

**Faculty of  
Agricultural and  
Food Sciences  
(FAFS)**

# Faculty of Agricultural and Food Sciences (FAFS)

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Ammar Olabi	Interim Dean
Yaser Abunnasr	Associate Dean
Bradley Jon Tucker	Registrar, ex-officio
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Mohamad Ghassan Abiad	Coordinator of Undergraduate Studies Program, Food Science and Management Program
Yaser Abunnasr	Coordinator of Undergraduate Studies Program, Landscape Architecture Program
Ali Chalak	Coordinator of Undergraduate Studies Program, Agribusiness Program
Mohamad Talal Farran	Coordinator of Undergraduate Studies

## Historical Background

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Basic university-level courses in agriculture were offered by the School of Arts and Sciences at AUB as early as 1914. Between the 1930s and 1940s, the university fulfilled its commitment to improving the livelihood of the less fortunate through the creation of the Institute of Rural Life. The Institute brought together students and faculty from various university schools and departments to implement improvement projects in rural health, education and farming. The School of Agriculture was established in 1952, along with the Advancing Research, Enabling Communities (AREC), a 100-hectare facility located in the Bekaa region 80 km away from the main AUB campus. The School offered a four-year program leading to a BS degree in Agriculture and the Diploma of Ingénieur Agricole and offered a one-year Technical Vocational Training (TVT) course, offered to government extension agents from 1956 to 1971. These programs contributed greatly to building the capacity of agricultural scientists and technicians from the Middle East region. A graduate program leading to the MS in Agriculture was initiated in 1956.

The importance of food and nutrition and their linkage to agriculture at AUB was recognized in the late 1970s. 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 three-year BS program in Nutrition and Dietetics (NTDT) was initiated in 1980. An eleven-month Dietary Internship program was established at the AUB Medical Center in 1983. The program 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. In 2012, a Bachelor of Landscape Architecture was introduced to replace the BS program in Landscape Design and Eco-Management, which started in 2000. 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 the region. 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

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The mission of FAFS is to foster sustainable enhancement of the health and well-being of people and nature throughout Lebanon and the region. To achieve its goals, the faculty uses basic and applied research as well as student-centered learning to prepare leaders and agents of change to address issues of local and global relevance at the nexus of human nutrition, food security and the sustainable use of resources.

## Vision

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FAFS is a reference academic center specialized in issues of relevance to the Middle East related to agriculture, food, nutrition and the environment for the enhancement of livelihoods, human health and well-being.

## Undergraduate Programs

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Six undergraduate programs are offered by FAFS:

### BS in Agriculture and the Diploma of *Ingénieur Agricole*

This is a four-year multidisciplinary program with the objective of training students in the various theoretical and practical aspects of agricultural sciences. It prepares students to address current agricultural issues at the regional and global levels using their scientific knowledge to improve production and protect the environment.

### Bachelor of Landscape Architecture (BLA) and the Diploma of *Ingénieur Agricole*

This is a four-year professional program offered by FAFS which leads to a Bachelor of Landscape Architecture (BLA) and a Diploma of Ingénieur Agricole. The program integrates sciences and the arts as a foundation to design, plan and manage landscapes in natural and urban settings.

The BLA program received accreditation by the Landscape Architectural Accreditation Board (LAAB) in September 2021 for a period of six years, making it the first BLA program worldwide to be accredited by LAAB outside the USA. LAAB is the academic arm of the American Society of Landscape Architects (ASLA).

### BS in Nutrition and Dietetics (NTDT)

This is a three-year program, which will lead to a BS degree in Nutrition and Dietetics (NTDT). The NTDT mission statement is to enhance the nutritional well-being and health of individuals, families and populations through promotion of scholarship in human nutrition and dietetics. The program is science-oriented, student-centered and committed to excellence in teaching, training, research and outreach service. The core values encompass the development of human potential and provide a collegial environment that fosters the professional growth of students for a career in nutrition and dietetics. This diverse and dynamic profession integrates human nutrition, food service administration, food science, biology, chemistry, physiology and interpersonal skills.

### BS in Nutrition and Dietetics Coordinated Program (NDCP)

This is a four-year program that leads to a BS degree in Nutrition and Dietetics Coordinated Program (NDCP). The program has a concentration in Medical Nutrition Therapy (MNT) and combines theoretical and experiential learning in Nutrition and Dietetics with at least 1200 hours of supervised practice in affiliated medical facilities. The proposed educational framework is based on the knowledge, skills and core competencies established by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) for entry-level dietitians. Students are first admitted to the didactic Nutrition and Dietetics program and then apply to the NDCP towards the end of their sophomore year in Nutrition and Dietetics after the completion of at least 30 credits. AUB's NDCP has been granted candidacy for full accreditation status by the Accreditation Council for Education in Nutrition and Dietetics of the Academy of Nutrition and Dietetics, (120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995, (312) 899-0040 ext. 5400. Website: <http://www.eatright.org/ACEND>).

This verifies that the program is equivalent and comparable in content and experience to United States-based programs meeting the ACEND accreditation standards. The accreditation makes students eligible to sit for the Commission on Dietetic Registration (CDR) examination for dietitians in the United States in order to obtain the Registered Dietitian (RD) status. The mission of the NDCP is to equip graduates with the knowledge, expanded skills and intellectual maturity to become progressive, innovative and inter-professional practitioners in the dietetic profession, capable of serving the public through promotion of optimal nutrition, health and well-being and to serve the profession and larger community through public service and leadership.

More specifically, the program involves several interrelated dimensions and is:

- dedicated to providing quality education that prepares students for competent practice and current and future roles in the dietetic 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 encourage 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 to the Code of Ethics for the Profession of Dietetics.

## Goals and Expected Outcomes of the NDCP

The goals of the NDCP are listed below; each is followed by supporting program objectives.

- NDCP provides quality didactic and supervised practice learning experiences that prepare graduates to be competent entry-level dietitians: At least 80 (GPA: 3.2) percent of students who enter the NDCP will successfully complete the program and receive a verification statement within four and a half years of enrolment.
- Over a period of five years, at least 80 percent of all graduates of the NDCP who sit for the colloquium/RD exam will pass the first time they take it.
- At least 90 percent of responses that evaluate the competencies attained from the NDCP will meet or exceed a rating of 3 on a 1–5 scale.
- At least 90 percent of ratings of professional preparation from the NDCP graduate's perspective will reach a rating of at least 3 on a 1–5 scale.
- At least 90 percent of ratings of professional knowledge from the employer's perspective will reach a rating of at least 3 on a 1–5 scale.
- NDCP prepares graduates who will commit to improving the quality of life of the community through improved health and well-being.
- Within five years of graduation from the NDCP, employment data will demonstrate that at least 70 percent 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.

- NDCP prepares graduates who will be successfully employed in their fields, attend graduate school or pursue other career options: At least 80 percent of NDCP graduates who have sought higher education will pursue an advanced degree within 12 months of graduation.
- At least 80 percent of NDCP graduates who have sought employment in dietetics will be employed within 12 months of program completion.
- At least 80 percent of employers will indicate that they would hire a graduate of the American University of Beirut NDCP in Nutrition and Dietetics.

Program outcome data are available from the program director upon request.

