total** | **15** |

**Total = 110 credit hours**
Course Descriptions

CIVE 200 Introduction to Civil Engineering 2 cr.
An introductory course to the world of civil engineering including significant developments in the field, both current and future. The course gives an overview of civil engineering as a profession covering aspects of concept, design, and execution through: seminars, case studies, field trips, laboratory experimentation, and hands-on group projects.

CIVE 220 Construction Drawing 2 cr.
An introductory course on 2-D drawing, orthogonal projection, auxiliary views, sectioning and sectional views, dimensioning and tolerance schemes, and standard layouts. Introduction to use of CAD in civil and construction engineering. Interpretation of typical civil engineering drawings. Using CAD to generate plans, cross section and profile drawings, and detail drawings.

CIVE 210 Statics 3 cr.
A course outlining vector mechanics of forces and moments; free-body diagrams; equilibrium of particles and rigid bodies in two and three dimensions; plane and space trusses; frames and machines; axial, shear, and moment diagrams of beams and simple frames; Friction; center of gravity and centroid; area moment of inertia; computer applications. Prerequisite: MATH 201.

CIVE 310 Mechanics of Materials 3 cr.
A course on stresses, strains, and stress-strain relationships; temperature; axial bars in tension and compression; torsion of circular bars; bending and shear stresses in beams; combined stresses; stress transformation and Mohr’s circle; and computer spreadsheet. Prerequisite: CIVE 210.

CIVE 311 Structures I 3 cr.
An introductory course covering equilibrium, stability, and determinacy; influence lines for beams and trusses; deflection of beams and frames by double-integration method, moment-area theorems, and conjugate beam; introduction to indeterminate structures; approximate analysis of indeterminate building frames; computer structural analysis applications; project building modeling and assessment. Prerequisite: CIVE 310.

CIVE 320 Construction Materials and Technologies 2 cr.
Introduction to the composition and properties of engineering materials such as asphalt, cement, concrete, geological materials, steel, polymers, and wood. Hands on laboratory experiments and demonstrations are part of the course, and are designed to familiarize the student with the materials, testing methods, equipment, and standards.

CIVE 321 Construction Materials and Quality Control 3 cr.
A course that covers materials used in construction; physical and mechanical properties of construction materials such as asphalt, pavement base materials, Portland cement concrete, steel, polymers, wood, aluminum, and advanced composite materials; proportioning of concrete mixtures including admixtures; and hands on laboratory experiments and demonstrations to familiarize students with testing methods, equipment, standards, and quality control procedures.

CIVE 340 Fluid Mechanics and Laboratory 3 cr.
A course that deals with fluid properties, fluid static, continuity equation, Bernoulli’s equation, energy principle, momentum principle, laboratory experiments.

CIVE 350 Environmental Engineering 3 cr.
A course that introduces the fundamentals of environmental engineering. A screening course of major topics in environmental engineering including water and wastewater, environmental hydrology, environmental hydraulics and pneumatics, air, solid waste, environmental modeling, and hazardous waste.

CIVE 351 Environmental Microbiology 3 cr.
A course that introduces the basic principles of environmental microbiology and discusses example applications from the natural and engineered worlds. The main goals of this course are to present an overview of important micro-organisms involved in environmental systems, their ecology, their interactions with various pollutants, and their beneficial or harmful effects on humans.

CIVE 360 Surveying 2 cr.
A course on the theory of measurements and errors; linear measurements; surveying instruments; leveling; angles, bearings, and azimuths; stadia measurements; traversing-field aspects; traverse computations and adjustment; topographic surveying; triangulation.

CIVE 361 Surveying for Construction Engineering 3 cr.
A course on the theory of measurements and errors; linear measurements; surveying principles and instruments; leveling; angles, bearings, and azimuths; stadia measurements; traversing-field aspects; traverse computations and adjustment; topographic surveying; triangulation; fundamentals of surveying for building and infrastructure construction; setting out horizontal and vertical curves; setting out engineering structures and construction projects.

CIVE 370 Introduction to Information Technology 3 cr.
The course introduces students to the main features of the Information Technology (IT) with emphasis on applications to civil engineering. Specifically, the course content includes presentation of several software applications and programming tools including: MS Word, Excel, PowerPoint, VBA, Visio, GIS and database technology and object-oriented programming.

CIVE 371 Introduction to Information Technology (ConsE) 4 cr.
A course introducing students to the main features of Information Technology (IT) with emphasis on applications to civil engineering. This course covers several software applications and programming tools including: FrontPage, Excel, VBA, Access, Visio, and database technology. The course also introduces students to basic programming skills using Matlab.

CIVE 410 Structures II 3 cr.
A course on the stability and determinacy of structures; energy theorems and applications to trusses, beams, and frames; analysis of statically indeterminate structures by flexibility (force) and stiffness methods; introduction to the direct stiffness method; influence lines for indeterminate structures. Prerequisite: CIVE 311.

CIVE 420 Concrete I 3 cr.
A course that covers the mechanical properties of concrete materials; ultimate strength theory of flexure and shear; flexural and shear design of beams; service load behavior; bond properties of reinforcing bars; design of solid and ribbed one-way slabs. Prerequisite: CIVE 310.

CIVE 421 Concrete II 3 cr.
This is a course that covers continuous beams, short columns, column bases and, biaxially bent columns; wall footings, concentrically and eccentrically loaded single column footings, and combined footings; staircases; bearing walls; cantilever retaining. Prerequisites: CIVE 420.

CIVE 430 Engineering Geology 3 cr.
This is a course that discusses the composition and properties of rocks; geologic processes; geologic hazards; geologic structure and engineering consequences; terrain analysis and geologic mapping; interpretation and use of geologic maps; application of geology to engineering practice. Annually.
CIVE 431  Soil Mechanics and Laboratory  3 cr.
A course on soil classification and index properties; soil structure and moisture; compaction; seepage; effective stress concept; compressibility and consolidation; stress and settlement analysis; shear strength; and laboratory experiments. Prerequisites: CIVE 310 and CIVE 430.

CIVE 440  Hydraulics and Laboratory  3 cr.
A course that covers flow in conduits, flow in open channels, flow measurements, and laboratory experiments. Prerequisite: CIVE 340.

CIVE 441  Engineering Hydrology  3 cr.
A course outlining hydrologic principles, rainfall-runoff analysis, flood routing, frequency analysis, and ground water hydrology.

CIVE 450  Water and Wastewater Treatment and Laboratory  3 cr.
A course that examines the quality and treatment methods of water and wastewater; testing for physical, chemical, and biological parameters. Prerequisite: CIVE 350.

CIVE 460  Highway Engineering  3 cr.
A course that examines road vehicle performance; principles of geometric design and highways; horizontal and vertical alignment; earthwork; intersections and interchanges; parking facilities; basic traffic models; queueing theory and traffic analysis; travel demand forecasting. Prerequisite: CIVE 360.

CIVE 461  Transportation Engineering and Laboratory  3 cr.
Introduction to the field of transportation engineering through presenting the basics of traffic engineering, traffic flow theory, and pavement design. The laboratory component consists of carefully structured experiments that reinforce students' understanding of the academic concepts and principles.

CIVE 580  Construction Management  3 cr.
A course that seeks to impart in students a sound understanding of the fundamental principles of construction management as applied to development of building and infrastructure projects. The course includes construction company and project organization, pre-construction activities, estimating and bidding, staffing for construction, macro-level planning and scheduling, and quality control.

CIVE 582  Construction Methods and Safety  3 cr.
A course that exposes students to the real world of construction and the complexity of managing machines, material and people with the one goal, to be on time and on budget while performing safely. The course content includes the selection of construction equipment and material based on applications, methods, and production requirements for earthmoving, heavy and building construction. Prerequisite: CIVE 321.

CIVE 583  Supervised Internship  1 cr.
Prerequisites: CIVE 580 and CIVE 582.

CIVE 584  Construction Systems Integration  3 cr.
The course exposes students to building systems and how to integrate them by best choosing materials and methods. The course will have particular emphasis on mechanical and electrical equipment in buildings, roofing, glazing, cladding, interior finishes, partitions, cost estimation and construction of the various systems. Presentation of professional construction documents including execution drawings, details, and specifications. Prerequisite: CIVE 583.

CIVE 585  Construction Planning and Scheduling  3 cr.
The course exposes students to basic concepts and methodology for making rational decisions in the design and implementation of real construction projects. The course content includes the investigation of the planning activities and scheduling techniques used in construction projects. This includes basic CPM-related techniques such as precedence diagrams computations, resource allocation and leveling, cost analysis, time-cost trade-off analysis, updating schedule, etc. In addition to Program Evaluation Review Techniques (PERT), and computer applications (Primavera). Prerequisite: CIVE 584.

CIVE 530  Foundation Engineering  3 cr.
A course that covers site investigations; evaluation of data from field and laboratory tests; estimation of stresses in soil masses; applications of principles of soil mechanics to determination of bearing capacity and settlement of spread footings, mats, single piles, and pile groups. Prerequisite: CIVE 431.

CIVE 581  Specifications and Cost Estimation  3 cr.
A course on the structure of construction documents and their interrelationships; bidding requirements; general and particular contract conditions; administrative and procedural requirements for construction; technical specifications; construction cost estimation processes; and unit rates determination and pricing.

Special Courses
CIVE 500  Approved Experience  0 cr.
Students are placed for eight full weeks at a recognized consulting and/or contracting firm in Lebanon or abroad, in a capacity which ensures that they apply their knowledge and acquire professional experience in the field of Civil Engineering.

CIVE 501  Final Year Project I  1 cr.
A chosen design topic and preparation of a detailed execution program for CIVE 502, through comprehensive research with the guidance and approval of the faculty.

CIVE 502  Final Year Project II  3 cr.
A supervised project in groups of normally three students aimed at providing practical design experience in the field of Civil and Environmental engineering application. Prerequisite: CIVE 501.

CIVE 503  Special Topics in Civil and Environmental Engineering  3 cr.

Construction Sequence
CIVE 680  Construction Business Management and Financing  3 cr.
A course that covers the principles of business management of construction companies – theory as well as international and regional practice; an overview of construction business operations including strategic planning, organizational structure, marketing, accounting, financing, risk analysis, and quality; and the principles and sources of construction funding for contracting firms and projects.

CIVE 681  Design and Analysis of Construction Operations  3 cr.
A course that covers planning and modeling of construction operations, design of efficient processes, productivity and resource use considerations, site layout design and analysis, use of quantitative methods and queuing theory, effects of new technologies on construction operations, and an introduction to construction automation.
CIVE 682 Building Information Modeling 3 cr.
A course on generating and managing building data during its life cycle; three-dimensional, real-time, dynamic building modeling techniques to increase productivity in building design and construction; producing the Building Information Model which encompasses building geometry, spatial relationships, geographic information, and quantities and properties of building components.

CIVE 683 Infrastructure Construction and Evaluation 3 cr.
A course on urban requirements and engineering technologies and procedures for construction of infrastructure facilities including roads and pavements, bridges, water and sanitary networks, electric power lines, and telephone/communication lines; with applications to urban and rural areas. Nondestructive evaluation techniques for infrastructure systems; accelerated and full-scale testing; instrumentation, video logging, and remote sensing will be covered.

Structural Sequence

CIVE 610 Advanced Structural Analysis 3 cr.
A course that offers a review of matrix algebra; basic principles of structural analysis: stiffness, flexibility, and energy methods; direct stiffness method for plane and space trusses and frames; linear and non-linear problems; special problems; and computer programming and applications. Prerequisite: CIVE 410.

CIVE 620 Plain Concrete 3 cr.
This is a course that examines portland cements; aggregates; pozzolans; proportioning normal concrete mixtures; pumping concrete; consolidating, finishing, and curing concrete; durability; testing hardened concrete; high-strength concrete; light and heavy weight concretes; and hot and cold weather concreting.

CIVE 621 Special Topics in Concrete 3 cr.
This is a course that reviews reinforced concrete (R/C) design; torsion in R/C members; wind load on structures; earthquake load and seismic design of structures; design of shear walls; design of corbels, brackets and deep girders; circular and rectangular water tanks; and spherical. Prerequisites: CIVE 410 and CIVE 421.

CIVE 622 Prestressed Concrete 3 cr.
A course on material characteristics; prestress losses; working strength design procedures; composite construction; ultimate flexural strength and behavior; shear design; continuous prestressed concrete members. Prerequisites: CIVE 420 and CIVE 421.

CIVE 623 Bridges 3 cr.
A course that discusses types of bridges; influence lines; loads and their distribution on bridges; serviceability of bridges; methods of design of bridge deck, superstructure, and substructure. Prerequisites: CIVE 410 and CIVE 421.

CIVE 624 Steel Design 3 cr.
A course that examines loads on structures; philosophies of design; LRFD versus ASD; behavior, analysis, and design (according to AISC) of tension members, bolted connections, welded connections, compression members, and beams. Prerequisite: CIVE 410.

CIVE 625 Strengthening and Rehabilitation of Concrete Structural Systems 3 cr.
This is a course on assessment of materials and structural deficiency using field test or analytical methods; repair and strengthening materials; strengthening and repair techniques; strengthening of structural members in flexure, shear and axial load; and upgrading of gravity load-designed buildings for earthquake load resistance. Prerequisites: CIVE 410 and CIVE 421.

CIVE 626 Earthquake Engineering 3 cr.
A course that examines the nature of earthquake ground motion; seismic hazard evaluation in engineering practice; response analysis of structures and effect of soil conditions on structural response and behavior under earthquake ground motion; design of structures under earthquake loading.

Geotechnical Sequence

CIVE 630 Applied Foundation Engineering 3 cr.
A course on braced excavations, retaining structures, deep foundations, slope stability, and computer applications. Prerequisite: CIVE 530.

CIVE 631 Environmental Geotechnics 3 cr.
A course on geotechnical practice in environmental protection and restoration; methods of soil and site characterization for sizing of waste repositories and site restoration; influence of physical and chemical processes in soils on the evaluation of contaminant distribution; design of waste containment systems including landfills, slurry walls, and soil stabilization; the applicability and use of geosynthetics; and technologies for site restoration and cleanup. Prerequisite: CIVE 431.

CIVE 632 Soil Behavior 3 cr.
A course on soil mineralogy, soil formation, and composition; influence of geological factors on properties; colloidal phenomena in soils; soil structure; analysis of conduction phenomena (hydraulic, diffusive, thermal, and electrical); compressibility, strength, and deformation properties. Prerequisite: CIVE 431.

CIVE 634 Soil and Site Improvement 3 cr.
A course that covers compaction, admixture stabilization, foundation soil treatment, reinforced soil and composite materials, and material site reclamation.

Environmental and Water Resources Sequence

CIVE 640 Hydraulic Structures 3 cr.
A course that covers closed conduit flow, water distribution systems, transient analysis, open channel flow, flood control, culvert hydraulics, design of various hydraulic structures. Prerequisite: CIVE 440.

CIVE 641 Surface Water Hydrology 3 cr.
A course on design storm, rainfall-runoff modeling, overland flow, flood routing, reservoir routing, simulation models, and stochastic hydrology. Prerequisite: CIVE 441 or equivalent.

CIVE 642 Groundwater Hydrology 3 cr.
This is a course that deals with properties of groundwater, Darcy’s Law, steady groundwater flow, unsteady groundwater flow, well hydraulics, unsaturated flow, sea-water intrusion, and numerical modeling. Prerequisite: CIVE 441.
CIVE 643  Hydraulics of Open Channels  3 cr.
A course that examines gradually varied flow theory and analysis, spatially varied flow, and numerical modeling of unsteady flow in open-channels. Prerequisite: CIVE 440.

CIVE 644  Coastal Engineering  3 cr.
A course on small-amplitude wave theory (linear theory); finite-amplitude wave theory (nonlinear theory); cnoidal wave theory; solitary wave theory; wave refraction, diffraction, and reflection; wave forces and interaction with man-made structures; and design of maritime structures e.g. breakwaters. Prerequisite: CIVE 440.

CIVE 645  Transport Phenomena in Surface and Subsurface Waters  3 cr.
A course on advection, diffusion, and dispersion of pollutants; transport in rivers and estuaries; transport in groundwater; numerical modeling; design of wastewater discharge systems.

CIVE 646  Water Resource Systems: Planning and Management  3 cr.
A course that introduces the concepts and principles of water resources planning and management. It demonstrates the logical steps in engineering planning as it applies to water resources management. The course provides coverage of mature and state of the art technologies and tools applied in the water resources industry. Emphasis will be placed on systems analysis, GIS, and economic and financial analysis, environmental impact assessment techniques.

CIVE 647  GIS for Water Resources and Environmental Engineering  3 cr.
A course that introduces the concepts and principles of Geographic Information Systems (GIS) from the perspective of water resources and environmental engineering. It provides coverage of state-of-the-art GIS methods and tools, specifically targeting water resources and environmental applications including: spatial and terrain analysis, geostatistical analysis, watershed delineation and identification of river networks, representation of groundwater and aquifer systems, time series analysis, and development of GIS integrated water and environmental models.

CIVE 648  Climate Change and Water Resources  3 cr.
The course introduces students to the global issue of climate change and its potential impact on water resources and implications for their management particularly in the semi-arid MENA region. It explores the drivers of climate change, greenhouse gases mitigation efforts, and adaptation options in the water resources sector with special emphasis on the Integrated Water Resources Management (IWRM) and adaptive management approach.

CIVE 649  Microbial Ecology and Molecular Biology for Engineers  3 cr.
A course that introduces students (undergraduate and graduate) from different engineering disciplines to the concepts and tools in microbial ecology and how to apply these concepts and tools to understand microbial communities underpinning environmental biotechnology processes. Prerequisites: CHEM 202, BIOL 210, or equivalent.

CIVE 650  Methods of Environmental Sampling and Analysis  3 cr.
A course on sampling techniques and instrumental methods in environmental sciences; determination of pollutants in water, air, and soil; analytical techniques; adaptation of procedures to specific matrices; case studies.

CIVE 651  Environmental Chemistry and Microbiology  3 cr.
A course that deals with organic, inorganic, and physical chemistry; chemical equilibrium; reaction kinetics; acidity, alkalinity; composition, morphology, and classification of micro-organisms; energy, metabolism, and synthesis; growth, decay, and kinetics; and biological water quality indicators. Prerequisites: CHEM 202, BIOL 210, or equivalent.

CIVE 652  Environmental Management and Decision Making  3 cr.
A course that deals with mathematical programming techniques, multi-objective optimization, and the generation of alternatives, as these are used in environmental systems analysis and management; as well as introducing how considerations such as economics, uncertainty, equity, and other sociopolitical parameters may influence environmental management and decision making.

CIVE 653  Water and Sewage Works Design  3 cr.
A course that examines the design of water and wastewater schemes, including design reports and a literature search on the development of conventional treatment processes. Prerequisite: CIVE 450.

CIVE 654  Solid Waste Management I  3 cr.
A course on nature and effects of solid wastes including hazardous wastes; engineering management principles, practices, and techniques for management of solid wastes administration; solid waste generation, storage, collection and transport, processing, resource recovery, and disposal; and trip to a local facility.

CIVE 655  Solid Waste Management II  3 cr.
A course on the design of solid waste disposal schemes, including design reports and a literature search on the development of conventional treatment and disposal processes. Prerequisite: CIVE 654 or consent of instructor.

CIVE 656  Air Pollution and Control I  3 cr.
An introductory course on air pollutants, sources, and effects; emissions estimates, regulations, and monitoring techniques; particulate matter characterization; meteorology and atmospheric dispersion; and air pollution control processes. Prerequisite: CHEM 202 or equivalent.

CIVE 657  Air Pollution and Control II  3 cr.
A course that examines process analysis, operational limitations, cost and performance, and evaluation of control process and equipment; and case studies, field visits, and inspection of industrial installations. Prerequisite: CIVE 656 or consent of instructor.

CIVE 658  Industrial/Hazardous Waste Management  3 cr.
A course that deals with sources, quantity, and quality of industrial wastes; basic industrial waste treatment processes; major industries, types of wastes, and existing treatment practices; disposal and fate of industrial wastes. Prerequisites: CIVE 450 and CIVE 651, or consent of instructor.

CIVE 659  Environmental Impact Assessment  3 cr.
A course that outlines theories and procedures of assessing environmental impact; analysis of the impact of development on various measures of environmental quality; and benefit-cost considerations in environmental impact assessment. Prerequisites: CIVE 450, CIVE 654, and CIVE 656; or consent of instructor.

Materials and Pavement Sequence

CIVE 660  Pavement Engineering  3 cr.
A course examining highway and airport pavement design; flexible and rigid pavement types and wheel loads; stresses in flexible and rigid pavements; pavement behavior under moving loads; soil stabilization. Prerequisite: CIVE 461.
Common Courses

**CIVE 586/481 Construction Methods and Safety** 3 cr.
The course exposes students to the real world of construction and the complexity of managing machines and people with the one goal, to be on time and on budget while performing safely. The course content includes the selection and utilization of construction equipment such as scrapers, dozers, cranes, etc., based on applications, methods, and production requirements for heavy and building construction. Specific topics cover power generation, transmission, and output capacity of equipment engines as well as calculation of transport cycle times, concreting methods including mixing, delivery, and placement, design of forms for concrete walls and supported slabs and safety and inspection requirements for construction sites and projects. Prerequisite: STAT 230.

**CIVE 670 Computer Methods in Civil Engineering** 3 cr.
A course on the use of the computer for analysis, design, and decision making in civil engineering, including programming, numerical, and CAD methods and applications. Prerequisites: EECE 230 and CIVE 370.

**CIVE 671 Numerical Modeling** 3 cr.
A course that deals with ordinary differential equations: initial-, boundary-, and characteristic-value problems; partial differential equations: steady state, time dependent, and oscillatory problems; techniques: Runge-Kutta, shooting, iterative, finite difference, and finite element methods.

**CIVE 672 Introduction to Geographic Information Systems** 3 cr.
An introductory course on Geographic Information Systems (GIS) and their applications in the planning and engineering fields, alternatives in computer-based graphics, data concepts and tools, network data management and planning applications, and implementation issues. This course satisfies the departmental requirements in all graduate engineering programs.

**CIVE 673 Infrastructure Systems Management** 3 cr.
A course on modeling and optimization methods and their application to inspection, performance prediction and maintenance decision making for the management of infrastructure systems.

**Transportation Sequence**

**CIVE 661 Urban Transportation Planning I** 3 cr.
An introductory course on methods and models used in transportation planning with emphasis on the urban context. Prerequisite: CIVE 461.

**CIVE 662 Traffic Engineering** 3 cr.
A course outlining traffic engineering studies; traffic control of signalized and unsignalized intersections; signal control hardware and maintenance; arterial performance and operations; and network optimization. Prerequisite: CIVE 461.

**CIVE 663 Transportation Systems Analysis** 3 cr.
A course on transportation and traffic problems in modern society. Among the topics covered are travel forecasting problems and methods; theoretical techniques for traffic flow description and management; highway, railway, and runway capacity and performance characteristics; economic considerations; and cost functions.

**CIVE 664 Design and Management of Transport Operations** 3 cr.
A course that covers the application of quantitative techniques from operations research and probabilistic analysis to transportation problems. Applications covered include: pickup and delivery systems, emergency urban services, facility location, and network problems. Prerequisite: STAT 230 or equivalent.

**CIVE 665 Transportation Economics** 3 cr.
A course that investigates the application of economic principles to the evaluation of projects and policies in the transport sector such as transport project benefits, costs, and financing, and pricing in the transport sector.

**CIVE 666 Transport Operations** 3 cr.
A course that introduces probabilistic and optimization methods for designing efficient operations in freight carrier, airline, transit, and traffic modes. Topics include crew and vehicle scheduling in freight, airline, and transit modes; vehicle routing problems in carrier systems; runway and air traffic operations; operations control in transit services; and fundamental relations and models of traffic flow. Prerequisite: CIVE 461.
Department of Electrical and Computer Engineering

Chairperson: Kabalan, Karim
Professors: Al-Alaoui, Mohamad Adnan; Artail, Hassan; Chaaban, Farid; Chedid, Riad; Diab, Hassan; El-Hajj, Ali; Hajj, Ibrahim; Kabalan, Karim; Karaki, Sami; Kayssi, Ayman; Mrad, Fouad; Saade, Jean; Sabah, Nassir
Associate Professors: Abou-Faycal, Ibrahim; Bazzi, Louay; Chehab, Ali; Dawy, Zaher; Jabr, Rabih; Karameh, Fadi; Mansour, Mohamed; Masri, Wassim
Assistant Professors: Akkary, Haitham; Awad, Mariette; Elhajj, Imad; Hajj, Hazem; Mrad, Fouad; Saade, Jean; Sabah, Nassir
Adjunct Professor: Khoury, Shahwan
Visiting Assistant Professor: Nasser, Youssef
Senior Lecturers: Chahine, Hazem; Hamandi, Lama; Huijer, Ernst; Khaled, Mohamad
Lecturers: Droubi, Ghassan; Mohtar, Taan; Moukallid, Ali
Instructors: Antoun, Sally; Hijase, Basma; Kanafani, Zaher; Marmar, Ali; Selim, Bassel; Tawil, Mona

The Department of Electrical and Computer Engineering offers two undergraduate programs leading to the degree of Bachelor of Engineering, and a minor in Biomedical Engineering.

Undergraduate Programs

The Department of Electrical and Computer Engineering offers the degree of Bachelor of Engineering in two majors:

- Computer and Communications Engineering (CCE)
- Electrical and Computer Engineering (ECE)

The mission of the undergraduate programs is to impart a basic understanding of electrical and computer engineering built on a foundation of mathematics, physical sciences, and technology; to expose students to practical and major design experiences; and to provide students with a global perspective and an awareness of their leadership role in regional development. This preparation is augmented by the liberal arts education offered to all undergraduates at the American University of Beirut.

The Electrical and Computer Engineering program provides the students with options to explore, and specialize in, one or more areas of electrical and computer engineering.

The Computer and Communications Engineering program prepares its graduates for careers and graduate studies in information and communication technologies.
<table>
<thead>
<tr>
<th>Term I (Fall)</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EECE 200 Introduction to Electrical and Computer Engineering</td>
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<td>EECE 210 Electric Circuits</td>
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<td>ENGL English Course</td>
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<td>MATH 201 Calculus and Analytic Geometry III</td>
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<td>MATH/CMP 211 Discrete Structures</td>
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<tr>
<td>EECE 230 Introduction to Programming</td>
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<tr>
<td>EECE 290 Analog Signal Processing</td>
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<td>MATH 202 Differential Equations</td>
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<td>MATH 218/219 Linear Algebra</td>
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<td>PHYS 210 Introductory Physics II</td>
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<tbody>
<tr>
<td>EECE 310 Electronics</td>
<td>3</td>
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<tr>
<td>EECE 310L Electric Circuits Laboratory</td>
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<tr>
<td>EECE 320 Digital Systems Design</td>
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<tr>
<td>EECE 330 Data Structures and Algorithms</td>
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<td>EECE 370 Electric Machines and Power Fundamentals</td>
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<tr>
<td>STAT 230 Introduction to Probability and Random Variables</td>
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<tr>
<th>Term V (Spring)</th>
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<tbody>
<tr>
<td>EECE 311 Electronic Circuits</td>
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<tr>
<td>EECE 321 Computer Organization</td>
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<tr>
<td>EECE 321L Computer Organization Laboratory</td>
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<tr>
<td>EECE 340 Signals and Systems</td>
<td>3</td>
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<tr>
<td>EECE 380 Engineering Electromagnetics</td>
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<td>Science Elective</td>
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<table>
<thead>
<tr>
<th>Term VI (Summer)</th>
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<tbody>
<tr>
<td>ENGL English Course</td>
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<tr>
<td>ARAB Arabic Course</td>
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<td>Humanities or Social Science Elective</td>
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<thead>
<tr>
<th>Term VII (Fall)</th>
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<tbody>
<tr>
<td>EECE 421 Computer Architecture</td>
<td>3</td>
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<tr>
<td>EECE 430/1/2/3/4 Software Elective</td>
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<tr>
<td>EECE 442 Communication Systems</td>
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<tr>
<td>MATH Math Elective</td>
<td>3</td>
</tr>
<tr>
<td>ENMG 400 Engineering Economy</td>
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<thead>
<tr>
<th>Term VIII (Spring)</th>
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<tbody>
<tr>
<td>EECE 411/412 Analog or Digital Integrated Circuits</td>
<td>3</td>
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<tr>
<td>EECE 430/1/2/3/4 Software Elective</td>
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<tr>
<td>EECE 450 Computer Networks</td>
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<td>EECE 413L Electronics Laboratory</td>
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<td>Ethics Elective (an approved GE Humanities Course)</td>
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<table>
<thead>
<tr>
<th>Term IX (Summer)</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EECE 500 Approved Experience</td>
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<th>Term X (Fall)</th>
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<tr>
<td>EECE 501 Final Year Project</td>
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<tr>
<td>EECE 442L Communications Laboratory</td>
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<td>EECE EECE Elective</td>
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<tr>
<td>Two Technical Electives EECE or Other</td>
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<tr>
<td>Humanities or Social Science Elective</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
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<table>
<thead>
<tr>
<th>Term XI (Spring)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EECE 502 Final Year Project</td>
<td>3</td>
</tr>
<tr>
<td>EECE Laboratory Elective</td>
<td>3</td>
</tr>
<tr>
<td>EECE EECE Elective</td>
<td>3</td>
</tr>
<tr>
<td>Two Technical Electives EECE or Other</td>
<td>6</td>
</tr>
<tr>
<td>Humanities or Social Science Elective</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
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</tbody>
</table>

**Total =143 credit hours**

*b. stands for billing
List of Pre-approved Technical Electives

- Any EECE course with a number equal to or greater than 400
- Any ENMG course with a number equal to, or greater than 500, with the exception of ENMG 504
- ACCT 21, 215
- BIOL 201, 202, 210, 223, 224, 225, 243, 244, 247, 260, 268, 290
- BUS 211, 235
- CHEM 200, 201, 202, 206, 208, 211, 212, 215, 217, 218, 227, 228, 229
- CIVE 460, 461, 467, 652, 656, 657, 662, 663, 664, 666, 672
- DCSN 200, 205, 210
- ENTM 241/FINA 241, 220, 225, 235
- FINA 210, 215
- GEOL 201, 205, 211, 212, 213, 219, 221
- MECH 310, 314, 320, 340, 550, 631,633, 634, 642
- MGT 210, 215, 225, 230, 238, 240
- MNGT 218, 220, 229, 230
- PHYL 246
- PHYS 212, 217, 223, 225, 226, 235, 236, 249
- Any STAT course with a number equal to, or greater than 234

List of Science Electives

- BIOL 201, BIOL 202, BIOL 210, CHEM 201, CHEM 211, GEOL 201, GEOL 205, GEOL 211, PHYL 246, PHYS 212, PHYS 217, PHYS 223, PHYS 235, PHYS 236

Electrical and Computer Engineering Program

Program Educational Objectives

The objectives of the ECE program are to graduate students able to
- achieve their employment or post graduate educational goals and
- advance in their careers through leadership, life-long learning, innovation, critical thinking, integrity, and civic responsibility.

Program Requirements

- **Mathematics**: MATH 201, MATH 202, MATH 211 or CMPS 211, MATH 218 or 219, STAT 230, and one of MATH 210, 224, 227, 251
- **Sciences**: PHYS 210, PHYS 210L, CHEM 201 or 202, CHEM 203 or 205, and one additional science elective

- **General Education Program**: Arabic course (according to APT), ENGL 206 and one other English course, two social sciences courses, three humanities courses, and a course on ethics approved for the GE program
- **ENMG 400**: Engineering Economy
- **ECE Core Courses**: EECE 200, EECE 210, EECE 230, EECE 290, EECE 310, EECE 311, EECE 320, EECE 321, EECE 330, EECE 340, EECE 370, and EECE 380
- **ECE Laboratories**: EECE 310L, EECE 321L, and three additional laboratory electives
- **Restricted Electives**: six courses from the list below
  - Integrated Circuits: EECE 411 or 412
  - Computer Architecture: EECE 421
  - Software 1: EECE 430, 431, 432, 433, or 434
  - Software 2: EECE 430, 431, 432, 433, or 434
  - Communication Systems: EECE 442
  - Computer Networks: EECE 450
  - Control Systems: EECE 460
  - Power Systems: EECE 471
  - Power Electronics: EECE 473
- **Other Technical Electives**: six courses, at least two of which must be in EECE, subject to approval of adviser. No more than two technical electives may be taken from the same department, program, and/or track.
- **Approved Experience**: EECE 500
- **Final Year Project**: EECE 501 and EECE 502

The program requirements can be completed according to the following proposed schedule:

<table>
<thead>
<tr>
<th>Term I (Fall)</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EECE 200</td>
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<tr>
<td>Introduction to Electrical and Computer Engineering</td>
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<tr>
<td>EECE 210</td>
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<tr>
<td>Electric Circuits</td>
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<tr>
<td>ENGL</td>
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<tr>
<td>English Course</td>
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<tr>
<td>MATH 201</td>
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<tr>
<td>Calculus and Analytic Geometry III</td>
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<tr>
<td>PHYS 210</td>
<td>3</td>
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<tr>
<td>Introductory Physics II</td>
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<tr>
<td>PHYS 210L</td>
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<tr>
<td>Introductory Physics Laboratory II</td>
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<table>
<thead>
<tr>
<th>Term II (Spring)</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EECE 230</td>
<td>3</td>
</tr>
<tr>
<td>Introduction to Programming</td>
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<tr>
<td>EECE 290</td>
<td>3</td>
</tr>
<tr>
<td>Analog Signal Processing</td>
<td></td>
</tr>
<tr>
<td>MATH 202</td>
<td>3</td>
</tr>
<tr>
<td>Differential Equations</td>
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<tr>
<td>MATH 218/219</td>
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<tr>
<td>Linear Algebra</td>
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<tr>
<td>MATH/CMPS 211</td>
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<tr>
<td>Discrete Structures</td>
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<td><strong>Total</strong></td>
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<td><strong>Total</strong></td>
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### Term III (Summer) Credits
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CHEM 201/202 Chemistry Course</td>
<td>3</td>
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<tr>
<td>CHEM 203/205 Chemistry Laboratory</td>
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<tr>
<td>Humanities or Social Science Elective</td>
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### Term IV (Fall) Credits
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>EECE 310 Electronics</td>
<td>3</td>
</tr>
<tr>
<td>EECE 310L Electric Circuits Laboratory</td>
<td>1</td>
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<tr>
<td>EECE 320 Digital Systems Design</td>
<td>3</td>
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<tr>
<td>EECE 330 Data Structures and Algorithms</td>
<td>3</td>
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<tr>
<td>EECE 370 Electric Machines and Power Fundamentals</td>
<td>3</td>
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<tr>
<td>STAT 230 Introduction to Probability and Random Variables</td>
<td>3</td>
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### Term V (Spring) Credits
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EECE 311 Electronic Circuits</td>
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<tr>
<td>EECE 321 Computer Organization</td>
<td>3</td>
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<tr>
<td>EECE 321L Computer Organization Laboratory</td>
<td>1</td>
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<tr>
<td>EECE 340 Signals and Systems</td>
<td>3</td>
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<tr>
<td>EECE 380 Engineering Electromagnetics</td>
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<td>Science Elective</td>
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### Term VI (Summer) Credits
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ENGL English Course</td>
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<tr>
<td>ARAB Arabic Course</td>
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### Term VII (Fall) Credits
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<th>Course</th>
<th>Credits</th>
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<tr>
<td>EECE Restricted Elective</td>
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<tr>
<td>EECE Restricted Elective</td>
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<tr>
<td>EECE Restricted Elective</td>
<td>3</td>
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<tr>
<td>MATH Math Elective</td>
<td>3</td>
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<tr>
<td>ENMG 400 Engineering Economy</td>
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### Term VIII (Spring) Credits
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<th>Course</th>
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<tr>
<td>EECE Restricted Elective</td>
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<tr>
<td>EECE Restricted Elective</td>
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<tr>
<td>EECE Restricted Elective</td>
<td>3</td>
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<tr>
<td>EECE Laboratory Elective</td>
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<tr>
<td>Ethics Elective</td>
<td>3</td>
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<tr>
<td>Humanities or Social Science Elective</td>
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### Term IX (Summer) Credits
<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>EECE 500 Approved Experience</td>
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### Term X (Fall) Credits
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<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EECE 501 Final Year Project</td>
<td>3</td>
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<td>EECE EECE Elective</td>
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<tr>
<td>EECE Laboratory Elective</td>
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<tr>
<td>Two Technical Electives</td>
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<td>Humanities or Social Science Elective</td>
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### Term XI (Spring) Credits
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<th>Course</th>
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<tbody>
<tr>
<td>EECE 502 Final Year Project</td>
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<td>EECE EECE Elective</td>
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</tr>
<tr>
<td>EECE Laboratory Elective</td>
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<td>Two Technical Electives</td>
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<td>Humanities or Social Science Elective</td>
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<tr>
<td><strong>Total</strong></td>
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</table>

*Total =143 credit hours*

### List of Pre-approved Technical Electives

- Any EECE course with a number equal to or greater than 400
- Any ENMG course with a number equal to, or greater than 500, with the exception of ENMG 504
- ACCT 21, 215
- BIOL 201, 202, 210, 223, 224, 225, 243, 244, 247, 260, 268, 290
- BUSS 211, 235
- CHEM 200, 201, 202, 206, 208, 211, 212, 215, 217, 227, 228, 229
- CIVE 460, 461, 647, 652, 656, 657, 661, 662, 663, 664, 666, 672
- CDSN 200, 205, 210
- ENMG 241/FINA 241, 220, 225, 235
- FINA 210, 215
- GEOL 201, 205, 211, 212, 219, 221
- MECH 310, 314, 320, 340, 550, 631, 633, 634, 642
- MKTG 210, 215, 225, 230, 238, 240
- MNTR 218, 220, 229, 230
- PHIL 246
- PHYS 212, 217, 223, 225, 226, 235, 236, 249

*b. stands for billing*
Minimum number of credits: 18

- One elective course from list A, B, or C below [3 cr.]
- (EECE 210 [3 cr.] (or equivalent) and EECE 601 [3 cr.])
- BIOL 202 or PHYL 246 [4 cr.]
- BIOL 201 [4 cr.]
- One core course [3 cr.] chosen from EECE 601, EECE 603, or MECH 633
- One elective course from list A below [3 cr.]
- One elective course from list A, B, or C below [3 cr.]

Minumum number of credits: 18

For biology students, the requirements are as follows:

- EECE 401 [1 cr.]
- BIOL 201 [4 cr.]
- BIOL 202 or PHYL 246 [4 cr.]
- BIOL 202 or PHYL 246 [4 cr.]
- BIOL 201 [4 cr.]
- One core course [3 cr.] chosen from EECE 601, EECE 603, or MECH 633
- One elective course from list A below [3 cr.]
- One elective course from list A, B, or C below [3 cr.]

Minimum number of credits: 18

For other students, the requirements are as follows:

- EECE 401 [1 cr.]
- BIOL 201 [4 cr.]
- BIOL 202 or PHYL 246 [6 cr.]
- (EECE 210 [3 cr.] (or equivalent) and EECE 601 [3 cr.])
- (CIVE 210 [3 cr.] (or equivalent) and MECH 634 [3 cr.])
- One elective course from list A, B, or C below [3 cr.]

Minimum number of credits: 18

**List of Science Electives**

- BIOL 201, BIOL 202, BIOL 210, CHEM 201, CHEM 211, GEOL 201, GEOL 205, GEOL 211, PHYL 246, PHYS 212, PHYS 217, PHYS 223, PHYS 235, PHYS 236

**Minor in Biomedical Engineering**

The minor in Biomedical Engineering is open to all AUB students. Students who have completed at least 60 credits at the sophomore level and higher, and who have a cumulative average of 70 or more, may apply by completing a minor application form available in the ECE department. The minor will be indicated on the transcript of the student who completes all the requirements described below, and who obtains an average in the minor courses of 70 or more.

The minor requirements are divided into a set of core courses, and a set of elective courses.

**For engineering students, the requirements are as follows:**

- EECE 401 [1 cr.]
- BIOL 201 [4 cr.]
- BIOL 202 or PHYL 246 [4 cr.]
- One core course [3 cr.] chosen from EECE 601, EECE 603, or MECH 633
- One elective course from list A below [3 cr.]
- One elective course from list A, B, or C below [3 cr.]

Minimum number of credits: 18

**For other students, the requirements are as follows:**

- EECE 401 [1 cr.]
- BIOL 201 [4 cr.]
- BIOL 202 or PHYL 246 [6 cr.]
- (EECE 210 [3 cr.] (or equivalent) and EECE 601 [3 cr.])
- (CIVE 210 [3 cr.] (or equivalent) and MECH 634 [3 cr.])
- One elective course from list A, B, or C below [3 cr.]

Minimum number of credits: 18

**Course Descriptions**

**EECE 200 Introduction to Electrical and Computer Engineering**

This course includes the following topics: an overview of electrical and computer engineering; engineering as a profession; introduction to the different areas of ECE such as biomedical systems, circuits, communications, computer design, control, distributed systems, electromagnetics, energy, machines, and signal processing; basic computer tools such as SPICE, MATLAB, and LabVIEW: basic laboratory instruments; laboratory experiments and a design project.

**EECE 210 Electric Circuits**

A course on the basic principles of programming and their application to the solution of engineering problems using a high level programming language. This course introduces structured and object-oriented programming, and covers the basic data types, control structures, functions, arrays, pointers, and classes. Weekly laboratory assignments are an integral part of this course.

**EECE 230 Introduction to Programming**

A course on circuits solution and analysis in the s and frequency domains. It includes operational amplifiers, step and steady-state response of RL, RC, and RLC circuits, Laplace transform and its use in circuit analysis; frequency-selective circuits; active filter circuits; Fourier transform, and two-port circuits; and circuit simulation using SPICE. **Prerequisite: EECE 210.**

**EECE 290 Analog Signal Processing**

A course on circuits solution and analysis in the s and frequency domains. It includes operational amplifiers, step and steady-state response of RL, RC, and RLC circuits, Laplace transform and its use in circuit analysis; frequency-selective circuits; active filter circuits; Fourier transform, and two-port circuits; and circuit simulation using SPICE. **Prerequisite: EECE 210.**

**EECE 310 Electronics**

This course includes the following topics: an overview of electrical and computer engineering; engineering as a profession; introduction to the different areas of ECE such as biomedical systems, circuits, communications, computer design, control, distributed systems, electromagnetics, energy, machines, and signal processing; basic computer tools such as SPICE, MATLAB, and LabVIEW: basic laboratory instruments; laboratory experiments and a design project.