## 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 Agribusiness

The BS in Agribusiness is a three-year cross-disciplinary program designed to provide students with comprehensive knowledge in 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 12 years of schooling, starting with elementary 1. 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 follow the below table:

Major Requirements / Useful Electives
Agribusiness Completion of MATH 101 or MATH 203, any combination of science courses totaling 9 credits, CHEM 200, MATH 204 and courses in the humanities
Agriculture Completion of MATH 101 or MATH 203, CHEM 101, CHEM 101L, CHEM 102, CHEM 102L, and BIOL 101, CHEM 200, MATH 204 and courses in the humanities
Food Science and Management Completion of MATH 101 or MATH 203, CHEM 101, CHEM 101L, CHEM 102, CHEM 102L, and BIOL 101, CHEM 200, MATH 204, and courses in the humanities and a cumulative average of at least 75 or GPA: 3.0 in the freshman year
Landscape Architecture Any combination of science courses totaling 9 credits (an elective in each of geology, chemistry, and biology), completion of MATH 101 or MATH 203 with a minimum grade of 70 (C+ or GPA 2.3) and a cumulative average of at least 75 (B or GPA 3.0) in the freshman year.
Nutrition and Dietetics Completion of MATH 101 or MATH 203, CHEM 101, CHEM 101L, and a cumulative average of at least 75 or GPA: 3.0 in the freshman year. CHEM 102, CHEM 102L, and BIOL 101 CHEM 200, SOAN 201, and courses in humanities. (Admission is by selection of the most promising eligible applicants)

Students from a twelve-year secondary school system must hold the Lebanese Baccalaureate Part II in general sciences, life sciences, or sociology and economics, or the equivalent if they come from another country. Holders of Baccalaureate Part

II in Humanities may be considered for admission provided they take an additional course, MATH 203. To be considered for admission, students applying for transfer from another faculty or university must have a minimum grade point average of 70 or GPA: 2.3 for Agriculture and for Agribusiness, and 75 or GPA: 3.0 for Nutrition, Food Sciences and Management, and Landscape Architecture. 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 (NDCP)

Students are first admitted to the three-year Nutrition and Dietetics program. In addition, a separate application for the NDCP must be submitted during the second term of the sophomore year (upon completion of at least 30 credits). The selection of students for the NDCP is based on the cumulative average of the sophomore year (80 or GPA: 3.2 or above, unless stated otherwise by the department) and completion of the prerequisite courses. Individuals interested in applying to the NDCP must contact the department for application details towards the end of the sophomore year.

A maximum of 20 students are admitted each year depending on practicum site availability. Students applying to the NFSC department for a second BS in Nutrition and Dietetics are not eligible for the NDCP.

## Transfer to the Nutrition and Dietetics Coordinated Program (NDCP)

In order to be eligible for transfer into the Nutrition and Dietetics Coordinated Program (NDCP), students should first apply for transfer and be accepted into the Nutrition and Dietetics (NTDT) 3-year program. Upon being accepted into NTDT, interested students should fill out a separate application in order to apply for the Nutrition and Dietetics Coordinated Program (NDCP) and will then be considered based on cumulative average of credits completed at AUB as well as availability of spots in the NDCP.

### Transfer into the NTDT Program

#### a) Transfer from Other Faculties at AUB to the Nutrition and Dietetics Program

Students enrolled at other faculties at AUB may apply for a transfer to the NTDT Program. To be eligible for an internal transfer, the applicant must:

- have completed at least 24 sophomore credits,
- not be on probation,
- and have achieved a minimum overall cumulative average of 75 or GPA: 2.7.

Applications of transfer students are evaluated and approved by the department of Nutrition and Food Sciences (NFSC) and the Admission Committee of the faculty. Admission into the program is by selection of the most promising eligible applicants. Top ranking students of the applying pool of students will be selected based on the number of available places in the NTDT for the term in question.

Upon approval of transfer, the student's complete program of study and course requirement is determined by the department.

#### **b) Transfer from Other Universities to the Nutrition and Dietetics Program**

Students currently pursuing an undergraduate degree at another university in Lebanon or abroad may apply for transfer to the NTDT Program. To be eligible for admission to AUB and the NTDT Program, the applicant must:

- be transferring from an appropriately accredited university or institution of higher education recognized by AUB,
- have successfully completed at least 30 sophomore credits,
- and have achieved a minimum overall cumulative average equivalent to the AUB average of 75 (or GPA: 2.7). Admission is by selection of the most promising eligible applicants.

Applications of transfer students from other universities are evaluated and approved by the Department of Nutrition and Food Sciences (NFSC) and the Admission Committee of the faculty. Admission into the program is by selection of the most promising eligible applicants. Top ranking students of the applying pool of students will be selected based on the number of available places in the NTDT for the term in question.

As stated in the General University Academic Information section of the catalogue, applicants should meet the Readiness for University Studies in English before registration.

Upon approval of transfer, the student's complete program of study and course requirement is determined by the department. Transfer of courses from other universities is the prerogative of the NFSC department.

### **Applying to the NDCP After Transfer into the NTDT**

#### **a) Transfer students from other faculties within AUB**

Transfer students from other faculties within AUB who are accepted into the Nutrition and Dietetics 3-year program should apply separately to the NDCP and may be considered for acceptance into the program based on the number of available places in the NDCP for the term in question after they:

- have successfully completed at least 30 sophomore credits,
- have achieved a minimum overall cumulative average of 80 (or GPA: 3.2).

Admission into the program is by selection of the most promising eligible applicants. Top ranking students of the applying pool of students will be selected based on the number of available places in the NDCP for the term in question.

#### **b) Transfer students from other universities**

Transfer students from other universities who are accepted into the Nutrition and Dietetics 3-year program should apply separately to the NDCP. These students may be considered for acceptance on the waiting list of the program based on the number of available places in the NDCP for the term in question after they:

- have successfully completed at least 30 credits at AUB,
- and have achieved a minimum overall cumulative average of 80 (or GPA: 3.2) in courses taken at AUB.

These students may be considered for acceptance into the NDCP as regular students based on the number of available places for the term in question.

It is important to note that credits/courses completed at another institution will not be granted equivalency credits/courses for the NDCP's core courses. Please refer to the

appropriate section of the catalogue for the list of the program's core courses and their descriptions.

## Requirements for Premedical Study

Students entering the Faculty of Agricultural and Food Sciences and who ultimately intend to enter the Faculty of Medicine must complete the premedical requirements as outlined in the Admissions section under the Faculty of Medicine in the Graduate Catalogue, page 38.

## Graduation Requirements

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### Eligibility for Graduation

To be eligible for graduation with the degree of BS in Agriculture (AGRI) or Bachelor of Landscape Architecture (BLA), and the Diploma of Ingénieur Agricole, a student must:

- complete a minimum of 128 term credit hours (AGRI) or 144 term credit hours (LDAR),
- complete a minimum of seven terms of residency (LDAR),
- complete a minimum of seven terms of residency (AGRI),
- achieve an overall minimum grade average of 70 (or GPA: 2.2), and
- be approved for graduation by the faculty.

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

- complete a minimum of 97 term credit hours for the NTDT program: 97 term credit hours for the FSMT program and 96 term credit hours for the AGBU,
- complete a minimum of five terms of residency,
- achieve an overall minimum average grade of 70 (or GPA: 2.2), and
- be approved for graduation by the faculty.

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

- complete a minimum of 133 credits hours,
- complete a minimum of 1200 hours of supervised practice in an affiliated hospital,
- achieve an overall minimum average grade of 80 (or GPA: 3.2) in each of the three years of NDCP,
- achieve an overall minimum average grade of 80 (or GPA: 3.2) in the supervised practice, and
- complete the program within four and a half years of enrolment in NDCP.

Failure to meet the above NDCP graduate requirements will result in dismissal from the NDCP program in which case students will graduate with a BS in Nutrition and Dietetics (NTDT).

## Minors in Nutrition and Dietetics and Food Science and Management

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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 (NTDT) or Food Sciences and Management (FSMT) and who wish to obtain a minor in NTDT or FSMT 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 her/his major with a cumulative grade average of 75 (or GPA: 2.7).

The courses required for a minor in Nutrition and Dietetics are NFSC 221, NFSC 222, NFSC 240, NFSC 265, NFSC 274, NFSC 285 and NFSC 281. Additional courses may be required from Agriculture and Food Sciences and Management students to replace required courses common to the major and minor and/or to fulfill pre-requisite courses.

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 and/or to fulfill prerequisite courses.

## Minor in Agribusiness

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The courses required for a minor in Agribusiness are AGBU 210, AGBU 213, AGBU 229 or AGBU 236, AGBU 239, AGBU 240, AGBU 248 and AGBU 292.

## Minor in Food Systems

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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. 18 credit hours are required; 3 credits of each of the majors listed below.

### List of Courses for the Minor in Food Systems

NFSC 220, NFSC 252, LDEM 211, AVSC 220, AGSC 203 and AGBU 210.

### Learning Outcomes

- Identify key stages of food-product 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 crop 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 their role in promoting nature conservation
- Develop marketing and distribution strategies to promote food products

## Second BS Degree

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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 Food Science and Management, Agribusiness, 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 for holders of BS degrees other than the above mentioned majors .
- complete at least five terms of residency at FAFS.

To obtain a second BS in Agribusiness<sup>1</sup>, a student must complete:

- a minimum of 54 credits while registered in FAFS, including all AGBU II and AGBU III required core courses listed in this catalogue (of which up to 15 credits can be from transferred course credits).
- additional prerequisite courses as recommended by the Admissions Committee and approved by the Academic and Curriculum Committee.

To obtain a second BS in Nutrition and Dietetics, a student must complete:

- a minimum of 52 credits while registered at FAFS, including all NTDT II and NTDT III required core courses listed in this catalogue (of which 15 credits can be transferred course credits).
- additional prerequisite courses as recommended by the Admissions Committee and approved by the Academic and Curriculum Committee.
- at least three terms of residency at FAFS.

To obtain a second BS in Food Science and Management, a student must complete:

- a minimum of 53 credits while registered in FAFS, including all FSMT II and FSMT III required core courses listed in this catalogue (of which up to 15 credits can be from transferred course credits).
- additional prerequisite courses as recommended by the Admissions Committee and approved by the Academic and Curriculum Committee.
- at least three terms of residency at FAFS.

## Second BS Degree in Agriculture for Agribusiness Students

A candidate with a bachelor's degree in Agribusiness or Food Science and Management wishing to obtain a second degree in Agriculture and the Diploma of Ingénieur Agricole must complete a minimum of 53 credit hours with a minimum residency period of two semesters and the following course requirements with a minimum average of 70.

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1) Does not apply to Agriculture students

## List of Courses for Second BS Degree in Agriculture for Agribusiness Students:

Semester	Credit hours	Courses
Fall	15	AGSC 220 (Plant Physiology), AGSC 230 (Crop Systems), AGSC 233 (Plant Health – I), AVSC 275 (Animal Anatomy And Physiology)
Spring AREC	16	AGSC 222 (Farm Practices,) AVSC 223 (Livestock Systems), AGSC 244 (Agricultural Water Technologies), AGSC 245 (Plant Health-II), AGSC 246 (Intensive Agricultural Production), AGSC 250 (Organic Farming, Horticulture)
Summer AREC	7	AGSC 223 (Agricultural Project and Entrepreneurship), AGSC 247 (Farm Power and Alternative Energy), AGSC 235 (Agricultural Extension in Development)
Fall	15	AGSC 249 (GIS for Agriculture), AGSC 265 (Soils and Fertility), AGSC 234 (Chemicals in Agriculture) + two concentration courses in AGSC or AVSC
<b>Total</b>	<b>53</b>	
(Only general AGRI degree)		

## Second BS Degree in Agriculture for Food Science and Management Students

A candidate with a bachelor's degree in Agribusiness or Food Science and Management wishing to obtain a second degree in Agriculture and the Diploma of Ingénieur Agricole must complete a minimum of 53 credit hours with a minimum residency period of two semesters and the following course requirements with a minimum average of 70.

## List of Courses for Second BS Degree in Agriculture for FSMT Students:

Semester	Credit hours	Courses
Fall	15	AGSC 207 (Land And Water Resources), AGSC 220 (Plant Physiology), AGSC 230 (Crop Systems), AGSC 233 (Plant Health – I), AVSC 275 (Animal Anatomy And Physiology)
Spring AREC	16	AAGSC 222 (Farm Practices,) AVSC 223 (Livestock Systems), AGSC 244 (Agricultural Water Technologies), AGSC 245 (Plant Health-II), AGSC 246 (Intensive Agricultural Production), AGSC 250 (Organic Farming, Horticulture)
Summer AREC	7	AGSC 223 (Agricultural Project and Entrepreneurship), AGSC 247 (Farm Power and Alternative Energy), AGSC 235 (Agricultural Extension in Development)
Fall	15	AGSC 249 (GIS for Agriculture), AGSC 265 (Soils and Fertility), AGSC 234 (Chemicals in Agriculture), AVSC 271 (Animal Nutrition) + 1 concentration courses in AGSC or AVSC
<b>Total</b>	<b>53</b>	
(Only general AGRI degree)		

## Double Major

Students may, upon approval of the faculty concerned, earn a double major if the two majors fall within the same degree structure (that is, both are BS majors) and if the graduation requirements for both majors are met simultaneously. The student must also satisfy requirements of both majors and complete a minimum of 127 credits hours. Note that both majors must lead to the same bachelor's degree and one diploma will be issued indicating both majors.

## 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 fees differ, students will pay the higher of the two fees.

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

## Transfers

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To transfer 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 terms toward the residency requirements at FAFS based on the rate of equating each 12 credits of transferable courses taken at AUB to one residency term. For purposes of residency requirements, two summer sessions are equivalent to one term.

Students wanting to transfer to another faculty must take at least 50 percent of their courses at FAFS including one FAFS course (2 or 3 cr.) in the corresponding major per term. Students who do not register at least 50 percent of courses required by their major in the first term will automatically be given the status of majorless in the second term. A student should transfer after two terms; if s/he fails to secure acceptance to the desired major by the end of the second term, s/he will be dropped from the faculty.

## Transfer of Courses

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Transfer of basic science courses taken at AUB with a minimum grade of 60 (D or GPA: 1.0) is allowed if these are also required courses in the core programs of FAFS. A minimum grade of 70 (C+ or GPA: 2.3) is required for transfer of elective courses. Students wishing to transfer one or more required or elective courses should submit a written request to the Academic and Curriculum Committee.

## Elective Courses

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Candidates for the degree of BS in Agriculture must complete 27 credits of elective courses: 9 credits of concentration courses in FAFS, 12 credits in the humanities and 3 credits in the social sciences.

Candidates for the degree of Bachelor of Landscape Architecture (BLA) must complete 27 credits of elective courses: 9 credits of elective courses in FAFS (can all be from LDEM) 6 credits in the humanities, 6 credits in the social sciences, 3 credits in the quantitative thought and 3 credits in the natural sciences.

Candidates for the degrees of BS in Nutrition and Dietetics and BS in Food Sciences and Management must complete a minimum of 12 credits in the humanities.

Candidates for the degree of BS in Agribusiness must also complete 12 credits in the humanities.

## Academic Rules and Regulations

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

Refer to General University Academic Information in this catalogue for information on the following: maximum course loads (under Credit Loads), dismissal from the faculty and readmission, 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 specific program policies and procedures.

## Classification and Promotion

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### BS in Agriculture and Diploma of Ingénieur Agricole

For clear promotion from year I to year II, a student must complete a minimum of 27 credits. For promotion from year II to year III, a student must complete a minimum of 58 credits. For promotion from year III to year IV, a student must complete a minimum of 98 credits. All such credits should be from courses specified in the regular program.

### Bachelor of Landscape Architecture (BLA) and Diploma of Ingénieur Agricole

For clear promotion from year I to year II, a student must complete a minimum of 35 credits. For promotion from year II to year III, a student must complete a minimum of 74 credits. For promotion from year III to year IV, a student must complete a minimum of 110 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 30 credits. For promotion from year II to year III, a student must complete a minimum of 63 credits. All such credits should be from courses specified in the regular program.

## BS in Nutrition and Dietetics-Coordinated Program

For clear promotion from year I to year II, a student must complete a minimum of 30 credits. For promotion from year II to year III, a student must complete a minimum of 63. For promotion from year III to year IV, a student must complete a minimum of 97 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 30 credits. For promotion from year II to year III, a student must complete a minimum of 60 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, a student must:

- complete a minimum of 58 credits by the end of the first term of Agriculture III with a cumulative grade average of higher than 70 (or GPA: 2.2) and must not have accumulated more than 12 credits of failed and/or missed courses (of which no more than 6 credits are failed courses) specified in the regular program.
- be approved for such action by the Academic and Curriculum Committee.