**EECE 310L Electric Circuits Laboratory**

A laboratory course that covers passive electronic components; laboratory instruments; voltage-divider circuits; sources and Thevenin's theorem; RC lead-lag networks; series resonance; the transformer; op-amp circuits; single-phase rectifier circuits; LEDs; Zener diode regulator; diode clamping and clipping; BJT and MOSFET characteristics. **Pre- or co-requisite: EECE 310.**

**EECE 311 Electronic Circuits**

A course on BJT amplifiers; MOSFET amplifiers; differential amplifiers; frequency response of amplifiers; feedback; operational amplifiers; oscillators; digital CMOS circuits; SPICE simulations. **Prerequisite: EECE 310.**
EECE 312 Electronics (for Mechanical Engineering students) 3 cr.
This course introduces the fundamentals of electronics and electronic circuits to non-majors. Its objectives are to provide a concise treatment of the basic concepts of electronic components and to introduce the student to the basic analog and digital electronic circuits. The course covers the fundamentals of semiconductor diodes, transistors, operational amplifiers and their applications, digital circuits and systems, and basic instrumentation. Prerequisites: EECE 210 and MATH 202.

EECE 320 Digital Systems Design 3 cr.
This course introduces digital systems design concepts. Topics include basic combinational building blocks and design methods to construct synchronous digital systems; alternative representations for digital systems; standard logic (SSI, MSI) vs. programmable logic (PLD, FPGA); finite state machine design; digital computer building blocks as case studies; introduction to computer-aided design software in VHDL. The course also includes a substantial design project. Prerequisites: EECE 210 and EECE 230.

EECE 321 Computer Organization 3 cr.
This course covers the organization of modern computer systems. In addition to learning how to program computers at the assembly level, students learn how to design the main components of a von Neumann computer system, including its instruction set architecture, datapath, control unit, memory system, input/output interfaces, and system buses. To consolidate the material presented in class, students work on assembly-language programming and datapath design assignments, and a major computer interfacing project. Prerequisites: EECE 230 and EECE 320.

EECE 321L Computer Organization Laboratory 1 cr.
A laboratory course with experiments in computer organization and interfacing techniques; digital hardware design using CAD tools and FPGAs; program-controlled and interupt-driven I/O; memory organization; simple peripheral devices and controllers; bus interfaces; microcontroller-based designs. Pre- or co-requisite: EECE 321.

EECE 330 Data Structures and Algorithms 3 cr.
This course covers fundamental algorithms and data structures that are used in software applications today. Particular emphasis is given to algorithms for sorting, searching, and indexing. Data structures such as linked lists, binary trees, heaps, B-Trees, and graphs will also be covered along with their associated algorithms. The course also covers basic algorithmic analysis techniques and seeks to promote student programming skills. Prerequisite: EECE 230.

EECE 340 Signals and Systems 3 cr.
This course covers basic concepts and methods related to continuous and discrete-time signals and systems. The course includes: signals and systems and their properties, linear time-invariant systems, stability analysis, sampling of continuous-time signals, z-transform, discrete Fourier transform, time and frequency domain representations of discrete-time signals and systems, and introductory concepts in communications. Prerequisite: EECE 290.

EECE 370 Electric Machines and Power Fundamentals 3 cr.
This course covers three-phase circuits and power calculation, magnetic circuits, transformers: single-phase ideal and real transformers, construction, operation, autotransformers, and 3-phase transformers; fundamentals of AC and DC machines: construction and basic concepts, DC machine: types, characteristics, and performance of series motor; synchronous generators: construction, equivalent circuits, testing and performance characteristics; Induction motors: construction, principle of operations, tests, power efficiency and torque. Prerequisite: EECE 210.

EECE 380 Engineering Electromagnetics 3 cr.
This course covers the fundamentals of applied electromagnetics by emphasizing physical understanding and practical applications in electrical and computer engineering systems. It deals with the study of static electric fields in vacuum and dielectrics, conductors, capacitance, electrostatic energy and forces, Poisson’s equation, static magnetic fields, Biot-Savart law, Ampere’s law, vector magnetic potential, inductance, Maxwell’s equations for time-varying fields, Faraday’s law, plane wave propagation, time-harmonic fields, propagation in lossless media, and wave reflection and transmission at normal incidence. The bridge between electric circuits and electromagnetics is done through the study of transmission lines and their lumped-element model, transmission line input impedance, and power flow on lossless transmission line. Prerequisites: EECE 210 and MATH 202.

EECE 401 Biomedical Engineering Seminar 1 cr.
Biweekly seminars given by members of the Faculty of Engineering and Architecture or by guest speakers. The seminars cover a range of biomedical engineering topics of theoretical and professional interest. Students are required to submit an assignment based on each seminar, which will be graded. The seminar is required of all students taking the Biomedical Engineering Minor. Prerequisite: EECE 601, or EECE 602, or MECH 633.

EECE 411 Analog Integrated Circuits 3 cr.
A course on the design of analog integrated circuits with an emphasis on MOS circuits; op-amp design; feedback and stability; applications of analog integrated circuits such as filtering and A/D conversion; comparison with bipolar circuits; extensive use of SPICE for circuit simulation. Prerequisite: EECE 311.

EECE 412 Digital Integrated Circuits 3 cr.
This course includes the following topics: an introduction to digital electronic circuits; models, current equations and parasitic of CMOS transistors for digital design; study of CMOS inverter and logic gates, including analysis, design, simulation, layout and verification; advanced circuit styles.; sequential circuits; and the advanced topics: semiconductor memories, power grid, clocking strategies, datapath building blocks, deep-submicron design issues, and Interconnect. Prerequisites: EECE 310 and EECE 320.

EECE 413L Electronics Laboratory 1 cr.
A laboratory course that covers electronic circuits used in control, communications, power, and computer interfacing. Experiments include amplifier characterization, PCB manufacturing, sensors and signal processing circuits, communication link, voltage-to-frequency conversion, and a human-computer interface. Students work in teams to complete a design project to build a product by integrating several electronic components. Prerequisites: EECE 311 and EECE 340.

EECE 421 Computer Architecture 3 cr.
A laboratory course that covers electronic circuits used in control, communications, power, and computer interfacing. Experiments include amplifier characterization, PCB manufacturing, sensors and signal processing circuits, communication link, voltage-to-frequency conversion, and a human-computer interface. Students work in teams to complete a design project to build a product by integrating several electronic components. Prerequisites: EECE 311 and EECE 340.

EECE 430 Software Engineering 3 cr.
A course that teaches students the formal processes employed for carrying out software projects, including the design, development, testing, and deploying of practical software systems. Students are exposed to the realities involved in developing software for clients and the requirements this imposes on quality, timing, and coordination. Students will develop hands-on experience with practical tools used in real-life applications. The course requires the completion of a group-based real-life software project. Prerequisite: EECE 330.
EECE 431  Design and Analysis of Algorithms  3 cr.
This course covers techniques for the design and analysis of efficient algorithms. Topics include:
sorting algorithms including merge-sort, quick-sort, and counting-sort; median and order
statistics algorithms; sorting lower bound; divide-and-conquer design strategy; polynomial and
matrix multiplication algorithms; balanced search trees; hash tables; augmenting data structures;
number-theoretic algorithms; dynamic programming; greedy algorithms; graph algorithms including
graph traversal algorithms and applications, minimum spanning tree, shortest path algorithms;
introduction to NP-completeness and intractability; selected topics. Prerequisite: EECE 330.

EECE 432  Operating Systems  3 cr.
This course covers the principles of operating systems and systems programming. The topics discussed
in class are processes, threads, concurrency and synchronization, scheduling, deadlocks, memory
management, file systems, I/O devices, parallel and distributed systems, and security. The course
will be accompanied with hands on assignments involving contemporary Linux kernels. Prerequisites:
EECE 321 and EECE 330. Students cannot receive credit for both EECE 432 and CMPS 272.

EECE 433  Database Systems  3 cr.
This course covers the nature and purposes of database systems and an introduction to data
modeling: entity relationship model, relational model with relational algebra, relational calculus
and SQL, integrity constraints, file organization and index files, and normalization. Prerequisite:
EECE 330. Students cannot receive credit for both EECE 433 and CMPS 277.

EECE 434  Programming Language Design and Implementation  3 cr.
This course will provide an introduction to the design and implementation of various programming
paradigms, namely object-oriented (Java, C++ and C#), functional (Haskell), and logic (Prolog).
Compiler construction will be covered, in addition to topics such as, virtual machines, intermediate
languages, and concurrency. Prerequisite: EECE 330. Students cannot receive credit for both EECE 434
and CMPS 258, or for both EECE 434 and CMPS 274.

EECE 442  Communication Systems  3 cr.
This course introduces the students to the transmission and reception of analog signals; performance
of analog communication systems in the presence of noise; analog to digital conversion and
pulse coded modulation; transmission and reception of digital signals; performance of digital
communication systems in the presence of noise and inter-symbol interference. Prerequisites:
EECE 340 and STAT 230.

EECE 442L  Communications Laboratory  1 cr.
A laboratory course with experiments covering the following topics: AM and FM modulation/
demodulation, sampling and quantization, digital modulation (PSK, FSK, MSK, GMSK), digital
modulation, and inter-symbol interference. Prerequisite: EECE 442.

EECE 450  Computer Networks  3 cr.
A course that outlines data communications; wide area networks; circuit and packet switching;
routing; congestion control; local area networks; communications architecture and protocols;
internetworking. Prerequisites: EECE 330 and STAT 230.

EECE 451L  Internetworking Laboratory  1 cr.
This laboratory course covers the technologies and protocols of the Internet. The experiments cover
the Internet protocol (IP), address resolution protocol (ARP), Internet control message protocol
(ICMP), user datagram protocol (UDP), and transmission control protocol (TCP); the domain name
system (DNS), routing protocols (RIP, OSPF, BGP), network address translation (NAT), dynamic
host configuration (DHCP), network management protocols (SNMP), and IP multicast. Prerequisite:
EECE 450.

EECE 460  Control Systems  3 cr.
This course seeks to impart in students a sound understanding of fundamental principles in control
engineering, based on analog technologies. The course includes: mathematical modeling of linear
continuous time invariant single input, single output dynamical systems; transfer functions and
state space models, performance specifications, analysis and design of closed loop analog control
systems. Prerequisite: EECE 340.

EECE 460L  Control Systems Laboratory  1 cr.
This course involves students in the practical implementation of the concepts acquired in EECE 460
by analyzing different types of dynamical systems, designing and understanding controllers suitable
to specific models, simulating system responses, and experimentally verifying the effectiveness
of various control schemes. Pre- or co-requisite: EECE 460.

EECE 461  Instrumentation  3 cr.
A design course for complete instrumentation systems, including measurements, sensors, data
acquisition, and component integration. Application areas and course projects include industrial
control, laboratory measurements, automation systems, and the like. This course is completed with
a set of laboratory experiments. Prerequisite: EECE 460.

EECE 470L  Electric Machines Laboratory  1 cr.
Transformers: open circuit, short circuit, and load test; unbalanced loading and parallel operation
of transformers; speed control and load characteristics of shunt, series and compound DC machines;
induction machines: blocked rotor, no-load, and loading tests; operation of single-phase induction
motors; operation of a synchronous machine connected to a large external source. Prerequisite:
EECE 370.

EECE 471  Fundamentals of Power Systems Analysis  3 cr.
This course covers the basic concepts of three-phase systems, generation modeling review, and
generation capability curve; transformers, autotransformers, three-winding transformers, and
regulating transformers. Calculation of transmission line parameters, evaluation of steady state
operation of transmission lines, reactive power compensation, line capability, power flow analysis
using Gauss-Seidel and Newton-Raphson methods, economic load dispatch with generation limits
and line losses, symmetrical fault analysis, symmetrical components and unsymmetrical fault
analysis. Prerequisite: EECE 370.

EECE 471L  Power Systems Laboratory  1 cr.
This lab course includes nine experiments to study various aspects of power systems: measurement
of the characteristics data of a transmission line and an assessment of its voltage drop and losses;
synchronization and steady state operation of a generator connected to an infinite bus system; load
characteristics of a synchronous motor and effect of field excitation on reactive power load; effect
of voltage levels on power transmission and effects of various load types on power plants; load
flow data preparation and system study; system analysis of symmetrical and unsymmetrical faults;
Transient stability data preparation and system study. Prerequisite: EECE 471.

EECE 473  Power Electronics  3 cr.
This lab course includes an overview of power electronics devices used and their desired
characteristics; diode circuits and rectifiers, effect of source inductance, three-phase rectifiers;
dc-dc switched mode converters, buck, boost, and buck-boost circuits, bridge converter; pulse-width
modulated inverters, voltage control, harmonics, three-phase inverters; introduction to gate and
base drive circuits, snubber circuits. Prerequisites: EECE 210 and EECE 310, and MATH 218 or 219.
EECE 473L  Power Electronics and Drives Laboratory  1 cr.
This lab course includes experiments to study the following: induction motor torque-speed curve and starting characteristic, induction motor speed control through a 4-quadrant drive, single phase capacitor-start induction motor, ac to dc converter, dc to dc converters; buck, boost, and buck-boost regulators, dc to ac inverter, ac to ac converter. Prerequisite: EECE 473.

EECE 474  Electric Drives  3 cr.
A course that covers steady-state analysis of dc and poly-phase induction motors, starting, and control; AC drives: solid-state control, dc link in adjustable speed drives, voltage and frequency controls, braking and plugging; DC drives: rectifier and chopper drives, dynamic and regenerative braking, plugging; stepper motors: types, operational characteristics, control algorithms, power drive configurations; and special-purpose motors. Prerequisite: EECE 370.

EECE 475  Industrial Electrification  3 cr.
A course that outlines medium and low voltage installations; lighting, practical applications of electric machines; motor control centers; emergency power supplies; and auxiliary systems. Prerequisite: EECE 370.

EECE 476  Power System Protection and Switchgear  3 cr.
A course that covers current and voltage transformer theories, construction, and applications, electro-mechanical relay, solid state relay, and numerical relay; analogue to digital converters (ADC), digital to analogue converter (DAC), memories, protection systems for electric machines, transformers, bus bars, overhead and underground transmission lines; over-voltage protection system; and a brief introduction to data transmission. Prerequisite: EECE 370.

EECE 499  Undergraduate Research  3 cr.
This course requires participation, under supervision of a faculty member, in a research project. Before registering, the student must create a proposal regarding the nature of the research, the specific goals of the research, and the desired final report outcome; this proposal must be submitted to and approved by the supervising faculty member and the department before registering. Prerequisites: Completion of 65 required credits in the major, and a cumulative average of 85.0 or above.

EECE 500  Approved Experience  1 b.
This is an eight-week professional training course in electrical and computer engineering.

EECE 501  Final Year Project  3 cr.
A supervised project in groups of normally 3 students aimed at providing practical experience in some aspects of computer, communications and electrical engineering. Students are expected to define the project, state its objectives, complete a literature survey, set project specifications and select a design method. They are also expected to do some preliminary modeling and analysis and to acquire the necessary material needed for the completion of the project in the spring term. A professional report and an oral presentation are also required from the students.

EECE 502  Final Year Project  3 cr.
This is a continuation of EECE 501. Students are asked to deliver a product that has passed through the design, analysis, testing and evaluation stages. The course also requires the production of a professional report that includes a description of the design process, implementation and testing, verification and validation and a critical appraisal of the project. An oral presentation and a poster are also within the project deliverables. Prerequisite: EECE 501.

EECE 503  Special Topics in ECE  3 cr.

EECE 601  Biomedical Engineering I  3 cr.
This course includes an introduction to: general instrumentation configuration, performance of instrumentation systems; types and characteristics of transducers; sources and characteristics of bioelectric signals; types and characteristics of electrodes; temperature regulation and measurement; cardiovascular system, measurements, and diagnostic equipment; blood instruments; patient care and monitoring; and electrical safety of medical equipment. Prerequisites: EECE 210 and BIOL 210, or EECE 210 and BIOL 202 for students doing a minor in biomedical engineering, or consent of instructor.

EECE 602  Biomedical Engineering II  3 cr.
This course covers respiratory system and measurements; nervous system and measurements; sensory and behavior measurements; biotelemetry; instrumentation for the clinical laboratory; x-rays and radioisotope instrumentation; magnetic resonance; and special surgical techniques. Prerequisite: EECE 601 or consent of instructor.

EECE 603  Biomedical Signal and Image Processing  3 cr.
A course that introduces the fundamentals of digital signal processing as implemented in biomedical applications. It provides a concise treatment of the tools utilized to describe deterministic and random signals as the basis of analyzing biological signals: data acquisition; imaging; denoising and filtering; feature extraction; modeling. The course is tightly coupled with a practical component as it looks at and assigns several laboratory projects. Examples include the auditory system, speech generation, electrocardiogram, neuronal circuits, and medical imaging. Students should have reasonable software skills in Matlab. Prerequisites: STAT 230 and EECE 340, or consent of instructor.

EECE 604  Communications Engineering for Genetics and Bioinformatics  3 cr.
This course presents current research efforts in the emerging interdisciplinary field of communications engineering for genetics and bioinformatics. It shows how concepts and techniques from the field of communications engineering can be applied to central problems from the fields of genetics and bioinformatics. As a basic analogy, voice information is digitized, transmitted, and processed in communications, and DNA information is replicated, transmitted, and processed in genetics. The main topics covered include DNA compression, mutual information for functional genomics, channel coding for gene expression, genomic signal processing, and biological computation. Prerequisite: Senior standing, or consent of the instructor.

EECE 605  Neuroengineering I  3 cr.
A course that focuses on the importance of biological systems from the engineering viewpoint; living cells and mechanisms; introduction to the nervous system; the resting membrane potential; generation and propagation of the action potential; motor systems; synaptic transmission; control of movement. Prerequisite: BIOL 210, or consent of instructor.

EECE 610  Introduction to Analog VLSI Systems  3 cr.
This course covers an introduction to digital electronic circuits; models, current equations and parasitic of CMOS transistors for digital design; study of CMOS inverter and logic gates, including analysis, design, simulation, layout and verification; advanced circuit styles; sequential circuits; advanced topics: semiconductor memories, power grid, clocking strategies, datapath building blocks, deep-submicron design issues, and interconnect. Prerequisites: EECE 310 and EECE 320, or consent of instructor.
EECE 612  Digital Integrated Circuits  3 cr.
A course on digital electronic circuits; models, current equations, and parasitics of CMOS transistors for digital design; study of CMOS inverter and logic gates, including analysis, design, simulation, layout, and verification; advanced circuit styles; sequential circuits; advanced topics: semiconductor memories, power grid, clocking strategies, datapath building blocks, deep-submicron design issues, interconnect. Prerequisites: EECE 311 and EECE 320, or consent of instructor.

EECE 613  RF and Microwave Circuits for Communications  3 cr.
The course focuses on the analysis and design of high-frequency electronic circuits, with emphasis on RF and microwave circuits and components for communication systems. The course covers the basic principles of radio-frequency (RF) and microwave circuits design, as applied to the design of microstrip and coplanar lines, impedance transformers, low-pass and band-pass filters, directional couplers, power dividers, amplifiers, mixers, and diode detectors. It provides understanding of S-parameters and signal-flow graph analysis techniques. The course enables the student to get hands-on experience in RF and microwave circuit design through the use of computer-aided design tools to simulate and analyze high frequency circuits, build them as part of a course project, and perform measurements in the lab using network and spectrum analyzers. Prerequisites: EECE 311, EECE 340, and EECE 380, or consent of instructor.

EECE 614  Computer-Aided Analysis and Design of VLSI Circuits and Systems  3 cr.
A course on circuit and logic simulation; timing analysis and verification; testing and fault simulation; logic and high-level synthesis; physical design automation. Prerequisite: EECE 311, or consent of instructor.

EECE 615  Computer Methods for Circuit and System Analysis  3 cr.
This course covers numerical methods and techniques for computer simulation of linear and nonlinear circuits and systems. This includes formulation methods, solution of linear equations and systems (DC analysis or static analysis), time-domain solution (transient analysis), solution of large systems, and sensitivity analysis. Application areas include simulation of electronic integrated circuits, power systems, electro-mechanical systems, mechatronics, and systems that can be modeled by sets of algebraic-differential equations. Prerequisites: EECE 210, MATH 202, and MATH 218 or 219, or consent of Instructor.

EECE 616  Advanced Digital Integrated Circuits  3 cr.
A graduate level course on advanced digital integrated circuits. The following topics are covered: impact of physical technology on architecture; technology issues: CMOS scaling and issues in deep submicron regimes, process variations; device and interconnect modeling; optimization for speed; high-speed logic families; low-power design: leakage reduction techniques, voltage scaling; power distribution; clocking strategies; timing concepts; memory design: clocked storage elements, SRAM, DRAM, flash memory; and high-speed arithmetic circuits. Prerequisite: EECE 412 or EECE 612, or consent of instructor.

EECE 620  Computer Graphics  3 cr.
A course on interactive graphics; graphics hardware; graphical input devices; windowing; clipping; viewports; zooming, geometrical transformations (2D and 3D); data structures; advanced raster display architectures; raster algorithms; special graphics techniques; applications. Prerequisite: Senior or graduate standing, or consent of instructor.

EECE 621  Advanced Computer Architecture  3 cr.
This course focuses on modern advancements in parallel computer architecture, with emphasis on advanced instruction level parallelism (ILP) and multiprocessor architectures. Topics include: advanced branch prediction, data speculation, computation reuse, memory dependence prediction, trace caches, dynamic optimizations, checkpoint architectures, latency-tolerant processors, simultaneous multithreading, speculative multithreading, virtual machines, message passing multiprocessors, UMA, NUMA and COMA shared-memory multiprocessors, single-chip multiprocessors, wormhole routing techniques, cache coherence, memory consistency models, high performance synchronization methods, speculative lock elision and transactional memory. A key component of the course is a research project in which students use architecture performance simulator to investigate novel architecture techniques. Prerequisite: EECE 421, or consent of instructor.

EECE 622  VLSI for Communications and Signal Processing  3 cr.
This course introduces concepts in the design and implementation of digital signal processing systems using integrated circuits. The main emphasis is on the architectural exploration, design and optimization of signal processing systems for communications. Algorithm, architecture, and circuit design techniques are introduced that enable joint optimization across the algorithmic, architectural, and circuit domains. A key component of the course is a project in which students investigate problems in the design and implementation of low-power and high-performance communication systems. Prerequisite: Senior or graduate standing, or consent of instructor.

EECE 623  Reconfigurable Computing  3 cr.
A course dealing with the design issues pertaining to the implementation of application specific architectures using the reconfigurable computing paradigm allowing the same circuit to be reused in order to run different applications. Emphasis is on the systematic design of reconfigurable computing platforms that exploit a high degree of parallelism. Prerequisite: EECE 321, or consent of instructor.

EECE 624  Digital Systems Testing  3 cr.
This course covers an overview of digital systems testing and testable design; test economics, fault modeling, logic and fault simulation, testability measures, test generation for combinational circuits, memory test, delay test, IDDQ test, scan design, and boundary scan. Prerequisite: EECE 320, or consent of instructor.

EECE 625  Embedded Systems Design  3 cr.
A course on embedded hardware and software design; the system design process: requirements analysis, specification, hardware/software co-design, testing; embedded computing platforms: general- and special-purpose processors, hardware accelerators, systems-on-a-chip, intellectual property (IP) core-based design, embedded networks; software design tools and technologies: CAD tools, compilers, and assemblers; hardware design tools and technologies: hardware-description languages, high-level synthesis tools, ASIC and FPGA design flows; real-time operating systems: multiple tasks and processes, context switching, task scheduling, multiprocessor communication mechanisms; low-power computing: circuit, architecture, and application techniques; system reliability and fault tolerance. Prerequisites: EECE 321 and EECE 321L, or consent of instructor.

EECE 626  Computer System Analysis  3 cr.
A course on the development of analytical models of computer systems and application of such models to performance evaluation. Topics covered include scheduling policies, paging algorithms, multi-programmed resource management, and queuing theory. Prerequisite: EECE 421, or consent of instructor.
EECE 630  Distributed and Object Database Systems  3 cr.
A course that covers design techniques used for distributing databases among multiple sites. The fundamental topics include fragmentation, replication, and allocation. The course also discusses the strategies used in executing distributed queries subject to given criteria and the commit protocols for managing transactions in a distributed environment. Other topics covered include parallel database implementations and the design of object database management systems. The course enables students to get hands-on experience in designing distributed database systems using a design project that requires the implementation of low-level functionality associated with the functions of distributed database system. Prerequisite: EECE 433, or consent of instructor.

EECE 631  Advanced Topics in Algorithms  3 cr.
This is a second course on the general principles of algorithm design and analysis. The course is a continuation of EECE 431. Topics include: computability theory; complexity theory: time complexity, P versus NP, circuit complexity, and space complexity; randomized algorithms; linear programming; approximation algorithms; and selected topics. Prerequisite: EECE 431, or consent of instructor.

EECE 632  Cryptography and Computer Security  3 cr.
This course includes an overview of encryption and computer security; classical encryption techniques, block ciphers and the data encryption standard, finite fields, advanced encryption standard, confidentiality using symmetric encryption, public-key cryptography, key management, hash and MAC algorithms, digital signatures, authentication applications, email security, and Web security. Prerequisite: EECE 431, or consent of instructor.

EECE 633  Data Mining  3 cr.
This course is an introduction to data mining. Data mining refers to knowledge discovery from huge amounts of data to find non-trivial conclusions. Topics will range from statistics to machine learning to database, with a focus on analysis of large data sets. The course will target at least one new data mining problem involving real data, for which the students will have to find a solution. Prerequisite: EECE 433, or consent of instructor.

EECE 634  Optimizing Compilers  3 cr.
Theoretical and practical aspects of building modern optimizing compilers. Topics: intermediate representations, basic blocks and flow graphs, data flow analysis, partial evaluation and redundancy elimination, loop optimizations, register allocation, instruction scheduling, and interprocedural analysis. Students will implement significant optimizations within the framework of a modern research compiler. Prerequisites: EECE 330 and EECE 421, or consent of the instructor.

EECE 635  Advanced Software Engineering  3 cr.
This course provides the students with an understanding of current topics in software engineering with an emphasis on software architectural design, software development, and autonomic computing. Prerequisite: EECE 430, or consent of instructor.

EECE 636  Analysis and Verification of Software  3 cr.
This course introduces the basics needed to understand automation techniques for the analysis and verification of computing systems including logics behind programming languages. We will present tools for automated analysis that improve the reliability and correctness of software that reflect state of the art design and validation techniques that are changing the way software is designed and implemented today. The students will have the chance to practice and possibly advance these techniques in small projects. Prerequisites: EECE 330 and senior standing, or consent of instructor.

EECE 637  Advanced Programming Practice  3 cr.
This course is an advanced course on programming practices with a focus on verification. The course introduces programming tools and techniques that make individual engineers more effective and productive and help them develop quality code. Teams will work in Agile and eXtreme programming environments with a focus on design by contract. They will use formal specifications, design patterns and aspect oriented programming. Projects will use tools for code control, building, configuration, language recognition, dynamic documentation, fast prototyping, refinement, coverage, automated and manual debugging, and dynamic and static verification. Prerequisite: EECE 330, or consent of instructor.

EECE 638  Software Testing  3 cr.
The course focuses on concepts, techniques and tools for testing software. It provides practical knowledge of a variety of ways to test software and an understanding of some of the tradeoffs between testing techniques. The topics include: software testing at the unit, module, and system levels; functional and structural testing; regression testing; mutation testing; test suite minimization and prioritization; automatic test case generation. Prerequisite: Senior standing, or consent of instructor.

EECE 639  Advanced Techniques and Applications in Data Mining  3 cr.
A course that covers advanced topics in data mining and recent progress in this field. Discussions will include which techniques fit best for complex applications in data mining. Mining complex data will include general text mining, Arabic text mining, social network analysis, spatial data mining, mining of the World Wide Web, stream data, time-series data, and sequence data. We will also discuss recent application sectors and trends in data mining such as for the telecommunication, biological, and financial sectors. Prerequisites: EECE 330; and one of the following EECE 633, EECE 667, or EECE 693, or consent of instructor.

EECE 640  Wireless Communications  3 cr.
A course that covers the fundamentals of wireless communications with emphasis on wireless channel modeling; digital modulation in wireless channels; diversity techniques; channel coding and interleaving in fading channels; adaptive equalization; multiple access techniques; the cellular concept; overview of current wireless communications systems. Prerequisite: EECE 442, or consent of instructor.

EECE 640L  Wireless Communications Laboratory  1 cr.
A laboratory course that covers the following topics: basics of radio network planning and optimization, radio network planning for the GSM cellular system, radio network planning for the UMTS cellular system, GSM-UMTS co-existence and co-citing, radio network planning for the WiMAX broadband system, indoor GSM drive testing measurements and analysis, outdoor GSM drive testing measurements and analysis, UMTS drive testing measurements and analysis, and measurement-based wireless channel modeling. Prerequisite: EECE 640, or consent of instructor.

EECE 641  Information Theory  3 cr.
In this course students study “data transmission” through introducing the field of information theory. The theory is introduced in a gradual fashion and students study its applications to communications theory, computer science, statistics and probability theory. Covering all the essential topics in information theory, students are introduced to the basic quantities of entropy, relative entropy, and mutual information to show how they arise as natural answers to questions of data compression, channel capacity, rate distortion and large deviation theory. Prerequisite: STAT 230 or EECE 442, or consent of instructor.
EECE 642  Introduction to Coding Theory  3 cr.
This course introduces the theory of error-correcting codes with a focus on the asymptotic, algorithmic, and algebraic aspects. Topics include: background material from combinatorics and algebra; Shannon's coding theorem; linear codes; coding bounds; classical algebraic codes; Hamming and Hadamard codes, Reed-Solomon codes and Justesen codes, and decoding algorithms; codes from graphs; low density parity check codes, expander codes, explicit constructions, and decoding algorithms; and an introduction to Turbo codes. Prerequisite: Senior standing, or consent of instructor.

EECE 643  RF System Engineering for Wireless Communications  3 cr.
This course introduces students to system blocks, system parameters, and architectures of RF systems for wireless communications. It focuses on the design of a radio system for transmission and reception of voice and data information; receivers and transmitters system topologies, key system blocks in a wireless system, determination of system block parameters from radio requirements and system analysis, tradeoffs between various blocks in a radio system, and frequency planning. It discusses how modulation and demodulation schemes and multiple-access techniques used in present wireless applications influence RF systems requirements. The last part of the course focuses the link budget analysis of RF radio links. Prerequisites: EECE 311, EECE 380, and EECE 442, or consent of instructor.

EECE 644  Stochastic Processes, Detection, and Estimation  3 cr.
This is a graduate-level introduction to the fundamentals of detection and estimation theory involving signal and system models in which there is some inherent randomness. The concepts that we develop are extraordinarily rich, interesting, and powerful, and form the basis for an enormous range of algorithms used in diverse applications. The material in this course constitutes a common foundation for work in the statistical signal processing, communication, and control areas. Prerequisites: STAT 230 and EECE 340, or consent of instructor.

EECE 645  The UMTS Cellular System  3 cr.
A course on the evolution of cellular technologies; UMTS standardization and services; WCDMA transmitter and receiver link level design; access and core network architectures; physical channels and signaling procedures; power control and soft/soft handover; capacity/coverage tradeoffs and cell breathing; capacity/coverage enhancement techniques; antenna diversity and MIMO techniques; multiuser detection techniques; high speed packet access (HSDPA and HSUPA); and basic principles of LTE. Prerequisite: EECE 640, or consent of instructor.

EECE 646  Advanced Digital and Data Communications  3 cr.
A course that addresses digital communication principles and techniques aimed at achieving improved reliability. The course examines information measures such as entropy and mutual information for discrete and waveform channels, source coding, channel capacity and coding theorem, linear block and cyclic codes, hard and soft decision decoding, spread spectrum modulation. Prerequisite: Senior standing, or consent of instructor.

EECE 647  Queuing Theory  3 cr.
A course that covers Poisson counting and renewal processes; Markov chains and decision theory, branching processes, birth death processes, and semi-Markov processes; simple Markovian queues, networks of queues, general single and multiple-server queues, bounds and approximations. Prerequisite: Senior standing, or consent of instructor.

EECE 651  Internet Engineering  3 cr.
A course that examines major protocols used in internet engineering: IP, ICMP, TCP, UDP; new technologies introduced on the Internet, such as IP Multicast, Mobile IP, IPv6, VPNs, and quality of service; routing on the Internet; network security and firewall design; and an overview of the application protocols such as SMTP, HTTP, RTP, and SNMP. Prerequisite: EECE 450, or consent of instructor.

EECE 651L  Internetworking Laboratory  1 cr.
This laboratory course covers the technologies and protocols of the Internet. The experiments cover the internet protocol (IP), address resolution protocol (ARP), internet control message protocol (ICMP), user datagram protocol (UDP) and transmission control protocol (TCP), the domain name system (DNS), routing protocols (RIP, OSPF, BGP), network address translation (NAT), dynamic host configuration (DHCP), network management protocols (SNMP), and IP multicast. Prerequisite: EECE 450, or consent of instructor.

EECE 652  Web Server Design and Programming  3 cr.
This course concentrates on major technologies used in building Web servers. Alternate versions are to be given each year: the Windows-based IIS Server and the Linux-based Apache server. For IIS, ASP, .NET along with C# are used for programming Web servers. For Apache, PHP is the language of choice. The course starts with a fast track on client programming, the HTTP protocol, SQL database servers, and XML programming. A weekly lab, two application projects, and a research project constitute the major requirements of the course. Prerequisite: Senior standing, or consent of instructor.

EECE 653  Multimedia and Networking  3 cr.
This course covers topics in multimedia such as system requirements, performance requirements, representation and compression. Multimedia networking is emphasized by discussing multicasting, streaming, multimedia networking protocols and quality of service-based traffic management protocols. Other topics covered include synchronization, VoIP, and Internet 2. Multimedia networking applications are designed and implemented as student projects. Prerequisite: EECE 450, or consent of instructor.

EECE 654  Pervasive Computing Systems and Applications  3 cr.
This course covers the technologies involved in integrating front-end mobile devices into local and global networks. An emphasis is placed on the underlying technologies and standards applied when building pervasive solutions. The course has a strong programming component in that it dedicates a significant portion of the time covering the development of mobile applications for three platforms: Windows CE for Pocket PCs, Palm OS for Palm PDAs, and Java 2 Micro Edition (J2ME) for wireless phones that run the Symbian OS. To emphasize this last component, code demonstrations will be held in class, and students will be required to complete three projects targeting the three platforms, designed to cover the different aspects of mobile applications (user interface, local database implementations, and networking). Prerequisite: EECE 430, or consent of instructor.

EECE 655  Internet Security  3 cr.
The course covers topics in internet security. The course discusses security threats, vulnerabilities of protocols and the different types of attacks. Preventive and defensive mechanisms are covered; such as: e-mail security, web security, IP security, network management security, wireless security, intrusion detection techniques, firewalls, VPNs and tracing the source of attacks. Student projects will be composed of Implementation, simulation and research components. Prerequisites: EECE 450 and EECE 632, or consent of instructor.

EECE 655L  Network and Computer Security Laboratory  1 cr.
A laboratory that addresses advanced network and computer security topics. Experiments include the execution of attacks, the setup of intrusion detection and prevention, securing computers and wired and wireless networks, and digital forensics. Prerequisite: EECE 655 and EECE 632, or consent of instructor.
EECE 656  Mobile Ad hoc and Sensor Networks  3 cr.
This course covers all aspects of ad hoc and sensor networking, from design through performance issues to application requirements. The course starts with the design issues and challenges that are associated with implementations of ad hoc and sensor network applications. This includes dealing with mobility, disconnections, and awareness of battery power consumption. The course then provides a detailed treatment of proactive, reactive, and hybrid routing protocols, in addition to the various operating system approaches. Next, it covers the IEEE 802.11 Wireless LAN and Bluetooth standards and discusses their characteristics and operations. The course also discusses research topics that involve collaboration among mobile devices, service discovery, and data caching. Through a project, the course gives students hands-on experience in designing a mobile ad hoc network using available Pocket PCs and simulation tools. Prerequisite: EECE 450, or consent of instructor.

EECE 657  Wireless Security  3 cr.
A course that covers wireless network security; security challenges in wireless networks; security problems facing existing and upcoming wireless networks; security in naming, addressing, neighbor discovery, and routing; and trust and privacy. Prerequisites: EECE 450 and EECE 632, or consent of instructor.

EECE 660  System Analysis and Design  3 cr.
A course that outlines state-space models of discrete and continuous, linear and nonlinear systems; controllability; observability; minimality; Eigenvector and transforms analysis of linear time invariant multi-input multi-output systems; pole shifting; computer control; design of controllers and observers. Prerequisite: Senior standing, or consent of instructor.

EECE 661  Robotics  3 cr.
A course that examines robotic manipulators classification and work envelope; robot kinematics, dynamics and forces; joints trajectory planning for end effector desired tracking and constrained motion; control of robots using linear, non-linear, and adaptive controllers. Prerequisite: EECE 460 or MECH 433, or consent of instructor.

EECE 662  Optimal Control  3 cr.
A course on optimization theory and performance measures, calculus of variations, the maximum principle, dynamic programming, numerical techniques, LQR control systems. Prerequisite: Senior standing or consent of instructor.

EECE 663  System Identification  3 cr.
This course introduces the fundamentals of system identification as the basic mathematical tools to fit models into empirical input-output data. While rooted in control theory, applications extend to general time-series modeling and forecasting, such as stock prices, biological data and others. Topics covered include nonparametric identification methods; time and frequency response analysis; parametric identification methods: prediction error methods, least squares, linear unbiased estimation and maximum likelihood; convergence, consistency and asymptotic distribution of estimates; properties and practical modeling issues: bias distribution, experiment design and model validation. Prerequisite: EECE 460, or consent of instructor.

EECE 664  Fuzzy Sets, Logic and Applications  3 cr.
A course that outlines fuzzy sets and related concepts; logical connectives; mapping of fuzzy sets; extension principle; fuzzy relations and fuzzy set ordering; fuzzy logic inference; applications: fuzzy control, signal processing, pattern recognition, decision-making, and expert systems. Prerequisite: Senior standing, or consent of instructor.

EECE 665  Adaptive Control  3 cr.
A course that includes the control of partially known systems; analysis and design of adaptive control systems; self-tuning regulators; model reference adaptive control of uncertain dynamic systems; typical applications. Prerequisite: EECE 460, or consent of instructor.

EECE 667  Pattern Recognition  3 cr.
The course provides an overview of the theory, principles and algorithms used in machine learning to construct high performance information processing systems that learn from experience. The course discusses main and modern concepts for model selection and parameter estimation in recognition, decision making and statistical learning problems. Special emphasis will be given to regression, classification, regularization, feature selection and density estimation in supervised modes of learning. Students will be assigned typical machine learning problems to investigate as projects. Prerequisite: Senior standing, or consent of instructor.

EECE 668  Game Theory and Decision Making  3 cr.
Game theory provides a set of tools, approaches, and perspectives on decision making to mimic the human elements of decision making that is best described by strategy, coercion and cooperation. This course offers an introduction to fundamentals of game theory and decision making with a special emphasis on the foundations of the mathematical background. Topics covered include: static, evolutionary, supermodular, repeated, cooperative, network, potential and congestion games as well as bargaining and uncertainty in games. Students will be assigned real-world examples of game theory and strategic decision making to investigate as projects. Prerequisite: Senior standing, or consent of instructor.

EECE 670  Power System Planning  3 cr.
A course that investigates energy and peak load forecasts, weather-sensitive forecasts, generation reliability, load duration curves, loss-of-load expectation, capacity reserve evaluation, generation and transmission expansion, power flow analysis, reliability of bulk supply, and cost-benefit analysis. Prerequisite: EECE 471, or consent of instructor.

EECE 671  Environmental Aspects of Energy Systems  3 cr.
A course that examines world energy resources and classifications; sources and effects of air pollution; air quality modeling, Gaussian dispersion models for pollution estimation; motor vehicle emissions and noise pollution; environmental impacts of electricity generation, pollution control systems, electromagnetic radiation, production and impacts in high-voltage applications; environmental impact assessment; basic concepts. Prerequisite: Senior standing, or consent of instructor.

EECE 672  Energy Planning and Policy  3 cr.
A course that focuses on features of modern energy planning and policy. Topics covered include the interaction among the technological, economic, environmental, and sociopolitical aspects of energy supply and use; electricity, oil, and gas industries, and their market structures; elements of energy planning on the sector and national levels; energy decision-making under conditions of uncertainty, risk management in energy planning; liberalization of energy markets; case studies. Prerequisite: Senior standing, or consent of instructor.

EECE 673  Power Electronics Systems and Applications  3 cr.
A course that reviews converter topologies for AC/DC, DC/AC, and DC/DC; power supply applications; converter applications to motor drives; utility interface of distributed energy systems; static VAR systems; flexible AC transmission; high voltage DC; power quality control; active and passive harmonics compensation. Prerequisites: EECE 473 or EECE 471, or consent of instructor.

EECE 675  Renewable Energy Systems  3 cr.
A course that covers the principles of renewable energy, solar radiation, solar water heating, building and other thermal applications, photovoltaic generation, wind power, fuel cells and the hydrogen cycle, biomass, and institutional and economic factors. Prerequisite: Senior standing, or consent of instructor.
EECE 676  Computer Analysis of Power Systems  3 cr.
A course on large scale power systems, power system matrices, and programming considerations; advanced power flow studies, voltage, and reactive flow control; fault analysis, transient analysis, and power system stability. Prerequisite: EECE 471, or consent of instructor.

EECE 677  Electric Power System Operation and Control  3 cr.
A course on short-term load forecasting, generation unit commitment, economic load dispatch, loss formula coefficients, nonlinear programming, optimal power flow, security assessment, security dispatch, spinning reserve evaluation, automatic generation control, reactive power and voltage control, and state estimation. Prerequisite: Senior standing, or consent of instructor.