## Curricula

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

#### Year I

First term		Credits
AGSC 205	The Food Odyssey	3
BIOL 200	Diversity for Life	4
CHEM 208	Brief Survey of Organic Chemistry	3
ENGL 203	Academic English	3
CMPS 209	Computers and Programming for the Sciences	3
		<b>Total 16</b>

<b>Second term</b>		<b>Credits</b>
ARAB	Arabic Communication Skills	3
NFSC 261	Biochemistry	3
AGSC 206	Agriculture and the Environment	3
MATH 204 or 201	Mathematics for Social Sciences II	3
ENGL 204	Advanced Academic English	3
		<b>Total 15</b>

## Year II

<b>First term</b>		<b>Credits</b>
AGSC 212	Microeconomic Theory of Food and Farming	3
AGSC 207	Land and Water Resources	3
AVSC 275	Anatomy and Physiology of Farm Animals	3
AVSC 243	Genetics and Biotechnology	3
AGSC 220	Principles of Plant Physiology	3
		<b>Total 15</b>

<b>Second term</b>		<b>Credits</b>
STAT 210/ NFSC 210	Elementary Statistics for the Sciences/ Nutrition and Food Science	3
AVSC 224	Agricultural Microbiology	3
AGBU 213	Legal and Policy Aspects of the Agriculture Sector	3
AGSC 225	Rural Community Development	3
Humanities Elective		3
		<b>Total 15</b>

## Year III

<b>First term</b>		<b>Credits</b>
AGSC 230	Crop Systems	3
AGSC 233	Plant Health-I	3
AGSC/AVSC 234	Chemicals in Agriculture	3
AGSC 252	Conservation Agriculture	3
AGBU 240	Career Planning Workshop for Agribusiness	0
Humanities Elective		3
		<b>Total 15</b>

<b>Second term (AREC)</b>		<b>Credits</b>
AGSC/AVSC 222	Farm Practices	1
AGSC 244	Agricultural Water Technologies	3
AGSC 245	Plant Health-II	3
		<b>Total 16</b>

AGSC/AVSC 250	Organic Farming	3
AVSC 223	Livestock Systems	3
AGSC/AVSC 246	Intensive Agriculture	3
		<b>Total 16</b>

<b>Summer Session (AREC)</b>		<b>Credits</b>
AGSC 223	Agricultural Project and Entrepreneurship	2
AGSC 247	Farm Power and Alternative Energy	3
AGSC 235	Agricultural Extension in Development	2
AGBU 256	Summer Internship	1
		<b>Total 8</b>

## Year IV

<b>First term</b>		<b>Credits</b>
AGSC 249	GIS for Agriculture	3
AGSC 257	Emerging Issues in Agriculture: Networking with the Private Sector	1
AVSC 271	Animal Nutrition	3
AGSC 265	Soils and Fertility	3
Social Science Elective		3
		<b>Total 13</b>

<b>Second term</b>		<b>Credits</b>
AGSC/AVSC	Concentration Courses	9
AGSC/AVSC 298	Capstone Course: From Seed to Table	3
Humanities Elective		3
		<b>Total 15</b>

# Curriculum for the Bachelor of Landscape Architecture and Diploma of Ingénieur Agricole<sup>1</sup>

## Year I

<b>First term</b>		<b>Credits</b>
LDEM 202	Studio I: Landscape Design Fundamentals	4
LDEM 200	Landscape Technical Drawing	4
LDEM 214	Landscape and Geomorphology	3
LDEM 207	Landscape Architecture History I	3
ENGL 203	Academic English	3
		<b>Total 17</b>
<b>Second term</b>		<b>Credits</b>
LDEM 216	Studio II: Landscape Garden Design	4
LDEM 201	Landscape Descriptive Drawing	4
LDEM 217	Soils in the Landscape	3
LDEM 291	Surveying and Base Plan Development	3
LDEM 211	Landscape Horticulture	3
		<b>Total 17</b>
<b>Summer Session</b>		<b>Credits</b>
LDEM 252	Computer Aided Design	3
LDEM 219	Plant Material I	2
		<b>Total 5</b>

## Year II

<b>First term</b>		<b>Credits</b>
LDEM 222	Studio III: Landscape Planting Design	4
LDEM 210	Botany and Plant Ecology for Landscape Architects	3
LDEM 247	Site Engineering I	3
LDEM 221	Plant Material II	1
Humanities Elective		3
Natural Sciences Elective		3
		<b>Total 17</b>
<b>Second term</b>		<b>Credits</b>
LDEM 204	Studio IV: Cultural Landscape Design	6
LDEM 208	Landscape Architecture History II	3
LDEM 248	Site Engineering II - Construction Material	3
LDEM 263	Landscape Appreciation and Site Analysis	3
		<b>Total 15</b>

1) A minimum of 144 credits required for graduation

<b>Summer Session</b>		<b>Credits</b>
LDEM 249	Site Engineering III - Design Implementation	4
LDEM 231	Sustainable Water Management Techniques	3
		<b>Total 7</b>

### Year III

<b>First term</b>		<b>Credits</b>
LDEM 228	Studio V: Urban Landscape Design	6
LDEM 251	Geographic Information System (GIS)	3
LDEM 218	Landscape Ecology	3
Social Sciences Elective		3
		<b>Total 15</b>

<b>Second term</b>		<b>Credits</b>
LDEM 246	Studio VI: Natural Landscape Design	6
LDEM 265	Landscape Management	3
Quantitative Thought Elective	Any course from the GE list, except; MATH 203 (only students coming from Humanities school background can take it); EDUC 271, EPHD 203 and NURS 203	3
LDEM 290	Professional Practice	3
		<b>Total 15</b>

<b>Summer Session</b>		<b>Credits</b>
LDEM 292	Internship (Practicum)	2
FAFS Elective		3
		<b>Total 5</b>

### Year IV

<b>First term</b>		<b>Credits</b>
LDEM 241	Studio VII: Landscape Capstone Project I	4
LDEM 260	Contemporary Issues in Landscape Architecture	3
FAFS Elective		3
Social Science Elective		3
ENGL 204	Advanced Academic English	3
		<b>Total 16</b>

<b>Second term</b>		<b>Credits</b>
LDEM 242	Studio VIII: Landscape Capstone Project II	6
ARAB	Arabic Communication Skills <sup>1</sup>	3
FAFS Electives		3
Humanities Elective		3
		<b>Total 15</b>

## Curriculum for the BS Degree in Nutrition and Dietetics (NTDT)<sup>1</sup>

### NTDT I

First term		Credits
BIOL 201	General Biology I	4
CHEM 200	Basic Chemistry and Applications	3
CHEM 205	Introductory Chemistry Laboratory	2
ENGL 203	Academic English	3
PSYC 201	Introduction to Psychological Science	3
		<b>Total 15</b>
Second term		Credits
CHEM 208	Brief Survey of Organic Chemistry	3
CHEM 209	Introductory Organic Laboratory	2
ENGL 204	Advanced Academic English	3
PHYL 246	Physiology for Nursing Degree Students and Undergraduates <sup>2</sup>	4
NFSC 221	Basic Nutrition <sup>2</sup>	3
		<b>Total 15</b>

### NTDT II

First term		Credits
AGSC 212	Microeconomics Theory of Food and Farming <sup>2</sup>	3
NFSC 274	Human Nutrition and Metabolism	3
NFSC 290	Food Service Management <sup>2</sup>	3
NFSC 261	Introductory Biochemistry <sup>2</sup>	3
NFSC 240	Nutrition Status Assessment <sup>2</sup>	2
MNGT 215	Fundamentals of Management and Organizational Behaviors	3
		<b>Total 17</b>
Second term		Credits
ARAB 201 or higher	Arabic Communication Skills <sup>3</sup>	3
NFSC 285	Nutrition in the Life Cycle	2
NFSC 281	Nutrition in the Life Cycle Lab for NTDT	1
NFSC 265	Food Chemistry <sup>2</sup>	3
NFSC 267	Food Analysis <sup>2</sup>	2
NFSC 229	Menu Planning	1
Humanities Elective		3
		<b>Total 15</b>

1) A minimum of 97 credits required for graduation

2) Course offered in Fall and Spring

3) The Arabic Placement Test is optional

## NTDT III

<b>First term</b>		<b>Credits</b>
NFSC 210	Statistics in Nutrition and Food Science <sup>1</sup>	3
NFSC 222	Community Nutrition	3
NFSC 277	Food Microbiology <sup>1</sup>	3
NFSC 292	Medical Nutrition Therapy I	3
NFSC 294	Medical Nutrition Therapy Lab I for NTDT	1
NFSC 299A	Projects in Nutrition and Food Sciences <sup>1</sup>	0
Humanities Elective		3
		<b>Total 16</b>

<b>Second term</b>		<b>Credits</b>
CMPS 209	Computers and Programming for the Sciences	3
NFSC 287	Food Processing <sup>1</sup>	2
NFSC 289	Food Processing Lab <sup>1</sup>	1
NFSC 293	Medical Nutrition Therapy II	3
NFSC 295	Medical Nutrition Therapy Lab II for NTDT	1
NFSC 296	Current Topics in Food Sciences and Nutrition <sup>1</sup>	1
NFSC 299B	Projects in Nutrition and Food Sciences <sup>1</sup>	2
Humanities Elective		3
Humanities Elective		3
		<b>Total 19</b>

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1) Course offered in Fall and Spring

## Curriculum for the BS Degree in Nutrition and Dietetics Coordinated Program (NDCP)<sup>1</sup>

### NTDT I

First term		Credits
BIOL 201	General Biology I	4
CHEM 200	Basic Chemistry and Applications	3
CHEM 205	Introductory Chemistry Laboratory	2
ENGL 203	Academic English	3
PSYC 201	Introduction to Psychological Science	3
		<b>Total 15</b>

Second term		Credits
CHEM 208	Brief Survey of Organic Chemistry	3
CHEM 209	Introductory Organic Chemistry	2
PHYL 246	Physiology for Nursing Degree Students and Undergraduates	4
ENGL 204	Advanced Academic English	3
NFSC 221	Basic Nutrition <sup>1</sup>	3
		<b>Total 15</b>

### NDCP II (Juniors)

First term		Credits
AGSC 212	Microeconomics Theory of Food and Farming <sup>2</sup>	3
NFSC 240	Nutrition Status Assessment	2
NFSC 261	Introductory Biochemistry <sup>2</sup>	3
NFSC 274	Human Nutrition and Metabolism	3
MNGT 215	Fundamentals of Management and Organizational Behavior	3
Humanities Elective		3
		<b>Total 17</b>

Winter Session		Credits
NFSC 225A	Job Shadowing	0
		<b>Total 0</b>

1) A minimum of 133 credits required for graduation

1) Course offered in Fall and Spring

<b>Second term</b>		<b>Credits</b>
ARAB 201 or higher	Arabic Communication Skills <sup>1</sup>	3
NFSC 285	Nutrition in the Life Cycle	2
NFSC 265	Food Chemistry <sup>2</sup>	3
NFSC 267	Food Analysis <sup>2</sup>	2
NFSC 286	Nutrition in the Life Cycle Lab for NDCP	1
NFSC 290	Food Service Management <sup>2</sup>	3
NFSC 229	Menu Planning	1
		<b>Total 15</b>

<b>Summer Session</b>		<b>Credits</b>
CMPS 209	Computers and Programming for the Sciences	3
NFSC 225B	Job Shadowing	0
Humanities Elective		3
		<b>Total 6</b>

### NDCP III (Seniors)

<b>First term</b>		<b>Credits</b>
NFSC 210	Statistics in Nutrition and Food Science <sup>2</sup>	3
NFSC 222	Community Nutrition	3
NFSC 277	Food Microbiology <sup>2</sup>	3
NFSC 292	Medical Nutrition Therapy I	3
NFSC 279	Medical Nutrition Therapy Lab I for NDCP	1
NFSC 299A	Projects in Nutrition and Food Sciences <sup>1</sup>	0
Humanities Elective		3
		<b>Total 16</b>

<b>Winter Session</b>		<b>Credits</b>
NFSC 298W	Dietetic Practicum	1
		<b>Total 1</b>

<b>Second term</b>		<b>Credits</b>
NFSC 287	Food Processing <sup>2</sup>	2
NFSC 289	Food Processing Lab <sup>2</sup>	1
NFSC 293	Medical Nutrition Therapy II	3
NFSC 297	Medical Nutrition Therapy Lab II for NDCP	1
NFSC 224	Advanced Nutrition Principles and Practices	1
NFSC 296	Current Topics in Food Sciences and Nutrition <sup>2</sup>	1
NFSC 299B	Projects in Nutrition and Food Sciences <sup>2</sup>	2
NFSC 275	Quantity Food Production	2
Humanities Elective		3
		<b>Total 16</b>

1) The Arabic Placement Test is optional.

2) Course offered in Fall and Spring

<b>Summer Session (May-June)</b>		<b>Credits</b>
NFSC 298SU	Dietetic Practicum	1
		<b>Total 1</b>

## NDCP IV

<b>First term</b>		<b>Credits</b>
NFSC 283	Nutrition Education and Communication	3
NFSC 284A	Seminar in Clinical Dietetics	1
NFSC 298F	Dietetic Practicum	13
		<b>Total 17</b>

<b>Second term</b>		<b>Credits</b>
NFSC 284B	Seminar in Clinical Dietetics	1
NFSC 298S	Dietetic Practicum	13
		<b>Total 14</b>

## Curriculum for the BS Degree in Food Science and Management<sup>1</sup>

### Food Science and Management I

<b>First term</b>		<b>Credits</b>
BIOL 200	Diversity of Life	4
CHEM 200	Basic Chemistry and Applications	3
CHEM 205	Introductory Chemistry Laboratory	2
ENGL 203	Academic English	3
MATH 204	Mathematics for Social Sciences II	3
		<b>Total 15</b>

<b>Second term</b>		<b>Credits</b>
CHEM 208	Brief Survey of Organic Chemistry	3
CHEM 209	Introductory Organic Laboratory	2
ENGL 204	Advanced Academic English	3
AGSC 212	Microeconomics Theory of Food and Farming <sup>1</sup>	3
NFSC 221	Basic Nutrition <sup>2</sup>	3
Humanities Elective		3
		<b>Total 17</b>

1) A minimum of 97 credits required for graduation

1) Course offered in Fall and Spring

## Food Science and Management II

First term		Credits
NFSC 210	Statistics in Nutrition and Food Science <sup>2</sup>	3
MNGT 215	Fundamentals of Management and Organizational Behavior	3
NFSC 261	Introductory Biochemistry <sup>2</sup>	3
NFSC 265	Food Chemistry <sup>2</sup>	3
NFSC 267	Food Analysis <sup>2</sup>	2
NFSC 277	Food Microbiology I <sup>2</sup>	3
		<b>Total 17</b>

Second term		Credits
ACCT 210	Financial Accounting	3
ARAB 201 or higher	Arabic Communication Skills <sup>1</sup>	3
CMPS 209	Computers and Programming for the Sciences	3
NFSC 272	Introduction to Food Service and Industries	2
NFSC 278	Food Microbiology II	3
Humanities Elective		3
		<b>Total 17</b>

Summer Session		Credits
NFSC 280	Summer Training in Food Establishments	1
		<b>Total 1</b>

## Food Science and Management III

First term		Credits
ACCT 215	Management Accounting	3
NFSC 282	Food Quality Management	3
NFSC 288	Technology of Food Products	3
FINA 210	Business Finance	3
NFSC 299A	Projects in Nutrition and Food Sciences <sup>1</sup>	0
Humanities Elective		3
		<b>Total 15</b>

Second term		Credits
MKTG 210	Principles of Marketing	3
NFSC 287	Food Processing <sup>1</sup>	2
NFSC 289	Food Processing Lab <sup>1</sup>	1
NFSC 291	Elements of Food Engineering	3
NFSC 296	Current Topics in Food Sciences and Nutrition <sup>1</sup>	1
NFSC 299B	Projects in Nutrition and Food Sciences <sup>1</sup>	2
Humanities Elective		3
		<b>Total 15</b>

1) The Arabic Placement Test is optional.