EECE 678  Advanced Power System Analysis  3 cr.
A course on optimal dispatch of generation, symmetrical components and unbalanced faults, transient stability, control of generation, state estimation in power systems and power system simulation. Prerequisite: EECE 471, or consent of instructor.

EECE 680  Antenna Theory and Design  3 cr.
This course provides the students with an understanding of the basic principles of antenna analysis and design; an overview of the fundamental characteristics and parameters of antennas; an overview of analytical and numerical methods used to analyze and design antennas with application to some basic antenna structures such as linear antennas, loop antennas, and antenna arrays. Prerequisite: EECE 380, or consent of instructor.

EECE 681  Advanced Antenna Design  3 cr.
This course provides the students with an understanding of advanced antenna structures and presents an overview of analytical and numerical methods used to analyze and design these antenna structures. The course includes broadband antennas, frequency-independent antennas, aperture antennas, horn antennas, microstrip antennas, and reflector antennas. Students will work on a research paper on a selected antenna design topic. Prerequisite: EECE 680, or consent of instructor.

EECE 682  Time-Harmonic Electromagnetic Fields  3 cr.
A course on time-varying and time-harmonic EM fields; electrical properties of matter; wave propagation and polarization; construction of solutions; reflection and transmission; electromagnetic theorems and principles in particular equivalence; rectangular waveguides and cavities; dielectric waveguide, circular waveguides, spherical waveguide; radiation from structures; scattering by wedges, cylinders and spheres; radiation from apertures, and perturbational and variational techniques. Prerequisite: EECE 380, or consent of instructor.

EECE 683  Numerical Methods in Electromagnetics  3 cr.
This course examines the principles and applications of numerical techniques for solving practical electromagnetics problems. It covers the moment methods, finite difference methods, finite element methods, and hybrid methods. The course also investigates the application of the finite-volume control method in electromagnetics. Prerequisite: EECE 682, or consent of instructor.

EECE 691  Digital Signal Processing  3 cr.
Course topics include a review of signals, systems, and transforms; design of digital filters: FIR and IIR; sampling and reconstruction of signals; multi-rate signal processing with applications; effects of finite word length; discrete random signals and spectral estimation; and an introduction to 2D signal and image processing. Prerequisite: Senior standing, or consent of instructor.

EECE 691L  Digital Signal Processing Lab  1 cr.
This graduate lab is comprised of a set of lab experiments in MATLAB, C and Assembly covering a series of real-time signal processing topics. The developed laboratory material is intended to complement the digital signal processing course (EECE 691). Upon completion of the lab, the student will have acquired the required knowledge and skills to develop real-time DSP systems. Prerequisites: EECE 691: Digital Signal Processing (may be waived upon approval of course instructor), and senior standing, or consent of instructor.

EECE 693  Neural Networks  3 cr.
The course provides a comprehensive foundation to artificial neural networks and machine learning with applications to pattern recognition and data mining; learning processes: supervised and unsupervised, deterministic and statistical; clustering; single layer and multilayer perceptrons; least-mean-square, back propagation, and Al-Alaoui algorithms; radial-basis function networks; committee machines; principal component analysis; self-organizing maps; and current topics of interest. Prerequisite: Senior standing, or consent of instructor.

EECE 694  Digital Image Processing  3 cr.
A course on two-dimensional signals and systems; image formation and perception; representation, coding, filtering restoration, and enhancements; feature extraction and scene analysis; introduction to computer vision. Prerequisite: Senior standing, or consent of instructor.

EECE 694L  Image Processing Lab  1 cr.
The EECE 694L graduate lab comprises a set of MATLAB/C++ based lab experiments in different image processing topics covering image pre and post processing techniques, image compression, morphological transformations, image restoration and enhancement techniques, color image processing, computer vision basics, and geographical image processing. In addition, students will be exposed to software optimizations for real time image processing using SIMD instructions. Prerequisite: EECE 694, or EECE 603, or consent of instructor.

EECE 695  Adaptive Filtering  3 cr.
A course that examines the fundamentals of optimal filtering and estimation, Wiener filters, linear prediction, steepest-descent and stochastic gradient algorithms; frequency-domain adaptive filters; method of least squares, recursive least squares, fast fixed order and order-recursive (lattice) filters; misadjustment, convergence and tracking analyses, stability issues, finite precision effects; connections with Kalman filtering; and nonlinear adaptive filters. Prerequisite: Senior standing, or consent of instructor.
Department of Mechanical Engineering

Chairperson: Darwish, Marwan
Professors: Azoury, Pierre; Darwish, Marwan; Ghaddar, Nesreen K. (Qatar Chair in Energy Studies); Moukalled, Fadl
Professor Emeritus: Sakkal, Fateh
Associate Professors: Ghali, Kamel; Hamade, Ramsey; Kuran, Albert; Lakkis Issam; Shihadeh, Alan
Assistant Professors: Al-Hindi, Mahmoud; Asmar, Daniel; Azizi, Fouad; Liermann, Matthias; Owais, Ghanem; Saad, Walid; Safieddine Salem; Shammas, Elie; Shehadeh, Mutasem; Zeaiter, Joseph
Lecturers: Abou Chakra, Hadi; Hassoun, Talal; Kasamani, Jihad; Najm, Wajih; Nasereddine, Mohammad; Rouhana, Natalie
Instructors: Al Saidi, Abdul-Kader; El Chmeitelly, Rana; Jalgha, Bassam; Karaoqklamian, Nareg; Kassis, Lina; Keblawi, Amer; Kfoury, Elie; Seif, Cherbe

The Department of Mechanical Engineering offers three undergraduate degree programs and a minor: Bachelor of Engineering, major Mechanical Engineering (BE ME); Bachelor of Engineering, major Chemical Engineering (BE ChE); Bachelor of Science, major Chemical Engineering (BS ChE); and a minor in Chemical Engineering.

Bachelor of Engineering (BE): Major Mechanical Engineering

The Mechanical Engineering Program extends over a four-year period offered exclusively on a daytime on-campus basis. The program is offered in eleven terms, eight terms are 16-week fall/spring semesters given over four years, and three terms are eight-week summer terms taken during the first three years of the program. In the summer term of the third year (Term IX), students are required to participate in a practical training program with a local, regional, or international organization. The entire program is equivalent to five academic years, but is completed in four calendar years with three summer terms.

The undergraduate program also provides the students with options to pursue minors in the following:

- Applied Energy offered by FEA
- Biomedical Engineering offered by ECE
- Chemical Engineering offered by ME
- Engineering Management offered by the EM Program

Other minors can be sought in the Faculty of Arts and Sciences and the Suliman S. Olayan School of Business.

Program Mission

The mechanical engineering faculty has agreed that the undergraduate program mission is as follows:

The undergraduate program in Mechanical Engineering seeks to empower students to pursue successful careers and to create a learning environment in which they can develop their creative and critical thinking, their ability to grow into lifelong learners in the light of ever-increasing challenges of modern technology, and their commitment to the ethical and professional responsibilities required in their calling at the global level while focusing on the needs of Lebanon and the region.

Program Educational Objectives

The program is based on the following education objectives that were approved by the mechanical engineering faculty members on May 27, 2010.

Our graduates will be able to advance successfully in their careers as reflected in continued employment, job satisfaction, leadership responsibilities, and professional recognition.

Our graduates will be able to succeed in graduate studies as reflected in admission to highly ranked programs, timely completion of degree requirements, and recognition by competitive fellowships and other awards.

Program Requirements

The undergraduate curriculum for the degree of Bachelor of Engineering (BE), Major: Mechanical Engineering is a five-year program. It consists of 173 semester credit hours of course work of which 30 credits are completed in the freshman year while the student is enrolled in the Faculty of Arts and Sciences and 143 credits are completed in four years while the student is enrolled at the Faculty of Engineering and Architecture. Students admitted at the sophomore level will be required to complete 143 credits in four years to earn the degree as outlined here:

- General Engineering: CIVE 210, EECE 210, EECE 230, EECE 312, EECE 312L, ENMG 400
- Mathematics: MATH 201, MATH 202, MATH 212, MATH 218, MATH 251, STAT 230
- Sciences: PHYS 211, PHYS 211L, CHEM 202, CHEM 203, and one biology elective (BIOL 210 or any other 200 level biology course)
- General Education: Arabic course (based on APT), ENGL 206, one English elective, two social sciences courses, three humanities courses, and a course on ethics approved for the GE program
- ME Core Courses: MECH 200, MECH 220, MECH 230, MECH 310, MECH 314, MECH 320, MECH 332, MECH 340, MECH 341, MECH 410, MECH 412, MECH 414, MECH 420, MECH 421, MECH 430, MECH 431, MECH 431L, MECH 510, and MECH 520
- Technical Electives: Five courses with at least three from the selected ME track. One elective can be from outside the major.
- Approved Experience: MECH 500
- Final Year Project: MECH 501 and MECH 502
## Curriculum

### Term I (Fall) Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 201</td>
<td>Calculus and Analytic Geometry III</td>
<td>3</td>
</tr>
<tr>
<td>CIVE 210</td>
<td>Statics</td>
<td>3</td>
</tr>
<tr>
<td>EECE 230</td>
<td>Introduction to Programming</td>
<td>3</td>
</tr>
<tr>
<td>MECH 220</td>
<td>Engineering Graphics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>Electricity and Magnetism</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 206</td>
<td>Technical English</td>
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**Total 17**

### Term II (Spring) Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>MATH 202</td>
<td>Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MECH 200</td>
<td>Introduction to Mechanical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EECE 210</td>
<td>Electric Circuits</td>
<td>3</td>
</tr>
<tr>
<td>MECH 230</td>
<td>Dynamics</td>
<td>3</td>
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<tr>
<td>English Elective</td>
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**Total 15**

### Term III (Summer) Credits

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<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>STAT 230</td>
<td>Introduction to Probability and Random Variables</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 202</td>
<td>Introduction to Environmental Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 203</td>
<td>Introductory Chemical Techniques</td>
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**Total 8**

### Term IV (Fall) Credits

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>EECE 312</td>
<td>Electronics (for mechanical engineering students)</td>
<td>3</td>
</tr>
<tr>
<td>EECE 312L</td>
<td>Circuits and Electronics Lab</td>
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<tr>
<td>MATH 212</td>
<td>Introductory Partial Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MECH 310</td>
<td>Thermodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>MECH 340</td>
<td>Engineering Materials</td>
<td>3</td>
</tr>
<tr>
<td>Humanities Elective</td>
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</tbody>
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**Total 16**

### Term V (Spring) Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 218</td>
<td>Elementary Linear Algebra with Applications</td>
<td>3</td>
</tr>
<tr>
<td>MECH 314</td>
<td>Introduction to Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>MECH 320</td>
<td>Mechanics of Materials</td>
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</tr>
<tr>
<td>MECH 332</td>
<td>Mechanics of Machines</td>
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</tr>
<tr>
<td>MECH 430</td>
<td>Instrumentation and Measurement</td>
<td>3</td>
</tr>
<tr>
<td>MECH 341</td>
<td>Materials Lab</td>
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**Total 16**

### Term VI (Summer) Credits

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Biology Elective</td>
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<tr>
<td>Arabic Elective</td>
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<tr>
<td>MECH 432</td>
<td>Dynamic Systems Analysis</td>
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**Total 8**

### Term VII (Fall) Credits

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<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>MATH 251</td>
<td>Numerical Computing</td>
<td>3</td>
</tr>
<tr>
<td>MECH 410L</td>
<td>Thermal/Fluid Systems Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>MECH 414</td>
<td>Thermodynamics II</td>
<td>3</td>
</tr>
<tr>
<td>MECH 420</td>
<td>Mechanical Design</td>
<td>3</td>
</tr>
<tr>
<td>MECH 421</td>
<td>Manufacturing Processes I</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective</td>
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**Total 16**

### Term VIII (Spring) Credits

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<thead>
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<th>Course</th>
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<tbody>
<tr>
<td>ENMG 400</td>
<td>Engineering Economy</td>
<td>3</td>
</tr>
<tr>
<td>MECH 412</td>
<td>Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>MECH 431</td>
<td>Control Systems</td>
<td>2</td>
</tr>
<tr>
<td>MECH 431L</td>
<td>Control Systems Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>MECH 520</td>
<td>Mechanical Design II</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective</td>
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**Total 15**

### Term IX (Summer) Credits

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>MECH 500</td>
<td>Approved Experience</td>
<td>1b**</td>
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<tr>
<td>MECH 501</td>
<td>Final Year Project I</td>
<td>1</td>
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<tr>
<td>MECH 510</td>
<td>Design of Thermal Systems</td>
<td>3</td>
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<tr>
<td>Technical Elective I</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Technical Elective II</td>
<td></td>
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<tr>
<td>Humanities Elective</td>
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**Total 16**

### Term X (Fall) Credits

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Ethics course (Humanities)</td>
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<tr>
<td>MECH 502</td>
<td>Final Year Project II</td>
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<tr>
<td>Technical Elective III</td>
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<tr>
<td>Technical Elective IV</td>
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<td>Technical Elective V</td>
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<tr>
<td>Humanities Elective</td>
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</tbody>
</table>

**Total 16**

* b. stands for billing
Mechanical Engineering Optional Tracks

The core courses in the mechanical engineering program are offered in the following track areas:

- Thermal and Fluid Engineering
- Mechatronics
- Design, Materials, and Manufacturing

The student may opt for any track by taking at least three technical electives in the selected track. Normally one technical elective is allowed from outside the mechanical engineering major.

### Track I: Thermal and Fluid Engineering

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MECH 310 Thermodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>MECH 314 Introduction to Fluids Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MECH 414 Thermodynamics II</td>
<td>3</td>
</tr>
<tr>
<td>MECH 410L Thermal/Fluid Systems Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>MECH 412 Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>MECH 501 Final Year Project I and</td>
<td></td>
</tr>
<tr>
<td>MECH 502 Final Year Project II</td>
<td>4</td>
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<tr>
<td>MECH 510 Design of Thermal Systems</td>
<td>3</td>
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### Technical Electives Courses (at least three technical electives are selected)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MECH 511 Intermediate Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>MECH 512 Internal Combustion Engines</td>
<td>3</td>
</tr>
<tr>
<td>MECH 513 Air Conditioning</td>
<td>3</td>
</tr>
<tr>
<td>MECH 514 Gas Turbines</td>
<td>3</td>
</tr>
<tr>
<td>MECH 515 Steam Turbines</td>
<td>3</td>
</tr>
<tr>
<td>MECH 516 Aerodynamics</td>
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</tr>
<tr>
<td>MECH 603 Solar Energy</td>
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<tr>
<td>MECH 604 Refrigeration</td>
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<tr>
<td>MECH 606 Aerosol Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>MECH 607 Microflows Fundamentals and Applications</td>
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### Track II: Design, Materials, and Manufacturing

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>CIVE 210 Statics</td>
<td>3</td>
</tr>
<tr>
<td>MECH 200 Introduction to Mechanical Engineering</td>
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<tr>
<td>MECH 220 Engineering Graphics</td>
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<tr>
<td>MECH 320 Mechanics of Materials</td>
<td>3</td>
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<tr>
<td>MECH 332 Mechanics of Machines</td>
<td>3</td>
</tr>
<tr>
<td>MECH 340 Engineering Materials</td>
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</tr>
<tr>
<td>MECH 341L Materials Lab</td>
<td>1</td>
</tr>
<tr>
<td>MECH 420 Mechanical Design I</td>
<td>3</td>
</tr>
<tr>
<td>MECH 421 Manufacturing Processes I</td>
<td>3</td>
</tr>
<tr>
<td>MECH 501 Final Year Project I and</td>
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<tr>
<td>MECH 502 Final Year Project II</td>
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<tr>
<td>MECH 520 Mechanical Design II</td>
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### Track III: Mechatronics

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<tr>
<td>MECH 230 Dynamics</td>
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<tr>
<td>EECE 210 Electric Circuits</td>
<td>3</td>
</tr>
<tr>
<td>EECE 312 Electronics (for mechanical engineering students)</td>
<td>3</td>
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<tr>
<td>EECE 312L Circuits and Electronics Lab</td>
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<tr>
<td>MECH 430 Instrumentation and Measurements</td>
<td>3</td>
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<tr>
<td>MECH 431 Control Systems</td>
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<tr>
<td>MECH 431L Control Systems Laboratory</td>
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<tr>
<td>MECH 501 Final Year Project I and</td>
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<tr>
<td>MECH 502 Final Year Project II</td>
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### Technical Elective Courses (at least three technical electives are selected)

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<tr>
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<tbody>
<tr>
<td>MECH 530 Mechatronics System Design</td>
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<tr>
<td>MECH 531 Mechanical Vibrations</td>
<td>3</td>
</tr>
<tr>
<td>MECH 628 Design of Mechanisms</td>
<td>3</td>
</tr>
<tr>
<td>MECH 631 Micro-Electro Mechanical Systems (MEMS)</td>
<td>3</td>
</tr>
<tr>
<td>MECH 634 Biomaterials and Medical Devices</td>
<td>3</td>
</tr>
<tr>
<td>MECH 661 Robotics</td>
<td>3</td>
</tr>
<tr>
<td>MECH 662 Computer Vision</td>
<td>3</td>
</tr>
<tr>
<td>MECH 663 Mechatronics and Intelligent Machines Engineering II</td>
<td>3</td>
</tr>
<tr>
<td>MECH 644 Modal Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MECH 645 Noise and Vibration Control</td>
<td>3</td>
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</tbody>
</table>
Bachelor of Engineering (BE): Major: Chemical Engineering

This is a new undergraduate program leading to the degree of Bachelor of Engineering (BE), Major: Chemical Engineering.

Program Mission

The mission of the Chemical Engineering Program at AUB is to provide an innovative educational program that is both rigorous and challenging to equip students with the technological tools required for professional practice and research in the chemical, petroleum, the food and pharmaceutical industries located regionally and internationally. In addition, the educational program strives to encourage the development of communication, teamwork, and leadership skills; and to provide guidance on the application of technical and non-technical skills that will contribute to the engineering profession and to the well-being of society.

Program Educational Objectives

• To produce graduates who can practice chemical engineering proficiently in a wide variety of contemporary industrial settings
• To produce graduates who have the basic competencies required to pursue advanced study and research in the chemical engineering and petrochemical domains, and other related disciplines
• To produce graduates with well-developed problem-solving skills and an understanding of current technical, economic, environmental, and safety issues, and their impact on local and global communities
• To produce graduates with the communication and leadership skills necessary to work in teams effectively and ethically
• To instill in the students the necessary interpersonal skills to perform professionally and make sound decisions under conditions of risk and uncertainty

Bachelor of Engineering Program Requirements

The undergraduate curriculum for the degree of Bachelor of Engineering (BE), Major: Chemical Engineering is a five-year program. It consists of 173 semester credit hours of course work of which 30 credits are completed in the freshman year while the student is enrolled in the Faculty of Arts and Sciences and 140 credits are completed in four years while the student is enrolled at the Faculty of Engineering and Architecture. Students who are admitted at the sophomore level will be required to complete 263 credits in four years to earn the degree as outlined here:

General Engineering Fundamentals (22 credits)

• CIVE 210 Statics 3 cr.
• EECE 210 Electric Circuits 3 cr.
• EECE 230 Computers and Programming 3 cr.
• MECH 220 Engineering Graphics 1 cr.
• MECH 310 Thermodynamics I 3 cr.
• MECH 340 Engineering Materials 3 cr.
• MECH 430/CHEN 351 Instrumentation and Measurement 3 cr.
• ENMG 500 Engineering Management I 3 cr.

Mathematics (15 credits)

• MATH 201 Calculus and Analytic Geometry III 3 cr.
• MATH 202 Differential Equations 3 cr.
• STAT 230 Introduction to Probability and Random Variables 3 cr.
• MATH 218 Linear Algebra 3 cr.
• MATH 251 Numerical Computing 3 cr.

Sciences (15 credits)

• CHEM 204 Physical Chemistry for Chemical Engineers 2 cr.
• CHEM 207 Survey of Organic Chemistry and Petrochemicals 4 cr.
• CHEM 219 Analytical and Instrumental Chemistry for Chemical Engineers 3 cr.
• BIOL 201 General Biology I or BIOL 220 Introductory Biochemistry 3 cr.
• Science Elective 3 cr.

General Education (27 credits) beyond Freshman at 200 Level

Given the current AUB General Education Requirements, as stipulated in the undergraduate catalogue, students are required to complete twelve credits in the humanities, six credits in the social sciences, six credits in English, and three credits in Arabic.

Core Chemical Engineering Courses (52 credits)

• CHEN 200 Introduction to Chemical Engineering 3 cr.
• CHEN 310 Transport Phenomena Lab 2 cr.
• CHEN 311 Fluid Flow Operations 3 cr.
• CHEN 312 Separation Processes 3 cr.
• CHEN 314 Chemical Engineering Thermodynamics 3 cr.
• CHEN 410 Unit Operation Lab 2 cr.
• CHEN 411 Heat and Mass Transfer Operations 3 cr.
• CHEN 417 Kinetics and Reactor Design I 3 cr.
• CHEN 451 Process Control 2 cr.
• CHEN 451L Process Control Lab 1 cr.
• CHEN 470 Chemical Process Design 3 cr.
• CHEN 480 Safety and Loss Prevention 3 cr.
• CHEN 500 Approved Experience 1 cr.
• CHEN 501 Final Year Project I 2 cr.
• CHEN 502 Final Year Project II 3 cr.
• CHEN 511 Transport Phenomena 3 cr.
• CHEN 517 Kinetics and Reactor Design II 3 cr.
• CHEN 531 Principles of Corrosion 3 cr.
• CHEN 570 Process Synthesis and Optimization 3 cr.
• CHEN 571 Chemical Product Design 3 cr.

Chemical Engineering Electives (12 credits)

• CHEN 413/CIVE 450 Water and Wastewater Treatment 3 cr.
• CHEN 490 Fundamentals of Petroleum Engineering 3 cr.
• CIVE 580 Construction Management 3 cr.
• CHEN 611 Desalination 3 cr.
• CHEN 613 Membrane Separation Processes 3 cr.
- CHEN 614 Environmental Engineering Separation Processes 3 cr.
- CHEN 617 Chemical Reactor Analysis and Design 3 cr.
- CHEN 618 Colloid and Interface Science 3 cr.
- CHEN 651 Advanced Process Control 3 cr.
- CHEN 672 Polymer Science 3 cr.

**BE in Chemical Engineering: Curriculum Plan**

**Freshman year (for students admitted at freshman level)**

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 101</td>
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<td>CHEM 101</td>
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<tr>
<td>Social Science Elective</td>
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</tr>
<tr>
<td>Arabic Elective</td>
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<tr>
<td>ENGL 200</td>
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Total 16

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>MATH 102</td>
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<td>PHYS 101E</td>
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<td>PHYS 101L</td>
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<tr>
<td>CHEM 102</td>
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Total 14

**First Year (40 credits)**

**Term I (Fall)**

<table>
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<tbody>
<tr>
<td>MATH 201</td>
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<tr>
<td>CIVE 210</td>
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<tr>
<td>EECE 230</td>
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<td>MECH 220</td>
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<td>ENGL 206</td>
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Total 16

**Term II (Spring)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEN 200</td>
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<tr>
<td>MATH 202</td>
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<tr>
<td>EECE 210</td>
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<tr>
<td>MECH 310</td>
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<tr>
<td>ENGL Elective</td>
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Total 15

**Second Year (35 credits)**

**Term IV (Fall)**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Arabic Elective</td>
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<tr>
<td>Ethics Course (Humanities)</td>
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<tr>
<td>MATH 218</td>
<td></td>
</tr>
<tr>
<td>MECH 430/CHEN 351</td>
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</tr>
<tr>
<td>CHEN 311/MECH 314</td>
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<td>CHEN 314</td>
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Total 18

**Term V (Spring)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 219</td>
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<tr>
<td>CHEN 310</td>
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<td>CHEN 312</td>
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<tr>
<td>MECH 340</td>
<td></td>
</tr>
<tr>
<td>MATH 251</td>
<td></td>
</tr>
<tr>
<td>Social Science Elective</td>
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Total 17

**Term VI (Summer)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Students may choose to take courses suggested elsewhere in this curriculum plan when offered</td>
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Total 0

**Third Year (36 credits)**

**Term VII (Fall)**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ECON 212</td>
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<tr>
<td>CHEN/MECH 411</td>
<td></td>
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<tr>
<td>CHEN 417</td>
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<td>CHEN 470</td>
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</tr>
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<td>CHEN 480</td>
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</tr>
<tr>
<td>Humanities Elective</td>
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</tbody>
</table>

Total 18
Bachelor of Science (BS):
Major: Chemical Engineering

This is a new undergraduate program leading to the degree of Bachelor of Science (BS), Major: Chemical Engineering.

Program Mission

The mission of the Chemical Engineering Program at AUB is to provide an innovative educational program that is both rigorous and challenging to equip students with the technological tools required for professional practice and research in the chemical, petroleum, food, pharmaceutical industries located regionally and internationally. In addition, the educational program strives to encourage the development of communication, teamwork, and leadership skills; and to provide guidance on the application of technical and non-technical skills that will contribute to the engineering profession and to the well-being of society.

Program Educational Objectives

• To produce graduates who can practice chemical engineering proficiently in a wide variety of contemporary industrial settings
• To produce graduates who have the basic competencies required to pursue advanced study and research in the chemical engineering and petrochemical domains, and other related disciplines
• To produce graduates with well-developed problem-solving skills and an understanding of current technical, economic, environmental, and safety issues, and their impact on local and global communities
• To produce graduates with the communication and leadership skills necessary to work in teams effectively and ethically
• To instill in the students the necessary interpersonal skills to perform professionally and make sound decisions under conditions of risk and uncertainty

Bachelor of Science Program Requirements

The undergraduate curriculum for the degree of Bachelor of Science (BS), Major: Chemical Engineering is a four-year program. It consists of 140 semester credit hours of course work of which 30 credits are completed in the freshman year while the student is enrolled in the Faculty of Arts and Sciences and 110 credits are completed in three years while the student is enrolled at the Faculty of Engineering and Architecture. Students who are admitted at the sophomore level will be required to complete 110 credits in three years to earn the degree as outlined here:

General Engineering Fundamentals (19 credits)

• CIVE 210 Statics 3 cr.
• EEEE 210 Electric Circuits 3 cr.
• EEEE 230 Introduction to Programming 3 cr.
• MECH 220 Engineering Graphics 1 cr.
• MECH 310 Thermodynamics I 3 cr.
• MECH 340 Engineering Materials 3 cr.
• CHEN 351/MECH 430 Instrumentation and Measurements 3 cr.

* b stands for billing
Mathematics (15 credits)
- MATH 201 Calculus and Analytic Geometry III 3 cr.
- MATH 202 Differential Equations 3 cr.
- STAT 230 Introduction to Probability and Random Variables 3 cr.
- MATH 218 Elementary Linear Algebra with Applications 3 cr.
- MATH 251 Numerical Computing 3 cr.

Sciences (9 credits)
- CHEM 204 Physical Chemistry for Chemical Engineers 2 cr.
- CHEM 207 Survey of Organic Chemistry and Petrochemicals 4 cr.
- CHEM 219 Analytical and Instrumental Chemistry for Chemical Engineers 3 cr.

General Education (27 credits) beyond Freshman at 200 Level
Given the current AUB General Education Requirements, as stipulated in the Undergraduate catalogue, students are required to complete twelve credits in the humanities, six credits in the social sciences, and six credits in English and three credits in Arabic.

Core Chemical Engineering Courses (34 credits)
- CHEN 200 Introduction to Chemical Engineering 3 cr.
- CHEN 310 Transport Phenomena Lab 2 cr.
- CHEN 311/MECH 314 Introduction to Fluids Engineering 3 cr.
- CHEN 312 Separation Processes 3 cr.
- CHEN 314 Chemical Engineering Thermodynamics 3 cr.
- CHEN 400 Approved Experience 0 cr.
- CHEN 401 Final Year Project 3 cr.
- CHEN 410 Unit Operation Lab 2 cr.
- CHEN 411 Heat and Mass Transfer Operations 3 cr.
- CHEN 417 Kinetics and Reactor Design I 3 cr.
- CHEN 451 Process Control 2 cr.
- CHEN 451L Process Control Lab 1 cr.
- CHEN 470 Chemical Process Design 3 cr.
- CHEN 480 Safety and Loss Prevention 3 cr.

Chemical Engineering Electives (6 credits)
- CHEN 413 Water and Wastewater Treatment 3 cr.
- CHEN 490 Fundamentals of Petroleum Engineering 3 cr.
- CHEN 511 Transport Phenomena 3 cr.
- CHEN 517 Kinetics and Reactor Design II 3 cr.
- CHEN 531 Principles of Corrosion 3 cr.
- CHEN 570 Process Synthesis and Optimization 3 cr.
- CHEN 613 Membrane Separation Processes 3 cr.
- CHEN 614 Environmental Engineering Separation Processes 3 cr.
- CHEN 617 Chemical Reactor Analysis and Design 3 cr.
- CHEN 618 Colloid and Interface Science 3 cr.
- CHEN 651 Advanced Process Control 3 cr.
- CHEN 671 Chemical Product Design 3 cr.
- CHEN 672 Polymer Science 3 cr.
- CHEN 673 Engineering of Drug Delivery Systems 3 cr.
### Term III (Summer)

<table>
<thead>
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<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>STAT 230</td>
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<tr>
<td>CHEM 204</td>
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<tr>
<td>CHEM 207</td>
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### Second Year (35 credits)

#### Term IV (Fall)

<table>
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<tbody>
<tr>
<td>Arabic</td>
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<tr>
<td>Ethics Course</td>
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<tr>
<td>MATH 218</td>
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</tr>
<tr>
<td>MECH 430/351</td>
<td>3</td>
</tr>
<tr>
<td>CHEN 311/314</td>
<td>3</td>
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<tr>
<td>CHEN 314</td>
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<td><strong>Total</strong></td>
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#### Term V (Spring)

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
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<td>CHEN 312</td>
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<td>MATH 340</td>
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<tr>
<td>Social Science</td>
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<tr>
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#### Term VI (Summer)

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CHEN 400</td>
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### Third Year (35 credits)

#### Term VII (Fall)

<table>
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<tr>
<td>ECON 212</td>
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<td>CHEN 411</td>
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<td>CHEN 417</td>
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<td>CHEN 470</td>
<td>3</td>
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<td>CHEN 480</td>
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<td>Humanities</td>
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<tr>
<td><strong>Total</strong></td>
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</table>

### Minor in Chemical Engineering

The minor in chemical engineering is open to engineering students in majors other than chemical engineering.

### Minor Program Requirements (21 credits)

The student taking the minor is required to complete 21 credits from the list given below. The student has to complete 14 credits of core courses and 6 credits of elective courses.

### Required Core Courses (15 credits)

- MECH 310 Thermodynamics I 3 cr.
- CHEN 311/MECH 314 Fluid Flow Operations 3 cr.
- CHEN 312 Separation Processes 3 cr.
- CHEN 411 Heat and Mass Transfer Operations 3 cr.
- CHEN 417 Kinetics and Reactor Design I 3 cr.

### Elective Courses (6 credits) selected from the following courses:

- CHEN 314 Chemical Engineering Thermodynamics 3 cr.
- MECH 412 Heat Transfer 3 cr.
- CHEN 451 Process Control 2 cr.
- CHEN 451L Process Control Lab 1 cr.
- CHEN 470 Chemical Process Design 3 cr.
- CHEN 480 Safety and Loss Prevention 3 cr.
- CHEN 490 Fundamentals of Petroleum Engineering 3 cr.
- CHEN 517 Kinetics and Reactor Design II 3 cr.
- CHEN 531 Principles of Corrosion 3 cr.
- CHEN 570 Process Synthesis and Optimization 3 cr.
- CHEN 571 Chemical Product Design 3 cr.
- CHEN 612 Desalination 3 cr.
- CHEN 672 Polymer Science 3 cr.
- CHEN 673 Engineering of Drug Delivery Systems 3 cr.
Course Descriptions

Mechanical Engineering Courses

**MECH 200  Introduction to Mechanical Engineering** 3 cr.
The course seeks to introduce students to the mechanical engineering discipline, build the student's interpersonal and communication skills, and give them insight about engineering concepts and creative design principles and an overview of mechanical engineering as a profession, and ethics in engineering. Teamwork experience is stressed.

**MECH 220  Engineering Graphics** 1 cr.
The course aims at preparing the future engineer to be able to understand and create technical drawings. The course seeks to develop effective utilization of computer-aided drafting (CAD) skills in order to create engineering drawings: orthogonal projection, exploded and auxiliary views, sectioning and sectional views, dimensioning and tolerance schemes, standard drawing formats, and detailing. *Introduction to the use of CAD packages (AutoCAD).*

**MECH 230  Dynamics** 3 cr.
This is a basic course in engineering mechanics covering dynamics of particles and planar rigid bodies. This course introduces Newton's law of motion, the principle of work and energy, and the principle of impulse and momentum. Diagrammatic representations of the basic laws are applied on motion of particles, systems of particles, and rigid bodies. *Prerequisites: CIVE 210 and MATH 201.*

**MECH 310  Thermodynamics I** 3 cr.
This course seeks to provide a methodology by which students view objects in the physical universe as "systems" and apply to them the basic laws of conservation of mass, energy, and the entropy balance. The course covers the thermodynamic state and properties of a pure substance, energy and mass conservation, entropy and the second law. Applications involve closed setups and flow devices. Simple vapor and gas cycles applications

**MECH 314/CHEN 311  Introduction to Fluids Engineering** 3 cr.
An introductory course on fluid behavior emphasizing conservation of mass, momentum, energy and dimensional analysis; study of fluid motion in terms of the velocity field, fluid acceleration, the pressure field, and the viscous effects; applications of Bernoulli's equation, Navier-Stokes, and modeling; flow in ducts, potential flows, and boundary layer flows. *Prerequisite: MECH 310.*

**MECH 320  Mechanics of Materials** 3 cr.
A course that addresses the mechanical behavior of materials under different loadings such as: axial, bending, transverse shear, torsion, and combined loadings. Stress and strain transformation is discussed. Deflection of beams and buckling in columns are covered. *Prerequisite: CIVE 210.*

**MECH 332  Mechanics of Machines** 3 cr.
A course that deals with the mechanismization of motion, kinematics analysis of linkage mechanisms, synthesis of cam-follower mechanisms, gear terminology and types of gears, analysis and synthesis of gear trains, force analysis, and introduction to linkage synthesis. *Prerequisite: MECH 230.*

**MECH 340  Engineering Materials** 3 cr.
The course introduces fundamental concepts in materials science as applied to engineering materials: crystalline structures; imperfections, dislocations, and strengthening mechanisms; diffusion; phase diagrams and transformations; ferrous and non-ferrous metal alloys, ceramics, and polymers; structure-property relationships; material selection case studies.

**MECH 341  Materials Lab** 1 cr.
The course seeks to accompany and compliment MECH 340:Engineering Materials. The laboratory sessions are designed to impart a qualitative and quantitative understanding of the mechanical properties of engineering materials. The laboratory sessions will also examine topics related to the microstructure of materials. *Co-requisite: MECH 340.*

**MECH 410L  Thermal/Fluid Systems Laboratory** 1 cr.
A series of experiments on basic thermodynamic cycles, psychrometry, combustion, and elementary fluid mechanics, with special emphasis on the use of the computer as a laboratory tool for data acquisition, reduction, analysis, and report preparation. *Prerequisite: MECH 310.*

**MECH 412/  Heat Transfer** 3 cr.
The course seeks to impart an understanding of the fundamental concepts and laws of conduction, convection and radiation heat transfer and their application to the solution of engineering thermal problems. The course covers steady and transient heat conduction; extended surfaces; numerical simulations of conduction in one and two-dimensional problems; external and internal forced convection of laminar and turbulent flows; natural convection; heat exchanger principles; and thermal radiation, view factors and radiation exchange between diffuse and gray surfaces. The use of Matlab is integrated into the homework assignments. *Prerequisite: MECH 314.*

**MECH 414  Thermodynamics II** 3 cr.
A course investigating the availability and work potential of systems; irreversibility; second law efficiency; availability; gas mixtures; air-conditioning; chemical reactions; high speed flow, nozzles and diffusers; environmental, economic, and social implications. *Prerequisites: MECH 310 and CHEM 202. Annually.*

**MECH 420  Mechanical Design I** 3 cr.
This is an introductory course in machine design in which one learns how to determine the structural integrity of common machine components and to apply this knowledge within the context of machine design problems. Mechanical elements such as shafts, bearings, springs, welding joints and fasteners are studied with emphasis on their behavior under both static and fatigue loading. *Prerequisites: MECH 320 and MECH 340.*

**MECH 421  Manufacturing Processes I** 2.1; 3 cr.
A course covering traditional material removal processes (machining and abrasion), CNC machining, as well as non-traditional material removal processes (EDM, ECM, thermal cutting, etc.); the science behind these technologies; assembly processes such as welding, brazing, soldering, and fastening are also covered. The course emphasizes process capabilities and limitations, relative cost, and guidelines for process selection; and design for manufacturing guidelines. This course contains hands-on exercises in a machine shop environment. *Prerequisite: MECH 340.*

**MECH 430/CHEN 351  Instrumentation and Measurements** 2.1; 3 cr.
A course on general concepts of measurement systems; classification of sensors and sensor types; interfacing concepts; data acquisition, manipulation, transmission, and recording; introduction to LABVIEW; applications; team project on design, and implementation of a measuring device. *Prerequisites: PHYS 211 and EECE 312.*

**MECH 431  Control Systems** 2 cr.
A course that involves modeling of mechanical, electrical, and magnetic systems; Laplace transform; transfer function and block diagrams, time domain analyses; root-locus, frequency-domain methods; stability analysis; sensitivity analysis; design of PID controllers and dynamic compensators via the root locus and frequency methods; state-space design methods; hands-on applications. *Prerequisites: EECE 210 and MECH 430 and MECH 432.*
MECH 431L Control Systems Laboratory 1 cr.
This course involves a series of hands-on experiments on modeling and design of control systems using Matlab, Simulink, and LabVIEW. The course also includes a team project. Co-requisite: MECH 431.

MECH 432 Dynamic System Analysis 2 cr.
A course introducing dynamic modeling and analysis of mechanical electrical, thermal, and fluid systems. The course integrates software to test and analyze the modeled systems. Prerequisites: PHYS 211 and ECE 312.

MECH 500 Approved Experience 1 b.
This is an eight-week professional training course in mechanical engineering.

MECH 501 Final Year Project I 1 cr.
The aim of this course is to provide students with practical experience in some design aspects of mechanical engineering. Students, working in groups, write a literature survey of an assigned project, critically analyze its components, and develop a bill of material necessary for the completion of the project.

MECH 502 Final Year Project II 4 cr.
A course in which the student integrates his/her acquired knowledge to deliver the product researched and planned in MECH 501. Prerequisite: MECH 501.

MECH 503 Special Topics in Mechanical Engineering 3 cr.

MECH 510 Design of Thermal Systems 2.1; 3 cr.
The course seeks to develop in students the ability to integrate rate mechanisms (i.e., heat transfer and fluid dynamics) into thermodynamic system modeling and analyses and provide design opportunities through open-ended problems with explicit considerations of engineering economics, optimization, environmental impact, ethical concerns, manufacturability and sustainability. Teamwork experience and communication skills are highly stressed. The students will gain some hands-on experience with the tools of investigation used for thermal and fluid systems and learn how to approach and solve problems typically encountered in engineering experimental work. Pre- or co-requisites: MECH 311, MECH 411, and MECH 412.

MECH 511 Intermediate Fluid Mechanics 3 cr.
A course that deals with potential flow and boundary layer analysis; lift and drag; flow separation; the use of computational techniques to solve boundary layer problems; viscous internal channel flow and lubrication theory; one-dimensional compressible flow in nozzles and ducts; normal shock waves and channel flow with friction or heat transfer; fluid machinery including pumps and hydraulic turbines. Prerequisites: MECH 314 and MECH 412.

MECH 512 Internal Combustion Engines 2.1; 3 cr.
A course that examines the fundamentals of internal combustion engine design and operation, with emphasis on fluid/thermal processes. Topics include analysis of the respiration, combustion, and pollutant formation processes; heat transfer and friction phenomena; engine types and performance parameters; thermo-chemistry of fuel-air mixtures; the use of engine cycle models for performance predictions; and social implications of motorization. Pre- or co-requisites: CHEM 202, MECH 414, and MECH 430.

MECH 513 Air Conditioning 3 cr.
A course on human thermal comfort and indoor air quality; solar radiation; heating and cooling load calculations in buildings; air conditioning systems; and water distribution systems; computer-based calculations. Prerequisite: MECH 412.

MECH 514 Gas Turbines 3 cr.
A course that introduces the thermodynamic and aerodynamic theory forming the basis of gas turbine design: shaft power cycles; gas turbine cycles for aircraft propulsion; turbofan and turboshaft engines; design and analysis of centrifugal and axial flow compressors and turbines. Prerequisites: MECH 314 and MECH 414.

MECH 515 Steam Turbines 3 cr.
A course that deals with impulse and reaction steam turbines, steam turbine cycles, flow of steam in nozzles, design aspects of turbines stage losses and efficiency, velocity diagrams; impulse and reaction blading velocities; nucleation, condensation, and two-phase phenomena in flowing steam; boiler room and its various equipment; the complete steam power plant; governors, electric generator, and power transmission lines. Pre- or co-requisites: MECH 314 and MECH 414.

MECH 516 Aerodynamics 3 cr.
A course on theoretical and empirical methods for calculating the loads on airfoils and finite wings by application of classical potential theory, thin airfoil approximations, lifting line theory, and panel methods; wings and airplanes; application of linearized supersonic flow to supersonic airfoils; performance and constraint analysis; longitudinal stability and control. Pre- or co-requisites: MECH 314 and MECH 414.

MECH 518 Environmental Challenges in Managing Ozone Depleting Substances 3 cr.
Introduction to environmental issues related to engineering. Review of selected multilateral agreements and, in particular, review of the Montreal Protocol with emphasis on compliance strategies and discussion of the current status of ozone depleting substances (ODS); also reviews available technologies that work best now, and future and alternative technologies. Applications are related to firefighting, aerosols, solvents, foams and pesticides; management of ODS programs, good practices and safety issues. Prerequisite: MECH 310 or equivalent.