2) Course offered in Fall and Spring

# Curriculum for the BS Degree in Agribusiness<sup>1</sup>

## Agribusiness I<sup>2</sup>

First term		Credits
AGSC 204	Natural Sciences for Agribusiness	3
AGBU 211	Introduction to Agricultural Issues and Policies	3
CMPS 209	Computers and Programming for the Sciences	3
ENGL 203	Academic English	3
MATH 204	Mathematics for Social Sciences	3
		<b>Total 15</b>
Second term		Credits
ACCT 210	Financial Accounting	3
AGSC 202	Introduction to Land and Water Resources	3
AGSC 203	Crop Production and Protection	3
ARAB	Arabic Communication Skills <sup>3</sup>	3
ENGL 204	Advanced Academic English	3
		<b>Total 15</b>

## Agribusiness II

First term		Credits
ACCT 215	Management Accounting	3
AGSC 212	Microeconomics Theory of Food and Farming <sup>2</sup>	3
AGBU 239	Agribusiness Communication Skills Workshop	0
NFSC 252	Food Processing <sup>2</sup>	3
NFSC 210	Statistics in Nutrition and Food Science	3
Humanities Elective	To be chosen from PHIL 206 or PHIL 209	3
		<b>Total 15</b>
Second term		Credits
AGBU 210	Marketing in Agribusiness	3
ECON 212	Elementary Macroeconomic Theory	3
AGSC 253	Harvest and Post-harvest Issues and Strategies	3
AGBU 255	Field Study of the Rural Agro-economy	3
AVSC 220	Livestock Production and Protection	3
		<b>Total 15</b>
Summer Session		Credits
AGBU 229	Entrepreneurship in Agriculture (Theory + Project)	3
AGBU 256	Summer Internship	1
		<b>Total 4</b>

1) A minimum of 96 credits required for graduation

2) Course offered in Fall and Spring

3) The Arabic Placement Test is optional.

## Agribusiness III

<b>First term</b>		<b>Credits</b>
AGBU 236	New Trends in Agricultural and Food Systems	3
AGBU 240	Career Planning Workshop for Agribusiness	0
FINA 210	Business Finance	3
INFO 200	Foundations of Information Systems	3
MNGT 215	Fundamentals of Management and Organizational Behavior	3
Humanities Elective		3
		<b>Total 15</b>
<b>Second term</b>		<b>Credits</b>
AGBU 213	Legal Aspects of Agribusiness	3
AGBU 248	Operation Management for Agribusiness	3
AGBU 292	Agribusiness Final Year Project (capstone course)	5
Humanities Elective		3
Humanities Elective		3
		Total 17
		<b>Total Credit Hours 96</b>

# Department of Agriculture (AGRI)

Interim Chairperson:	Bashour, Isam
Professor Emeritus:	Kawar, Nasri
Professors:	Abou Jawdah, Yusuf; Bashour, Isam; Farran, Mohamad; Haidar, Mustapha; Hamadeh, Shady
Adjunct Professor:	Mohtar, Rabi
Associate Professors:	Chaaban, Jad <sup>1</sup> ; Chalak, Ali; Jaafar, Hadi
Adjunct Assistant Professors:	Abebe, Gumataw; Martiniello, Giuliano; Aoun Mirella
Assistant Professors:	El Kayal, Walid; Yanni, Sandra <sup>1</sup>
Lecturer:	Jaber, Lina; Doughan, Youssef
Instructors:	Bahn, Rachel Anne <sup>1</sup> ; Sobh, Hana

## Undergraduate Program

The Department of Agriculture 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 a BS degree in Agriculture and the Diploma of Ingénieur Agricole, and the other leading to a BS degree in Agribusiness.

The Agriculture (AGRI) 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, animal production and health, and land and water conservation. The department also trains students to become skilled farm operators and managers who are innovative and responsive to local and regional needs and who are capable of adapting to market changes and rising production costs.

The department offers two concentrations. A Concentration requires a total of 12 credits. Students in their final year may select 12 credits from the lists, which include courses in agricultural sciences and animal and veterinary sciences. Students who do not wish to do a concentration will be considered to be following the broader Agriculture sequence (Receive a Bachelor of Science in Agriculture and Diploma of Ingénieur Agricole with no concentration).

Undergraduate courses are offered in the areas of crop systems, agro-chemicals, farm power and alternative energy, plant health, organic and intensive agriculture, water technologies, conservation agriculture, soils, GIS in agriculture, agricultural economics and rural development. In addition, the program covers animal agriculture including nutrition, genetics and physiology, management and health. 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.

1) On Leave

The Agribusiness (AGBU) program combines the study of management with agricultural sciences 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 the fields of agriculture and food production and who are capable of communicating and using their skills in order to improve their livelihood and that of their community.

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

## Course Descriptions

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### Core Courses for the BS Degree in Agriculture

**AGSC 205            The Food Odyssey From Hunter-gatherers to GMOs            3.0; 3 cr.**  
The course will take the students through the journey of food systems evolution from pre-historic times to the present day and a glimpse into the future.

**AGSC 206            Agriculture and the Environment            3.0; 3 cr.**  
This course will introduce students to the subject of the impact of agricultural processes on the environment. It will discuss nutrient cycling and the various agricultural activities that lead to losses of nutrients and agricultural pollutants to the environment. The course will cover agricultural activities that contribute to climate change, buffer zones between agriculture and its environment, and mitigation strategies.

**AGSC 207            Land and Water Resources            2.3; 3 cr.**  
Global soil and water resources and their current rates of degradation. The main processes of degradation (erosion, loss of organic matter, salinization, pollution) and their causes; consequences of degradation and conservation of resources through improved land use practices. Causes, influences and mitigation measures; water use and supply management for sustainable agriculture.

**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, consumer behavior and demand for agricultural and food products. *Students cannot receive credit for both AGSC 212 and ECON 211; however, the two courses will be treated as equivalent. Fall and Spring.*

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

**AGSC 233/ AGSC 245 Plant Health I and II 3.0; 3 cr.**

Students will be introduced to major plant pests covering viruses, bacteria, fungi, phytoplasma, nematodes, weeds and insects and their management.

**AGSC/AVSC 222 Farm Practices 0.6; 1 cr.**

The course exposes students to 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 and Entrepreneurship 0.6; 2 cr.**

The course involves directed study with field and laboratory work. *Prerequisites: AGSC III standing and eligibility for enrollment in the regular program at AREC.*

**AGSC 230 Crop Systems 2.3; 3 cr.**

This course aims to provide students with an understanding of the scientific basis of crop production. These include broad-area agronomy cropping and horticulture. In this course students will gain an understanding of the basic physiological controls on crop yield.

**AGSC 225 Rural Community Development 3.0; 3 cr.**

Students will gain an introduction to the concepts and models of community development. They will be able to identify the consequences of development strategies for social, economic and environmental well-being, focusing on the interrelationships of these aspects of development. Students will be introduced to strategies to identify capacity and resources available in communities and those that need to be enhanced.

**AGSC 247 Farm Power and Alternative Energy 2.3; 3 cr.**

The course focuses on the study of internal combustion engines, power trains, and safe operation of tractors. The course explores the relationships between renewable energy and agriculture with emphasis on biofuels, wind energy and hydropower.

**AGSC 249 GIS for Agriculture 3.0; 3 cr.**

Basic introduction to geographical information systems with emphasis on applications to agriculture; GIS data types, editing GIS data, spatial data analysis, and GPS collection; basic concepts and techniques of map analysis and the way these are used in geographical information systems in general and desktop GIS in particular. The major areas of practical application of GIS in agriculture; data and principles of sampling and modeling; computer skills for GIS software.

**AGSC 244 Agricultural Water Technologies 2.3; 3 cr.**

This course deals with the practice of irrigation as a green technology with promising effects. Emphasis is given on smart irrigation systems from soil moisture measurement and monitoring to controllers and automated irrigation techniques based on weather sensing. Methods to calculate water requirements and determining application rates and irrigation schedules will be taught. Innovations in drip, sprinkler and surface irrigation practices will be stressed.

**AGSC/AVSC 246 Intensive Agriculture 2.3; 3 cr.**

This course introduces the students to the bases of intensive plant and animal production in terms of resource use, mechanization, technology, management and environmental impact.

**AGSC 235            Agricultural Extension in Development            2.0; 2 cr.**  
The course involves a comparative study of developmental philosophy, objectives and adaptation to developing countries; it examines principles and methods of extension and adult teaching. *Prerequisite:* AGSC 225.