MECH 519 Compressible Flows 3 cr.
The objective of the course is to impart an understanding of the fundamental principles of steady and unsteady one-dimensional perfect-gas flow. Students learn about the behavior of homogenic and homentropic flow, develop an understanding of normal shock waves and homogenic flow in nozzles; learn how to analyze frictional homogenic flow in a constant-area duct and frictionless diabatic flow in a constant-area duct; and learn how to draw skeleton wave diagrams of wave processes. Prerequisites: MECH 310 and MECH 314.

MECH 520 Mechanical Design II 3 cr.
This is an advanced course in mechanical design. Students taking this course are expected to have a firm grasp in the fundamentals of failure theories. This course proposes the methods for designing and selecting components such as gears, belts, clutches, brakes, flywheels, and journal bearings. A design project using a finite element package is emphasized. Prerequisites: MECH 332 and MECH 420.

MECH 521 Manufacturing Processes II 2.1; 3 cr.
A course on heat treatments, deformation, phase-change, and particulate consolidation processing of metals; fabrication processing of non-metallic engineering materials such as ceramics, polymers, and composites; emphasis on process capabilities and limitations, relative cost, and guidelines for process selection; the behavior of materials under processing conditions; design for manufacturing guidelines. This course emphasizes hands-on training exercises. Prerequisite: MECH 340.
**MECH 522  Mechanical CAD/CAM   3 cr.**
The course gives students exposure to the realm of computer-aided design (CAD), computer-aided engineering (CAE), and computer-aided manufacturing (CAM). The course teaches the students to harness the power of these powerful tools in the solution of various problems of mechanical engineering. The course utilizes several commercially available software packages but the emphasis is placed on Pro/Engineer. Prerequisites: MECH 320 and MECH 420.

**MECH 530  Mechatronics System Design   2.1; 3 cr.**
A course that discusses mechatronics; data; numbering systems, architecture of the 8-bit Motorola MC68HC11 microcontroller, assembly language programming, A/D and D/A conversion; parallel I/O programmable timer operation, interfacing sensors and actuators, applications; a team project on design and implementation of a mechatronic system. Prerequisites: EECE 312 and MECH 430.

**MECH 531  Mechanical Vibrations   3 cr.**
A course on free and forced response of non-damped and damped system; damping vibration absorption; response of discrete multi-degree of freedom systems; modal analysis; vibration measurement, case studies, vibration analysis with Matlab and Simulink. Prerequisite: MECH 230.

**MECH 532  Dynamics and Applications   3 cr.**
This course examines the dynamics of particles and rigid bodies moving in three dimensions. Topics include Lagrange's equations of motion for particles, rotations of rigid bodies, Euler angles and parameters, kinematics of rigid bodies, and the Newton-Euler equations of motion for rigid bodies. The course material will be illustrated with real examples such as gyroscopes, spinning tops, vehicles, and satellites. Applications of the material range from vehicle navigation to celestial mechanics, numerical simulations, and animations. Prerequisite: MECH 230.

**MECH 535  Fluid Power Systems   3 cr.**
This is a senior level undergraduate lecture course which covers the fundamentals of fluid power transmission and drive technology. Students learn about the main hydraulic and pneumatic components and their static and dynamic performance characteristics. Students learn how to read circuit diagrams and understand the principles of circuit operation. Through the use of simulation software students will learn to design and analyze complex fluid power systems. Prerequisites: MECH 314 and MECH 431.

**MECH 540  Selection and Properties of Materials   3 cr.**
A course that reviews the mechanical behavior of materials. Topics covered include structure-property relationships in materials; continuum mechanics and tensor notation; theorems of elastic, plastic, viscoelastic behavior of materials; elements of creep, fatigue, and fracture mechanics. Prerequisite: MECH 340.

**MECH 550  Computer Applications in Mechanical Engineering   3 cr.**
A course dealing with the application of numerical techniques for the solution of a variety of mechanical engineering problems involving systems of linear or non-linear algebraic equations, systems of ordinary differential equations of the initial and boundary value types, systems of ordinary differential equations, and partial differential equations of the parabolic, elliptic, and hyperbolic types. Engineering applications are introduced through a number of case study problems. Prerequisites: MATH 202 and MATH 251.

**MECH 600  Applied Reservoir Engineering I   3 cr.**
This course introduces the concepts and principles needed to understand and analyze hydrocarbon reservoir fluid systems, and defines (with the help of geological and petrophysical principles) the size and contents of petroleum accumulations. Students will learn to organize programs for systematically collecting, recording, and analyzing data describing fundamental characteristics of individual well and reservoir performance (i.e. pressure, production, PVT data). The course covers topics on: fundamental concepts of fluid distribution, porosity distribution, trapping conditions; nature and type of primary drive mechanisms; production rates, ultimate recoveries, and reserves of reservoirs; supplementary recovery schemes to augment and improve primary recovery; economics analysis of developing and producing reservoirs and conducting supplementary recovery operations. Prerequisite: MECH 314 or CIVE 340.

**MECH 602  Energy Conservation and Utilization   3 cr.**
A course that deals with methods for reduction of losses and gains from a building envelope, energy conservation in cooling, heating, air-handling, and plumbing systems, energy management program. Prerequisites: MECH 310 and MECH 412.

**MECH 603  Solar Energy   3 cr.**
A course that examines the fundamentals of solar radiation, collectors and concentrators, energy storage, estimation and conversion formulas for solar radiation. Prerequisite: MECH 412.

**MECH 604  Refrigeration   3 cr.**
A course on fundamental concepts and principles, cold storage; functions and specifications of refrigeration equipment, applications. Prerequisite: MECH 412.

**MECH 606  Aerosol Dynamics   3 cr.**
This course covers the physical and chemical principles that underlie the behavior of aerosols - collections of solid or liquid particles, such as clouds, smoke, and dust, suspended in gases - and the instruments used to measure them. Topics include: aerosol particle characterization; transport properties and phenomena in quiescent, laminar, and turbulent flows; gas- and particle-particle interactions; and applications to human respiratory tract deposition and atmospheric pollution. Prerequisites: MECH 314, MECH 412, and MECH 414; or approval of instructor.

**MECH 607  Micro Flows Fundamentals and Applications   3 cr.**
An advanced course on theory and applications of micro flows; the continuum hypothesis and the various flow regimes; shear and pressure driven micro flows; electrokinetically driven liquid micro flows; compressibility effects of the micro flow of gases; particulate flows in bio-applications; modeling techniques; hybrid continuum-molecular methods; reduced order modeling of micro flows in multi-physics micro flow applications; case studies in BioMEMS. Prerequisites: MECH 310, MECH 314, and MECH 412, or equivalent.

**MECH 608  Applied Reservoir Engineering II   3 cr.**
This course introduces the advance concepts and principles needed to analyze hydrocarbon reservoir fluid systems, and defines the size and contents of petroleum accumulation. Students will learn to organize programs for collecting, recording, and analyzing data describing the advanced characteristics of individual well and reservoir performance. This course of advanced reservoir engineering topics covers a variety of topics such as: fluid flow in a porous medium; fluid distribution, fluid displacement; fractional flow equation; Buckley-Leverett equation; pressure drawdown and pressure buildup analysis; in addition to the nature and type of primary, secondary and tertiary recovery, water influx and prediction of water-flood behavior, reservoir model simulation and history matching. Prerequisite: MECH 600.
MECH 609  Experimental Methods in Fluid Dynamics  3 cr.
This is a graduate level course to introduce students to experimental methods used to measure fluid flow quantities such as pressures, forces, and velocities. The course starts with an introduction to what and why we measure, uncertainty analysis and measurement error estimation. Some basic techniques for data reduction and data post-processing are introduced. The available fluid measurement methods are surveyed briefly, with selected applications. Emphasis is on advanced optical diagnostic techniques; namely particle image velocimetry (PIV), and laser induced fluorescence (LIF). The theoretical foundations of these techniques are established, and the discussion extended to practical considerations including software and hardware components. A few laboratory sessions are incorporated into the course to supplement the lectures and make use of the instruments available in the ME department, including the open circuit wind tunnel and the PIV system. In addition to the lectures and lab sessions, there is emphasis on the available literature. Prior knowledge of the basic principles of fluid mechanics and fluid systems is required. MATLAB is needed for course work. Prerequisite: MECH 314.

MECH 619  Quality Control in Manufacturing Systems  3 cr.
The course covers the foundations of modern methods of quality control and improvement that may be applied to manufacturing industries. It aims to introduce students to the tools and techniques of quality control used in industrial applications, and develop their ability to apply the tools and techniques to develop solutions for industrial problems. Emphasis is given to the application of quality management techniques to solve industrial case problems. The course emphasizes the philosophy and fundamentals of quality control, the statistics foundations of quality control, statistical process control, acceptance sampling, and product and process design. Prerequisites: STAT 230 and MECH 421.

MECH 622  Modeling of Machining Processes and Machines  3 cr.
This course covers the principles and technology of metal machining; mechanics of orthogonal and 3D metal cutting; static deformations, forced and self-excited vibrations and chatter; and design principles of metal cutting CNC machines. Prerequisite: MECH 421.

MECH 624  Mechanics of Composite Materials  3 cr.
A course on anisotropic elasticity and laminate theory, analysis of various members of composite materials, energy methods, failure theories, and micromechanics. Materials and fabrication processes are introduced. Prerequisites: MECH 320 or CIVE 310, and MECH 340, or equivalent.

MECH 625  Fatigue of Materials  3 cr.
A course that deals with high cycle fatigue; low cycle fatigue; S-N curves; notched members; fatigue crack growth; cycling loading; Manson-Coffin curves; damage estimation; creep and damping. Prerequisite: MECH 320 or CIVE 310.

MECH 626  Metals and their Properties  3 cr.
A course that investigates ferrous and non-ferrous alloys; industrial equilibrium diagrams; heat treatment of metals; surface properties of metals; plastic deformation of metals; elements of fracture mechanics; process-structure-properties relations. Prerequisite: MECH 340.

MECH 627  Polymers and their Properties  3 cr.
A course on chemistry and nomenclature, polymerization and synthesis, characterization techniques, physical properties of polymers, viscoelasticity and mechanical properties and applications. Prerequisite: MECH 340.

MECH 628  Design of Mechanisms  3 cr.
A course involving graphical and analytical synthesis of single- and multi-loop linkage mechanisms for motion, path, and function generation through 2-3-4- and 5-precision positions; optimum synthesis of linkage mechanisms; synthesis of cam-follower mechanisms; synthesis of gear trains. Prerequisite: MECH 332.

MECH 630  Finite Element Methods in Mechanical Engineering  3 cr.
A course on the classification of machine components; displacement-based formulation; line elements and their applications in design of mechanical systems; isoparametric formulation; plane stress, plane strain, axi-symmetric, and solid elements and their applications; modeling considerations and error analysis; introduction to ALE/ER general formulation and Galerkin approach; and analysis of field problems. Prerequisites: MECH 420 and MATH 251.

MECH 631  Micro Electro Mechanical Systems (MEMS)  3 cr.
A course that deals with materials for micro-sensors and micro-actuators. Materials for micro-structures, microfabrication techniques and processes for micromachining, computer-aided design and development of MEMS, commercial MEMS structures and systems, packaging for MEMS, future trends, and includes a team project. Prerequisite: MECH 430.

MECH 633  Biomechanics  3 cr.
A course on study of the biomechanical principles underlying the kinetics and kinematics of normal and abnormal human motion. Emphasis is placed on the interaction between biomechanical and physiologic factors (bone, joint, connective tissue, and muscle physiology and structure) in skeletal-motor function and the application of such in testing and practice in rehabilitation. The course is designed for senior level undergraduate/graduate engineering students with no previous anatomy/physiology. Prerequisite: MECH 320 or CIVE 310, or consent of instructor.

MECH 634  Biomaterial and Medical Devices  3 cr.
A course that examines the structure-property relationships for biomaterials and the medical applications of biomaterials and devices. The first part of the course focuses on the main classes of biomaterials, metal, ceramic, polymeric, and composite implant materials, as well as their interactions with the human body (biocompatibility). The second part examines the various applications of biomaterials and devices in different tissue and organ systems such as orthopedic, cardiovascular, dermatology, and dental applications. Experts from the medical community will be invited to discuss the various applications. Prerequisite: MECH 340, or approval of instructor.

MECH 641/ EECE 661  Robotics  3 cr.
A course discussing concepts and subsystems; robot architecture; mechanics of robots; kinematics and kinetics; sensors and intelligence; actuators; trajectory planning of end effector motion; motion and force control of manipulators; robot languages. Prerequisite: MECH 431.

MECH 642  Computer Vision  3 cr.
An Introductory course on the problems and solutions of modern computer vision. Topics covered include image acquisition, sampling and quantization; image segmentation; geometric framework for vision: single view and two-views; camera calibration; stereopsis; motion and optical flow; recognition; pose estimation in perspective images. Prerequisites: MATH 202 and EECE 230.

MECH 643  Mechatronics and Intelligent Machine Engineering II  3 cr.
A course on sensors, sensor noise and sensor fusion; actuators; system models and automated computer simulation; information, perception, and cognition; planning and control; architectures, design, and development; a team project is included. Prerequisites: MECH 340 and MECH 530.
MECH 644  Modal Analysis  3 cr.
A course reviewing MDOF system vibrations, frequency response functions, damping, mobility measurement, curve fitting and modal parameter extraction, derivation of mathematical models, laboratory experiments, and projects are included. Prerequisite: MECH 531.

MECH 645  Noise and Vibration Control  3 cr.
A course on fundamental concepts in noise and vibration, passive and active damping strategies, damping materials, control methods; and applications. Prerequisites: MECH 230, MATH 212, and MECH 531.

MECH 647  Hydraulic Servo Systems  3 cr.
A graduate lecture course which teaches the fundamentals of modeling and control of hydraulic servo-systems. It provides theoretical background and practical techniques for the modeling, identification and control of hydraulic servo-systems. Classical and advanced control algorithms are discussed. The use of Matlab/Simulink and DYMOLA will be an integral part in this course. Prerequisites: MECH 314 and MECH 431.

MECH 648  Nonlinear Systems: Analysis, Stability, and Control  3 cr.
This course presents a comprehensive exposition of the theory of nonlinear dynamical systems and its control with particular emphasis on techniques applicable to mechanical systems. The course will be punctuated by a rich set of mechanical system examples, ranging from violin string vibration to jet engines, from heart beats to vehicle control, and from population growth to nonlinear flight control. Prerequisite: MECH 431 or equivalent.

MECH 660  Advanced Fluid Mechanics  3 cr.
A course that examines fundamental concepts and principles in addition to basic relations for continuous fluids; Vorticity dynamics, Kelvin Helmholtz theorems; Navier-Stokes equations; and turbulence and oscillating flows. Prerequisite: MECH 314.

MECH 663  Computational Fluid Dynamics  3 cr.
A course that deals with discretization process in fluid dynamics, numerical approaches and applications, iterative and direct matrix methods and numerical implementation of turbulence models. Prerequisites: MECH 314 and MECH 412.

MECH 665  Unsteady Gas Flow  3 cr.
A course examining equations of unsteady continuous adiabatic multidimensional flows, unsteady continuous one-dimensional flow of a perfect gas with and without discontinuities, applications and pressure exchangers. Prerequisite: MECH 414.

MECH 670  Laboratory for Renewable Energy in Buildings  2 cr.
A laboratory course that will investigate means of reducing building energy consumption first through green building design, giving consideration to building orientation, thermal massing, wind- and buoyancy-driven flows, “urban heat island” effects, and second, by retrofitting existing buildings with energy saving materials and devices such as window films, solar water heaters, and green roofs. This course is offered because in Lebanon and the region, electricity consumption for building services accounts for a major portion of national energy use and greenhouse gas emissions. Students will measure and compare effects of various designs and retrofit interventions on the thermal performance, lighting and glare, and natural ventilation of model-scale buildings, and characterize performance of devices used in green building design. Lab assignments may vary by semester but will normally include mathematical modeling and experimental measurement components organized around aspects of building physics. Prerequisite: MECH 430.

A course that covers the principles and utilization of solar (thermal and photovoltaic), wind, and geothermal energy, as well as energy from biomass. Issues relevant to energy efficiency and energy storage are discussed (heat and power storage and bio-tanks). The course distinguishes between energy sources for large-scale, industrial/commercial settings and those intended for smaller structures. The potential of using renewable energy technologies as a complement to and, to the extent possible, replacement for conventional technologies, and the possibility of combining renewable and non-renewable energy technologies in hybrid systems are analyzed. Design aspects of active, passive, wind, bio-energy, and photovoltaic energy conversion systems for buildings; and strategies for enhancing the future use of renewable energy resources are presented. The course will include several demonstrations of concept experiments. Prerequisite: MECH 310. Students cannot receive credit for both MECH 671 and EECE 675.

MECH 672  Modeling Energy Systems  3 cr.
A course that covers indoor space thermal models. The course also deals with the analysis and modeling of building energy systems involving applications of thermodynamics, economics, heat transfer, fluid flow and optimization. The use of modern computational tools to model thermal performance characteristics of components of HVAC systems including chillers, recovery systems, flow control devices, heat exchanges, solar panels, dehumidification systems, boilers, condensers, cooling towers, fans, duct systems, piping systems and pumps. The course will use modern simulation tools extensively. Prerequisite: MECH 310.

MECH 673  Energy Efficient Buildings with Good Indoor Air Quality  3 cr.
The course covers energy consumption standards and codes in buildings; energy conservation measures in built environment to enhance the building's energy efficiency while maintaining space thermal comfort and indoor air quality requirement; fundamental ventilation, indoor-air-quality, infiltration natural and mechanical ventilation, importance and impact of indoor air quality on human health and energy performance of the building air conditioning system; and ASHRAE requirement for ventilation. Particular focus will be given to green energy alternative measures. An overview of the different heating, ventilation and air conditioning system designs is covered. Performance and energy consumption of the conventional air conditioning system (constant and variable air volume) as well as the hybrid integrated air conditioning systems will be discussed and compared. The course will include several demonstrations of concept experiments. Prerequisite: MECH 310.

MECH 674  Energy Economics and Policy  3 cr.
A course that aims at developing an understanding of practical analytical skills of energy economics and planning approaches taking into account the cost of impact on the environment. This course will cover fundamental concepts of economic issues and theories related to energy, such as economics of natural and energy resources, aggregate supply and demand analysis, and the interrelationship between energy, economics and the environment as well as some important issues in energy policy. The course will also demonstrate the use of economic tools for decision making in energy and environment planning and policy. It will explore the terminology, conventions, procedures and planning policy applications. It will also cover a number of contemporary energy and environmental policy issues, including energy security, global warming, regulations of energy industries, energy research and development, and energy technology commercialization. Prerequisite: ENGM 400. Students cannot receive credit for both MECH 674 and ECON 333.
MECH 675 Building Energy Management Systems 3 cr.
A course that provides an opportunity for students to explore topics in energy management systems and management strategies for new and existing buildings; energy use in buildings; energy systems analysis and methods for evaluating the energy system efficiency; energy audit programs and practices for buildings and facilities; initiating energy management programs; guidelines for methods of reducing energy usage in each area in buildings; conservation of the energy in the planning, design, installation, utilization, maintenance; control and automation of the mechanical systems in existing and new buildings; air conditioning and ventilation systems in buildings; assessment and optimization of energy control strategies; prediction methods of economic and environmental impact of implemented control strategies and indoor settings. Prerequisites: MECH 310 and MECH 412.

MECH 676 Passive Building Design 3 cr.
A course that centers on issues surrounding the integration of sustainable and passive design principles into conceptual and practical building design. Topics will include: solar geometry, climate/ regional limitations, natural lighting, passive design and sustainability initiatives, insulating and energy storing material, and bioclimatic design and concepts. Case studies will be used extensively as a vehicle to discuss the success/failure of ideas and their physical applications. The course will focus on the use of energy auditing/modeling methods as means to both design and evaluate the relative “greenness” of buildings, as well as to understand the global implications of sustainable buildings. The course will include several demonstrations of concept experiments. Prerequisite: MECH 671.

MECH 677 Heat Pumps 3 cr.
A course that focuses on heat pumps in low energy and passive buildings as well as ground source heat pump fundamentals, loop systems, open systems, soil/rock classification and conductivity, grouting procedures, and performance of ground source heat pumps in housing units; water loop heat pumps, inside the building, bore holes, design and optimization of heat pump plants, including heat sources for such plants, and cost effective design options will also be considered. The course includes study visits and seminars given by industry experts. Prerequisite: MECH 310.

MECH 678 Solar Electricity 3 cr.
A course that focuses on the solar cell: photo generation of current, characteristic current-voltage (I-V) curve, equivalent circuit, effect of illumination intensity and temperature: the Photovoltaic (PV) generator: characteristic I-V curve of a PV generator, the PV module, connections of modules, support, safeguards, shadowing; the PV system: batteries, power conditioning. PV Systems: grid- connected and stand-alone systems, economics and sizing, reliability, applications; and manufacturing: preparation of crystalline silicon wafers, formation of contacts, coatings, construction of modules. The course will include several demonstrations of concept experiments. Prerequisite: MECH 671.

MECH 679 Energy Audit Lab 2 cr.
A course designed to give the students “hands-on” experience with carrying out energy audit measurements and studies on buildings to identify possible savings through selected energy conservation measures. Students will carry out measurements to investigate ventilation, air conditioning equipment, lighting and other office and lab equipment. Students will then be introduced to Visual DOE or E-Quest to perform energy simulation of buildings. Such tools will then be used to carry out a full building simulation taking into consideration occupancy data, equipment lights, and building envelope. A base case of energy usage will thus be established and energy conservation is then applied to deduce possible savings and their economic value. Pre- or co-requisite: MECH 672.

Chemical Engineering Courses

CHEN 200 Introduction to Chemical Engineering 3 cr.
This course is an introduction to the most important processes employed by the chemical industries, such as plastics, pharmaceutical, chemical, petrochemical and biochemical. Major emphasis is on formulating and solving material and energy balances for simple and complex systems. Equilibrium concepts for chemical process systems are developed and applied. Computer software is utilized extensively. The course activities include guest speakers and plant trips.

CHEN 310 Transport Phemonena Lab 2 cr.
This lab includes experimentation in thermodynamics and heat, mass, and momentum transport on a bench scale; and measurement error estimation and analysis.

CHEN 311/ MECH 314 Introduction to Fluids Engineering 3 cr.
An introductory course on fluid behavior emphasizing conservation of mass, momentum, energy and dimensional analysis; study of fluid motion in terms of the velocity field, fluid acceleration, the pressure field, and the viscous effects; applications of Bernoulli’s equation, Navier-Stokes, and modeling; flow in ducts, potential flows, and boundary layer flows. Prerequisite: MECH 310.

CHEN 312 Separation Processes 3 cr.
This course includes the design of industrial separation equipment using both analytical and graphical methods; equilibrium based design techniques for single and multiple stages in distillation, absorption/stripping, and liquid-liquid extraction are employed; and an introduction to gas-solid and solid-liquid systems is presented as well. Mass transfer considerations are included in efficiency calculations and design procedures for packed absorption towers, membrane separations, and adsorption. Ion exchange and chromatography are discussed. Degrees of freedom analyses are threaded throughout the course as well as the appropriate use of software. Prerequisites: MECH 310 and MATH 202.

CHEN 314 Chemical Engineering Thermodynamics 3 cr.
This course covers the applications of thermodynamics to pure and mixed fluids; and to phase equilibria and chemical reaction equilibria. Prerequisite: MECH 310.

CHEN 351/ MECH 430 Instrumentation and Measurements 2.1; 3 cr.

CHEN 400 Approved Experience 1 b.
This is an eight-week professional training course in chemical engineering for students enrolled in the BS program.

CHEN 401 Final Year Project (for students in the BS program) 3 cr.
The Final Year Project provides collaborative design experiences with a problem of Industrial or societal significance. Projects can originate with an industrial sponsor, from an engineering project on campus, or from other industrial or academic sources. In all cases, a project is a capstone experience that draws extensively from the students’ engineering and scientific background and requires independent judgments and actions. The projects generally involve a number of unit operations, a detailed economic analysis, simulation, use of industrial economic and process software packages, and experimentation and/or prototype construction. Prerequisite: approval of instructor.
CHEN 410 Unit Operations Lab 2 cr.
This laboratory introduces students to basic concepts, experimental techniques and calculation procedures in unit operations. Experiments include fluid dynamics, heat exchange (pilot-scale units designed to study air-solid, steam-water, water-water heat transfer), cooling towers, gas absorption, solvent extraction, ultrafiltration of hemoglobin solutions in water, chemical reactions (to study stoichiometry and kinetics of batch reactions in the liquid phase), drying of solid materials, and distillation. Some reaction kinetics experiments and flow pattern in industrial process equipment are also included. Prerequisite: approval of instructor.

CHEN 411 Heat and Mass Transfer Operations 3 cr.
The course covers heat conduction, convection, and radiation; general differential equations for energy transfer; conductive and convective heat transfer; radiation heat transfer; process heat exchangers molecular, convective and interface mass transfer; the differential equation for mass transfer; steady state molecular diffusion and film theory; convective mass transfer correlations; and mass transfer equipment. Prerequisite: MECH 310.

CHEN 417 Kinetics and Reactor Design I 3 cr.
This course covers the fundamentals of chemical reaction engineering; rate laws, kinetics, and mechanisms of homogeneous and heterogeneous reaction; analysis of rate data; diffusion limitations; and the design of industrial reactors. Prerequisite: approval of instructor.

CHEN 451 Process Control 2 cr.
This course covers the development of deterministic and non-deterministic models for physical systems, engineering applications, and simulation tools for case studies and projects. Prerequisite: CHEN 312.

CHEN 451L Process Control Lab 1 cr.
Laboratory experiments demonstrating the principles covered in the process dynamic and control course CHEN 451. These include temperature, temperature flow, and concentration measuring devices, and process control simulation for typical chemical plants. Prerequisite: CHEN 312.

CHEN 470 Chemical Process Design 3 cr.
This course is an integration of material from other chemical engineering courses with applications to the design of plants and processes representative of the chemical and related process industries; basic concepts and methodology for making rational decisions; and the implementation of real engineering projects and comparing alternatives. Prerequisite: approval of instructor.

CHEN 480 Safety and Loss Prevention 3 cr.
Topics covered in this class include: history of health and safety; causes and effects of loss; policy development; loss control and health basics; emergency preparedness and standards; hazard identification; safe process design; inspection and investigation processes; measurement, evaluation and audits of OH&S program elements; legislation, HAZOP and HAZAN.

CHEN 500 Approved Experience 1 cr.
This is an eight-week professional training course in chemical engineering for students enrolled in the BE program.

CHEN 501 Final Year Project I 2 cr.
The Final Year Project provides collaborative design experiences with a problem of industrial or societal significance. Projects can originate with an industrial sponsor or from other industrial or academic sources. Prerequisite: approval of instructor.
CHEN 612  Desalination  3 cr.
A course that will provide an in-depth coverage of the commonly used thermal and membrane based desalination technologies. Fundamental thermodynamic and transport processes which govern desalination will be developed. Environmental, sustainability and economic factors which may influence the performance, affordability and more wide-spread use of desalination systems for fresh water production and reuse will be highlighted. Renewable energy technologies coupled with desalination processes will be reviewed. A team-based student project will be assigned to design a reverse osmosis membrane desalination plant (brackish water, seawater, or treated sewage effluent) using conventional or alternative energy sources. Prerequisite MECH 310, CHEN 411, or MECH 41.2

CHEN 613  Membrane Separation Processes  3 cr.
The course will provide a general introduction to membrane science and technology: transport mechanisms, membrane preparation and boundary layer effects. The course will also cover the various types of membranes used in industry: microfiltration, ultrafiltration, reverse osmosis, electrodialysis and pervaporation. Prerequisite: CHEN 312.

CHEN 614  Environmental Engineering Separation Processes  3 cr.
This course includes a discussion of the unit operations associated with environmental engineering separation processes of solid-liquid, liquid-liquid and gas-liquid systems; general use, principles of operation and design procedures for specific type of equipment. Prerequisite: approval of instructor.

CHEN 617  Chemical Reactor Analysis and Design  3 cr.
This course covers design for optimum selectivity; stability and transient behavior of the mixed flow reactor; non-ideal flow and balance models; fixed and fluidized bed reactors; and multiphase flow reactors. Prerequisite: CHEN 417.

CHEN 618  Colloid and Interface Science  3 cr.
This is a first course in colloid and interface science. The repulsive and attractive forces at interfaces are described along with the dynamics of the interfaces. Topics include the stability of macroemulsions, the formulation and properties of microemulsions, and surface metal-support interactions of catalysts. Prerequisites: CHEN 312 and CHEN 417.

CHEN 651  Advanced Process Control  3 cr.
This course covers the mathematical modeling and computer simulation of process dynamics and control. Prerequisites: CHEN 451 and 451L.

CHEN 672  Polymer Science  3 cr.
This course is a broad technical overview of the nature of synthetic macromolecules, including the formation of polymers and their structure, structure-property relationships, polymer characterization and processing, and applications of polymers. The course tends to focus on thermoplastic polymers and elastomers. Prerequisite: MECH 340.

CHEN 673  Engineering of Drug Delivery Systems  3 cr.
This course focuses on recent advances in the development of novel drug delivery systems. The fundamentals of drug delivery are discussed. Various strategies to tune and control the release of active agents for optimized therapeutic outcomes are explored. The course covers polymers and techniques used to produce drug nanoparticles, with specific examples of nanoparticle-based drug delivery systems. Prerequisites: MECH 310, CHEN 411, and CHEM 204.
Engineering Management Program

Coordinator: Abdul Malak, M. Asem
Professors: Abdul Malak, M. Asem; Salameh, Moueen
Associate Professor: Nasrallah, Walid; Yassine Ali
Assistant Professor: Maddah, Bassel; Srour, Isam
Senior Lecturers: Charif, Hassan; Noueihed, Nazim; Tannir, Akram; Trabulsi, Samir
Lecturers: Abillama, Walid; Nizam, Youssef; Srour, Jordan F.
Instructors: Itani, Mona; Saad, Youssef; Shumeitelli, Rana; Zogbi, Hala

Minor in Engineering Management

The Engineering Management Program offers a minor in engineering management that can be pursued by undergraduate engineering and architecture students, as well as by students from related majors, starting as early as the fall semester of their third year of enrollment. To satisfy the requirements of this minor, a student must earn 18 credits of course work from the engineering management course offerings as follows:

- At least nine of the total requirement of 18 credits must be fulfilled from the six undergraduate courses offered by the program, which must include ENMG 400: Engineering Economy.
- The other nine credits can be satisfied by taking courses either from the list of undergraduate courses, or from the elective graduate courses (See AUB Graduate Catalogue).

A minimum grade of 70 is required for a course to be counted toward the fulfillment of a minor in engineering management.

Undergraduate Courses

**ENMG 400  Engineering Economy**  3 cr.
A course that covers principles, basic concepts, and methodology for making rational decisions in the design and implementation of real engineering projects; time value of money, depreciation, comparing alternatives, effect of taxes, inflation, capital financing and allocation, and decision under uncertainty. Prerequisite: STAT 230 or equivalent. Every semester.

**ENMG 500  Engineering Management I**  3 cr.
A course on operations research modeling concepts with emphasis on linear programming; topics include: linear programming, network programming, and project management. Annually.
ENMG 501 Engineering Management II 3 cr.
A course outlining basic management models used to optimize operation systems; discrete- and continuous-time Markov chains and their application in modeling queues, inventories, and production process behavior. Prerequisite: STAT 230 or equivalent. Annually.

ENMG 502 Construction Management 3 cr.
A course on organizing for construction projects; pre-construction activities; bidding and contracts; fundamentals of construction planning, monitoring, and control; application of construction control tools: CPM, materials management, operations analysis, and quality control. Annually.

ENMG 503 Specifications and Cost Estimation 3 cr.
A course on the structure of construction documents and their interrelationships; bidding requirements; general and particular contract conditions; administrative and procedural requirements for construction; technical specifications; construction cost estimation process; and unit rates determination. Prerequisite: ENMG 502 or CIVE 580. Annually.

ENMG 504 Engineering Ethics 3 cr.
A course on engineering ethics covering responsibility in engineering; framing the moral problem; organizing principles of ethical theories; computers, individual morality, and social policy; honesty, integrity, and reliability; safety, risk, and liability in engineering; engineers as employees; engineers and the environment; international engineering professionalism; and future challenges. Every regular semester.
Faculty of Health Sciences (FHS)
Faculty of Health Sciences (FHS)

Officers of the Faculty

Peter F. Dorman  
President of the University
Ahmad Dallal  
Provost, ex-officio
Iman Nuwayhid  
Dean
Rima Affi  
Associate Dean
Moueen Salameh  
Registrar, ex-officio
Salim Kanaan  
Director of Admissions, ex-officio
Lokman Meho  
University Librarian, ex-officio

Faculty Administrative Support

Mona Katul  
Executive Officer
Amal Kassis  
Student Services Officer
Joseph Azar  
Systems Administrator
Hilda Nassar  
Medical Librarian

Historical Background

The Faculty of Health Sciences (FHS) was first established in 1954 as an Independent School of Public Health, the first of its kind in the region. The name of the school was changed to the Faculty of Health Sciences in 1978 to accommodate programs in allied health.

FHS serves to educate and train professionals and competent leaders to help meet the health needs of Lebanon and the region. Currently, FHS hosts four departments: Epidemiology and Population Health (EPH), Environmental Health (EH), Health Promotion and Community Health (HPCH), Health Management and Policy (HMP), and a Medical Laboratory Sciences Program in collaboration with the Faculty of Medicine. FHS offers a BS degree in: Environmental Health or Medical Laboratory Sciences; a master’s degree in Public Health (MPH) (concentrating in EPBS – Epidemiology and Biostatistics, HPCH, or HMP); an MS in Epidemiology; an MS in Population Health; and, an MS in Environmental Sciences (concentrating in EH). FHS also provides teaching of public health to students in the Faculty of Medicine.

Accreditation

In October 2006, the Graduate Public Health Program of the Faculty of Health Sciences became accredited by the Council on Education for Public Health (CEPH). CEPH is an independent agency in the United States which is recognized to accredit schools and programs of public health. The GPHP at FHS is the first graduate public health program to be accredited by CEPH outside the Americas. Accreditation indicates that the GPHP of the FHS meets standards for Public Health Education of leading schools of public health in the world.

Mission

The Faculty of Health Sciences prepares professionals in the disciplines of public health and health sciences through graduate and undergraduate programs, and introduces future physicians to public health. It contributes to knowledge and the improvement of the public’s health in the region by conducting scholarly and relevant research and by responding to priority health issues and training needs in collaboration with stakeholders. In all of its functions, FHS promotes and adheres to the principles of ethics, social justice, and collective responsibility.

Vision

The vision of FHS is to contribute to the promotion of the health and well-being of populations through the provision of quality higher education in public health and related disciplines. This is to be accomplished through state-of-the-art research that addresses public health problems particularly relevant to Lebanon, the region, and the developing world, and through transfer of that knowledge to policy makers, program managers, and other practitioners in relevant organizations and fields.

Undergraduate Programs

Admission Requirements

To be eligible for admission to the programs leading to the degree of Bachelor of Science, candidates must have satisfactorily completed the freshman program in the Faculty of Arts and Sciences, or its equivalent, with a minimum cumulative average of 70 and a minimum science average of 70.

Freshman students applying to the first year in health sciences must complete the following science requirements: CHEM 101, 101L, 102, and 102L, or CHEM 200; MATH 101 and 102, or MATH 203, (see page 122). Courses taken before the student is admitted to any of the BS programs may be credited at the discretion of the appropriate department.

To be eligible for admission to advanced standing (second and third year), a candidate must have completed the equivalent requirements for the first (or second) year of undergraduate study in the
Faculty of Health Sciences and meet the following criteria:

- a minimum cumulative average of 70
- a minimum average of 70 in science courses
- completion of a minimum of 6 credits in basic science courses

A student, who has completed a minimum of two semesters of study as a sophomore, or its equivalent, is eligible for admission to the first year in the Faculty of Health Sciences if the following criteria are met:

- a minimum cumulative average of 70
- a minimum average of 70 in science courses
- a minimum average of 70 in science courses
- completion of a minimum of 6 credits in basic science courses

Lebanese students must present the Lebanese Baccalaureate, or its equivalent, and should be considered eligible by the AUB Office of Admissions for admission to the first year in health sciences. These candidates are evaluated based on SAT I scores and school performance.

Candidates holding the Lebanese Baccalaureate Part II - literature and humanities - or its equivalent are required to take CHEM 200 as remedial courses. Candidates holding the Lebanese Baccalaureate Part II - sociology and economy - or its equivalent are required to take CHEM 200 as a remedial course.

For complete and detailed information regarding admission to AUB, including recognized certificates, see the Admissions section on pp. xx–xx and Certificate and Class Chart on pp. xx–xx of this catalogue.

Graduation Requirements

All recommendations for graduation are made by a vote of the faculty, upon the recommendation of the Academic and Curriculum committee.

- **BS in Environmental Health:** To be eligible for graduation with the degree of Bachelor of Science in Environmental Health, a student must:
  1. pass a minimum of 96 credit hours (in addition to field training), after freshman science class or its equivalent,
  2. achieve a total cumulative average of 70
  3. achieve a cumulative average of 70 in the major field of study

- **BS in Medical Laboratory Sciences:** To be eligible for graduation with the degree of Bachelor of Science in Medical Laboratory Sciences, a student must:
  1. pass a minimum of 103 credit hours after freshman science class or its equivalent,
  2. achieve a total cumulative average of 70
  3. achieve a cumulative average of 70 in the major field of study

Residency Requirements

Students of the Faculty of Health Sciences must meet the following minimum residency requirements:

- **Environmental Health Major:** A student must register in residence at the Faculty of Health Sciences - Environmental Health major for the last three regular semesters including completion of the summer field training requirement.
- **Medical Laboratory Sciences Major:** A student must register in residence at the Faculty of Health Sciences - Medical Laboratory Sciences major for the last four regular semesters.

Minors and Electives

The Faculty of Health Sciences offers two minors, which require the completion of a number of courses as specified in the list below. Moreover, electives can be chosen from the following list of courses to satisfy the distributional requirements of social sciences or sciences.

- **The minor in Environmental Health** introduces students to the environmental system and the interactive processes that affect human health, environmental protection, and development.
  - The minor in Environmental Health requires 15 credits, including the following:
    - HPCH 200, ENHL 220, plus a minimum of 9 credits selected from the following ENHL courses: ENHL 221, ENHL 230, ENHL 231, ENHL 234 and ENHL 241. The following courses can be selected following the approval of the department: HMPD 203, EPHD 213.
  - The minor in Environmental Health introduces students to the public health field through exposure to the contemporary issues in public health. Students are given a general overview of the field in HPCH 200 and subsequently get more in–depth knowledge by choosing one course from each of the public health disciplines. A minor in public health allows students to become more aware of the factors influencing health and hence more capable of making choices that influence their own health and that of their communities. In addition, a minor in public health expands students’ career options by exposing them to an increasingly important and expanding profession.
  - The minor in Public Health requires 15 credits, including the following:
    - HPCH 200, plus a minimum of 9 credits selected from the following ENHL courses: ENHL 221, ENHL 230, ENHL 231, ENHL 234 and ENHL 241. The following courses can be selected following the approval of the department: ENHL 232, ENHL 233, ENHL 237, ENHL 242 or ENHL 243.
  - The minor in Public Health requires 15 credits, including the following:
    - HPCH 200, plus a minimum of 9 credits selected from the following ENHL courses: ENHL 221, ENHL 230, ENHL 231, ENHL 234 and ENHL 241. The following courses can be selected following the approval of the department: EPHD 213.

The remaining credits can be taken from courses listed above in any of the departments, or from other courses in the faculty, with permission of the instructor.

To graduate with a minor, a student must attain a cumulative average of 70 or more in courses taken to satisfy the requirements of that minor.

*Not required by FHS students. The course could be replaced by a course from the above list of courses for the minor.
1 Satisfies the General Education requirements in social sciences
2 Satisfies the General Education requirements in natural sciences
3 Satisfies the General Education requirements in quantitative thought
General Education Requirements
Please refer to the General Education Requirements section in this catalogue (page xx-xx.)

Dual Degree
Students may, upon approval of the Faculty concerned, complete the requirements for a second degree while registered in another Faculty at AUB. In such a case, a student will be granted two degrees at the same time of graduation. If tuition differs, students will pay the higher of the tuitions. Information about deadlines and applications are available on the following link: http://www.aub.edu.lb/registrar/Documents/pdfdoc/dualdegree.pdf

Academic Rules and Regulations
Please refer to the section on General University Academic Information (pp. xx-xx) for information on attendance, classes and laboratories, examinations and quizzes, course loads, premedical requirements, incompletes, probation (placement on academic probation, removal of probation), dismissal and readmission, repeating courses, special students not working for a degree, tutorials, and withdrawal from courses.

Full-time Students and Credit Load
A full-time student must carry a minimum load of 12 credits per semester. If a student wishes, or is forced to reduce, his/her load to fewer than 12 credits, s/he must first apply to the Academic and Curriculum committee for approval. This should be done no later than 10 weeks after the start of the semester.

Students on probation for the first time are allowed a maximum load of 17 credits. Students who continue on probation beyond one semester can register for a maximum of 13 credits per semester.

Promotion
For class promotion from year I to year II, a student must complete a minimum of 30 credits (for EH major) or 31 credits (for MLS major), excluding credits for ENGL 102. For class promotion from year II to year III, a student must complete a minimum of 63 credits (for EH major) or 65 credits (for MLS major).

Majorless Status
Students who refrain from following the assigned course curriculum, will be automatically given the status of majorless. Majorless students in the Environmental Health program are required to take ENHL 220. Majorless students are given two academic semesters to transfer to the desired major. If, by the end of the second semester, the student does not secure acceptance to the desired major, s/he is dropped from the Faculty.

Curriculum for Bachelor of Science in Environmental Health

First Year

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<th>Course</th>
<th>Lecture Hrs./Week</th>
<th>Lab Hrs./Week</th>
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Second Semester

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Second Year

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1 CHEM 200 is a remedial course required of Literature and Humanities and Sociology and Economics Baccalaureate holders. MATH 203 is a remedial course required of Literature and Humanities Baccalaureate holders.
### Curriculum for Bachelor of Science in Medical Laboratory Sciences

#### First Year

<table>
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<th>Semester</th>
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#### Second Year

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<th>Lab Hrs./ Week</th>
<th>Credit Hrs.</th>
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</thead>
<tbody>
<tr>
<td><strong>Second Semester</strong></td>
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</tr>
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<td>MLSP 203</td>
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<tr>
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<td>Humanities Elective</td>
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<tr>
<td><strong>Total 18</strong></td>
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Practical Training in Laboratory Medicine

A total period of ten months (July to June excluding a one month vacation in September) to cover practical experience and application of theoretical knowledge in the following areas of laboratory medicine, for the periods and credits indicated below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Duration</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LABM 220</td>
<td>Clinical Chemistry and Endocrinology</td>
<td>8 weeks</td>
<td>4</td>
</tr>
<tr>
<td>LABM 230</td>
<td>Clinical Hematology and Reception</td>
<td>8 weeks</td>
<td>4</td>
</tr>
<tr>
<td>LABM 240</td>
<td>Clinical Microbiology</td>
<td>8 weeks</td>
<td>4</td>
</tr>
<tr>
<td>LABM 250</td>
<td>Clinical Parasitology and Urinalysis</td>
<td>4 weeks</td>
<td>2</td>
</tr>
<tr>
<td>LABM 260</td>
<td>Serology</td>
<td>4 weeks</td>
<td>2</td>
</tr>
<tr>
<td>LABM 270</td>
<td>Blood Banking</td>
<td>4 weeks</td>
<td>2</td>
</tr>
<tr>
<td>LABM 280</td>
<td>Cytogenetics, Molecular Diagnosis and Histotechniques</td>
<td>4 weeks</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Lecture Hrs./Week</th>
<th>Lab Hrs./Week</th>
<th>Credit Hrs.</th>
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</thead>
<tbody>
<tr>
<td>LABM 202</td>
<td>Clinical Chemistry II</td>
<td>2</td>
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<td>2</td>
</tr>
<tr>
<td>LABM 210</td>
<td>Cytology and Histological Techniques</td>
<td>2</td>
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<td>2</td>
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<tr>
<td>MBIM 223</td>
<td>Parasitology for MLS students</td>
<td>2</td>
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<tr>
<td>MLSP 202</td>
<td>Clinical Hematology II</td>
<td>3</td>
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<td>MLSP 204</td>
<td>Systematic Bacteriology</td>
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<td>MLSP 259</td>
<td>Diagnostic Serology</td>
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<tr>
<td>Summer Session</td>
<td>Lecture Hrs./Week</td>
<td>Lab Hrs./Week</td>
<td>Credit Hrs.</td>
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<tr>
<td>Labrador Medicine</td>
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<tr>
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<table>
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<tr>
<th>Third Year</th>
<th>Lecture Hrs./Week</th>
<th>Lab Hrs./Week</th>
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<tbody>
<tr>
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<td>17</td>
</tr>
<tr>
<td>EPHD 203</td>
<td>Epidemiology and Biostatistics</td>
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<td>HMPD 204</td>
<td>Introduction to Health Services Administration</td>
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<tr>
<td>LABM 233</td>
<td>Genetics and Molecular Biology</td>
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<tr>
<td>LABM 235</td>
<td>Medical Mycology</td>
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<tr>
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<tr>
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Second Semester: PHIL 205, Bio-medical Ethics 3 Hrs./Week, Lab Hrs./Week, Credit Hrs.; HPCH 203, Health Communication 3 Hrs./Week, Lab Hrs./Week, Credit Hrs.; LABM 234, Special Topics/Techniques in Laboratory Medicine 2 Hrs./Week, Lab Hrs./Week, Credit Hrs.; MLSP 211, Seminar 1 Hrs./Week, Lab Hrs./Week, Credit Hrs.; Labrador Medicine 8 Hrs./Week, Lab Hrs./Week, Credit Hrs.

**Total 17**
The Department of Environmental Health offers a three-year program in environmental health. Students are admitted to the department after the completion of the freshman science program or its equivalent, and awarded a Bachelor of Science degree upon graduation. The curriculum provides a broad education in basic sciences and a fundamental knowledge of environmental health. Emphasis is placed on the evaluation and control of major environmental health problems in developing countries in such fields as water supply, waste disposal, food hygiene, occupational health, air and control of disease vectors. Students in this program are also required to take public health courses in the fields of epidemiology, biostatistics, health services administration, and public health education, which lead to a minor in public health.

Due to increased environmental concerns, Lebanon and countries in the region are in great need of qualified personnel capable of planning and implementing programs for the improvement of the human environment. This provides great job opportunities for graduates of this program in various sectors such as public/governmental agencies, international organizations, private companies, nongovernmental organizations and academic/research institutions.

ENHL 200  Environment and Health  3.0; 3 cr.
This course exposes the students to major local and global environmental issues relating to air, water, land and energy and the importance of proper integrated management to promote and protect public health and achieve sustainable development. In addition, the course highlights the importance of environmental laws and policies as major tools in the management of environmental health issues. Environmental ethics is also emphasized as a critical core factor of the management processes. The importance of environmental awareness of different stakeholders is exposed as a means to achieve proposed objectives. Open to freshman students only.

ENHL 220  Introduction to Environmental Sciences  3.0; 3 cr.
An introductory course that explores the interdisciplinary nature of environmental studies. This course covers a variety of topics: population growth, biodiversity, air and water pollution, work environment, domestic and hazardous wastes, energy, technology, environmental economics, ethics, and policy. Preventive and control programs are discussed within the overall context of sustainable development.

ENHL 221  Management of Domestic and Hazardous Wastes  3.0; 3 cr.
A course that introduces the elements of solid waste management: sources, characterization, generation rates, collection, transportation, and disposal technologies. Concepts are presented within the context of integrated management: reduction, recycling, reclaiming, and disposal. Socioeconomic implications at the community and national levels are emphasized. Prerequisite: ENHL 220.

ENHL 230  Food Quality and Control  4.0; 4 cr.
A course that introduces the concept of quality control in terms of wholesomeness and safety. Management of food from production to consumption (preparation, processing, preservation, storage, marketing, trading) is thoroughly discussed. Emphasis is placed on the development, implementation, and appraisal of food control programs (such as HACCP) at the national and international level. Prerequisites: BIOL 200/201, CHEM 208 and ENHL 220.

ENHL 231  Water and Wastewater Quality Control  3.0; 3 cr.
A course that focuses on the principles of water management (both in quantity and quality) with emphasis on fresh water resources for domestic and multi-purpose utilization. Characterization, treatment, reclamation, and recycling of wastewater are also discussed. National and international guidelines, standards, and directives for water and wastewater management are presented. Prerequisite: ENHL 220.

ENHL 232  Instrumentation, Analytical Techniques and Sampling  2.3; 3 cr.
A course that focuses on the basic concepts and application of different sampling methods, and instrumental and analytical techniques: electrical conductance, absorption spectrophotometry (visible, ultraviolet light, infrared, atomic absorption), emission (flame photometry) and chromatography (gas chromatography, high performance liquid chromatography, ion chromatography).

ENHL 233  Quality Determination of Water and Wastewater  1.4; 3 cr.
A course that focuses on the quality determination (physical, chemical, biochemical, and microbiological) of water and wastewater samples using standard analytical techniques. Students are required to write professional quality assessment reports. Proper presentation and interpretation of results and practical recommendations for preventive or corrective measures are emphasized. Prerequisites: ENHL 220, ENHL 231 and ENHL 232.

ENHL 234  Occupational Health and Toxicology  3.2; 4 cr.
A course that provides an overview of the general principles relating to occupational health and toxicology. Exposures to hazardous agents in the environment are discussed with emphasis on the working environment, routes of entry, mode of action, toxicity, metabolism, and dose-response relationships. Health hazards to workers and principles of recognition, evaluation, and control of work hazards are presented. The principles of risk assessment are introduced. Prerequisites: BIOL 200/201, CHEM 208/209 and ENHL 220.

ENHL 236  Summer Field Training  0 cr.
Field training is offered to students at the end of their second year in the environmental health program. This course provides students with practical and field experience to supplement the theoretical and laboratory knowledge. Visits to selected sites include: water and wastewater treatment plants, food industries and establishments, landfills, and other areas. Emphasis is placed on writing technical reports, evaluating environmental conditions, and recommending corrective and control measures. This course also introduces the principles of geographical information systems, walk-through surveys, and management of community-based environmental programs. Prerequisite: Completion of the requirements of first and second year.
**ENHL 237  Environmental Microbiology**  
3.3; 4 cr.  
In its first part the course covers the fundamental aspects of microbiology in relation to environmental health. In its second part the course covers infectious diseases of man and animals transmitted through air, fresh and saline water, food, soil, municipal solid wastes, and wastewater. The laboratory sessions cover basic microbiological techniques and applications (aseptic and cultivation techniques, microscopy, microbial growth requirements, biochemical profile of micro-organisms, and antibiotic sensitivity testing) and expose students to principles of quality assessment of environmental samples by applying standard analytical techniques and emphasizing quality control protocols. **Prerequisites:** BIOL 200/201 and ENHL 220.

**ENHL 241  Indoor and Outdoor Air Pollution**  
3.0; 3 cr.  
A course that discusses exposure and health effects of indoor (e.g., asbestos, tobacco smoke, formaldehyde, radon) and outdoor air pollutants. Students are introduced to modeling, quality determination, and management strategies. **Prerequisites:** CHEM 208, ENHL 220 and senior standing.

**ENHL 242  Environmental Management Tools and Applications**  
2.4; 3 cr.  
A course that provides an overview of the general principles relating to environmental management tools and applications. Topics covered include environmental impact assessment, environmental auditing, and environmental regulations and standards. To provide students with practical experience, they are requested to conduct a community-based environmental health project. Emphasis is placed on investigating the problem and proposing management strategies. **Senior standing required. Prerequisite:** Completion of all the ENHL courses of first and second year, co-requisite ENHL 241.

**ENHL 243  Global Environmental Issues**  
1.6; 3 cr.  
A course that reviews a specific global environmental issue in which students are required to write a paper and present a seminar on the selected topic. Emphasis is placed on stating the problem clearly and presenting control strategies and recommendations for action plans. **Senior standing required. Prerequisites:** ENHL 241 and 242.

<table>
<thead>
<tr>
<th>Modes of Analysis</th>
<th>English and Arabic(9)</th>
<th>Humanities (12)</th>
<th>Social Sciences (12)</th>
<th>Natural Sciences (9)</th>
<th>Quantitative Thought (6)</th>
<th>Major Courses</th>
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<tr>
<td>Lecture Course (9+12+12+9+6+27)</td>
<td>1. Required Arabic Course (3)</td>
<td>PHIL 209(3), 3 electives (9)</td>
<td>1. HMPD 251(3)</td>
<td>1. BIOL 200(4)</td>
<td>1. EPHD 203(3)</td>
<td>ENHL 220(3), 221(3), 230(4), 231(3), 233(3), 234(4), 237(4), 241(3)</td>
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<td>2. HPCH203(3)</td>
<td>2. CHEM 209(3)</td>
<td>2. EPHD 213(3)</td>
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<tr>
<td>Lab (4+4)</td>
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<td>3. HPCH 237(3) or HMPD 204(3)</td>
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<td>4. non-FHS elective (3)</td>
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<td>ENHL 236</td>
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</table>

Students take, in addition to the above required courses, 9 or 12 free elective credits in various fields and modes of analysis.
Department of Epidemiology and Population Health

Chairperson: Chaaya, Monique M.
Professors: Chaaya, Monique M.; Sibai, Abla M.; Zurayk, Huda C.
Professor of Public Health Practice: Myntti, Cynthia L.
Associate Professor: DeJong, Jocelyn L.
Assistant Professors: Al-Dewachi, Omar A.; Ghandour, Lilian A.; Jaffa, Miran A.; Mahfoud, Ziyad R.
Visiting Assistant Professor: Yassin, Nasser K.
Assistant Research Professor: Kobeissi, Loulou H.
Instructors: El Roueiheb, Zana Y.

The Department of Epidemiology and Population Health offers required and elective courses to undergraduate students in the Faculty of Health Sciences. The courses introduce students to the basis of Epidemiology and Biostatistics, Survey Methods, and Population Health.

**EPHD 203  Epidemiology and Biostatistics  2.2; 3 cr.**
An introductory course offered to undergraduates on the basic principles of epidemiology and biostatistics. This course introduces students to the types and sources of data in measuring population health, the different epidemiological study designs, and exploratory data analysis. Furthermore, it introduces students to inferential statistical methods commonly used in the biological and health sciences. This course includes both theory and applications in the form of discussions and lab sessions, and introduces students to basic skills in the use of the statistical package SPSS.

**EPHD 213  Survey Methods  2.2; 3 cr.**
A course that covers basic principles of survey methodology, and enables the student to design and execute a survey research study. Topics covered include formulation of research questions and objectives, sampling and survey designs, question and questionnaire design for different types of survey topics, data collection techniques, analysis and interpretation of survey data, and research ethics. Prerequisite EPHD203 or an Introductory biostatistics or consent of instructor

**EPHD 227  Population and Development  2.1; 3 cr.**
A course designed to introduce students to important demographic concepts and which aims to enable them to analyze how population trends have consequences for society, the environment and public health. Special emphasis will be placed on the Middle East and North Africa, examining issues such as changes in marriage, the family and in age-structures and why these are important in the region.

*On leave
+ Seconded to the Center for Research on Population and Health (CRPH)
P Part-time
Department of Health Promotion and Community Health

Chairperson: Makhoul, Jihad J.
Professor: Afifi, Rima A.
Associate Professors: Kabakian-Khasholian, Tamar K; Makhoul, Jihad J.
Assistant Professors: Abdulrahim, Sawsan A.; Osman, Hibah O.
Assistant Research Professor: Nakkash, Rima T.
Senior Lecturer: El Kak, Faysal H.
Lecturer: Kallash-El-Khoury, Michel R.
Instructor: Kanj, Mayada F.
Instructor of Public Health Practice: Ghazar Aline, H.

Departmental courses are designed to introduce students to the theory and concepts of the field of Health Promotion and Community Health, with an emphasis on the socio-cultural aspects of health behavior change. The Department of Health Promotion and Community Health contributes courses to undergraduate programs. The department also contributes courses to and coordinates a Teaching Diploma in Health Education with the Department of Education at the Faculty of Arts and Sciences.

The department hosts the Health Education Resource Unit (HERU) which was established in 1986 to act as the service arm of the Department. HERU is a community oriented initiative that serves as a resource for health promotion for Lebanon and the Arab region by developing health education materials, training health promotion professionals, networking, and conducting service related research in response to community needs.

The following courses are offered by the Department:

**HPCH 200 Global Public Health** 3.0; 3 cr.
In this course, students will receive an introduction to global public health issues with special emphasis on developing countries and through the framework of liberal education. As such, students will learn basic principles of public health in ways that encourage them to become more civically responsible. This will be accomplished through readings from the sciences, social sciences, and the humanities on public health issues which influence the region. Students will be trained in the course to critically evaluate health problems, identify contributory causes, propose solutions and think about strategies to improve health.

**HPCH 201 Health Awareness** 3.0; 3 cr.
A course that aims to increase understanding of the social dimensions of health and illness and the factors that relate to healthy living. This course tackles common health concerns as they relate to the individual, with an emphasis on prevention and wellness lifestyle behavior. This course is open to students from all faculties.

**HPCH 203 Health Communication** 2.2; 3 cr.
A course that provides an introduction to the assumptions we make about communication and key elements of the communication process. Factors that inhibit communication as well as some of the functions of communication as they relate to increasing positive health behavior and group effectiveness are dealt with. This course aims to enhance writing and oral presentation skills, as well as effective interaction skills with peers and supervisors at work. *Students cannot receive credit for both HPCH 203 and EDUC 238."

**HPCH 209 Socio-Cultural Factors in Health and Illness** 3.0; 3 cr.
An introductory course on the social and behavioral theories and concepts that apply to the analysis of health-related behaviors. Emphasis is placed on core concepts relating to health and illness, and on the main models relating to the study of health behavior at the personal, familial, institutional, and cultural levels.

**HPCH 237 Theories and Methods of Health Education** 3.0; 3 cr.
A course that introduces students to the major theories of health behavior and health promotion. Emphasis is placed on the application of health behavior theories to health promotion and education practice. *Students cannot receive credit for both HPCH 237 and EDUC 237.*
Department of Health Management and Policy

Chairperson: Saleh, Shadi S.
Associate Professor: Saleh, Shadi S.
Associate Professor of Public Health Practice: Kassak, Kassem M.
Assistant Professors: Alameddine, Mohamad S.; El-Jardali, Fadi M.; Tanzi, Vito L.
Senior Lecturer: Jabbour, Samer H.
Instructor: Germani, Aline S.

Departmental courses are designed to introduce students to the principles and practices in the field of health management and policy, with an emphasis on managerial functioning in healthcare organizations. The Department offers a few undergraduate courses in health administration, and contributes to courses, catered to major and minor programs.

The following courses are offered by the department:

HMPD 203  Medical Terminology  1.0; 1 cr.
A course that provides students with a basic understanding of the principles of medical term construction and a vocabulary of commonly used terms in diagnosis, operations, radiological investigations, and laboratory tests.

HMPD 204  Introduction to Health Services Administration  3.0; 3 cr.
A course that provides students with basic knowledge and skills demanded to assist in managing healthcare and related organizations. The objective of the course is to acquaint the students with the principles of healthcare systems, human resources management, financial materials management, and issues related to quality of care and regulation.

HMPD 212  Introduction to Health Planning  3.0; 3 cr.
A course that portrays the application of planning theory to health concerns. This course covers basic terms and concepts relating to health planning and also acquaints students with some tools of prediction and decision-making.

HMPD 251  Introduction to Health Care Economics  3.0; 3 cr.
An introduction to the basic principles of microeconomics and the elements necessary to apply these principles to the health care field. This course introduces usable economic tools, especially those that will improve the efficiency of resource allocation and decision-making in the health sector.

* On research leave
P Part time
Program of Medical Laboratory Sciences

Coordinator: Ramia, Sami T.
Professor: Ramia, Sami T.
Assistant Professor: Melhem, Nada M.
Visiting Assistant Professor: Yazbeck, Soha N.
Instructor: Khatib, Rolla J.

This program is run in coordination with the Department of Pathology and Laboratory Medicine in the Faculty of Medicine.

The MLS program is designed to prepare students for a career in the profession of medical laboratory sciences by acquiring theoretical knowledge and practical skills in various disciplines of the specialty. Besides presenting theoretical knowledge, the program is dedicated to training students in the reliable performance of physical, chemical, and biological tests by utilizing routine and automated techniques. In addition, students are trained to develop the ability to interpret generated laboratory results and hence contribute to the diagnosis of disease. Continuing one's education, and updating skills and knowledge, as well as medical professional ethics, are emphasized.

MLSP 201 Clinical Hematology I 3.0; 3 cr.
A course that introduces students to fundamental concepts in hematology, including the development of blood cell elements, normal physiology of blood cells, and their disorders. This course focuses on anemia, with a special emphasis on diagnosis. First semester.

MLSP 202 Clinical Hematology II 3.0; 3 cr.
A course that consists of lectures and demonstrations in hematology with emphasis on coagulation and hemostatic disorders, white blood cell anomalies, and leukemia. Second semester.

MLSP 203 General Microbiology 2.3; 3 cr.
A course that covers structure and morphology of micro-organisms, nutritional requirements and growth, sterilization and disinfection, introduction to microbial genetics, collection and handling of clinical specimens, culture techniques for clinical specimens and expected pathogens, antibiotic sensitivity testing, and assay. First semester.

MLSP 204 Systematic Bacteriology 2.3; 4 cr.
A course that covers the characteristics of bacteria of medical importance with concentration on the diseases they cause, pathogenesis, mode of transmission, control and methods for isolation, identification, and interpretation of results. Second semester.

MLSP 207 Immunology and Blood Banking 2.0; 2 cr.
A course that consists of lectures in basic immunology, including types of immune responses, cells of the immune response, antigens, antibodies, and complement system, as well as basic principles in blood banking and transfusion medicine. First semester.
**MLSP 208** General and Diagnostic Virology  
2.0; 2 cr.  
An introduction to virology covering the general characteristics of viruses, their classification, mode of transmission, pathogenesis, and the diseases they cause in man, is the focus of the first part of this course. The second part emphasizes viral diseases of public health importance, including their epidemiology, control, and possible prevention. *First semester.*

**MLSP 211** Seminar  
1.0; 1 cr.  
A seminar in which students are trained to read recently published scientific papers in medical journals, summarize, and present the information. This process also involves discussion and critiques of the presented manuscripts. *Second semester.*

**MLSP 259** Diagnostic Serology  
1.0; 1 cr.  
An introduction to the principles of serologic reactions and laboratory techniques in the diagnosis of infectious diseases. *Second semester.*

Below are descriptions of the required courses offered by several departments at the Faculty of Medicine: Biochemistry, Microbiology and Immunology, Pathology and Laboratory Medicine, and Physiology.

**BIOC 255** Biochemistry for MLSP  
45.0; 3 cr.  
The course provides an overview of structure, function, and metabolism of basic biological micro/macromolecules; a general review of the genetic makeup; and emphasizes the clinical relevance by correlating disease to basic information. The course is an introductory biochemistry course, offered to undergraduate students in the Medical Lab Sciences Program and related fields. Prerequisite or corequisite: CHEM. 208 or CHEM 211. *Second semester.*

**LABM 201/202** Clinical Chemistry I and II  
2.0; 2 cr.  
A pair of courses in which the main objective is to acquaint students with fundamentals of clinical chemistry, including various analytical procedures, instrumentation, and methods used for determination of clinical analyses. Correlation of laboratory results with clinical manifestation is also an integral part of these courses. These two courses cover all aspects of routine clinical chemistry testing, such as carbohydrates, electrolytes, acid-base balance, blood gases, nitrogen metabolites, proteins, enzymes, liquids and lipoproteins, and liver function. *First and second semester respectively.*

**LABM 210** Cytology and Histological Techniques  
32.0; 2 cr.  
A course that includes a series of lectures and demonstrations on cell biology, a review of normal histology of various human organs, a description of examples of pathological changes, lectures on techniques of tissue handling, and preparation and staining of sections and smears for cytological material. *Members of the department and the department of Human Morphology.*

**LABM 220** Clinical Chemistry and Endocrinology  
0.128; 4 cr.  
Practical experience in clinical chemistry and endocrinology. *Eight weeks.*

**LABM 230** Clinical Hematology and Reception  
0.128; 4 cr.  
Practical experience in clinical hematology special procedures and reception area. Prerequisites: MLSP 201 and MLSP 202.

**LABM 233** Genetics and Molecular Biology  
2.0; 2 cr.  
A course that includes an introduction to human genetics, comprising the structure and function of DNA and the classification of genetic disorders. Diagnostic techniques in human genetics (cytogenetics, biochemical, and molecular) will be covered, as well as molecular techniques applied in pathology and microbiology.

**LABM 234** Special Topics/Techniques in Laboratory Medicine  
2.0; 2 cr.  
A course that provides theoretical knowledge in specialized topics including endocrinology, chromatography, toxicology, tumor markers, therapeutic drug monitoring, flowcytometry, molecular testing, advanced clinical microbiology, antimicrobial agents, blood banking and transfusion medicine, and total quality management.

**LABM 235** Medical Mycology  
1.0; 1 cr.  
A course that covers the different kinds and types of fungi (yeast and mold). This course discusses their disease spectrum mode of infection, gross requirements, and cultural and non-cultural methods of identifications as well as antifungal drugs and susceptibility testing of fungi.

**LABM 240** Clinical Microbiology  
0.128; 4 cr.  
Practical experience in clinical microbiology (aerobic and anaerobic bacteriology, mycobacteriology, mycology, and susceptibility testing). *Eight weeks.* Prerequisites: MLSP 203 and MLSP 204.

**LABM 250** Clinical Parasitology and Urinalysis  
0.64; 2 cr.  
Practical experience in clinical microscopy pertaining to parasitology, urinalysis, and spermogram. *Four weeks.* Prerequisite: MBIM 223.

**LABM 260** Serology  
0.64; 2 cr.  
Practical experience in clinical immunology and serodiagnostic techniques. *Four weeks.* Prerequisite: MLSP 259.

**LABM 270** Blood Banking  
0.64; 2 cr.  
Practical experience in blood banking and transfusion medicine. *Four weeks.* Prerequisite: MLSP 207.

**LABM 280** Cytogenetics, Molecular Diagnostics and Histotechniques  
0.64; 2 cr.  
Practical experience in reception, cytogenetics, and histotechniques. *Four weeks.* Prerequisite: LABM 210.

**MBIM 223** Parasitology for MLS Students  
39.39; 4 cr.  
*Second semester.*

**PHYL 246** Physiology for Nursing Degree Students and Undergraduates  
48; 4 cr.  
A course that outlines fundamental principles of human physiology and the mechanisms governing the function of different body organs. *Prerequisites: BIOC 246, BIOL 201 (or BIOL 210). Annually.*
Center for Research on Population and Health (CRPH)

Staff

Director: Zurayk, Huda C.
Assistant Research Professors: Kobeissi, Loulou H.; Nakkash, Rima T.
Program Administrator: Ismail, Ruba A.
Communications Coordinator: Dimechkie, Hala R.

Affiliates

Professors: Afifi, Rima A.; Chaaya, Monique M.; Ramia, Sami T.
Professor of Public Health Practice: Myntti, Cynthia L.
Associate Professors: DeJong, Jocelyn L.; Kabakian-Khasholian, Tamar K.; Makhoul, Jihad J.
Assistant Professors: Abdulrahim, Sawsan H.; Ghandour, Lilian A.; Mahfoud, Ziyad R.; 'Osman, Hibah O.
Visiting Assistant Professor: Yassin, Nasser K.
Senior Lecturer: 'El Kak, Faysal H.
Instructor: Kanj, Mayada F.
Associate: Khawaja, Marwan K.

The mission of the Center for Research on Population and Health is to strengthen and enrich the population and health research at AUB, and to support a program of interdisciplinary research on issues at the intersection of population and health. The Center seeks to promote collaboration among researchers and professionals with similar research interests in Lebanon, the region, and internationally, and to disseminate findings to scientists, policymakers, and the public.

Research Program

The Center’s current research programs focus mainly on the health of women and youth conceived broadly to include physical and mental health, as well as social well-being. Topics of research include women’s maternal and reproductive health, an assets approach for improving youth mental health, tobacco use and control policy, and others, all seen within the framework of social determinants of health. Multidisciplinary community and facility-based participatory research is undertaken, including surveys, qualitative investigations and intervention research.

Activities

Research Working Groups

The Center’s research activities are undertaken by research working groups formed through collaboration among FHS faculty, graduate students, and colleagues at AUB and in the region. These interdisciplinary research teams work on various dimensions of health, informed by population, public health, and sociological and epidemiological perspectives. Current research working groups include the regional Choices and Challenges in Changing Childbirth Group, the Youth Working Group, the Women’s Reproductive Health Working Group, the Bedouin Health Group and the Tobacco Control Group.

Research Networking

CRPH also supports an active regional network through its Visiting Fellows Program, periodic training workshops and conferences, and the maintenance of regional data sets. CRPH and FHS enjoy collaborative relationships with other institutions and groups in the region, including the Social Research Center at the American University in Cairo, the Institute of Community and Public Health at Birzeit University in Palestine, the Department of Community Medicine at Damascus University, and the regional FHS-based Reproductive Health Working Group.

Research Support

The Center provides researchers at FHS with access to resources and technical support in terms of computing and analysis; access to the CRPH computing lab and regional data sets; limited computing support for data entry and statistical analysis; training for field researchers in data analysis, statistical computing, and qualitative methods; assistance to affiliates in proposal development, including budgeting and logistical support for survey field operations.

Outreach

The Center is committed to the broad dissemination of all research findings through publications and printed materials including research briefs, working papers, bi-annual newsletters, and workshops and conferences.
Outreach and Practice Unit (OPU)

Staff

Coordinator: Yassin, Nasser K.
Associate Professor of Public Health Practice: Kassak, Kassem M.
Instructors: Germani, Aline S.; Kanj, Mayada F.
Instructors of Public Health Practice: Ghazar, Aline H.; Mohanna, Zeina K.

Advisory Committee

El Kak, Faysal; Habib, Rima; Jabbour, Samer; Jurdì, Mey; Kobeissi, Loulou; Melhem, Nada; Nakkash, Rima; Saleh, Shadi; representative from the community, and representative from FHS Alumni

The Outreach and Practice Unit (OPU) fosters the link between academic programs, research and service to the society at large. The OPU aims at facilitating the transfer of skills and knowledge in the field of public health, building community partnerships, developing human capabilities, endorsing service learning, and enhancing the culture of collective responsibility.

The Unit has three goals:

• To develop and implement community partnerships to promote individual and community health; and to advance service learning.
• To contribute to the development of human capital and capability in public health in Lebanon and the region, by offering diverse, multidisciplinary and financially sustainable training.
• To impact policy-making in Lebanon and the region through transferring evidence based knowledge generated from rigorous and community-based research.

The three goals are reflected into three components each led by a coordinator as follows:

1- Community Engagement and Services (Coordinated by Aline Germani)
2- Workforce development and continuing education/Training and Workshops (Coordinated by Kassem Kassak)
3- Informed Policy (Coordinated by Nasser Yassin).

OPU works closely with different national, regional, and international entities including but not limited to the Bloomberg School of Public Heath at Johns Hopkins University, Institute of Community and Public Health at Birzeit University, United Nations Populations Fund (UNFPA), International Rescue Committee (IRC), World Education Inc. USA, and Lebanese Health Management Association (LHMA).
Rafic Hariri School of Nursing (HSON)
Rafic Hariri
School of Nursing

Historical Background
The School of Nursing, founded in 1905, was the first nursing school in the Middle East. The five-year Bachelor of Science in nursing program, established in 1936, was replaced in 1964 by a four-year program leading to the degree of Bachelor of Science in Nursing. Students entering the school as sophomores graduate in three calendar years. A two-year associate degree in nursing program was established in 1980 and discontinued in 1984. The RN-BSN program was reactivated and launched in 2003. The Masters of Science in Nursing (MSN) program was launched in 2003. The Bachelor of Science in Nursing program (BSN) and the MSN programs are registered by the Department of Education of New York State, HEGIS codes 1203.00 and 1203.10, respectively. The BSN and MSN programs are accredited by CCNE, the Commission on Collegiate Nursing Education, in the USA. AUB School of Nursing is the first School of Nursing outside the US territories to be accredited by CCNE.

Mission
The mission of the School of Nursing is to promote and maintain the highest educational standards of excellence, integrity, and professionalism in nursing, following the American model of nursing education and practice. The school aims to provide learning opportunities that will enable students to develop into competent nurses who respect cultural diversity while coordinating and delivering high-quality, compassionate nursing care in Lebanon and the region, guided by ethical principles. The faculty believes education is an interactive process between faculty and students with both taking responsibility for active learning. The baccalaureate program, drawn primarily from the humanities, sciences, and caring disciplines, focuses on the use of nursing theory and research as a basis for practice. The master’s program focuses on preparing nurses for advanced nursing practice roles, and is based on the use and generation of research-based knowledge to guide practice. Nursing students at AUB learn to think critically, develop professional attitudes and leadership skills, and appreciate the value of life-long learning and freedom of speech.

Vision
The School of Nursing aspires to become the leading school of nursing in Lebanon and the region; nationally and internationally recognized for excellence in education, research, and service. The school is committed to offering cutting-edge culturally-relevant and internationally recognized graduate and undergraduate education, fostering life-long learning and scholarship, developing leaders in nursing and health care, and attracting a competent and culturally diverse student body.

Undergraduate Program Outline
Admission
Students holding diplomas from a 12-year secondary school may gain admission to the School of Nursing as first year nursing students (see pp. xx-xx for required courses at the freshman level). Freshman students wishing to transfer to the School of Nursing from AUB or another institution may gain admission provided they complete the required freshman courses.
Bachelor of Science in Nursing (BSN)
The School of Nursing follows the admission policies and criteria of the University. For further details see the section on Admissions on pp. xx-xx of this catalogue.

RN–BSN Program
The curriculum is designed to permit the graduates of a technical program in nursing to pursue the degree of Bachelor of Science in Nursing provided the university entrance requirements are met. The time limit for completion of the program should not exceed six calendar years. A selected number of nursing courses may be validated if applicable.

Preferred requirement for admission to the program is three years experience, in addition to the English Entrance Exam. The candidate may be asked to interview with the school’s director and/or program coordinator.

BS/BA–BSN Accelerated Program
The School of Nursing accelerated program is designed for individuals who have a BS/BA in fields other than nursing. The streamlined curriculum permits students to earn a BSN in 24 months. Students who graduate from this program are entitled to sit for the National Colloquium Exam to become registered nurses. The admission to the BS/BA–BSN program requires the following:

- BS/BA degree in a field other than nursing
- A minimum GPA of 75 including prerequisite courses and general education requirements
- Completion of the following pre-requisite courses prior to admission: Engl 203, 204, PSYC 202, Biostat course, PSYC 229, SOAN 201, and four elective courses.

Dual Degree
Students may, upon approval of the Faculty concerned, complete the requirements for a second degree while registered in another Faculty at AUB. In such a case, a student will be granted two degrees at the same time of graduation. If tuition differs, students will pay the higher of the tuitions.

Information about deadlines and applications are available on the following link: http://www.aub.edu.lb/registrar/Documents/pdfdoc/dualdegree.pdf

Courses

Numbers Preceding Course Titles
Nursing courses are numbered according to level and they normally follow a sequence. See curriculum for the Bachelor of Science in Nursing and course descriptions on pp. xxx-xx.

Numbers Following Course Titles
- The first number following the title of a course indicates the number of class hours per week.
- The second number indicates the clinical hours required each week.
- The last number indicates the number of credit hours applied toward graduation. The credit assigned to each course is stated for the semester.

Frequency of Courses
Courses marked fall/spring/summer are offered accordingly during each academic year.

Graduation Requirements
All recommendations for graduation are made by vote of the faculty, upon the recommendation of the academic committee.

To be eligible for graduation with the degree of Bachelor of Science in Nursing, the requirements include the following:

- completion of the prescribed program of study with a minimum of 102 credits after the freshman class or equivalent, 90 credits for those entering as registered nurses
- an overall average of 70, excluding freshman courses
- the maximum time allowed for the completion of the degree program should be within the following specified periods:
  - BSN I eight calendar years
  - BSN II six calendar years
  - BSN III four calendar years
  - BSN IV two calendar years

Students must petition the academic committee for an extension of time if needed.

All undergraduate transfer students from AUB or from other recognized institutions of higher learning, to the School of Nursing need to complete the required prerequisites and all required nursing courses. A minimum residency period of one year or 30 credits for within AUB transfers, and 45 credits for transfers from outside must be completed at AUB.

Course credits pertinent to the nursing curriculum may be transferred according to criteria set by the admission and academic committees.

Licensing
Graduates are qualified for the licensing examination in Lebanon (Colloquium).
Academic Rules and Regulations

For information on Academic Advisers, Categories of Students, Correct Use of Language, and Graduation with Distinction and High Distinction, see pp. xx–xx for General University Academic Information in this catalogue.

Attendance

Classes and Laboratories

- Students are expected to attend all classes, laboratories, and any other required activities. Absence by students, whether excused or not, from any class or laboratory session, does not excuse them from their responsibility for the work done or for any announcements made during their absence.
- Students who are absent from more than one fifth of the number of lectures of any course during a semester lose all credit for the course.
- Students may not be excused from laboratory and field requirements. All missed clinical and field requirements must be made up. In case of repeated absences from clinical courses, over one fifth of the total hours, the student may be asked to drop the course.
- A student who withdraws from a theory course has to withdraw from the corresponding clinical course.

Examinations and Quizzes

- Students are not allowed to be absent from announced final examinations and quizzes unless they present an excuse considered valid by the coordinator of the course. The course coordinator may then require the student to take a make-up examination.
- Students taking non-nursing courses from the Faculty of Medicine and other faculties of the University are required to follow the attendance regulations of that faculty.

Grading System

In the Rafic Hariri School of Nursing the following grading system is used:

<table>
<thead>
<tr>
<th>Cumulative Average</th>
<th>GPA</th>
<th>Cumulative Average</th>
<th>GPA</th>
<th>Cumulative Average</th>
<th>GPA</th>
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<tbody>
<tr>
<td>&lt;60</td>
<td>0</td>
<td>67</td>
<td>1.86</td>
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<tr>
<td>60</td>
<td>1</td>
<td>68</td>
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<td>76</td>
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<tr>
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<td>78</td>
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<td>63</td>
<td>1.38</td>
<td>71</td>
<td>2.31</td>
<td>79</td>
<td>3.11</td>
</tr>
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<td>1.5</td>
<td>72</td>
<td>2.42</td>
<td>80</td>
<td>3.2</td>
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<tr>
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<td>1.63</td>
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<td>1.74</td>
<td>74</td>
<td>2.62</td>
<td>82</td>
<td>3.38</td>
</tr>
</tbody>
</table>

I  Incomplete, P  Pass, PR  In Progress, W  Withdraw, F  Fail
All final grades are expressed in multiples of one.

Incomplete Grades

- Incomplete course work will be reported as an “I” followed by a numerical grade reflecting the evaluation of the student available at the end of the semester. This evaluation is based on a grade of zero on all missed work and reported in units of five—thus a grade could be 155 for example.
- To secure permission to complete the work for a course, a student must submit a valid excuse to the instructor of the course and the academic committee within two weeks from the date of the scheduled final exam for the course.
- Students permitted to complete work for a course must do so within four weeks from the start of the next regular semester. After the incomplete work is done and evaluated by the faculty member, a grade change will be considered by the director of the school (upon the recommendation of the academic committee) and a new grade reported to the Office of the Registrar.
- If no valid excuse is present and the work, if permitted, is not completed within the time limits specified above, the “I” will be dropped, and the numeric grade available becomes the final grade in the course.
- For the purposes of averaging the numeric grade is used, until changed through the procedure set above.

Withdrawal from a Program

To maintain student status, a student must register every semester, excluding the summer session, unless required by the program. Students who do not register can be readmitted provided they can complete the requirements within the time limit of the program.

Promotion

Students shall be promoted at the end of the summer session after completion of 30 or more credits beyond the requirements from the previous level. However, students who register in October, lacking six or fewer credits for completion of a class, will be registered in the next higher class at the discretion of the academic committee. In order to be promoted, students must attain a minimum average of 65 in the sophomore year and 70 in the following years.

Placement on the Dean's Honor List

To be placed on the Dean's Honor List at the end of a semester a student must

- carry at least twelve credits of courses other than those repeated
- not be on probation
- have passed all the courses of the semester and attained in all the courses an overall average of 85 or be ranked in the top 10 percent of the class and have an overall average of 80.
- not have been subjected to any disciplinary action within the University

Failures and Deficiencies

Placement on Probation

A student will be placed on probation for any of the following reasons:
When, in accordance with university regulations, a student is dropped, the implication is that the student is not qualified to continue his/her education at the School of Nursing. Consideration for readmission is given for one of the following reasons:

- if the student was not able to do his/her work efficiently because of health reasons (in such cases, the school relies on a medical report from the university physician)
- if the adviser of the student or a faculty member or administrative official of the University knows of certain family problems that may have influenced the academic achievement of the student
- if, after spending one or two years at another institution, the student is able to present a satisfactory record and recommendation

Ordinarily, supporting documents for the first two reasons must be presented within 30 days after the student is dropped from the school, but in exceptional cases this presentation may be made at the beginning of the following regular semester.

If a student is on probation and leaves the University after the tenth week of the semester, the academic committee will decide whether the student will be allowed to return to the University.

**Disciplinary Action**

A student engaging in academic misconduct, such as cheating on examinations or plagiarism, will be referred to the Student Affairs Committee and the Director.

**Awards**

**Penrose Award**

A non-cash honorary award made on the basis of scholarship, character, leadership, and contribution to university life, to an outstanding graduate of the school.