**AGSC 265            Soil Fertility            2.3; 3 cr.**  
The course focuses on the study of 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 207.

**AGSC 252            Conservation Agriculture            3.0; 3cr.**  
This course will introduce students to the concept of conservation agriculture, which is a management system that integrates the use of soil, water, and biological resources. It will discuss soil properties, crop rotations, crop diversification, nutrient cycling, soil management, cover cropping, and soil inputs. The course will cover the benefits and challenges of conservation agriculture. The concept and link of soil health and sustainability with conservation agriculture will be discussed. *Prerequisite:* AGSC 207.

**AGSC/AVSC 298    Capstone Course: From Seed to Table            3 cr.**  
This course offers students an opportunity to demonstrate integrated knowledge of the courses that were provided by the curriculum of the chosen major.

**AVSC 223            Livestock Systems            2.3; 3 cr.**  
In this course the students will be presented with the different animal systems. The major characteristics of each will be defined in relation to environmental impact and adaptation to different climates, animal welfare, economics and productivity.

**AVSC 224            Agricultural Microbiology            2.3; 3 cr.**  
The course 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/AGSC 243    Genetics and Biotechnology            3.0; 3 cr.**  
This course is an introduction to the fundamental principles of genetics, molecular biology and biotechnology. Following description of cell multiplication and trait inheritance and segregation according to Mendelian genetics, the course will focus on DNA and gene regulation, transcription, translation; gene expression, mutation and DNA recombination with a brief description of current molecular techniques. The important applications of biotechnology in the field of agriculture will be discussed including transgenic organisms, marker assisted selection, and transformed microorganisms for genetic improvement.

**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.

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

**AVSC 275 Anatomy and Physiology of Farm Animals 3.0; 3 cr.**  
The course explores the systematic anatomy and physiology of farm animals.

## Concentration Courses

### Sustainable Agriculture (Organic/Conservation)

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

**AGSC 272 Natural Control of Plant Pests 3.0; 3 cr.**  
The principles and practices of using natural enemies and antagonist to manage the abundance of plant pests (invertebrates, pathogens, and weeds) and reduce economic losses.

**AGSC/AVSC 274 Agricultural Biotechnology 3.0; 3 cr.**  
This course aims at teaching students the modern technology advancements in the field of agriculture from plant and animal biotechnology, to breeding and genetics.

**AGSC/AVSC 270 Principles of Integrated Farming 3.0; 3 cr.**  
Introduces the students to modern sustainable farming systems including permaculture landscaping, agroforestry, aquaculture in combination with animal and plant farming. Nutrient cycles, crop residue and manure management, grazing systems and multi species interactions, the environmental and economic impact of these systems and their management will be addressed.

**AGSC 285 Post-harvest Technology 3.0; 3 cr.**  
The principles and current technology used in handling horticultural crops including harvesting systems, cooling, storage, sanitation, quality control and marketing.

**AGSC/AVSC 273 The Energy-Water-Food Nexus 3.0; 3 cr.**  
Energy, water and food are linked, where water is the major component of crop production and energy is needed for water supply through pumps and for food distribution. This course aims at exploring the link and explaining the connection between these three components.

### Agricultural Technology

**AGSC/AVSC 283 Precision Farming and Agricultural Technology 3.0; 3 cr.**  
The course covers essential aspects of precision agriculture concepts including: soil/landscape and crop spatial variability; new technologies; GIS, DEM, GPS, sensors, special software, remote sensing; geostatistics, sampling, experimental designs; precision integrated crop management; variable rate technologies; data acquisition, processing, and management.

**AGSC/AVSC 273 The Energy-Water-Food Nexus 3.0; 3 cr.**  
Energy, water and food are linked, where water is the major component of crop production

and energy is needed for water supply through pumps and for food distribution. This course aims at exploring the link and explaining the connection between these three components.

**AGSC/AVSC 274 Agricultural Biotechnology** **3.0; 3 cr.**  
This course aims at teaching students the modern technology advancements in the field of agriculture from plant and animal biotechnology, to breeding and genetics.

**AGSC 285 Post-harvest Technology** **3.0; 3 cr.**  
The principles and current technologies used in handling horticultural crops including harvesting systems, cooling, storage, sanitation, quality control and marketing.

## Elective Courses

**AGSC 201 Orientation to Agriculture and Food Systems** **2.0; 2 cr.**  
This course provides students with basic introductory knowledge of the various disciplines and related subjects in the Faculty of Agricultural and Food Sciences. It covers the various aspects of agricultural production and development including natural resources, plant sciences, plant health management, animal production and management, agribusiness, nutrition and food sciences, and landscape design and eco-management.

**AGSC 286 The Fruitful Branches: Grapevine and Olive** **3.0; 3 cr.**  
This course explores facts on grape and olive production and distribution around the world and particularly in Lebanon in addition to the art and science of planting, growing and training these rich crops. The course is a broad-based course covering aspects from history to modern trends, from production to processing, from vine to wine and from olive to olive oil.

**AGSC 219 Apiculture** **2.3; 3 cr.**  
The course introduces the basics of the honeybee world by exploring the natural history of apiculture, honeybee biogeography and evolution, biology, social structure, natural enemies, hive products and pollination dynamics. It illustrates the ecological aspects of one of nature's most fascinating creatures under the looming environmental degradation and focuses on hands-on beekeeping activities.

**AGSC 251 Vegetable Production** **3.0; 3 cr.**  
The course introduces students in the Agriculture program to scientific and hands-on, practical knowledge of vegetable production. Students will also gain an understanding of the physiological controls on vegetable crop yield under protective and local environments. They will become familiar with the current sources of information available to produce and develop production management skills through the production of vegetables. Practical sessions will guide students in understanding different vegetable crop production techniques used in Lebanon and worldwide.

**AGSC 278 Floriculture** **2.3; 3 cr.**  
This course will explore the different basic cultural and production requirements in the field of floriculture in theory and practice. Also production methods for different species in the special categories of production, such as flower potted plants and interior plants, cut flowers and bedding plants. A general outlook on soil media, environmental influence and techniques in propagation, and controlling plant development, will be discussed besides structures and greenhouse management.

**AGSC 293 Integrated Plant Health Management for Economic Crops 3.0; 3 cr.**  
 The course focuses on 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.  
*Prerequisite: Consent of Instructor.*

**AGSC 294 Applied Plant Protection 2.3; 3 cr.**  
 The course explores observations and study of major insect pests and plant diseases on field and greenhouse crops with emphasis on recognition, identification and management. *Prerequisite: Consent of Instructor.*

**AGSC 295 Pesticides 3.0; 3 cr.**  
 It is a survey of the commonly used insecticides, acaricides, nematocides, fungicides, rodenticides and related materials as to their chemistry, mode of action, toxicity, metabolism, hazards to the environment, registration and appropriate field use within integrated pest management strategies.

**AGSC 299 Special Topics in Agricultural Science 2 cr.**  
 The course is a directed study. Tutorial. *Prerequisites: Fourth year standing and consent of instructor.*

**AVSC 230 Animal Health and Diseases 3 cr.**  
 The course introduces students of varying backgrounds to principles of Animal Biological and Health Sciences. It presents different selected commensal and pathogenic organisms causing common symptomatic and asymptomatic diseases; signs of health and disease specific to different domestic, marine mammal, fish and wildlife animal species; epidemiology of disease incidence; immunology, immune competence vs. tolerance, and vaccination principles; emerging animal diseases; monitoring disease incidence using surveillance techniques; vector biology; methods used to prevent disease occurrence including principles of management, environmental modification and nutritional support. *Free elective.*

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

**AVSC 260 Introduction to Laboratory Animal Science and Management 2.3; 3 cr.**  
 This is an introductory course covering the essentials of laboratory animal species biology, behavior, physiology and genetics; health and diseases; experimental models; facility and staff management within laboratory animal facilities; and regulatory compliance requirements in the US and European countries. Students should have previously taken any combination of two courses in the natural and health sciences and in management to gain prerequisite knowledge. *Free elective.*

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

**AVSC 277 Animal Breeding 2.0; 2 cr.**  
 The course focuses on the principles of permanent improvement of animal and poultry production. *Prerequisite: AVSC 243 or BIOL 223.*



The course is 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 standing.*

**AGBU 211 Introduction to Agricultural Issues and Policies 3.0; 3 cr.**

The course is a survey of global food and agricultural issues. It covers the 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, and agriculture and the environment.