**Women’s Auxiliary Awards**

- Mary Crawford (Florence Nightingale)
- Nada Alameddine Kanso
- Emily Asfour
- Poppy Haddad
- Alexandra Jureidini
- Najla Morston
- Henriette Sabra
- Hanneh Shahine
- Ann Smith
- Leila Ilya

Cash and certificate awards are granted to senior students who meet the following criteria: academic achievement, professional integrity and seriousness of purpose, contribution to professional and university life, and willingness to join AUBMC after graduation.
### Second Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>No. of Weeks</th>
<th>Lecture Hrs.</th>
<th>Lab. or Clinical Hrs.</th>
<th>Total Clock Hrs.</th>
<th>Credit Hrs.</th>
</tr>
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<tbody>
<tr>
<td>NURS 201</td>
<td>Introduction to Nursing Practice</td>
<td>16</td>
<td>16</td>
<td>35</td>
<td>51</td>
<td>2</td>
</tr>
<tr>
<td>NURS 202</td>
<td>Health Assessment</td>
<td>16</td>
<td>16</td>
<td>35</td>
<td>51</td>
<td>2</td>
</tr>
<tr>
<td>PHYL 246</td>
<td>Physiology for Nursing</td>
<td>16</td>
<td>64</td>
<td>-</td>
<td>64</td>
<td>4</td>
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<tr>
<td>MBIM 237</td>
<td>Microbiology and Immunology</td>
<td>16</td>
<td>32</td>
<td>28</td>
<td>60</td>
<td>3</td>
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<tr>
<td>ENGL 204</td>
<td>Advanced Academic English</td>
<td>16</td>
<td>48</td>
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<tr>
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<td><strong>176</strong></td>
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<td><strong>274</strong></td>
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### Summer Session

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<th>Credit Hrs.</th>
</tr>
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<tbody>
<tr>
<td>NURS 210</td>
<td>Pathophysiology</td>
<td>8</td>
<td>32</td>
<td>-</td>
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<tr>
<td>PSYC 229</td>
<td>Human Growth and Development</td>
<td>8</td>
<td>48</td>
<td>-</td>
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<td>3</td>
</tr>
<tr>
<td>NURS 203</td>
<td>Biostatistics for Nurses</td>
<td>8</td>
<td>48</td>
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<td><strong>Total</strong></td>
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### Third Year

#### First Semester

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>No. of Weeks</th>
<th>Lecture Hrs.</th>
<th>Lab. or Clinical Hrs.</th>
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<th>Credit Hrs.</th>
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<tbody>
<tr>
<td>PHRM 240</td>
<td>Pharmacology</td>
<td>16</td>
<td>48</td>
<td>-</td>
<td>48</td>
<td>3</td>
</tr>
<tr>
<td>NURS 300</td>
<td>Nursing Care of Adults I, Theory and Practicum</td>
<td>16</td>
<td>32</td>
<td>112</td>
<td>144</td>
<td>5</td>
</tr>
<tr>
<td>NURS 304</td>
<td>Nursing Care of the Expectant Family, Theory and Practicum</td>
<td>16</td>
<td>32</td>
<td>112</td>
<td>144</td>
<td>5</td>
</tr>
<tr>
<td>SOAN 201</td>
<td>Introduction to the Study of the Society</td>
<td>16</td>
<td>48</td>
<td>-</td>
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<td>3</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>160</strong></td>
<td><strong>224</strong></td>
<td><strong>384</strong></td>
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#### Second Semester

<table>
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<tr>
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<th>Course Title</th>
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<th>Lecture Hrs.</th>
<th>Lab. or Clinical Hrs.</th>
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<th>Credit Hrs.</th>
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<tbody>
<tr>
<td>NURS 302</td>
<td>Nursing Care of Adults II</td>
<td>16</td>
<td>32</td>
<td>112</td>
<td>144</td>
<td>5</td>
</tr>
<tr>
<td>NURS 306</td>
<td>Nursing Care of the Children, Theory and Practicum</td>
<td>16</td>
<td>32</td>
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<tr>
<td>ELEC</td>
<td>Elective Humanities</td>
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<td>48</td>
<td>-</td>
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<td>ELEC</td>
<td>Elective Humanities</td>
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<td><strong>224</strong></td>
<td><strong>384</strong></td>
<td><strong>16</strong></td>
<td></td>
</tr>
</tbody>
</table>

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1. Students are required to choose from the freshman courses in natural sciences, social sciences and humanities. Natural Sciences BIOL 105 or 106; CHEM 102; GEOL 101,102 or 103; PHYS 101, 103 or 200; Social Sciences ECON 103, PSPA 101; Humanities ARRL 101, CVSP 110,111,112 or 150; ENGL 103, 104, 105, 106, 107 or 108; HIST 101, 100 Or 200; PHIL 101 or 102.
2. Electives as necessary to add up to 30 credits in total.
3. For Arabic speaking students. For other students credits have to be replaced by an elective.
4. One credit hour of laboratory is the equivalent of two clock hours weekly per semester; one clinical hour is the equivalent of three clock hours.
5. GE Refers to List of Courses under General Education Section.
6. Level is decided by placement test in the Department of English, Faculty of Arts and Sciences.
### Summer Session

<table>
<thead>
<tr>
<th>Course</th>
<th>No. of Weeks</th>
<th>Lecture Hrs.</th>
<th>Lab. or Clinical Hrs.</th>
<th>Total Clock Hrs.</th>
<th>Credit Hrs.</th>
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<tbody>
<tr>
<td>BIOC 246</td>
<td>8</td>
<td>48</td>
<td>-</td>
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<td>ENGL 203</td>
<td>16</td>
<td>48</td>
<td>-</td>
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<tr>
<td>PSYC 229</td>
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<td>ARAB 201A or B</td>
<td>16</td>
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**Total**

<table>
<thead>
<tr>
<th></th>
<th>No. of Weeks</th>
<th>Lecture Hrs.</th>
<th>Lab. or Clinical Hrs.</th>
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<td>96</td>
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### Fourth Year

#### First Semester

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<th>Course</th>
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<th>Lecture Hrs.</th>
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### Second Semester

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4 One credit hour of laboratory is the equivalent of two clock hours weekly per semester, one clinical laboratory hour is the equivalent of three clock hours.

5 GE Refer to List of Courses under General Education Section

6 Level is decided by placement test in the Department of English, Faculty of Arts and Sciences
### Course Descriptions

**NURS 200**  
Introduction to Nursing  
2.0; 2cr.  
Introduces concepts basic to the nursing profession. The nature of nursing as a profession, past, present, and future, is studied with a focus on the role of nurses in meeting the health needs of humanity throughout the health–illness continuum. **Fall.**

**NURS 201**  
Introduction to Nursing Practice  
1.2.3; 2cr.  
This course introduces students to concepts and interventions basic to nursing practice. The course uses the nursing process as the organizing framework, and the concepts of health, nursing, client, and environment are integrated throughout. Performance of basic client care skills are emphasized, including the scientific rationale for both health promoting and health restoring nursing interventions. **Prerequisites:** NURS 200 and HUMR 246. **Spring.**

**NURS 202**  
Health Assessment  
1.2.3; 2cr.  
The course focuses on assessment of health across the life span and provides the student with the knowledge and skills needed to assess the health status of individuals from infancy to old age. Emphasis is placed on assessment of the physical, psychosocial, and cultural dimensions of the individual. The course includes lectures and practical experiences in the assessment of individuals to identify normal and abnormal findings. **Prerequisite:** NURS 201. **Summer.**

**NURS 203**  
Biostatistics for Nurses  
3.0; 3cr.  
This course is designed to introduce the BSN students to the concepts and applications of statistics in the nursing field. The course starts with a general overview of probability, types of data, and ways to summarize and present them. The course then introduces the concept of hypothesis testing and the methods to carry them. Applications on the computer using the SPSS software will be discussed in class.

**NURS 205**  
Foundation of Professional Nursing  
2.0; 2cr.  
In this course students will explore recent issues affecting the nursing profession in terms of role expansion of the nurse. The nursing process is covered as an organizing framework for nursing practice.

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4 One credit hour of laboratory is the equivalent of two clock hours weekly per semester, one clinical laboratory hour is the equivalent of three clock hours.
5 GE Refer to List of Courses under General Education Section
7 Sequence I: one of the following courses: CVSP 201, 202, 205 or 207
8 Sequence II: one of the following courses: CVSP 203, 204, 206 or 208
NURS 210  Pathophysiology  2.0; 2cr.
This course focuses on the biologic alterations that affect body dynamic equilibrium or homeostasis. The content of this course is organized into three areas of focus based on the health–illness continuum: 1) control of normal body function 2) pathophysiology or alteration in body function 3) system or organ failure. Prerequisites: BIOC 246, HUMR 246, PHYL 246, and MBIM 237. Summer.

NURS 300  Nursing Care of Adults I, Theory and practicum  2.2; 6 cr.
This course covers scientific principles in the care of adults presenting with medical–surgical problems. It builds on the framework of man, environment, health and nursing. The practicum provides students with opportunities to apply knowledge in clinical practice. Prerequisites: NURS 200, NURS 210. Fall.

NURS 302  Nursing Care of Adults II, Theory and practicum  2.2; 6 cr.
This course is a continuation of NURS 300. Emphasis is placed on the following dysfunctions: metabolic and endocrine, neurologic, eye ear nose and throat, renal and urinary, integumentary, hepatic and biliary, rheumatic, as well as the infectious process. Prerequisites: PHRM 240, and NURS 300. Spring.

NURS 304  Nursing Care of the Expectant Family, Theory and Practicum  2.2; 6 cr.
This course focuses on reproductive health, from conception to the neonatal period. The content stresses the nurse’s role in reproductive health and risk. The practicum provides clinical application of knowledge, focusing on women in the childbearing cycle, the newborn, and families as clients in the hospital and outpatient settings. Prerequisites: NURS 202 and NURS 210. Fall.

NURS 306  Nursing Care of Children, Theory and Practicum  2.2; 6 cr.
This course focuses on the care of children, from infancy through adolescence. Topics include ambulatory and in-patient care, as well as primary, secondary and tertiary care. The practicum provides the students with opportunities to assess health needs of children based on knowledge of growth and development, and to implement nursing care, based on the nursing process. The roles of nurse as teacher, patient advocate and nurturer are emphasized. Prerequisites: PHRM 240, NURS 304, and PSYC 239. Spring.

NURS 307  Practicum I  0.9; 0cr

NURS 308V  Maternal Child Nursing, Theory and Practicum  3.9; 6cr.
This course focuses on the childbearing family from conception to the newborn period as well as primary and tertiary care of the ill child from infancy to adolescence. The clinical component emphasizes the application of knowledge acquired in class in the care of the childbearing family and children with illnesses from infancy to adolescence.

NURS 311V  Nursing Care of Adults, Theory and Practicum  3.9; 6cr.
Facilitates the development of advanced knowledge and application of scientific principles in the care of clients representing medical–surgical problems of the adult population. This course builds on the framework of person, environment, health status, and nursing. The clinical component provides an opportunity for advanced clinical application of concepts discussed in class in the care of patients and their families.

NURS 312  Mental Health and Psychiatric Nursing, Theory and Practicum  2.8; 5cr
The holistic philosophy of clients as bio–psycho–social entities is stressed in both mental health and mental illness. General theories of psychiatry and mental health therapies are presented. The course provides clinical experience in psychiatric–mental health settings. Emphasis is placed on the quality of coping abilities of clients in varying degrees of stress and crisis. Opportunities are provided for students to work collaboratively with multi-disciplinary health teams to assess, plan, and implement relevant nursing interventions in both mental health and illness. Prerequisites: SOAN 201, and PSYC 202. Fall and spring.

NURS 313  Leadership and Management in Nursing, Theory and Practicum  2.8; 5cr.
This course discusses concepts of leadership, management, creativity, analysis, power, change, and evaluation. Students investigate, analyze, and conceptualize the different modalities of leadership, utilizing nursing and management theories. The practicum allows the student to explore his/her role as a potential leader. The learner observes and assists in the practice of different modalities of leadership and managerial skills in a variety of health care settings.

NURS 314  Community Health Nursing, Theory and Practicum  2.8; 5cr
The course provides knowledge in the broad area of the field of nursing, public health, and primary health care. The levels of prime concern are the small group, including the family and its individual members, and the large group, including the community. The focus of the clinical component is on the promotion and maintenance of high levels of health and well-being, and prevention of illness and disability. Fall and spring.

NURS 400  Critical Care Nursing, Theory and Practicum  2.4; 4cr.
This course focuses on the care of clients with critical care problems. Emphasis is placed on cardiovascular and respiratory problems, neurologic disturbances, shock, sepsis, metabolic and endocrine imbalances, altered nutrition, renal failure, emergency and disaster nursing. The practicum provides opportunities to apply knowledge in clinical settings. Prerequisite: NURS 302. Fall.

NURS 402  Mental Health and Psychiatric Nursing, Theory and Practicum  2.8; 5cr.
This course provides the mental health setting for self-awareness and therapeutic use of self in effective communication. The holistic philosophy of clients as bio–psycho–social entities is stressed in both mental health and mental illness. General theories of psychiatry and mental health therapies are presented. The practicum provides clinical experience in psychiatric–mental health settings. Emphasis is placed on the quality of coping abilities of clients in varying degrees of stress and crisis, with experiences in working with multi-disciplinary health teams to assess, plan, and implement relevant nursing interventions. Prerequisites: Senior standing, SOAN 201, and PSYC 202. Fall and spring.

NURS 404  Nursing Informatics  2.0; 2cr.
This course focuses on the history of health care informatics, basic informatics concepts, and health information management applications. The student progresses from developing knowledge of basic concepts and methods of health care informatics; to learning about specific information management applications in health care administration, practice, education, and research; and finally to a hands-on experience with a specific application of his/her own choosing. Prerequisite: Consent of instructor. Fall.
NURS 405  Critical Care Nursing, Theory and Practicum  2.6; 4cr.
This course addresses the management of critically ill adults. Emphasis is placed on diagnostic reasoning, interventions, and outcome assessment in patients presenting with complex cardiovascular, respiratory, renal and metabolic problems, as well as trauma. The clinical component provides experiences where students apply concepts learned in class in critical care areas in the hospital. **Prerequisite: NURS 311V.**

NURS 406  Nursing Research  3.0; 3cr.
Focuses on the process involved in the scientific approach and its application to nursing. Special emphasis is on the basic research steps, the research design, assessment measures, and data analysis with a focus on research utilization. **Prerequisite: NURS 203. Fall.**

NURS 408  Community Health Nursing, Theory and Practicum  2.8; 5cr.
This course provides knowledge in the broad field of nursing, public health, and primary health care. The levels of primary concern are the small group, including the family and its individual members, and the large group, including the community. The practicum provides field practice through collaboration with other health professionals in primary care settings, with focus on health promotion, maintenance, and the prevention of illness and disability. **Prerequisite: Senior standing. Fall and spring.**

NURS 410  Leadership and Management in Nursing, Theory and Practicum  2.8; 5cr.
This course discusses how professional nursing incorporates the concepts of leadership, management, creativity, analysis, power, change, and evaluation. In this course students investigate, analyze, and conceptualize the different modalities of leadership, utilizing nursing and management theories. The practicum allows students to explore their role as potential leaders. Students observe and assist in the practice of different modalities of leadership and managerial skills in a variety of health care settings. **Prerequisite: Senior standing. Spring.**

NURS 411  Intensive Practicum in Area of interest  0.9; 0cr.
This course focuses on preparing students towards their transition to professional nursing practice. Opportunities are provided for students to synthesize knowledge and refine skills acquired in the planning, provision and evaluation of nursing care, communication, and interdisciplinary practice in a clinical area of their interest. Consent of instructor is required for the site of clinical practice. **Prerequisite: Senior standing. Spring.**
Radiologic Technology Training Program
Radiologic Technology Training Program

Program Coordinator: Mansour, Zepure

General Information

The Radiologic Technology program offers two years of theoretical and clinical training in all diagnostic imaging modalities. Theoretical training is provided in the program’s facilities located in the sub-basement of the Medical Center, and clinical training is provided in the Department of Diagnostic Radiology of the Faculty of Medicine.

The program also offers post-certificate courses in specialized imaging modalities.

Admission

The minimum requirement for admission to the first year is the Lebanese Baccalaureate, or its equivalent. Applicants must take the SAT I and the University’s English Entrance Examination or TOEFL, as specified in the admissions section of this catalogue.

Curriculum

First Year

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<td>Image Production and Processing 6</td>
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<tr>
<td>XR 226</td>
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<td>XR 228</td>
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Course Descriptions

XR 101  Orientation, Theory  3 cr.
An overview of the field of radiologic technology and its role in health care delivery. Students are oriented to academic and administrative structure, and the profession as a whole. Basic principles of radiation protection are introduced. The ethical and legal responsibilities of the profession are discussed.

XR 102  Clinical, Practicum  2 cr.
Clinical training in the Department of Diagnostic Radiology.

XR 103  Physics, Theory  7 cr.
A course that focuses on units of measurement, the structure of the atom, electrostatics, electricity, magnetism, AC generators, DC motors, transformers, and rectification of AC.

XR 104  Physics, Theory  7 cr.
An introduction to modern physics, production of x-rays, x-ray interactions, radioactivity, production of radionuclides, and health physics.

XR 105  Anatomy and Physiology, Theory  6 cr.
A course that provides students with a knowledge of the structure and function of the human body. Cells, tissues, skeletal and muscular system, nervous system, sense organs, and the endocrine system are discussed.

XR 106  Anatomy and Physiology, Theory  6 cr.
A course that describes the anatomy and physiology of the cardiovascular system, the blood, lymphatic and immune systems, respiratory, urinary and digestive systems, male and female reproductive systems, growth and development, and genetics and heredity.

XR 107  Image Production and Processing, Theory  6 cr.
An introduction to computer technology. Detailed study of various image-detecting systems; description of different types of films, screens, darkroom design, computed and digital radiography. A focus on computed radiography image quality.

XR 108  Image Production and Processing, Theory  6 cr.
A course that focuses on the chemistry of film processors, automatic film processing, daylight systems, overall radiographic image quality, sensitometric assessment of films, and digital image processing.

XR 109  Radiographic Technique, Theory  7 cr.
An introduction to radiographic procedures, radiographic nomenclature, positioning aids, and accessory equipment. This course also provides a description of radiographic procedures pertaining to upper and lower extremity, shoulder girdle, and pelvis.

XR 110  Radiographic Technique, Theory  7 cr.
A description of the radiographic procedures pertaining to the thorax, the vertebral column, the cranium, facial bones, and forensic radiography.

XR 111  Clinical, Practicum  2 cr.
Clinical training in the Department of Diagnostic Radiology.

XR 112  Fundamentals of Nursing and Patient Care, Theory  3 cr.
A course that provides knowledge and skills in selected techniques commonly performed by technologists. This course assists students in developing a greater understanding of patients as individuals, and the role of the technologist as a member of the health care team.

XR 114  Clinical, Practicum  4 cr.
Clinical training in the Department of Diagnostic Radiology.

XR 201  Special Procedures, Theory  6 cr.
An overview of contrast materials used in imaging. This course also provides a study of imaging procedures related to gastrointestinal, hepato-biliary, and genito-urinary.

XR 202  Special Procedures, Theory  6 cr.
A study of imaging procedures related to the circulatory system, breast imaging techniques and interventional procedures related to different systems.

XR 203  Radiologic Equipment, Theory  8 cr.
A detailed study of the x-ray tubes with methods of kV, mA, and exposure time control; control of scattered radiation, mammographic and tomographic equipment, image intensification, and television systems. A description and function of automatic film changers and pressure injectors.

XR 204  Radiologic Equipment, Theory  8 cr.
This course covers the topics of equipment design and function in computed tomography, nuclear medicine, ultrasonography, and magnetic resonance imaging.

XR 205  Introduction to Principles of Disease, Theory  5 cr.
An introduction to pathology that focuses on nature and causes of diseases, diseases of the gastrointestinal and hepato-biliary systems, and genito-urinary and endocrine systems.

XR 206  Introduction to Principles of Disease, Theory  5 cr.
A study of diseases of the nervous system, skeletal system, respiratory, cardio-vascular, and hematopoietic diseases; and miscellaneous diseases related to nutrition and the immune system.

XR 207  Sectional Anatomy, Theory  2 cr.
A study of the sectional anatomy of the head, neck, and thorax.

XR 208  Sectional Anatomy, Theory  2 cr.
A study of the sectional anatomy of the abdomen, pelvis, and extremities.

XR 209  Clinical, Practicum  4 cr.
Clinical training in the Department of Diagnostic Radiology.

XR 210  Projects  2 cr.
An application of basic research methodology in the preparation of case studies, presentations, and journal clubs.

XR 212  Clinical, Practicum  4 cr.
Clinical training in the Department of Diagnostic Radiology.

XR 214  Clinical, Practicum  4 cr.
Clinical training in the Department of Diagnostic Radiology and various departments/divisions using imaging modalities.
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<td>Ultrasonography, Practicum, and Projects</td>
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<td>XR 224</td>
<td>Computed Tomography, Practicum, and Projects</td>
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<td>XR 226</td>
<td>Magnetic Resonance I, Practicum, and Projects</td>
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<td>Magnetic Resonance II, Practicum, and Projects</td>
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Continuing Education Center (CEC)
Continuing Education Center (CEC)

Mission

The mission of CEC is to meet the lifelong educational and training needs of all learners in the local community and the region. Harnessing AUB’s resources in various fields of knowledge, CEC offers a variety of standard and customized certificate programs, non-credit courses, and workshops in Lebanon and the region. CEC aims to enhance professional and technical skills while addressing the needs for personal development and cultural enrichment.

Vision

CEC aspires to become a center of excellence in providing quality education and training in a variety of fields to a diverse population of learners in Lebanon and the Middle East and North Africa (MENA).

Programs of Study


CEC students may also consider enrolling in individual courses to continue their professional development without earning a certificate. These students will be provided with attestations of courses completed.

CEC also offers non-certificate courses in languages, arts, computer skills, SAT, and a variety of special courses; and it develops workshops tailored to corporate clients in Lebanon and the region. In addition to courses and workshops, CEC, in collaboration with the Office of Alumni Relations and the Worldwide Alumni Association of the American University of Beirut (WAAAUB), offers a special summer program to children of AUB alumni throughout the world to strengthen the ties between AUB and all of its alumni.

General Criteria for Admission

- Students applying to one of the certificate or diploma programs should submit a certificate of secondary education. Also, a minimum score of 400 in EEE (TOEFL: CBT 163 or IB 57) is required for admission. Applicants who are graduates of an English speaking university are exempted from the English language test. An applicant might also be required to report for an interview with the program coordinator.

- A student with an EEE score of 350-399 (TOEFL: CBT 155 or IB 50) might be allowed to take a maximum of two courses in one of the certificate programs provided that s/he sits for the EEE/TOEFL at the end of the first and/or second course and meets the minimum requirements. If the student does not meet the minimum required English score for entry into that program by the end of the second course, s/he will be disqualified for the certificate and will not be allowed to register
for another course in that certificate. The student will have to take more English courses before being allowed to re-register to complete the courses in that certificate program and become eligible for a certificate upon completion of course requirements.

- Students applying for enrollment in English language courses are required to sit for a placement test given at CEC to all new applicants before the semester begins.
- Enrollment in special courses is generally open to all learners from diverse educational backgrounds.

**Certificate Programs**

**Accounting Studies Certificate**

**Objective**

The objective of this program is to provide learning opportunities in selected aspects of accounting with emphasis on modern developments.

**Certificate Requirements**

This program consists of four courses to be completed in two years:

- CACT 101 Principles of Accounting I
- CACT 201 Principles of Accounting II
- CACT 301 Cost Accounting and Control
- CACT 302 Auditing

**E-Business Certificate**

**Objectives**

The objectives of this program are to introduce participants to the role of electronic business (e-business) in modern business practices, to offer coverage of e-business development and the impact of e-business on commercial transactions and management of organizations, and to present participants with a selection of “best practices” in e-business.

**Target Participants**

The program is intended for individuals who want to pursue knowledge of e-business from a business management perspective. It is intended for business executives, early and middle level managers, entrepreneurs, practitioners, and financial and customer support managers of small, medium, and large enterprises. Technical background is not necessary as the course is given from a managerial and marketing perspective rather than from a purely information technology perspective.

**Certificate Requirements**

The program consists of four courses to be completed in two years:

- CCMS 101 Introduction to Computing, the Internet, and Web Design
- CMKT 201 Electronic Marketing
- CBUS 201 Financial and Regulatory Aspects of E-commerce
- CBUS 302 Managerial Aspects of E-business

**Essentials of Business Certificate**

**Objective**

The objective of this program is to provide learning opportunities in selected aspects of business with emphasis on modern developments. Some may consider enrolling in individual courses to continue their professional development and will be given attestations of courses completed.

**Certificate Requirements**

The program consists of the following six courses to be completed in three years:

- CACT 101 Principles of Accounting I
- CMKT 101 Principles of Marketing
- CECN 101 Introduction to Economics
- CMGT 101 Principles of Management
- CECN 301 Money and Banking
- CFIN 101 Principles of Finance
Financial Management Certificate

Objective
The objective of this program is to introduce participants to the process of financial decision making to serve various business objectives in different settings. The program enables participants to deal with financial decisions facing businesses, household savers and institutional and individual investors. Participants cover the areas of financial management, financial reports, security analysis, and banking activities.

Target Participants
The program designed to be accessible to those with no prior knowledge of finance.

However, participants should meet the following profiles:
- Entry-level employees
- Secondary school graduates interested in financial practices

Certificate Requirements
The program consists of the following four courses to be completed in two years:
- CFIN 201 Business Finance
- CFIN 301 Financial Statements Analysis
- CFIN 302 Investment Analysis
- CFIN 303 Commercial Banking

Human Resource Management Certificate

Objective
The objective of this certificate is to offer instruction on practical, current issues in the human resource field for professional development. Increasingly, companies in Lebanon realize that a motivated, appropriately selected, trained, appraised and compensated workforce is critical to improving company financial performance and success. Human resource professionals facilitate this process through effective management of human resource issues.

Target Participants
The certificate is targeted at professionals new to the human resource fields, human resource assistants, human resource staff that provide technical and administrative support, and owners/general managers of small/entrepreneurial companies.

Certificate Requirements
The Human Resource Certificate requires successful completion of four core courses to be completed in two years:
- CHRM 101 Overview of Human Resource Management
- CHRM 201 Workforce Planning and Staffing
- CHRM 202 Total Compensation and Benefits
- CHRM 203 Employee Training and Development

Information Technology Certificate

Objectives
This certificate is designed for a wide range of prospective participants from various professional tracks and at different decision-making levels. It focuses on the increasingly specialized information requirements of the modern organization and the role of the manager as an information nerve center. A variety of computer business applications will be covered.

Certificate Requirements
The program consists of six courses to be completed in three years:
- CCMS 101 Introduction to Computers
- CCMS 102 Visual Basic I
- CCMS 201 Productivity Tools (Microsoft Office Applications)
- CCMS 202 Internet Technologies
- CCMS 203 Introduction to Information Systems
- CCMS 301 Networking

Journalism Certificate

Objectives
This certificate aims to help journalists upgrade their skills and learn new techniques over an extended period, and to help professional media practitioners advance in their careers. A converged newsroom is meant to be the venue for the training of Arab journalist in print, broadcast and online media. The courses are hands-on application-oriented modules with heavy reliance on case studies. Lab work, exercises and projects will take priority over theoretical pursuits.

Target Participants
The certificate courses are aimed at participants ranging from beginners to middle and senior level journalists in their respective hierarchies.

Certificate Requirements
The Human Resource Certificate requires successful completion of four core courses to be completed in two years:
- CHRM 101 Overview of Human Resource Management
- CHRM 201 Workforce Planning and Staffing
- CHRM 202 Total Compensation and Benefits
- CHRM 203 Employee Training and Development
Certificate Requirements

The Journalism certificate requires the successful completion of four core courses and one elective in two years.

Core courses
- CJRN 101 Media and Society / Laws and Ethics
- CJRN 102 Basic Reporting, Writing and Editing
- CJRN 103 Multi-Media / Online Journalism
- CJRN 104 Broadcast Journalism

Elective Courses
- CJRN 105 Investigative Journalism
- CJRN 106 Newsroom Management

Marketing Management Certificate

Objective
The objective of this program is to provide participants with an understanding of the marketing-management process. The basic components of marketing, such as consumer behavior, marketing research, product distribution, promotion, and price planning will be emphasized.

Certificate Requirements
The program consists of the following four courses to be completed in two years:

- CMKT 101 Principles of Marketing
- CMKT 202 Marketing Research
- CMKT 301 Marketing Communications and Advertising
- CMKT 302 Sales Management

Nutrition and Food Safety Certificate

Objectives
This program is designed to help participants acquire expertise in food quality, safety, and nutrition to promote healthy living and appropriate food preparation environments.

Target Participants
- Entry-level employees
- Secondary school graduates

Certificate Requirements
This certificate requires completion of the following courses in two years:

- CNFS 101 Basics of Nutrition and Health
- CNFS 102 Nutrition in the Life Cycle
- CNFS 201 Food Safety
- CNFS 202 Food Preparation and Preservation

Office Management Certificate

Objective
The objective of this program is to develop efficient executive secretaries to facilitate the complex and demanding jobs of today’s executives.

Certificate Requirements
The program consists of the following four courses to be completed in two years:

- CBUS 101 Introduction to Business
- CBUS 102 Business English
- CBUS 202 Office Procedures and Routines
- CBUS 203 Office Automation

Small Business and Entrepreneurship Certificate

Objective
The objective of this program is to introduce participants to the process of launching and managing a small business. It includes spotting new opportunities, raising funds and getting started, as well as managing day-to-day operations.

Certificate Requirements
The program consists of the following four courses to be completed in two years:

- CBUS 206 Opportunity Identification and Analysis
- CBUS 204 Gathering Resources and Launch
- CBUS 205 Management of Family Enterprises
- CBUS 301 Entrepreneurial Decision Making
Vocational and Technical Education (VTE) Certificate

Objective
This program aims to improve VTE in Lebanon by providing educational training to VTE instructors who are not in possession of the LET (Licence d’Enseignement Technique) and who are outside the public sector. This will increase the effectiveness of instruction and also help to raise the image of VTE in Lebanon. The VTE certificate is designed mainly for practicing VTE instructors who are engaged in teaching at the Baccalauréat Technical level. It is also open to teachers of Brevet Pratique classes and would likely be of some benefit to instructors teaching at the Technicien Supérieur level.

Certificate Requirements
The VTE Certificate is composed of four courses to be completed over two years:

- CVTE 101 Teaching and Learning
- CVTE 201 Sociology and Economics of Education
- CVTE 202 Curriculum and Assessment
- CVTE 301 Practicum: On-the-job involving AUB instructor visits to students' workplace

Human Resources Management (HRM) Diploma

This diploma program provides a comprehensive overview of HRM roles and responsibilities in the workplace from a strategic perspective. It fosters and develops the participants’ professional expertise and competency. This diploma program involves an intensive education program using traditional classroom instruction, hands-on case studies, and executive presentations.

Target Participants
This program is targeted at people working in the human resource field.

Diploma Requirements
This program consists of the following eight courses to be completed in four years:

- CHRM 101 Overview of Human Resource Management
- CHRM 201 Workforce Planning and Staffing
- CHRM 202 Total Compensation and Benefits
- CHRM 203 Employee Training and Development
- CHRM 301 Managing Human Behavior in Organizations
- CHRM 302 Managing the Employment Relationship: HRM, Society and the Law
- CHRM 401 Strategic Human Resource Management
- CHRM 402 Advanced Topics in Human Capital Management

Marketing Management Diploma

Objective
The objective of this diploma is to provide an advanced and comprehensive overview of marketing from basic to strategic. The components of marketing, such as consumer behavior, sales management, marketing communication, marketing research, market segmentation, and strategic marketing planning will be emphasized.

Diploma Requirements
The program consists of the following eight courses to be completed in four years:

- CMKT 101 Principles of Marketing
- CMKT 202 Marketing Research
- CMKT 301 Marketing Communications and Advertising
- CMKT 302 Sales Management
- CMKT 401 Services Marketing
- CMKT 402 Public Relations
- CMKT 403 Consumer Behavior
- CMKT 404 International Marketing

Certificate and Diploma Programs Course Descriptions

CACT 101 Principles of Accounting I
This course introduces students to principles of recording transactions, the preparation of financial statements, and completion of the accounting cycle.

CACT 201 Principles of Accounting II
This course is a continuation of Accounting I. It covers depreciation policies and procedures, depletion and amortization, income determination, partnership accounts, corporate capital accounts, dividends and retained earnings.

CACT 301 Cost Accounting and Control
This course focuses on the nature and purpose of cost accounting; basic techniques of process and job costing; accounting of materials, labor and overhead; development and use of cost budgets and standards for planning and evaluation of performance; cost classification in relation to behavior; and cost condition statements as tools for evaluating alternative courses of action.

CACT 302 Auditing
This course focuses on the principles and procedures covering the public accountant’s responsibilities in examining and reporting on financial statements of business concerns, including professional ethics, legal responsibility scope, and application of audit procedures.

CBUS 101 Introduction to Business
The purpose of this course is to provide students with the opportunity to study many dimensions of the business system. Subjects covered include management and organization, human resource management, information for business decision-making, financial information, and business and its environment.
CBUS 102 Business English
The purpose of this course is to focus on the communication requirements of participants in business situations in order to project a professional image and avoid costly mistakes. Guided activities include problem-solving, information transfer tasks, role playing and transfers to participants' work environments to develop confidence in applying common uses of language structures, business terminology, and expressions.

CBUS 201 Financial and Regulatory Aspects of E-commerce
This course focuses on electronic financial transactions and payment networks, security issues in E-commerce, financing an E-commerce project, legal and regulatory environment of E-commerce, and E-government.

CBUS 202 Office Procedures and Routines
The purpose of this course is to present fundamental principles and successful practices for completing office work effectively and efficiently. Subjects covered include techniques for general secretarial duties, such as filing, information processing skills, preparing and publishing reports, handling mail and electronic messages, using effective telecommunication practices, making meeting arrangements, making travel arrangements, keeping company books and records, and maintaining good human relations proper etiquette.

CBUS 203 Office Automation
This course is intended to introduce students to computer office automation systems which are designed primarily to improve office productivity and efficiency. It focuses on topics like managing documents, electronic filing systems, electronic mail, maintaining calendars and appointments, and word processing using Microsoft Word (advanced features like manipulating tables, merging documents, using style, outline, footnotes, pictures, etc.) and spreadsheets using Microsoft Excel (advanced features like formulas, functions, charts, page setup, database management, filtering, etc.).

CBUS 204 Gathering Resources and Launch
In this course, students learn to determine the physical, financial and human resources for the project as well as to identify and plan the necessary activities for a successful launch.

CBUS 205 Management of Family Enterprises
This course aims at introducing participants to the management activities involved in the day-to-day operations of a small business: planning, operations, finance, marketing, human resources, and accounting.

CBUS 206 Opportunity Identification and Analysis
This course deals with spotting new opportunities and analyzing them in terms of demand analysis, competition, growth prospects, and profitability.

CBUS 301 Entrepreneurial Decision Making
This course integrates the material introduced in the previous courses and applies it to the evaluation and creation of new ventures. The course is about how to create value in firms, not only through new products or services, but also through new technologies, business concepts, transaction mechanisms, and distribution channels.

CBUS 302 Managerial Aspects of E-business
This course focuses on B2B and B2C E-business, the impact of E-business on organizations, the impact of E-business on business processes, managing E-commerce projects, and E-Business Best Practices.

CCMS 101 Introduction to Computing
The course is intended to give students competency in computer-related knowledge. It allows them to understand the rules and the power of microcomputers and to take advantage of increasingly productive software, hardware, and the connectivity revolutions that are expanding the microcomputer capability. Students will be introduced to the general architecture of PCs and their components, including microprocessors, digital representation of data, data storage devices, and input-output devices. It will also cover the basics of computer software, focusing on a complete hands-on introduction to Windows operating system, Word, and Excel.

CCMS 102 Visual Basic I
This course introduces students to programming in Visual Basic with special emphasis on Object Oriented Programming (OOP), Objects, Properties, Methods, Events, etc. Programming Excel using Visual Basic for application (VBA).

CCMS 201 Productivity Tools (Microsoft Office Applications)
This course introduces students to Word, Excel in depth, Microsoft Power Point and the Internet.

CCMS 202 Internet Technologies
Students will be introduced to the basics of E-commerce and the technologies of the web (URLs, HTML, HTTP, Applets, etc.). Topics will include client side programming within a web browser like JavaScript, and the server side programming like CGI.

CCMS 203 Introduction to Information Systems
This course introduces students to Relational Database Management Systems (RDBMS) principles using Microsoft Access and underlying theory for System Analysis Design. It focuses on data storage and data manipulation and retrieval. Students will be able to design structure of tables, create relationships among tables, design forms, design queries to retrieve information satisfying a specific criterion, produce reports, and put it all together to publish on the web.

CCMS 301 Networking
This course focuses on telecommunications and networking as used in business environments. It provides a survey of the technologies and applications of telecommunications with emphasis on internet, intranets, and extranets. Topics will include collaboration technology, videoconferencing, multimedia document transfer, collaborative work, and security issues.

CECN 101 Introduction to Economics
This course is a survey of economic principles that includes national income accounting and analysis, monetary and fiscal policies, and demand and supply analysis.

CECN 301 Money and Banking
This course focuses on management of commercial banks, the structure of commercial banking, management of bank funds and the role of money in the economy.

CFIN 101 Principles of Finance
This course is an introduction to the field of financial management, including the institutional framework of finance, the role of finance in the business firm, financial analysis, planning and control, working capital management, cash budgeting, and elements of capital budgeting.

CFIN 201 Business Finance
This course is an introduction to major decisions a financial manager has to make, including assessment of the profitability of investment opportunities, short-term and long-term financing alternatives, risk-return tradeoff, and the concept of the goal of wealth maximization.
Continuing Education Center (CEC)

CFIN 301  Financial Statements Analysis
This course focuses on the description and interpretation of reported and audited financial statements, limitations of company reports, analysis of financial ratios, examinations of professional practices regarding measurement and disclosure of financial information, and development of skills needed to read, analyze and evaluate financial statements. Prerequisite: Business Finance.

CFIN 302  Investment Analysis
This course focuses on the description and analysis of the sources of investment information, various investment vehicles, operations of security markets, trading environment, security valuation models, investment objectives, and modern techniques of investing in securities. Prerequisite: Business Finance.

CFIN 303  Commercial Banking
This course is an introduction to banking regulations, evolution of banking activities, description of banking accounts and lending practices, functions and operations of commercial banks, credit analysis, liquidity management, assets and liability management, profitability and adequacy measures. Prerequisite: Business Finance.

CHRM 203 Employee Training and Development
This course introduces students to many of the basic principles of human behavior that effective managers use when managing individuals and groups in organizations. These include theories relating to individual differences in abilities and attitudes, attribution, motivation, group dynamics, power and politics, leadership, conflict resolution, organizational culture, and organizational structure and design.

CHRM 302  Managing the Employment Relationship: HRM, Society and the Law
The purpose of this course is to increase student knowledge of legislation and practices related to employment and labor law in the work environment and to provide an introduction to the basic elements of the relationship between employers and their employees. This course provides an overview of legal issues affecting human resources management. It focuses on the impact of law on individuals in organizations, recognition of legal problems, and the legal impact of human resources decisions. It also integrates employment and labor laws with social and economic forces shaping the current diverse management-labor environment.

CHRM 401  Strategic Human Resource Management
This course is intended to expose students to the "big picture" at the intersection of human resource management, business policy, and competitive strategy. It covers both the design and execution of human resource management strategies and is organized around two central themes: (1) How to think systematically and strategically about aspects of managing the organization's human assets, and (2) What really needs to be done to implement these policies and to achieve competitive advantage. In essence, the course objective is to have students develop a broader perspective of business through the development of a strategic HR viewpoint.

CHRM 402  Advanced Topics in Human Capital Management
This course is designed to give the student insights into contemporary and future HRM issues. It addresses leading-edge human resource management theories and practices in terms of their ability to have a positive impact on organizational results and encourage desired employee attitudes and behaviors. This course will help the student understand the diverse aspects of HRM, while providing knowledge of the tools and techniques of the modern Human Resource Manager. Main topics cover the importance of managing intangible assets, knowledge management and learning organizations, flexibility, empowerment and ethics.

CJRN 102  Basic Reporting, Writing and Editing
This course introduces students to the "big picture" at the intersection of human resource management, business policy, and competitive strategy. It covers both the design and execution of human resource management strategies and is organized around two central themes: (1) How to think systematically and strategically about aspects of managing the organization's human assets, and (2) What really needs to be done to implement these policies and to achieve competitive advantage. In essence, the course objective is to have students develop a broader perspective of business through the development of a strategic HR viewpoint.

CJRN 101  Media and Society/Laws and Ethics
This course is a critical analysis of the role media play in shaping democracy and the effects of political, economic, cultural and technological factors on media operation. The course includes national and international issues of censorship and government control, media organization and ownership. The law component focuses on national and international legislation affecting media and the ethics track covers key issues and values related to truth telling, sources, conflicts of interest, checkbook journalism, sourcing and plagiarism.

CJRN 102  Basic Reporting, Writing and Editing
This course is an introduction to journalism research and writing, covering principles of news gathering, writing and judgment for all media: newspapers, magazines, wire services (news agencies), radio, TV and the internet. Study of news sources, field work/assignments, research and interview techniques and editing. Copy editing would focus on the skills copy editors (or sub-editors) need to handle stories: learn to edit for tightness, accuracy and style, to focus on the story line and as a whole: design and produce pages, including selecting and using pictures, and writing captions, writing headlines, sub-heads, and summaries, with an introduction to elements of desktop publishing.
This course focuses on evolution of the Internet as a journalistic medium. Students learn to write for online and multimedia sites, including how to organize links and use databases, how to post stories and update and advance them as developments occur, how to create pages for web sites, upload them to a server and use digital audio, video and photographic equipment. The creation of civic/citizen journalism, an examination of how blogs complement and sometimes replace traditional media.

This course is an introduction to the techniques of gathering: analyzing and writing news and features for broadcast media. Students learn to use audio and video recorders and editing systems in the production of news stories, how to interview for tape, how to write commentary and to picture, and the elements of on-air performance.

This course focuses on knowledge and training in different media: writing, editing, design, production and administration. Course stresses organization, concept, audience, budget, printing, advertising, circulation and promotion and handling of newsroom personnel issues.

This course is an overview of promotion management and integrated marketing communications. Topics covered include behavioral foundations of marketing communications, environmental influences on marketing communications, and the promotion management process and its execution.

This course focuses on the functions of management: planning, organizing, staffing, directing, and control.

This course focuses on the marketing function and the environment affecting marketing managers. Topics covered include the marketing environment and planning and developing of the marketing mix.

This course will cover the marketing function in the internet age, the supply chain, e-consumer behavior, customer service, and internet promotion and advertising.

This course is an overview of the scope of the marketing function and the environment affecting marketing managers. Topics covered include the marketing environment and planning and developing of the marketing mix.

This course is an overview of the process of marketing services. It includes a study of the characteristics of services and their marketing implications, developing marketing strategies, creating value, pricing and promoting the service performance, and ensuring a positive customer experience.

This course focuses on the communication between an individual or organization and the public to promote stakeholder acceptance and approval. Students explore traditional and emerging components of the public relations process through mass media, as well as the needs of different types of businesses, such as corporations, non-profit organizations, and governmental offices.

This course focuses on the customer as the key to market success. Topics covered include the roles of a customer, market values a customer seeks, determinants of customer behavior, the customer’s mind-set, customer decision-making, and customer-focused marketing.

This course is an overview of the scope and challenge of international marketing. Topics covered include the cultural environment of global markets; assessing global market opportunities; and developing and implementing global marketing strategies.

This course introduces students to basic concepts of nutrition and highlights ways that they can integrate good nutrition into their lifestyles. Principles of digestion and absorption, the function of nutrients, dietary analysis and food labels, recommended nutrient intake, diet modifications, and weight control are covered. Practical applications of these principles are also emphasized.

This course emphasizes the nutritional needs throughout the life cycle: infant, childhood, adolescence, adulthood and old age and special nutritional requirements for pregnancy and lactation. The course also covers the basic nutritional requirements for fitness and sports and key nutrition concepts, nutritional needs, and nutrition and health disease outcomes by using a problem-based learning case studies. Issues like the cultural, environmental, psychological, physical and economic factors affecting nutritional status throughout the life span as well as dietary planning and health promotion are also highlighted in the course.

This course focuses on changes that influence food safety and security. It benefits individuals involved in any industry associated with food preparation in terms of how to design, plan and manage food service systems. This course provides general food hygiene knowledge, including legislation and labeling, food contamination, food preparation, cleaning and disinfecting.

This course covers common methods and processes of food preparation and preservation. It is designed to help students acquire knowledge related to applied concepts of menu planning and food manufacturing and processing technology.

This course is an introduction to the basic psychology of teaching and learning. Major skills that will be imparted are the writing of lesson plans and the sequencing of lessons within instructional modules.
CVTE 201 Sociology and Economics of Education
This course introduces students to the notion of the school as a social institution which reflects and promotes the values of a society and shapes young people for future roles within that society. It then moves on to the portrayal of an educational institution as a producer of human capital.

CVTE 202 Curriculum and Assessment
This course involves in-depth studies of Baccalaureate Technique curricula particular to students' specialization, ideally in cooperative learning groups. There is an additional focus on assessment modus operandi with respect to both classroom-based assessment procedures and external assessment regimes. Prerequisite or Co-requisite: Teaching and Learning.

CVTE 301 Practicum
The practicum component of the program will involve on-the-job assessment of students' teaching performance and the submission of a portfolio containing the student's lesson plans and assessment instruments over one whole semester for one particular class. Prerequisite: Curriculum and Assessment.

Lesson observation: An AUB instructor will attend at least one whole lesson conducted by the student. This lesson will be evaluated using an observation schedule which the student will be given beforehand. There may be a second observation if the score for the first observation is below 70 percent or if the student requests a second visit.

Portfolio: The portfolio containing all lesson plans and assessment data for one given BT class over one semester will be submitted at the end of that semester and graded according to a marking schedule which the student will be given beforehand.

Non-Certificate Courses
CEC offers non-certificate courses in languages, arts, and computer skills; it also offers SAT courses and a variety of special courses.

Languages
English language courses are offered at all levels of proficiency, as well as specialized courses for members of various professions and students preparing for the TOEFL and SAT. CEC also serves non-native speakers of Arabic by providing classes in Modern Standard Arabic, and colloquial Arabic. Students may also take classes in a variety of other languages.

English Language
Courses are offered at all levels from beginners to advanced with emphasis on communication competence. Students who complete Level 6 are often able to pass the AUB English Entrance Exam (EEE) or the Test of English as a Foreign Language (TOEFL). Each student's level is determined by a placement test given to all new applicants before the session begins.

Duration: 12 weeks–8 hrs/wk

CENG 100 English Language for Beginners
CENG 101 English Language Level 1
CENG 102 English Language Level 2
CENG 103 English Language Level 3
CENG 104 English Language Level 4
CENG 105 English Language Level 5
CENG 106 English Language Level 6

Duration: 12 wks–2 hrs/wk
This course offers students the opportunity to speak in formal and informal situations. Throughout the course, students will participate in discussions, group activities, and simulated role-playing. They will also give and evaluate presentations.

Applicants eligible for this course must have a score of 450 on the EEE; otherwise, candidates will sit for a placement test at the CEC.

Arabic Language
Standard Arabic Language

Duration: 12 weeks–4 hrs/wk

CARB 101 Standard Arabic Beginner
This course introduces students to the language through a proper acquisition of the alphabet, pronunciation of the sounds, connection of letters, and formation of words and simple sentences.

CARB 102 Standard Arabic Intermediate
This course focuses on basic grammar structures and vocabulary; and on comprehension and articulation of simple statements, questions, and paragraphs.

CARB 103 Standard Arabic Advanced
This course stresses complex grammar structures and vocabulary needed to comprehend and compose written and oral material.
Colloquial Arabic Language

Duration: 12 weeks—4 hrs/wk

CARB 201  Colloquial Arabic Beginner
This course focuses on pronunciation and vocabulary needed to engage in simple dialogues such as, greetings, directions, travelling, and shopping.

CARB 202  Colloquial Arabic Intermediate
This course focuses on the basic principles of expression and builds the students’ vocabulary to enable them to comprehend and compose simple sentences needed in day-to-day conversations.

CARB 203  Colloquial Arabic Advanced
This course offers students the opportunity to practice their communication skills in different settings to achieve a comfortable level of verbal interaction in business, social, and formal environments.

Other Languages

CFRN 101  French I
Duration: 12 wks—3 hrs/wk
This course provides students with the chance to use the language in familiar contexts both orally and in writing. In Level One, the emphasis is on conversations using basic structures.

CFRN 102  French II
Duration: 12 wks—3 hrs/wk
This course provides students with the chance to use the language in familiar contexts both orally and in writing. In Level Two, the student will be able to read and write simple texts.

CGER 101  German I
Duration: 12 wks—3 hrs/wk
In this course, students will learn basic vocabulary and sentence formation that would enable them to participate in simple conversations.

CGER 102  German II
Duration: 12 wks—3 hrs/wk
In this course, students will learn the basics for writing and conversing in a more professional way. Prerequisite: German I.

CHNS 101  Chinese I
Duration: 12 wks—3 hrs/wk
This course provides students with a basic working knowledge of Chinese (Mandarin). The course exposes beginners to Chinese Pinyin (spelling with one tone), Chinese characters, Chinese grammar, common-used sentence structures, and simple situational dialogues.

CHNS 102  Chinese II
Duration: 12 wks—3 hrs/wk
This course is a continuation of Chinese I. Students will learn more characters, grammar, sentence structures, and dialogues; and they will practice simple applied writing. Prerequisite: Chinese I.

SAT Courses

CSAT 201  English for SAT
Duration: 12 wks—5 hrs/wk
This course aims to familiarize students with the English component of the Scholastic Aptitude Test (SAT). It helps them practice their English language skills and vocabulary.

CSAT 202  Math for SAT
Duration: 12 wks—5 hrs/wk
This course aims to familiarize students with the mathematical and reasoning components of the SAT test. It reviews mathematical concepts and helps students practice their basic math and reasoning skills.
Special Courses

**CFCH 101 The Franchise Cycle, the Players' Roles, Franchisee, Franchisor**
Duration: 12 wks–3 hrs/wk
This course introduces participants to the role of Franchise in the business sector in the 21st century, in particular in the Arab world; it emphasizes the importance of the Franchise sector on the growth of any local economy; offers a comprehensive understanding of the Franchise cycle, its players being the Franchisor and Franchisee, their relationship and obligations; and presents a brief overview of the required Franchise tools for any Franchise to succeed.

The course includes case studies and role playing, which allow participants to experience the role of becoming a Franchisor or a Franchisee, or work for a Franchise network. The student will also participate in senior level franchisor training, discussion and activities. Management background is not necessary. Proficiency in English is required.

**CFCH 102 The Franchisor's Essential Tools-Manuals**
Duration: 12 wks–3 hrs/wk
This course introduces participants to the method by which a company can become a Franchisor; teaches them how to write up the Franchisor's Essential Tools including the Manuals (Operations, Training and Product Assembly Manuals); and offers an in-depth comprehensive understanding of the Franchise cycle and its players.

The course includes a “step by step” methodology which allows the participant to learn how to write up the Franchisor’s Essential Tools, based on International Standards including the Manuals (Operations, Training and Product Assembly Manuals) required for any Franchisor to succeed. It also includes discussion and activities. Management background is not necessary. Proficiency in English is required. Prerequisite: CFCH 101.

**CFIN 110 Personal Financial Planning**
Duration: 12 wks–3 hrs/wk
This course focuses on topics such as the financial planner’s role, cash flow budgeting, consumer credit, debt management, insurance, taxation and financial planning, retirement planning, estate planning and wills, personal bankruptcy and insolvency, and preparation of financial plans.

**CGAP 101 Guitar Appreciation I**
Duration: 12 wks–3 hrs/wk
These two courses help students improve their playing ability, with exposure to different guitar styles. Students will also be introduced to guitar history, development, the anatomical evolution of the instrument and the work of famous guitarists.

**CGAP 102 Guitar Appreciation II**
Duration: 12 wks–3 hrs/wk
This course is a continuation of Guitar Appreciation I at a more advanced level.

**CIFE 201 Business Protocol and Etiquette**
Duration: 12 wks–3 hrs/wk
This course teaches students how to greet people, converse with them, understand their business and management styles while respecting their cultural attitudes. Topics include: first impressions and networking skills, dressing for success, communication at its best, business lunching and dining etiquette, hosting business potentials, and mastering business meetings.

**CIFE 202 Social Etiquette**
Duration: 12 wks–3 hrs/wk
This course teaches students the accepted behavior in society. It not only includes table manners and dress, but also behavior, positioning oneself in events, arts, culture and fine conversation. Topics include: conversation, composure, invitations, food and drink, entertaining, restaurant etiquette, attire, gift giving, and everyday life.

**CIFE 203 Cross-Cultural Trainings**
Duration: 12 wks–3 hrs/wk
This course provides fast ways to become familiar with business and protocol practices in other countries and cultures, to increase your chance of success in business in new markets. Tailored to different markets and needs, cross-cultural training gets you started on the right foot and challenges you to find ways to improve your success in the global marketplace – by understanding cultural differences in the way people communicate and do business with each other. Topics include: body language and non-verbal communication, space and touch, eye contact, time concept, linear and nonlinear aspects of language, management and leadership styles, decision making processes, status and ranks, gift giving, and presentations.

**CLAB 101 Legal Aspects of Business**
Duration: 12 wks–3 hrs/wk
The objective of this course is to introduce participants to commercial law and to the legal elements that are required for starting and managing a small business or for the constitution of different kinds of companies. It includes information on various contracts and day-by-day operations from a legal point of view.

**CLGS 201 Leadership Skills**
Duration: 12 wks–3 hrs/wk
The objective of this course is to introduce the participants to the essential skills needed for a successful leader. Participants will be able to determine their leadership qualities and personal leadership style. They will also understand their responsibility in developing further as leaders. Participants will learn how to set, evaluate, and follow up on short and long-term objectives. This course will use a practical approach emphasizing exercises, discussion, group work, and practical experience. A pre-test will be given at the beginning of the course and a post-test at the end so that participants will be able to evaluate their leadership skills and plan for improvement.

**CLGH 101 Landscape Gardening for the Home**
Duration: 10 wks–3 hrs/wk
This 10-week course includes: horticulture skills (potting, propagation and transplantation of annuals and perennials) and landscape principles (plant selection and layout in small gardens, balconies and indoors) introduced through lectures, live demonstrations and hands-on application.

**CSST 101 Survival Strategies**
Duration: 12 wks–3 hrs/wk
This course teaches participants how to survive in the wild, in any climate, on land or at sea. The need for survival training has never been greater in this unstable world. Survival depends upon applying basic principles and adapting them to the circumstances. Kit, Knowledge, and Will to Live constitute the essential pyramid of learning for the survivor.
Art Courses

Duration: 12 wks–3 hrs/wk

**CADP 101 Adobe PhotoShop**
This course introduces the student to the many facets of Adobe PhotoShop, one of the best software tools ever designed to create and enhance artistic work, such as drawing, painting and photography. The course explores Adobe's great capacity for manipulating design, form and color to expand the user's creative power and imagination. The key tools include image editing to mask complex images, painting to achieve greater creative freedom, basic color correction, and selection tools for optimizing and previewing images. Adobe photography includes restoring old or damaged photographs and exporting pages ready for the web; correcting common problems such as red-eye, scratches and fading, as well as professional quality collages, calendars, brochures and other projects. The Adobe PhotoShop course is an opportunity to create, refine and optimize pictures.

**CART 201 History of Arts**
This course is an introduction to the art of the twentieth century. It focuses on the approaches and methodology used in the Dadaist and the Surrealist movements in visual art and literature. The course covers the sources and influences of the major artists. Styles and movements of this period are closely examined. Emphasis is on discussion of pioneering attitudes, theories, and concepts of the art world with topics ranging from a focus on artists and media, art politics, and various thematic concerns. Seminars, workshops and lectures diversify the course.

**CDRW 101 Life Drawing I**
This course concentrates on “seeing” and rendering with pencil and charcoal. Special emphasis is placed on still life, taken from nature and landscapes.

**CGRD 101 Introduction to Graphic Design**
This course is for beginners who seek an introduction to graphic design. The course helps students acquire the creative, conceptual, narrative and presentation skills necessary to integrate content with technical skills in the production of effective and evocative design. It emphasizes the principles of visual organization and the elements of graphic design that govern effective design and page layout. Topics include shape, color, and communication; visual hierarchy; word/image relationships and integration; typography; composition. It includes practical exercises in visual perception, visual organization, and visual communication.

**CINR 101 Interiors**
This course will introduce students to creation of living spaces, types of interior spaces, types of interior space organizations, and techniques of harmony and esthetics. It will focus on clarifying interior design concepts through graphics and sketches, colors and geometric instruments, as well as planned visits to art galleries and factories.

**CPHT 101 Basic Photography**
This course introduces the different parts of the camera such as the lens, the aperture, and the shutter speed. It is designed to familiarize the students with image composition, printing, and selection. Throughout the course, students will be expected to complete shooting assignments; and periodic analysis of pictures will be conducted during the sessions to assist the students in developing their creative skills. A professional or semi-professional camera is needed for the course.

**CPHT 201 Creative Photography**
Creative photography explores the practice of photography in a logical, sequential fashion, and is divided into major fields. Composition, color and harmony, are treated in a practical manner and are analyzed as they occur. This course begins with reportage which the photographer normally has no control over and must deal with as stories evolve; later the course moves toward images that owe more to the photographer's own skill. The aim is to help the photographer to fully understand each field in order to be better able to control the final results of his/her picture.

**CTHT 201 Practical Theatre and Playwriting**
This course is delivered through studio-based classes that introduce contemporary acting methods and techniques in the form of workshops. Practical technique classes include training to imagine, practical improvisational theatre techniques to enhance creativity, teamwork, discovering your inner voice, physical theatre and movement. Other skills are supported with a number of classes in creative writing with seminars in how to write short plays.

**CWBD 101 Introduction to Web Design**
This course will provide students with technical and artistic information to help them design and create a website. The student learns to manage a website, format and enhance web pages, use advanced website techniques, and publish and update a website.

### Intensive Training Workshop Programs

CEC works closely with the various AUB academic departments to develop workshops that meet the training and professional needs of our clients in Lebanon and the region. These workshops provide a highly interactive setting that allows participants to collaboratively examine and learn new ideas and practices. Workshops are conducted on-campus and off-campus, and inside and outside Lebanon. They can be delivered individually or as a part of a consulting project. The language of instruction is English while some may be delivered in Arabic or French.

Workshops can also be either generic or customized depending on the needs of the client; and a needs-analysis study is sometimes conducted to help the client identify those areas where learning and training are mostly needed. CEC draws on the expertise of AUB faculty to respond to our clients' training needs in many areas such as, engineering, medicine, business, English, IT, education, and agriculture. Some of the workshops that were recently developed and conducted include the following:

#### Business Management

**Accounting for Non-Accountants**
Accounting for Non-Accountants introduces the participants to the language of business and the accounting cycle. It equips the participants with the knowledge and skills to interpret, analyze, and use financial information from a national and international perspective. Topics include: Introduction to financial accounting, Income Statement (Income, Revenues, and Expenses), and the balance sheet (Assets, Liabilities, and Stockholders' Equity).
Advanced Negotiation and Conflict Resolution Skills
This workshop gives participants a better understanding of conflicts from an objective point of view. It introduces them to the dynamics of conflicts and offers methods, such as negotiation, through which conflicts can be resolved. Topics include: the explicit and implicit issues inherent in a conflict situation, conflict resolution frameworks and techniques within the context of current organizational decision making models, practical negotiating and conflict resolution skills and experiences that can be applied immediately.

Best Practices in Benchmarking
This workshop is designed to train participants in using the benchmarking concept in management to the benefit of their organizations (or equivalent). It teaches participants the definition and history of benchmarking and trains them using exercises for benchmarking. Topics include: the history of benchmarking, the benchmarking process/concept, benchmarking tools and techniques, implementing a benchmarking strategy, knowledge management, and benchmarking trends for the 21st century.

Business English
This workshop aims to improve the English language communicative competence of the participants in business and social settings. It focuses on developing participants’ productive skills of speaking and writing as well as the receptive skills of reading and listening. It also focuses on the acquisition of a wide range of business expressions, idioms, and grammatical knowledge.

Creative Problem Solving
This workshop provides participants with the tools and techniques needed to analyze business solutions critically and generate creative solutions that are feasible, can be readily implemented, and would lead to innovation in the workplace.

Culture Change
This workshop introduces participants to corporate culture and culture change. Participants will be trained to study, plan, implement, and audit the culture change of a corporation. Topics include: the principal methods for the study of organizational culture and change, the organization’s readiness for change, implementation and monitoring of planned changes, resistance to the change process, the various pressures and rationales for change and their significance to the change process, and corporate values and strategic objectives.

International Financial Reporting Standards
This workshop introduces professional accountants to the International Financial Reporting Standards (IFRS), and provides them with extensive hands-on practice in applying these standards through the utilization of case studies and model financial statements. Topics include: the importance of international standards for the accounting profession, the different types of financial reports in accordance with IFRS, and interpretation and analysis of financial statements in accordance with IFRS.

Project Cost Estimation and Economic Evaluation
This workshop discusses the processes and tools for preparing accurate and realistic cost estimates, the concepts and methods for conducting a cost-benefit analysis, and the role of economic evaluation in decision-making. Topics include: cost estimating methods, the process of cost budgeting and control, importance of risk management, realistic benefit estimations, and comprehensive economic evaluations that secure desirable investment returns.

Risk Management
This workshop introduces participants to: the nature and sources of credit risk, credit risk management by the commercial bank, analytical tools and techniques in credit risk management, credit structuring for the purpose of reducing problem loans, the deteriorating credit relationship for commercial banks, troubled debt restructuring, and credit risk management by the commercial bank with focus on the market.

Introduction to Public International Law
This workshop introduces participants to the historical and philosophical evolution of International Law. It focuses on determining the primary sources and subjects of International Law, rights and duties of the state, and the scope of application; and on recognizing state and international agreements.

Finance for Non-Financial Officers
This workshop covers the use, interpretation, and analysis of the principal financial statements and other sources of corporate financial information from a national and international perspective. It introduces the participants to the language of business and the accounting cycle enabling them to prepare and analyze financial statements. Participants will learn the concepts of finance to help navigate them through appropriate courses of action regarding corporate financial decisions.

Financial Best Practices
This workshop focuses on finance and the quality movement, best practices, benchmarking, major international initiatives for promoting financial best practices, area-specific financial best practices, and metrics and measures.

Islamic Finance: Theory and Application
This workshop focuses on the Islamic financial instruments, Islamic capital markets, regulation and risk management of Islamic financial institutions, and their corporate governance. Topics include: Islamic banking regulation, Islamic modes of finance, regulations and requirements for conventional banks to deliver Islamic products, application of Islamic banking and finance concepts, current status of the Islamic banking industry, the challenge of innovation in Islamic banking, the critical success factors of Islamic banking, and diminishing equity participation.

Corporate Risk Management
This workshop focuses on risk management using derivative securities including options, futures, forwards, and swaps, their valuations and their applications to manage various risks. Topics include: corporate risk analysis, measurement, and management; investment risk analysis and management; measuring and managing risk and return in a portfolio framework; and interest rate risk and asset-liability management.

Developing Young Professionals
This workshop is designed to prepare young employees or prospective employees for the work environment. It teaches them business communication, time management, discipline, presentation techniques, and other practical and mental tools that will facilitate their way to success.

Projecting a Positive Professional Image
This workshop helps participants explore and master various techniques to enhance their appearance, communication skills, work habits, and attitude in order to convey confidence and professionalism to internal and external customers.

Leading and Developing Others
This workshop focuses on the elements and functioning of a successful team, and on the practices and skills that help team leaders guide, motivate, and develop their team members.
Resource Management
This workshop helps participants to improve workflows, service delivery, and streamline routine services via: a better understanding of the structural workflow issues in hospital environments; developing a basic understanding of process analysis and mapping techniques; a better understanding of the hospital care delivery as service management and patients as customers; thinking through and solving process improvement/standardization problems; and learning how to explore alternative process paths in achieving same result in a healthcare environment.

Change Management
This workshop focuses on understanding the concept of Change Management and presents the tools and methodologies to manage the change. A case study and practices will be presented.

Project Management Professional
This workshop introduces participants to the science of Project Management and how it applies to their business; and refreshes the knowledge of those who want to sit for the PMP exam. The basic elements of project management will be discussed: PMP logistics, integration management, project scope management, project time management, cost management, quality management, human resource management, communication, risk, procurement, and professional responsibility. Each topic is introduced and discussed with emphasis on the Inputs-Processes-Tools and Techniques-Outputs structure outlined in the PMBOK.

Education

Classroom Management for Intermediate and Secondary Classes
Classroom Management for Intermediate and Secondary Classes introduces the participants to the art of teaching and managing a classroom in order to promote an environment conducive to learning. It equips the participants with the skills for establishing and maintaining acceptable behavior in students, as well as strategies on implementing effective teaching in the classroom.

Interactive Lecturing
Lectures in large classes can be planned to engage all students even in large classes and still be conducive to optimal learning experiences. In this workshop, participants will be introduced to teaching strategies which can be implemented effectively in large classes. The workshop will highlight those strategies which allow for an interactive environment in large classes. Discussions and hands-on experiences are the design of this workshop.

Inquiry Model
The Inquiry Model encourages students to learn by experiencing the excitement of solving a task or problem on their own. Since the Inquiry Model requires careful instructional design and support in higher education, this workshop will acquaint participants with the Inquiry Model implementation techniques, and explain how it will be used as a framework for teaching in higher education. Hands-on experiences will be used to practice implementation. Pros and cons will be addressed.

Project-based learning
Project-based learning is an instructional model in which teaching shifts from the teacher-centered lessons to student-centered classes. In this workshop, the process of integrating project-based learning with real world issues and practices will be highlighted, components of project-based learning will be presented, implementation techniques will be practiced, and the implications of working with others will be addressed.

Discussion Model
This workshop offers guidelines for conducting a successful discussion in higher education. Participants will identify elements of an effective discussion, practice discussion, and develop guidelines for implementing proper discussions. The following questions will be addressed: how can I use the discussion model in my classroom? How should I deal with irrelevant questions? How should I interpret silence? How can I reactivate a dying discussion? What do I do with unused time? What makes a discussion worthwhile? The design of the workshop is activities-based, encouraging participants to apply these activities in their classrooms.

Course Syllabus Design and Learning Outcomes
In this workshop participants will design a course syllabus based on articulating student learning outcomes (SLO’s). They will develop their course syllabus based on the following components: course description, course General Instructional Objectives (GIO), course Student Learning Outcomes (SLO), course policies, course schedule, course assignments, information about instructor, and course resources. In addition, selecting assessment tools which align with SLO’s will be discussed.

Assessment of Student Learning Outcomes
The purpose of this workshop is to assist faculty to (1) become familiar with basic principles and approaches for assessing student learning outcomes at the course level; (2) select assessment approaches (direct, indirect or both) which best assess student learning outcomes in alignment with the instructional approach; (3) develop a variety of classroom assessment tools which measure student performance and achievement; (4) justify the use of selected assessment tools to show how they assess student performance using multiple resources.

Peer Observation
This workshop aims to help faculty to get started on peer observation as means to improve their own teaching as well as improve learning opportunities for students. Procedures for applying peer observation will be practiced in order to draw attention to aspects of teaching about which one might not be aware.

Engineering

Engineering Projects: Implementation Challenges and Effective Management
This workshop aims at providing an overview of engineering projects and the challenges faced in implementing them. It introduces the basic management functions exercised throughout the engineering project delivery process, and it discusses management tools and methods that are used for the purpose of project control. In addition, the workshop provides an opportunity to examine the risks encountered in engineering projects and the contractual mechanisms used for mitigating such risks.

Basic Software Engineering
This workshop focuses on the principles of software engineering, and on the software lifecycle and quality. Topics include: project management, requirements and specifications, design process, implementation, and software verification.

Building Management Systems
This workshop is an introduction to the computer-based system that controls all the mechanical and electrical equipment in a building for efficiency, safety, and comfort. Topics include: System design and maintenance, functions, and benefits.
**Wireless Phone Programming using Java 2 ME (J2ME)**  
This workshop trains participants to develop Java 2 Micro-Edition (J2ME) applications that target wireless Phones (Smart Phones).

**Health Sciences**  
**Current Practices in Healthcare Organizations**  
This workshop offers a framework for making managerial decisions and strategies to lead a healthcare organization (HCO) to operate at optimal efficiency and effectiveness. It exposes participants to the different challenges that hospital administrators usually face in trying to implement these strategies. Topics include: the goals of HCO administration, different methods of reducing overall costs in an HCO without hampering quality of care, standard procedures that enhance quality of care in an HCO, and the framework that considers all financial aspects of an HCO with the goal of increasing profitability.

**Global Trends in Healthcare Human Resources**  
This workshop is designed to prepare participants to direct the Human Resources (HR) of an HCO. It focuses on environmental factors that affect HR management, the aspects of HR that an HR officer would consider in strategic HR planning and managerial decisions, topics include: general demographic trends relevant to healthcare HR, economic conditions and events that affect healthcare HR salaries and working conditions, globalization and its implication on HCO employment, the current status of HCO HR in terms of supply and demand, and technological advancements and their effects on HCR HR.

**Cost Effective Performance Improvement in Healthcare Organizations**  
This workshop focuses on how to reduce costs in an HCO without impairing quality care. It uncovers the different inefficiencies in an HCO that cause futile expenses and highlights activities that can be made more efficient.

**Accreditation and Quality in Healthcare Organizations**  
This workshop educates HCO Administrators about the accreditation requirements for an HCO, and offers an implementation process for HCO development procedures related to acquiring accreditation. It also trains participants in general quality improvement in an HCO.

**Hospital Management**  
**Current Practices in Healthcare Organizations**  
This workshop will focus on efficiency, effective performance, quality of care, performance improvement, service-profit chain, and managerial roles.

**Global Trends in Healthcare Human Resources**  
This workshop will discuss in detail the trends impacting human resources: demographics, economics, globalization, labor shortage, and technology.

**Cost-Effective Performance Improvement**  
This workshop will focus on quality and cost, types of costs, prevention vs. failure costs, efficiency and PI, measures to enhance material management and procurement, staffing review and cost containment, and performance measurement.

**Quality Management, Improvement and Accreditation**  
This workshop will discuss the definition of quality management, dimensions of quality, types of quality measurements, quality management principles, and the three P’s of quality activity.

**Information Technology**  
**Introduction to Computer and Information Security**  
This workshop introduces participants to the major issues involved in a secure computer system. It provides them with hands-on experience in gathering information in attack’s planning, detecting unknown security situations in a computer system, and in using some of the related tools in solving security problems.

**Databases Fundamentals**  
This workshop trains participants to use a scientific method to design a database from business requirements. It focuses on the process of normalization, and gives the participants an overview of the main components of a database engine and techniques for improving query performance and protecting data through views, authorization control, and semantic integrity control.

**Web Programming using ASP.NET**  
This workshop trains participants to use the ASP.NET controls to develop state of the art web sites that match in capability and sophistication those major sites that exist on the Web. In a nutshell, this training enables trainees to develop database-enabled web sites of such caliber.

**Journalism**  
**Communication/Media Crisis Management**  
This workshop introduces participants to the diverse means of mass communication, how to manage a media crisis in a globalized 21st century, and the effect of the technological expansion in the world of communication. It equips the participants with the knowledge and skills to interpret, analyze, set priorities, and communicate information via various media and to maintain effective public relations.

**Coverage of Financial Crises**  
This workshop focuses on the intricacies of the economic crisis; the dangers of financial crises and their impact on national economies; key economic crises worldwide and how to deal with them; the broad economy; companies and commodities; ethics in business/economic coverage and how to obtain and assess documents.

**Investigative Journalism**  
This workshop introduces reporters to definitions of the genre, duties and responsibilities of investigative journalists, obstacles and legal limits to this type of reporting, ethics, ideas for reports and how to dig for information.

**War Coverage/Safety**  
This workshop involves basic rules about dangerous assignments, recognizing danger and weapons, health and safety precautions, accidents, first aid tips and medical aid, bodyguards, escorts, translators and fixers, safety equipment and gear, and dealing with civil unrest. Participants will also learn about the risks involved in embedding with regular and irregular combat troops, coverage of children and families in conflict, media ethics in war situations and the role of humanitarian organizations and NGOs in wars.
Elections Coverage
This workshop deals with campaigns, finances, political parties, surveys and voting. Participants will improve their skills in questioning candidates, tracking polls, monitoring legislation, observing vote counting, eyeing funding and maintaining ethical standards.

Citizen/Online Journalism
This workshop provides participants with the opportunity to hone their skills in cyber publishing. Web 2.0, audio and video editing, converged content and online media ethics are a few of the topics that will be tackled. Participants will set up their own blogs (web blogs), shoot digital pictures and video, work with images and file resolution, integrate feeds into their blogs, and create multimedia packages for the web.

Media Literacy
This workshop focuses on “globalization” of the media (moving from the local to the global), media content analysis, dealing with multimedia and social media, interactivity and “screenagers”; digital media filtering, media literacy skills, educators’ roles, parents’ inputs, critical thinking and empowerment.

Medicine
Life Support Essentials
This workshop introduces participants to the basics of responding successfully to a medical situation in all its stages. It provides them with knowledge on the theory and the practice of patient-physician communication and educates them on how to evaluate and implement pro-active measures to prevent infection risks. It also focuses on practical and life-saving skills on how to react promptly and efficiently to victims of trauma. This workshop addresses the role of different professionals in response to a major incident. Furthermore, it utilizes lectures, demonstrations, role-playing, and applications within the conceptual framework of safe medication to help participants deal with a medical condition efficiently.

Modern Radiotherapy Techniques
This workshop introduces participants to the physical and biological bases of radiotherapy. It equips them with the knowledge and skills to identify, determine, plan, monitor, and manage the physical and biological mechanisms while applying modern radiotherapy techniques.

Principles of Pharmacy
This workshop introduces the participants to the Drug Management Cycle. Topics include: management of the Hospital Pharmacy; medication errors; principles of aseptic techniques under a laminar flow-hood; risk level classification, documentation and labeling; Aseptic Technique Activity (Handling ampoules, handling vials, etc.); parenteral nutrition; and pharmacists’ role in processing patient orders.

Nursing
Basic Trauma Life Support (BTLS)
This workshop prepares participants to deal with cardiopulmonary arrest and secondary trauma resulting from a variety of factors. It consists of two core components: Basic Life Support and Advanced Cardiac Life Support. In addition to formal lectures and discussions, the participants will have the opportunity to practice on manikins throughout the course.

Advanced Trauma Care for Nurses (ATCN)
This workshop introduces participants to the established standards of trauma care. It focuses on practical and life-saving skills that are needed by nurses working in situations where they experience frequent incidences of critical cases. This workshop provides participants with skills to manage multiple trauma patients.

Training of Trainers for Emergency Health Rehabilitation
This workshop is designed to help develop the training skills of future trainers who will be educating other nurses and paramedics in their home institutions. It focuses on: searching for evidence based answers; adult learning; curriculum design; and giving effective presentations.

Major Incident Medical Management Support
This workshop addresses the role of different professionals in response to a major incident. It will train them in the timely activation of the systems required for a successful medical response to a major incident.

Scholarships and Awards
Kamil Sadeddin Continuing Education Scholarship
The Kamil Sadeddin Continuing Education Scholarship fund aims to encourage AUB’s community members to enhance their education and become more effective employees by pursuing individual courses and professional certificates at CEC.

All AUB staff members at grade 12 or below are eligible to apply for the Kamil Sadeddin Continuing Education scholarship.

Abdul-Hamid Hallab REP Service Excellence Award
Purpose
The purpose of Abdul-Hamid Hallab REP Service Excellence Award is to recognize the accomplishments of outstanding REP consultants from the AUB community who have made major contributions to the AUB mission of serving “the peoples of the Middle East and beyond” and the REP mission of providing “the Middle East and North Africa with world class professional services…while reflecting AUB core values and its commitment to service excellence.” By recognizing these individuals, REP demonstrates its commitment to service excellence and provides incentives for AUB faculty and staff to serve as REP consultants. The award is based on qualitative and quantitative evidence for excellence in consulting work.

Eligibility
Full-time AUB faculty and staff who have served on at least one REP project during the entire fiscal year are eligible to be nominated. Consultants who were nominated in previous years may be nominated again on condition that they haven’t received the award during the previous year.
The AUB Summer Program for AUB Alumni Children (SPAAC)

Overview

The American University of Beirut’s Continuing Education Center (CEC), in collaboration with the Office of Alumni Relations and the Worldwide Alumni Association of the American University of Beirut (WAAAUB), offers a special summer program to children of AUB alumni throughout the world to strengthen the ties between AUB and all of its alumni. SPAAC offers AUB alumni children the opportunity to experience campus life while learning about Lebanon’s rich history and culture. The summer program aims at deepening the students’ knowledge of their heritage, expanding their understanding of the modern Middle East, and strengthening alumni ties through the experiences of their children. This summer program is a rich and pleasurable educational experience, and a unique opportunity to enjoy the summer, make new friends, get a taste of college life, and explore Lebanon.

The summer program is open for bright and highly motivated students from around the world between the ages 18 and 21. The participants’ stay on campus will be facilitated and carefully supervised by our highly qualified staff. All participants will be accompanied by our staff for all planned activities including on-campus activities and field trips to extraordinary historical sites throughout Lebanon.

Eligibility

All participants must be either high school or college students and must be at least 18 years of age. Priority will be given to children of AUB alumni. All other applicants will be considered based on availability of vacancies.

Program Structure

Academic Courses

Participants will learn classical and colloquial Arabic using a curriculum rich in social and cultural activities. Participants will also cover pre-history, contemporary history, and the archaeology of Lebanon through field trips and course work. The language of instruction is English, though Arabic will be used where it is found suitable.

The following academic courses will be offered to each participant:

- **Colloquial Arabic:** Arabic for communicating in common day-to-day situations
- **Literary Arabic:** An elementary knowledge of classical Arabic grammar, expanded vocabulary and basic reading skills
- **Contemporary Lebanese Studies:** This course aims at giving participants a better understanding of Lebanon from the pre-historic period till today. The archaeology program starts with a general introduction to the archaeological sites in Lebanon and surveys prehistoric Lebanon.
Art Elective: Students may choose to participate in one of three afternoon courses (photography, drama, or life drawing).

Social Activities
Afternoons on the scenic campus of AUB will be a time for a variety of extracurricular activities. Participants are at liberty to choose from the following social activities:

• Visits to museums, souks, and AUB libraries.
• Extensive use of the Charles Hostler Student Center facilities including swimming, gym, basketball courts, and the soccer field.
• Volunteer services at AUB Medical Center
• Dinner outings to various destinations in the country.

During the evening hours, participants will sometimes go on dinner outings to various destinations in Beirut. Every Friday, students will enjoy the beauty of the Lebanese.

Country Excursions
One-day and overnight trips to significant historical and cultural destinations throughout Lebanon will ensure participants’ exposure to the diversity Lebanon has to offer.

Field trips may include (among others):

• Visits to the archaeological and historical sites in Jbeil, Batroun, Beiteddine, Moussa Castle, Baalback, Jeita
• Hiking in the Cedars and Qadisha Valley
• Rafting on the Orontes River (Nahr-El-Assi) in Hermel
• Weekly visits to various Lebanese beaches.

Meals and transportation on our planned excursions are included in the program costs.

**CEC Rules and Regulations**

**AUB EEE**
Applicants who need to sit for the AUB EEE should register for the test two days prior to the examination day, pay an exam fee of L.L. 50,000, and submit two passport photos and an identity card. Registration and test administration are done in Nicely Hall, Room 500.

**Student IDs**
CEC students are provided with AUB identification cards which they should carry while on AUB campus. In case the student loses his/her ID card that s/he gets upon registration, s/he can get a new one by paying a replacement fee.

**Course Offerings**
The updated course listing is posted each semester on the CEC website.

CEC is under no obligation to offer any of the certificate or diploma courses at all times.

**Course Cancellations**
CEC reserves the right to cancel any course due to insufficient enrolment or other unavoidable circumstances. All registrants will be notified and a complete refund is made automatically.

**Student Withdrawal**
Should a student need to withdraw from a course anytime before or after classes officially begin, s/he must inform CEC in writing and return his/her AUB ID (if issued). Non-attendance does not constitute official withdrawal.

**Attendance**
Attendance to all classes is required. A student who is absent one fourth the number of sessions of a course without a valid excuse will not be entitled to a final grade for that course.

**Access to University Facilities**

• Students enrolled in CEC courses are entitled to use the reading facilities at Jafet Library but not to check out books.
• CEC students are not entitled to free access to Charles Hostler Student Center. Those who want to join can apply for a paid monthly membership.
Examinations
Final Examinations are held within one week of the last class session, unless the course instructor specifies otherwise.

Grading System
CEC uses the AUB grading system which is as follows:

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<th>Cumulative Average</th>
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I: Incomplete
P: Pass
PR: In Progress
W: Withdraw
F: Fail

All final grades are expressed in multiples of one.

Repeating a Course
A student is not allowed to register for the same course more than twice.

Attestations
Attestations are offered to students who enroll in individual courses to continue their professional development. Request for attestations can be made in person at CEC Office or by sending an email to cec@aub.edu.lb.

During registration and examination periods, attestations are not issued.

Holidays
The CEC follows the AUB calendar with respect to holidays.

 Aub Rules and Regulations
All students are expected to abide by the rules and regulations of the University.

Change of Personal Information
Students are encouraged to inform CEC about any changes in their contact information.

Contact CEC
Continuing Education Center
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Beirut, Lebanon

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Center for Civic Engagement and Community Service (CCECS)

Director: Mabsout, Mounir, Professor of Civil Engineering
Project Coordinator: Safa Majzoub, Olga
Administrative Assistant: Abou Farraj, Lina
Research Assistant: Fayyad, Reem
Project Consultant: Shibli, Rabih

Introduction

Established in 2008, the Center for Civic Engagement and Community Service (CCECS) aims to develop a culture of service and civic leadership within the AUB community and provide opportunities for AUB students, faculty, and staff from all backgrounds to study and respond to social and civic needs. The Center identifies, integrates, and supports university-wide community initiatives, thus upholding AUB’s mission of service towards its community.

The Center seeks connections between civic engagement and liberal learning and encourages leadership, scholarship, volunteerism, and community partnerships by:

- promoting the integration of service to society with academic study and research in a variety of disciplines;
- encouraging responsibility and leadership through volunteer services; and
- creating close links with the community.

Approach

To fulfill its mission, CCECS has adopted Community Service Outreach Activities, Community-Based Projects and Research, and Community-Based Learning (or Service Learning) which is an academic type of experiential learning combining service with explicit academic learning objectives, preparation for community work, and deliberate reflection. The Center’s main focus is on education, public health, the environment, urban and rural sustainable development, philanthropy, and social justice.

Partners

The Center works with AUB departments, faculty, centers, and student organizations, and with a growing list of community partners including governmental and non-governmental organizations, and various municipalities throughout Lebanon. It supports the Tomorrow’s Leaders program under the Middle East Partnership Initiative (MEPI) by providing community service opportunities to students in the program and developing service learning at AUB. CCECS also collaborates with centers and institutes within the region and around the world which share a mutual commitment to community service and its implementation through Community-Based Learning. Through the Center, AUB is a founding member of the Ma’an Arab University Alliance, and a member of the Talloires Global Network of Universities and Campus Compact. It is also a partner with nine other universities from Europe, Jordan, and Lebanon on a TEMPUS EU-supported project to develop service-learning and civic engagement partnerships across the curriculum.

Volunteering

CCECS seeks to establish and maintain an active volunteering program at AUB, whereby students mainly, but also faculty and staff, can identify opportunities and options to be involved in projects that best satisfy their aspirations, match their expertise, and respond to critical societal needs. These events and activities involve volunteers with the community at large, and inspire them to develop a relationship with those in need. For more information on volunteering opportunities, contact the Center at ccecs@aub.edu.lb.
Endowed Faculty Chairs, Student Scholarships, Fellowships, Hardship Awards, and Research Funds
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Endowed Faculty Chairs

FM
Raja N. Khuri Deanship for the Faculty of Medicine: Sayegh, Mohamed

FEA
Mohammed Abdulmohsin Al-Kharafi Chair in Engineering: None
Al Mu'allim Mohamed Awad Binladin Chair in Architecture in the Islamic World: None
Dar Al-Handasah (Shair & Partners) Endowed Professorship in FEA: El-Fadel, Mutasem
The Qatar Chair for Energy Studies: Ghaddar, Nesreene
Zakhem Deanship of Engineering and Architecture: None

OSB
Coca-Cola Chair in Marketing: None
The Abdul Aziz Al-Sagar Chair in Finance: None
Kamal Shair Chair in Leadership at OSB: None
The Husni A. Sawwaf Chair in Business Management: None

FAS
Michael Atiyah Chair in Mathematics: None
Alfred H. Howell Chair: Hamadeh, Shrime
Margaret Weyerhaeuser Jewett Chair of Arabic: Baalbaki, Ramzi
The Sheikh Zayid bin Sultan Al-Nahyan Chair of Islamic and Arab Studies: Khalidi, Tarif
Edward W. Said Endowed Chair in American Studies: Reidpharr, Robert
Mary Fox Whittlesey Visiting Professorship: Khalidi, Lamya

Scholarships, Fellowships, and Hardship Awards

The scholarships listed below have been made available to needy and deserving students through the generosity of alumni and friends of the University. Many of them represent the income from endowed funds which in some cases are supplemented by an additional grant. A student requesting aid does not apply to a particular fund but is considered for all awards administered by the University for which the student is qualified.

Scholarships, Fellowships, Awards, and Hardship

Grants

President Mahmoud Abbas Scholarship for Palestinian Students in Lebanon
Teddy A. Abdo Scholarship
Ahmad Abdul Jabbar Endowed Scholarship
Dr. Aff and Mrs. Zamzam Abdul Wahab Endowed Scholarship
Khayreddine and Adel Abdul Wahab Endowed Scholarship
Samir and Malak Abdulhadi Scholarship
Samia Ghaddar Abdul Salam Scholarship
Terry and Pierre Abou Khater Endowed Scholarship
Oussama Aboughazale Scholarship
Abu Dhabi Alumni Chapter Endowed Scholarship for FHS
Abu Dhabi Alumni Chapter Endowed Scholarship for UndergraduateFHS
Abu Dhabi Alumni Endowed Scholarship
Abu Dhabi Alumni Medical Sciences Endowed Scholarship
Ahmad Abu Ghazaleh Scholarship
Sumaya Aboughazale Scholarship
Maher Abu Ghazaleh Scholarship
Dr. Marwan S. Abouljoud Scholarship
Shakour Mohammad Abu-Ghazaleh Scholarship
Dr. Fadil Raji Abu-Haydar Endowed Scholarship
Yusef Abu-Khadera Endowed Scholarship
Nicolas Abu Marad Endowed Scholarship
Walid and Nada Abushakra Endowed Scholarship
Fuad Muhsin Afman Memorial Endowed Scholarship
Farouk W. Agha Endowed Scholarship
Osmane Aidi Endowed Scholarship
Maysoon Akrawi Dowling Endowed Scholarship
Samih Alami Memorial Endowed Scholarship
Sulayman Salim Alamuddin (Baakline-Lebanon) Memorial Endowed Scholarship
Alfardan Excellence Sponsorship
The Ameen and Sophia-Taft and Nelly Antoun Endowed Scholarship
Appeal Scholarship for Fine Arts
Khalil Arab Scholarship
Arabia Insurance's Nabih Faris Memorial Endowed Scholarship
J.J. Arakelyan Endowed Scholarship
AREC ‘78 and Friends Endowed Scholarship
AREC ‘80 Endowed Scholarship
AREEN Projects Endowed Scholarship
The Armenian Catholicosate of Cilicia Endowed Scholarship
The Armenian Students Endowed Scholarship
Emir Faysal Majid Arslan Scholarship
Joseph Asmar Endowed Scholarship
The Asfari Scholarship
Odette Atalla Scholarship
Sami Maurice Atallah Scholarship
Haidar and Sirin Ataya Scholarship
American Task Force for Lebanon Scholarship In the name of Joseph J. Jacobs
AUB Alumni Association—Dubai Branch Scholarship
AUB Alumni Association—Dubai and Northern Emirates Endowed Scholarship
AUB Alumni Association—Greece Branch Endowed Scholarship
AUB Alumni Association—Mount Lebanon Branch Endowed Scholarship
AUB Alumni Association of North America (AANA) Endowed Scholarship
AUB Alumni Association of North America (AANA) Southern California Chapter Endowed Scholarship
AUB Alumni Association—Oman Branch Endowed Scholarship
AUB Alumni Association—Qatar Branch Endowed Scholarship
AUB Alumni Association—Swiss Branch Endowed Scholarship
AUB Alumni Association in Syria Branch Endowed Scholarship
AUB Alumni Association—UK Branch Endowed Scholarship
AUB Alumni Development Endowed Scholarship
AUB Alumni Club of Jordan Scholarship Fund
AUB Alumni of Kuwait Society Endowed Scholarship
AUB Alumni—Riyadh Branch Endowed Scholarship
AUB Alumni Staff of BankMed Scholarship
AUB Faculty and Staff Scholarship
AUB Scholarship Fundraising Committee Endowed Scholarship
AUB UNRWA-EU Scholarship
Hanna Ayoub Scholarship
George and Wafa El-Azar Scholarship
Lina Naaman Azhari Endowed Scholarship
Saad Na’man Azhari Scholarship Fund
Munir Baalbaki Memorial Scholarship
Samih and Sanaa Baalbaki Scholarship
Khatchig Babikian Scholarship
Mary Bajada Memorial Endowed Scholarship
Abdul Aziz Al-Bahar Scholarship
Banque Audi Scholarship
Nabil and Reem Barakat Scholarship
Barakat-Sawabini Endowed Scholarship
Eissa A. Bateh and Brothers Endowed Scholarship
Hazel Reed Baumeister Trust Endowed Scholarship
Bechtel Group Foundation Scholarship
Ziad Beydoun Memorial Endowed Scholarship
Anis Abdul Hamid Bibli Memorial Endowed Scholarship
Anthony Bing Scholarship
Hanna Bisharat Scholarship
Dr. Maurice H. Bisharat Endowed Scholarship
Zahra Bissat Endowed Scholarship
Bliss Memorial Endowed Scholarship
Daniel Bliss Endowed Scholarship
Mrs. Daniel Bliss Endowed Scholarship
BLOM Bank Scholarship
Mamdouha and Elmer Bobst Endowed Scholarship
Issa I. Farah Scholarship
Dr. George Fakhoury Endowed Scholarship
FAO Fellowship Award in Plant Protection
Issa I. Farah Scholarship
Dr. Gebran and Mrs. Salma Farah Endowed Scholarship
Muneef Assaf Farah Endowed Scholarship
Suhayl Assaf Farah Endowed Scholarship
Nabil Bustros Scholarship
CCC PhD Fellowship in Manufacturing
The Nemr and Helene Chamoun Endowed Scholarships
Emile and Helen Chartourni Endowed Scholarship
The Chartourni Scholarship
Wa’el Nohad Chehab Endowed Scholarship
Wa’el Nohad Chehab Endowed Scholarship for Business Students
Chinese Class Endowed Scholarship
Hanna Said Choufelli Endowed Scholarship
Citigroup Foundation Scholarship
Clapp-Constance Endowed Scholarship
Class Reunion Endowed Scholarship
Archie and Mary Crawford Endowed Scholarship
C.V. Starr Endowed Scholarship
Nicolas Harissi Dagher and Hannah Farah Dagher Scholarship
Kamel Dajani Memorial Endowed Scholarship
Serene Dajani Memorial Endowed Scholarship
Mahmoud Dalal Endowed Scholarship
Zouheir Chaifk Daouk Memorial Endowed Scholarship
Mr. and Mrs. Khalil Darawish Scholarship
Deloitte and Touche (M.E.) Scholarship
Avedis and Rita Demirdjian Scholarship Fund
Office of Development Endowed Scholarship
The Cleveland H. Dodge Foundation Endowed Scholarship
The Cleveland H. Dodge Foundation Endowed Scholarship-Ford Foundation Match
David S. Dodge Arabic Fund
David S. Dodge Endowed Scholarship
Doris Dodge Endowed Scholarship
Dr. Harry G. Dorman Endowed Scholarship
Harry G Dorman Jr. and Virginia Whitney Dorman Memorial Scholarship
Douma Ladies’ Charitable Society of Boston, Massachusetts, Endowed Scholarship
Elas M. Doumet Scholarship
Druze Foundation for Social Welfare Scholarship
Eastern Province Saudi Arabia Endowed Scholarship
Ziad Anwar El Khalil Scholarship
Endowed Scholarship Fund
Engineering and Architecture Alumni Chapter Endowed Scholarship
Enno and Hildegard Ecklentz Endowed Scholarship
Harold Morton Esty Memorial Endowed Scholarship
Aznive Etinoff Memorial Endowed Scholarship
Samira Fadli Scholarship
FAFS 50th Anniversary Graduate Student Endowed Scholarship
FAFS Dean’s Hardship Fund
The Dorothy Fals/Beck Endowed Scholarship
Dr. George Fakhoury Endowed Scholarship
FAO Fellowship Award in Plant Protection
Trinity College Dublin Endowed Scholarship
Mr. and Mrs. Khalil Darawish Scholarship
Muneef Assaf Farah Endowed Scholarship
Suhayl Assaf Farah Endowed Scholarship

Endowed Faculty Chairs, Student Scholarships, Fellowships, Hardship Awards, and Research Funds
Dr. Kassem Faress Foundation Scholarship Fund
Dr. Kassem Faress Foundation Endowed Scholarship
George F. Faris Memorial Endowed Scholarship
The Samei Taj Faraouki Arts and Sciences Endowed Merit Scholarship
Roosevelt and Georgette Fatouh Endowed Scholarship
FEA Class of 1964 Endowed Scholarship
FEA Class of 1964 Scholarship
Fine and Performing Arts Endowed Scholarship
Fingerprints Endowed Scholarship Fund — 2002
Fingerprints Endowed Scholarship Fund — 2003
Fingerprints Endowed Scholarship Fund — 2004
Fingerprints Endowed Scholarship Fund — 2005
Fingerprints Endowed Scholarship Fund — 2006
Fingerprints Endowed Scholarship Fund — 2007
Fingerprints Endowed Scholarship Fund — 2008
Fingerprints Endowed Scholarship Fund — 2009
Fingerprints Endowed Scholarship Fund — 2010
Fingerprints Endowed Scholarship Fund — 2011
Musa and Amal Freijji Endowed Scholarship
David F. Fuleihan Endowed Scholarship
The Fuleihan Family Endowed Scholarship
Gaza Endowed Scholarship
Rafic Gazzazouli Scholarship
Pierre Amin Gemayel Endowed Doctoral Fellowship in FEA
General ScholarshipAbdul Fattah and Mona Ghali Scholarship
Ali Ghandour Endowed Scholarship
Dinaar Y. Alghanim Scholarship
Samia Ghabril Endowed Scholarship
Shawki Gholmeh Endowed Scholarship
Goguikian Foundation Scholarship
Graduate Regional Endowed Scholarships-Ford Foundation Match
The Alexis and Anne-Marie Habib Foundation Scholarship
Karim Habre Endowed Scholarship
William and Aida Haddad Endowed Scholarship for Engineering
Charles Haggopian Endowed Scholarship
Abdul Hamid Hallab FAFS Dean's Hardship Fund
Abdul Malik Al-Hamar Scholarship
Abdul Malik Yousuf Al-Hamar Memorial Scholarship
Abdul Ghani Hammour Endowed Scholarship
Antoine Saad Hamra Endowed Scholarship
Iliya Harik Memorial Scholarship
Rafic Hariri Endowed Scholarship for Nursing Students
Nayel Al Harith Endowed Fellowship
Saadat Hasan Endowed Scholarship
Hazar-AUB Development Endowed Scholarship
George Issa Hazboun Memorial Endowed Scholarship
Kamal and Nuha Hemady Endowed Scholarship
The Herter Endowed Scholarship
HH Shaikh Khalid Bin Hamad Al-Thani Endowed Scholarship
Rahi K. Hindawi Endowed Scholarship for Medical Students
Philip and Mary G. Hitti Endowed Scholarship
Dr. Yusuf K. Hitti Endowed Scholarship
Maximilian E. and Marion D. Hoffman Foundation, Inc. Endowed Scholarship
Maximilian E. and Marion D. Hoffman Foundation, Inc. Endowed Scholarship for Dental students
HRH Prince Talaal Ben Abdel Aziz Endowed Scholarship
Suad Al-Homaizi Scholarship
Harold B. Hoskins Endowed Scholarship
Mounzer Hourani Scholarship in FAS
The HSBC Scholarship
Dr. Elias Hussni Endowed Scholarship
Hassan and Kulthum Al-Husseini Scholarship
Dr. Farouk S. Idriss Endowed Medical Scholarship
Houda Idriss Memorial Endowed Scholarship
Dr. Yakub Inat Medical Endowed Scholarship
Intermedic (Jean Farah & Co.) S.A.L. Endowed Scholarship
Ray R. Irani Endowed Scholarship
Rida Irani Memorial Endowed Scholarship
Iranian Students Endowed Scholarship
H.H. Mar Ignatius Zakka Iwas Endowed Scholarship
Humam Jabban Scholarship
Abdul Halim Jabra Memorial Scholarship
Amal and Farouk K. Jabra Endowed Scholarship
Philippe Jabra Scholarship
Ali Abdallah Jammal Memorial Scholarship
Ghassan Jedeed Scholarship
The Morris Janowitz Endowed Scholarship
Sakina Jarudi Scholarship
Yervant Jidejian Memorial Endowed Scholarship
Mohieddine Jishni Memorial Scholarship
Salman Al Jishi Scholarship Fund
Job Fair Committee Scholarship
Walid Joumblatt Scholarship
Suad Hussein Juffali Endowed Scholarship
Mr. and Mrs. Mustafa Jundi Endowed Scholarship
Mr. and Mrs. Nafez Mostafa Jundi Endowed Scholarship
Jamilee Dagher Jureidini Memorial Endowed Scholarship
Elie Kaf Scholarship
Habib Kairouz Scholarship
Karaqulla Endowed Scholarship
Zohrab A. Kaprielian Endowed Scholarship
Nadim Kasser Scholarship
Aly A. Al-Katami Scholarship for Business Students
Stella B. Kern Endowed Scholarship
Elsa Reckman Kerr and Stanley Kerr Endowed Scholarship
Malcolm H. Kerr Memorial Endowed Scholarship
Shake Ketefian Scholarship in Nursing
Ahmad S. Al-Khalidy Endowed Scholarship
Bashar Hassan Khayat Memorial Endowed Scholarship
Marie Al-Kheury Endowed Scholarship
The Fuad I. Khuri Scholarship
Suha B. and Grace H. Kirkwood Endowed Scholarship
Dr. Abdul Afou Kronfol Scholarship
Endowed Faculty Chairs, Student Scholarships, Fellowships, Hardship Awards, and Research Funds
Endowed Faculty Chairs, Student Scholarships, Fellowships, Hardship Awards, and Research Funds

Dr. Naji Sahyoun Endowed Scholarship
Nasser Saidi Scholarship
Fouad M. Saleh Scholarship
Najib Ibrahim Salha Scholarship
Joseph Sanbar Scholarship
Ingeborg Sa’i Scholarship
Fuad Es-Said Endowed Scholarship
Salwa Es-Said Endowed Scholarship
Dr. Fateh Sakkak Scholarship
Camille Sarieddine Scholarships
Henri Sarkissian Scholarship for Armenian Students
Saudí Binladín Group Scholarship
Husni Ahmad Sawwaf Endowed Scholarship
Asma Sayyour Endowed Scholarship Fund
Maroun Semaan Scholarship
Araiek and Maroun Sarieddine Endowed Scholarship
Khaled Muhieddine Sosun Award
Dr. Michael A. Shadid Endowed Scholarship
Shaheen Brothers Endowed Scholarship
Shafik Melhem Shabshab Endowed Scholarship
Aziz and Saleemeh Shaheen Endowed Scholarship
Selma Shaheen Nursing Endowed Scholarship
Youssef Shammas Scholarship
Ahmad Shamsuddin Memorial Endowed Scholarship
Dr. Fady and Mrs. Roula Dalloul Sharara Scholarship
Hassan Al Shawwaf Scholarship
Ramsey L. Sheikh Endowed Scholarship
Jabir Shibli Endowed Scholarship
Shweir Scholarship Fund
Sidani Scholarship Fund
Peggy Smith Memorial Endowed Scholarship
The Starr Foundation Endowed Scholarship
Aziz Stephan Scholarship
Isam and Awef Soufan Scholarship Fund
Maria Shaar Sukkar Scholarship
Nancy Maysara Sukkar Scholarship
Yumna Hoss Sukkar Scholarship
Abdel Rahman Tabbara Scholarship
Fadwa Nassif Taleb Endowed Scholarship
May Halabi Taleb Endowed Scholarship
Khalil Thabet Memorial Endowed Scholarship
Jacob Thaddeus Scholarship
The Medicine Class of 1982 Endowed Scholarship Fund
Dr. Fuad and Alice Trabulsi Endowed Scholarship
Sleyman and Sofia Trabulsi Endowed Scholarship
Makram Ghassan Tuunni Memorial Endowed Scholarship
Shafik and Mary Tumeh Endowed Scholarship
Sara Al-Turki Endowed Scholarship
University Student Faculty Committee Endowed Scholarship
University Student Faculty Committee 2003 Endowed Scholarship

University Prizes and Awards

Mudar al-Aiki Awards: First prize $150 and second prize $100, awarded on a competitive basis for the best essay, speech, or debate on the subject of “How I Can Serve My Fellow Man.”

Abdul Hadi Debs Endowment Award for Academic Excellence: Three awards not exceeding $1,000 each to graduating students, preferably at the graduate level, in the Faculty of Agricultural and Food Sciences, the Faculty of Arts and Sciences, and the Faculty of Engineering and Architecture. Candidates have an outstanding academic record and have demonstrated their research capabilities through a paper, project, or thesis deemed by the faculty to be worthy of publication.

Pepsi Cola International Scholarship Award: ($5,000) awarded annually for students with Special Needs.

Abdul Hamid Hallab REP Service Excellence Award: ($1,000) awarded to full time AUB faculty or staff who served on at least one REP project during the fiscal year.

Rosemarie S. Haggar Music Award: ($1,000) awarded to students in the AUB Choir to be used to support a musical performance or for supervised education and research experience outside AUB.

BCG AUB Promising Leader Award: ($11,000) awarded to students in their penultimate year of study who demonstrate exceptional ability in academics, leadership, creativity, teamwork and communication.

Penrose Award: Non-cash honorary awards made to the outstanding graduate of each faculty on the basis of scholarship, character, leadership, and contribution to university life.

Agricultural and Food Sciences

Edgecombe Memorial Prize: $500 awarded to the outstanding student in third year agriculture.

FAFS Alumni Award: Annual award of $500 to a qualified and needy agriculture student(s) at AREC with a cumulative average of 75 or more.
The Joanna Haidar Award: Annual award of $200 to a deserving and needy AREC student having a cumulative average of 75 and above. The student should be environmentally aware and interested in agricultural practices and development.

Kashadarian Award: To a deserving student who was at AREC and has shown outstanding performance in farm skills and practices, and an appreciation for farm life at AREC.

Penrose Award: Non-cash honorary awards made to the outstanding graduate of each faculty on the basis of scholarship, character, leadership, and contribution to university life.

Dean Thomas M. Sutherland Prizes: Awarded annually at graduation to outstanding Faculty of Agricultural and Food Sciences graduates. For undergraduate excellence, $500 to the recipient of the Penrose Award for the year. For graduate excellence, $1,000 to the MS graduate with the thesis judged best overall for design, research, presentation, and contribution to its field.

Sana Najjar Zahr Award: To a senior agriculture student who will continue his or her studies for a Master of Science degree in agriculture.

Arts and Sciences
Shehadeh Abboud Memorial Excellence Award in English Language: $1,000 awarded to a graduating senior student majoring in English with the highest average in the major English courses during his/her undergraduate studies.

HE Ghassan Al-Rashash Excellence Award in Political Studies: The prize ($500) will be awarded to a graduating student with the highest average in the graduate program in Political Studies.

Sheikh Fawzi Azar Memorial Prize: $200 awarded to student(s) in SBS with a commendable paper or study submitted to the department. Annual balance will be used for the purchase of educational materials and subscription to scientific journals.

Educators' Endowed Award in Education: $1,000 awarded to one or two outstanding students in the Education Department in the acknowledgement of their achievement. These students should have shown innovation, served community service and had an average of 75 or above.

Mahmoud Farra Prize: Awarded on the basis of academic excellence at the discretion of the dean.

Philip K. Hitti Prize: Awarded in books to the senior student in the Faculty of Arts and Sciences who, in the judgment of the president of the University, the dean of the faculty, and the chairman of the department concerned, exemplifies in his/her academic career the scholarly spirit of AUB at its best.

Nicholas Jabre Prize: Awarded on the basis of academic excellence at the discretion of the dean.

Nadim Khalaf Memorial Award: $500 awarded at the end of each academic year to the graduating senior student in economics with the highest average in economics during his/her undergraduate studies at AUB.

Mrs. Jinan Majzoub Excellence Award in English Literature: The prize ($500) will be awarded to a graduating student with the highest average in the graduate program in English Literature.

Samir Makdissi Award in Economics: The prize will be awarded to the project/thesis during the academic year that best fits the criteria for selection.

The Muhanna Foundation in Mathematics Award of Excellence: $1,000 awarded annually to the most outstanding senior Lebanese student in the Department of Mathematics.

Hussein Oueini Memorial Award: $4,000 divided equally between a graduating senior student in PSPA with the highest average and the best thesis written during the same academic year, as recommended by the department and dean.

Penrose Award: Non-cash honorary awards made to the outstanding graduate of each faculty on the basis of scholarship, character, leadership, and contribution to university life.

Amal Saidi Memorial Prize: $500 awarded to a graduating senior excelling in the subject of anthropology or sociology.

Engineering and Architecture
AREEN Projects award for excellence in Architecture and Design: Six prizes of $2,000, $1,500, and $1,000, awarded to six students based on projects they submit to the department and who are chosen upon the recommendation of a jury. The recipients should have a cumulative average of at least 80 in architecture and design courses during the last four semesters. The graduation project's purpose should be to serve the community in Lebanon, and should demonstrate outstanding and distinctive creativity and aesthetic value.

Farouk W. Agha Excellence Award: $1,000 awarded to a graduating student with a BE degree in Mechanical or Civil Engineering who succeeded to accumulate the highest average over his/her period of study at AUB.

Fawzi W. Azar Award: $10,000 awarded annually toward the tuition of one or more fifth-year student(s) in the architecture program of the Faculty of Engineering and Architecture based on a project they present in their fourth year that is deemed best by a special jury.

Dean's Award for Creative Achievement: Awarded to a student in each of the main programs of the Faculty of Engineering and Architecture (architecture, graphic design, civil engineering, computer and communications engineering, electrical engineering, and mechanical engineering) who has demonstrated outstanding creativity in his/her approach to academic work.

The Distinguished Graduate Award: Awarded to a graduating student in each of the undergraduate engineering programs of the Faculty of Engineering and Architecture (civil engineering, computer and communications engineering, electrical engineering, mechanical engineering) in recognition of outstanding academic achievement, character, and contribution to the faculty throughout his/her tenure in the faculty.

The Charli S. Korban Awards: $1,500 awarded annually to an outstanding undergraduate student and an outstanding graduate student, both majoring in the field of electrical engineering.

Penrose Award: Non-cash honorary awards made to the outstanding graduate of each faculty on the basis of scholarship, character, leadership, and contribution to university life.

Professor Emeritus Fateh Sakkal Renewable Energy Research Award: $3,000 awarded annually to Mechanical Engineering students for the best thesis in the field of renewable energy.

Youssef Salam Civil Engineering Award: $1,000 awarded to a graduating student with a BE degree in Civil Engineering who succeeded to accumulate the highest average over his/her period of study at AUB.
Health Sciences

Graduate Academic Achievement Award: Non-cash honorary award in recognition of excellence in academic performance. Awarded to a student in the MPH program and a student in the MS programs.

Distinguished Graduate Award: Non-cash honorary award in recognition of excellence in academic performance and community service. Awarded to a senior FHS student.

Distinguished MLS Graduate Award: Non-cash honorary award in recognition of excellence in Medical Laboratory skills with good academic performance. Awarded to a senior student in the Medical Laboratory Sciences program.

Distinguished Graduate Award for Community Service: Non-cash honorary award in recognition of excellence in community service with good academic performance. Awarded to a senior FHS student.

Penrose Award: Non-cash honorary awards made to the outstanding graduate of each faculty on the basis of scholarship, character, leadership, and contribution to university life.

Medicine

Mrs. Robert J. Lewis Memorial Award: For the best paper written during the current year on neuroscience.

Franklin Thomas Moore — Ethel Jessup Memorial Prize: Established by the children and friends of Dr. and Mrs. Franklin T. Moore; awarded to the senior medical student who has shown the highest proficiency in obstetrics and gynecology or, lacking such, in any department, and in the student’s personal life a dedication to humanity, a zeal for truth, and a belief in God.

Penrose Award: Non-cash honorary awards made to the outstanding graduate of each faculty on the basis of scholarship, character, leadership, and contribution to university life.

Dr. Munib Shahid Award: Given annually to the fourth year medical student demonstrating the best performance in internal medicine and a mature character.

Nimir Tuqan Memorial Prize in Pathology: In memory of the late Dr. Nimir Tuqan. To be awarded to the student of Medicine II who excels in his/her work in the Department of Pathology.

Women's Auxiliary Nursing Students Award: Full tuition for a needy and outstanding student in the School of Nursing.

Anoir Hamoud Makarem Nursing Award: ($1,000) awarded to Nursing students from Ain Wa Zein, Lebanon.

Joseph Mouro Nursing Award: ($1,000) awarded to a BSN III needy student who demonstrates excellence in patient care.

Suliman S. Olayan School of Business

Dr. Emile Ghassas Memorial Award: A cash prize of $1,000 awarded to the best graduating student in the Bachelor of Business Administration program.

Penrose Award: Non-cash honorary awards made to the outstanding graduate of each faculty on the basis of scholarship, character, leadership, and contribution to university life.

Current and Endowed Research Funds

AUB Education Reform Fund
Boustany Batten Research
The Joseph and Ilham Cicippio Endowed Research Fund at FAFS
Dar Al-Handasah (Shair & Partners) Endowed Fund For Research In Engineering
The Harik Research Fund
Farouk K. Jabre Fund for Biomedical Research
Mikati Endowed Research Fund
Salim A. Salam Endowment Fund
Maroun Semaan Research Fund for Graduate Students
Dr. Mohamad Tajuddin Research Fund in FAFS
Faculty List
Dean Emeritus
Daghir, Nuhad, PhD; Iowa State University, AVSC

Professors Emeriti
Abboud-Klink, Sami, PhD; Rensselaer Polytechnic Institute; Civil and Environmental Engineering
Daghi, Ibrahim, MD; AUB; Surgery, Cardiothoracic
Fakhry, Majid, PhD; University of Edinburgh; Philosophy
Haddad, Fuad, PhD; University of Chicago; Education
Haddad, Fuad Sami, MD; AUB; FRC; Canada; Surgery, Neurosurgery
Hanna, Azmi, PhD; University of Erlangen; Mathematics
Iliya, Raja, PhD; University of Texas, Austin; Civil and Environmental Engineering
Issa, Philip, MD; Université Saint Joseph; Radiation Oncology
Issidorides, Costas, PhD; University of Iowa; Chemistry
Kennedy, Edward S., PhD; Lehigh University; Mathematics
Khalaf, B. Wadad, RN, MSN; Boston University; Medical Surgical Nursing
Khouri, Farid, MD; AUB; Laboratory Medicine
Makarem, Selwa, PhD; Columbic University; Nursing
Makdisi, Samir, PhD; University of Economics; Mathematics
Muwafi, Amin, PhD; University of Florida; Mathematics
Nabbut, Nassim, PhD; University of Texas; Microbiology and Immunology
Nasif, Raif, MD; AUB; MPH, Yale University; Laboratory Medicine
Obeid, Sami, MD; AUB; Clinical Surgery, General
Prothro, Edwin, PhD; Louisiana State University; Social and Behavioral Sciences
Sakkal, Fateh, PhD; University of Manchester; Mechanical Engineering
Saab, Ihab, PhD; University of London; History and Archeology
Shabibi, Samir, MD; AUB; Surgery, Plastic and Reconstructive
Shawary, Edmond, MD; AUB; Internal Medicine, Nephrology
Yff, Peter, PhD; University of Illinois; Mathematics
Ziad, Nicolas, PhD; University of London; History and Archeology

Faculty Members
Abbas, Jaber, MD; AUB; Clinical Associate Professor; Surgery, General
Abbas, Ossama, MD; AUB; Assistant Professor of Clinical; Dermatology
Abboud, Antoine, ME; AUB; Instructor (Part time); Civil and Environmental Engineering
Abboud, Miguel, MD; AUB; Professor; Pediatrics and Adolescent Medicine, Hematology-Oncology
Abboud, Rania, MA; Lebanese University; Instructor (Part time); Architecture and Design
Abbyad Weir, Christine, PhD, RN, WHNP; University of Texas at Austin; Clinical Assistant Professor; Nursing
Abchee, Antoine, MD; AUB; Associate Professor of Clinical; Internal Medicine, Cardiology
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Jamal, Dimna, PhD; University of Kent, Canterbury; Associate Professor; Management, Marketing and Entrepreneurship

*on leave
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<td>Social and Behavioral Sciences</td>
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<tr>
<td>Semerjian, Lucy</td>
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<td>Civil and Environmental Engineering</td>
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<tr>
<td>Serhan, Randa</td>
<td>Columbia University</td>
<td>Assistant Professor</td>
<td>Social and Behavioral Sciences</td>
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<td>Serof, Gregoire</td>
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<td>Senior Lecturer (Part time)</td>
<td>Architecture and Design</td>
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<tr>
<td>Seoud, Muhieddine</td>
<td>AUB</td>
<td>Professor of Clinical</td>
<td>Obstetrics and Gynecology</td>
</tr>
<tr>
<td>Sefir, Pierre</td>
<td>AUB</td>
<td>Assistant Professor of Clinical</td>
<td>Surgery, Cardiothoracic</td>
</tr>
<tr>
<td>Seifir, Roger</td>
<td>AUB</td>
<td>Clinical Associate Professor</td>
<td>Surgery, Vascular</td>
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<tr>
<td>Shaaban, Kassim</td>
<td>University of Texas</td>
<td>Professor</td>
<td>Professor</td>
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<tr>
<td>Shaaban, Reem</td>
<td>AUB</td>
<td>Instructor</td>
<td>University Preparatory Program</td>
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<tr>
<td>Shakilad, Rima</td>
<td>AUB</td>
<td>Instructor</td>
<td>English, Oxford</td>
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<tr>
<td>Shahidi, Hossein</td>
<td>St. Antony’s College</td>
<td>Assistant Professor</td>
<td>Social and Behavioral Sciences</td>
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<tr>
<td>Shahin, Hassand</td>
<td>AUB</td>
<td>Clinical Associate</td>
<td>Ophthalmology</td>
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<tr>
<td>Shalak, Maha</td>
<td>AUB</td>
<td>Instructor (Part time)</td>
<td>English</td>
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<tr>
<td>Shalaloub-Khouy</td>
<td>Nina, K.</td>
<td>AUB Instructor</td>
<td>English</td>
</tr>
<tr>
<td>Shammas, Elie</td>
<td>Carnegie Mellon University</td>
<td>Assistant Professor</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>Shamra, Sara</td>
<td>AUB</td>
<td>Instructor</td>
<td>Medical Laboratories</td>
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<tr>
<td>Shamseddine, Fadi</td>
<td>University of Saint Joseph</td>
<td>Clinical Associate</td>
<td>Pediatrics and Adolescent Medicine</td>
</tr>
<tr>
<td>Shamseddine, Maha</td>
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<td>Instructor (Part time)</td>
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</tbody>
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Index
A

academic advisers, 47
General University Academic Information, 47
OSB, 294
See also supervision
Academic Calendar, 14
Academic Computing Center, 27
Academic rules and regulations
FAFS, 86
FAS, 121
FEA, 321
FHS, 426
Nursing, 449
Academic Services, the University, 27
Accounting, OSB, 288
CEE, 473
Accreditation, 24
Administration, 20
Admissions, 32
BBA Program, 291
early admission, 37
FAFS, 86
FEA, 319
FHS, 423
OSB, 291
non-degree and other programs, 39
Nursing, 447
premedical study, 82,121
Psychology, 262
Radiologic Technology Training Program, 446
special students not working for a degree, 38
Sociology-Anthropology, 266
summer session, 38
transfer from other universities, 37
undergraduate study, 33
university employees, 38
Agriculture Science, Department of, 102
American literature, English, 195
American Studies (see Center for American Studies and Research), 275
Animal and Veterinary Sciences, Department of (AVSC), 98
Anis Malakdhi Program in Literature, (AMPL), 274
Anthropology, Social and Behavioral Sciences, 265
application
application procedures, Admissions, 32
Arabic and Near Eastern Languages, Department of, 139
Archaeology, Department of History and Archaeology, 225
Architecture, Department of Architecture and Design, 327
AREE, 87
Art History Program, 203
Arts and Sciences, Faculty of, 118
athletics, 71
attendance
FAS, 133
General University Academic Information, 47
Nursing, 450
Auditing courses, 48
Awards, School of Nursing, 453

B

BBA Program, 291
Biology, Department of, 145
Biomedical Engineering, minor, 325
Board of Trustees, 18

C

Calendar, Academic, 14
Career and Placement Services, 71
categories of students, 48
Center for American Studies and Research, The Prince
Alwaleed Bin Talal Bin Abdulaziz Al-Saud (CASAR), 275
Center for Behavioral Research (CBR), 277
Center for Civic Engagement and Community Service (CCECS), 506
Center for English Language Research and Teaching (CELTR), 278
Center for Teaching and Learning (CTL), 27
certificate
admitting certificate, 41
Certificate and Class Chart, 43–46
change of major, FEA, 322
See also transfer
Chemistry, Department of, 152
Civilization Sequence Program, 158
Civil and Environmental Engineering, Department of, 348
classes and laboratories, attendance
FAS, 133
General University Academic Information, 47
Nursing, 450
classification
FAFS, 88
FAS, 120
OSB, 294
class status, FEA, 322
cognitive Science, 262, 264
commencement exercises, 53
Communication, Program in Media Communication, Social and Behavioral Sciences, 272
Communication Skills Program, English, 191
Comparative and World Literature, English, 197
Computer and Communications Engineering Program, 365
Electrical and Computer Engineering, 364
Computer Science, Department of, 164
Computing and Networking Services, 27
Continuing Education Center (CEC), 471
counseling, 71
course/credit load(s), 49
FAFS, 120
FHS, 426
General University Academic Information, 47
OSB, 295
course numbers, FAS, 121,137
Nursing, 448
Creative Writing, English, 196
Critical Theory, English, 195
cross-registration
General University Academic Information, 61
OSB, 297
curriculum/major requirements
Agriculture, 87, 88
Agribusiness, 96, 97
Anthropology, 265, 273
Arabic, 140–144,183
Archeology, 228
Architecture, 328
Art History, 204, 212
BBA, 291
Biology, 145, 151
Chemistry, 153, 157
Civil Engineering, 349, 353
Computer and Communications Engineering Program, 365–367
Computer Science, 165, 171
COSP 150–160
Economics, 173, 176
Education, 178, 179, 180
Electrical and Computer Engineering, 366–371
Engineering Management Program, 419
English Language, 201
English Literature, 198
Environmental Health, 427, 428
Food Science and Management, 93, 94
Geology, 217
Graphic Design, 340
History, 225
Landscape Design, 89–90
Mathematics, 235, 236
Mechanical Engineering, 391–394, 397–399, 402–404,
Medical Laboratory Technology, 429–430
Nursing, 454–458
Nutrition and Dietetics, 91, 92, 93
Petroleum Studies, 218
Philosophy, 243
Physics, 249
Political Studies, 260
Psychology, 265
Public Administration, 260
Radiologic Technology, 444
Sociology, 273
Statistics, 238
Studio Arts, 203, 211, Veterinary Sciences 95, 96

deadlines
undergraduate applications, 33, 34
Dean’s Honor List, FAS, 132
General University Academic Information, 50
Nursing, 451
Decision Systems, OSB, 315
deferred registration, 39
deficiencies
Nursing, 451,
 Dietetics, BS degree in Nutrition and Dietetics, 86, 91, 93, 108
BS degree in Nutrition and Dietetics (Coordinated Program), 93, 109
Diploma Programs, CEC, 472–478
Education, 179–180
directed study, General University Academic Information, 50
FAS, 132
disciplinary action, Nursing, 453
disclosure, student records, 51
dismissal
FAS, 136
FHS, 426
General University Academic Information, 58
Nursing, 452
OSB, 296
distinction, graduation with, 56
distribution requirements
FEA, 321
dual degree, 55, 85, 128, 293, 426
early admission, 37
Economics, Department of, 172
Ecosystem management, Department of Landscape Design and (LDEM), 112
Education, Department of, 177
Electrical and Computer Engineering, Department of, 364
Electrical Engineering Program, Electrical and Computer Engineering, 368–371
Endowed Faculty Chairs, 508
Engineering Management Program, minor, 419
English, Department of, 190
English Language Proficiency Requirement (ELPR), 34, 35
English proficiency, 54
Entrepreneurship, OSB, 310
Environmental Health, Department of, 432
Epidemiology and Population Health, Department of, 435
examinations and quizzes, attendance
FAS, 133
Nursing, 450
OSB, 297
F
failure
FAS, 137
Nursing, 451
fees,
General University Academic Information, 59
fees and expenses, 65
student housing, 73
Finance, OSB, 289
financial aid, 68
Food Science and Management, Department of Nutrition and Food Science (NFSC), 107
Food Science and Management, minor, 84
French language courses, 163
Freshman Program, 121
full-time students
General University Academic Information, 48
FAS, 120
FHS, 426
G
General education requirements, 51
Genre courses, English, 194
Geology, Department of, 213
German language courses, 163
grading system
General University Academic Information, 55
FAS, 133
Nursing, 450
graduation requirements
IELC, 472
FAFS, 83
FAS, 125
FEA, 321
FHS, 424
General University Academic Information, 55
Nursing, 449
OSB, 298
graduation with distinction and high distinction, 56
Graphic Design, Department of Architecture and Design, 327
H
Health Promotion and Community Health (HPCH), Department of, 436
Health Management and Policy, Department of, 438
Health Sciences, Faculty of, 422
History, Department of History and Archaeology, 219
history of AUB, 25, 26
I
incompletes/incomplete grades
FAS, 134
FHS, 426
General University Academic Information, 57
Nursing, 450
OSB, 297
Intensive English Course (IEC), 35, 36
International Programs Office, 75
L
Landscape Design and Ecosystem Management, Department of, 112
language, correct use of, 49
Language Program, English, 198
language requirement (Arabic and English)
FAS, 126
OSB, 298
See also English Language Proficiency Requirement (ELPR); Intensive English Course (IEC)
Lebanese Baccalaureates, 41
Lebanese Ministry of Education, recognition of AUB degrees, 60
Libraries, 31
licensing, Nursing, 449
Literature Program, English, 193
Loans, 68
location and climate, The University, 27
M
majorless status,
General University Academic Information, 57
FAS, 128
make-up examinations
General University Academic Information, 47
FAS, 133
Management, OSB, 289, 312
Management Information Systems, 315
Managerial Economics, OSB, 288
Marketing, OSB, 288, 313
Mathematics, Department of, 229
Mechanical Engineering, Department of, 389
Mechatronics, 390
Medical Center, 29
Medical Laboratory Sciences, Department of, 439
medical record, 57
minor(s)
FAFS, 83
FAS, 129
FEA, 323–326
FHS, 425
OSB, 293–294
Mission Statement, University, 25
Museum, 29
N
names, on diplomas and degrees, 56
National Social Security Fund (NSSF) Medical Branch, 58
Numbers, assigned to courses
FAS, 137, 138
Nursing, 448, 449
Nutrition and Dietetics, BS in, 91–93
Nutrition and Food Science, Department of (NFSC), 107
O
Office of Institutional Research and Assessment (OIRA), 30
Office of Communications, 30
P
part-time students, 48
passports, 59, 75
Period Courses, English, 194
Petroleum Studies, Geology, 218
Philosophy, Department of, 239
Physics, Department of, 244
plagiarism test, 50
Political Studies and Public Administration (PSPA), Department of, 250
Population Health, Department of Epidemiology and, 435
premedical study, requirements
FAFS, 83
FAS, 121
Preparatory Program, University (UPP), 36, 280
prizes, University, 517
proclamation
General University Academic Information, 59, 60
FAS, 135, 136
FHS, 426
Nursing, 451
OSB, 296
promotion
FAFS, 82
FHS, 426
Nursing, 451
Psychology, Social and Behavioral Sciences, 261
Public Administration, Department of Political Studies and Public Administration (PSPA), 250
R
Radiologic Technology Training Program, 464
readmission
  Admissions, 39
  FAS, 136
General University Academic Information, 60
Nursing, 453
OSB, 296
Records, disclosure of student university records, 51
recreation, 72
registration
  cross-registration, 61
  deferred registration, 39
  Medical Record form, 57
payment of fees, 65
requirements, 39, 40
secondary school certificate/diploma requirements, 40
removal of probation
  General University Academic Information, 60
  FAS, 136
  OSB, 296
repeating courses/semester/year
  FAS, 128
General University Academic Information, 62
Nursing, 426
OSB, 296
residence halls, 73,74
residence permits, 75
residence requirements
  General University Academic Information, 62
  FEA, 321
RN-BSN, Nursing, 448
Rules and Regulations, Academic,
  FAFS, 86
  FAS, 121
  FEA, 321
  FHS, 426
  Nursing, 449
S
  scholarships, 274, 499, 508
  School of Nursing, 446
Science and Mathematics Education Center (SMEC), 279
second degree(s)
  FAFS, 84
  FAS, 128
  OSB, 293
Secondary School Certificate, diploma requirements, 40
Social and Behavioral Sciences, Department of, 250
Sociology, Social and Behavioral Sciences, 265
Special Education, Education, 181
special students not working for a degree
Admissions, 38
FAS, 133
Statement of Accreditation Status (SAS), 24
Statistics, Mathematics, 231, 237
student activities, 70
student housing, 73
student records, disclosure of, 51
Studio Arts Program, 203, 211
study abroad, 75
summer session, Admission, 38
T
  Teaching diploma Programs, 179–181
test, plagiarism, 50
transfer
  Admissions, 37
  FAFS, 85
  FAS, 123,127
  FEA, 320
  FHS, 427
  General University Academic Information, 63
  Nursing, 447
  OSB, 292
tutorials
  General University Academic Information, 63
  FAS, 132
U
  University Preparatory Program (UPP), 36, 280
V
  Veterinary science, BS in, 81 86, 95–96
  visas, 59,75
  visiting students (junior year abroad), 39
  Vocational Secondary Certificates, 42
W
  Water Resources, Civil and Environmental Engineering, 360
withdrawal
  FAS, 133
  Fees and Expenses, 67
  General University Academic Information, 64
  Nursing, 451
Work-Study Program, 69, 74
Writing Center, The, 282
Z
  Zaki Nassif Music Program, The, 283