**AGSC 212 Microeconomic Theory of Food and Farming 3.0; 3 cr.**

The course introduces economic principles which are 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, consumer behavior and demand for agricultural and food products.

**AGBU 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 standing.*

**AGBU 229 Entrepreneurship in Agriculture 3.0; 3 cr.**

The course focuses on the study of 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 standing.*

**AGBU 236 New Trends in Agricultural and Food Systems 3.0; 3 cr.**

The course explores current trends in agricultural production and trade, developments in private sector markets and in public policy, and the concerns related to the effects of agricultural production and 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-strict standards. Moreover, the course will 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 in Agribusiness.*

**AGBU 239 Agribusiness Communication Skills Workshop 0 cr.**

The course is 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 by simulating the work environment.

**AGBU 240 Career Planning Workshop for Agribusiness 0 cr.**

The course is 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 preparation for joining the labor market, basic career guidance, understanding career stages, and practicing self-assessment are emphasized. *Prerequisite: Junior standing.*

**AGBU 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 standing.*

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

**AGBU 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 of observing 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.*

**AGBU 256                    Summer Internship                    1 cr.**

**AGBU 292                    Agribusiness Final Year Project                    5.0; 5 cr.**  
This is a milestone capstone course for students in Agribusiness that emphasizes the 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. Through the course, students develop team-building as well as written and oral communication skills. *Prerequisite: Senior standing.*

**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 students to the modern management practices required for the production of economically beneficial avian species including 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 the World Trade Organization in the import and export of animals, including rules that prevent the trans-boundary transmission of microbes causing economic diseases.

# Department of Nutrition and Food Sciences (NFSC)

Chairperson:	Obeid, Omar
Professors:	Hwalla, Nahla; Obeid, Omar; Olabi, Ammar; Toufeili, Imad
Associate Professors:	Abiad, Mohammad; Kharroubi, Samer; Nasreddine, Lara
Assistant Professors:	Fares, Elie Jacques; Jomaa, Lamis <sup>1</sup>
Lecturers:	Chamieh, Marie Claire; Iskandar, Christelle
Instructors:	Ayoub, Jennifer; Daroub, Hamza; Hamadeh, Basma; Hjeij, Laura

## Undergraduate Program

The mission of the Department of Nutrition and Food Sciences 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 Faculty of Agricultural and Food Sciences (FAFS) undergraduate core program and additionally 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 (NTDT) 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.

Moreover, the department offers a four-year Nutrition and Dietetics Program (NDCP), which combines didactic and supervised practice components. The program is U.S. accredited under the International Dietitian Education program standards. It has also been granted candidacy for accreditation status by the Accreditation Council for Education in Nutrition and Dietetics of the Academy of Nutrition and Dietetics, (120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995, (312) 899-0040 ext. 5400. <http://www.eatright.org/ACEND>).

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:

<sup>1</sup>)On Leave

## Core Courses for the BS Degree in Nutrition and Dietetics

- NFSC 210**                    **Statistics in Nutrition and Food Sciences**                    **2.3; 3 cr.**  
 An introduction to the study of statistics as it applies to nutrition and food sciences. Topics include both descriptive and inferential statistics: samples, population and types of data; organizing and graphing data; numerical descriptive measures; probability; discrete random variables and their probability distributions; continuous random variables and the normal distribution; point and interval estimation and hypothesis testing; correlation and simple linear regression; Chi-Square tests. Students will learn to use the computer package SPSS for statistical analysis. *Students cannot receive credit for NFSC 210, STAT 201, STAT 210, STAT 230, ECON 213 or EDUC 227. Fall and Spring.*
- NFSC 221**                    **Basic Nutrition**                    **3.0; 3 cr.**  
 The course is a survey of nutrients, including their food sources, digestion, metabolism, functions and requirements in humans. *Fall and Spring.*
- NFSC 222**                    **Community Nutrition**                    **3.0; 3 cr.**  
 The course is an introduction to key concepts and current topics in community nutrition. The course 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. Fall.*
- NFSC 229**                    **Menu Planning**                    **0.3; 1 cr.**  
 The course explores the principles and techniques of menu planning for healthy persons. Topics include nutrient needs for optimum health, dietary guidelines, food groups, food portion sizes and the use of exchange lists for meal planning and client nutrition education in both the English and Arabic languages. *Prerequisites: NFSC 221 and NFSC 240. Spring.*
- NFSC 240**                    **Nutritional Status Assessment**                    **1.3; 2 cr.**  
 The course 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 and NFSC 274. Fall.*
- NFSC 261**                    **Introductory Biochemistry**                    **3.0; 3 cr.**  
 The course focuses on study of the chemistry of biological compounds, their enzymatic degradation and intermediary metabolism. *Prerequisite: CHEM 208. Fall and Spring.*
- NFSC 265**                    **Food Chemistry**                    **3.0; 3 cr.**  
 The course focuses on study of the chemical composition and physical and sensory properties of foods. *Prerequisite: CHEM 208. Fall and Spring.*
- NFSC 267**                    **Food Analysis**                    **1.3; 2 cr.**  
 The course explores laboratory methods for chemical analysis of nutrients and chemicals in food products. *Prerequisites: CHEM 205 and CHEM 209; pre- or corequisite: NFSC 265. Fall and Spring.*

- NFSC 274 Human Nutrition and Metabolism 3.0; 3 cr.**  
The course explores human physiological needs for energy, carbohydrates, fats, proteins, vitamins and minerals; control of nutrient metabolism. *Prerequisites: NFSC 221, NFSC 261 and PHYL 246. Fall.*
- NFSC 277 Food Microbiology I 3.0; 3 cr.**  
The course is a survey of microorganisms and their role in causing food spoilage and food poisoning, and the control of microbial spoilage and pathogenic microorganisms in foods. *Fall and Spring.*
- NFSC 281 Nutrition in the Life Cycle Lab for NTDT 0.3; 1 cr.**  
The course emphasizes practical applications of the principles of nutrition and human development in the context of normal physiological changes that occur throughout the life cycle. It includes evidence-based recommendations and interventions to improve nutrition status and food-related behaviors through the life cycle for individuals, groups and populations. *Prerequisites: NFSC 221 and NFSC 229. Corequisites: NFSC 274 and NFSC 285. Spring.*
- NFSC 285 Nutrition in the Life Cycle 2.0; 2 cr.**  
The course 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. Corequisite: NFSC 274. Spring.*
- NFSC 287 Food Processing 2.0; 2 cr.**  
The course focuses on the principle of food spoilage, food preservation and the different methods of food processing. *Prerequisites: NFSC 265, and NTDT III or FSMT III. Fall and Spring.*
- NFSC 289 Food Processing Laboratory 0.3; 1 cr.**  
The course involves students in laboratory exercises in the pilot plant in food preservation, preparation and processing. *Corequisites: NFSC 287 and NTDT III or FSMT III. Fall and Spring.*
- NFSC 290 Food Service Management 2.3; 3 cr.**  
The course explores techniques of management of functional operation of food service; field trips, self-study modules, reports and discussion. *Prerequisite: NFSC 221; pre- or corequisite: MNGT 215. Fall and Spring.*
- NFSC 292 Medical Nutrition Therapy I 3.0; 3 cr.**  
The course examines selected metabolic diseases, HIV and cancer by covering their etiology, metabolic pathways and the importance of medical nutrition therapy. *Prerequisites: NFSC 240, NFSC 274 and NFSC 285. Fall.*
- NFSC 293 Medical Nutrition Therapy II 3.0; 3 cr.**  
The course is a thorough review of the nutrition care process in the treatment of diet-related diseases. It prepares students to implement the nutrition care process for various conditions, including but not limited to overweight and obesity, diabetes, cardiovascular, gastrointestinal and renal diseases; helps students understand the pathophysiology of selected diseases in which nutritional intervention plays a major role, identify the nutritional needs of patients with disease and develop an appropriate patient nutrition care plan. *Prerequisites: NFSC 274, NFSC 240 and NSFC 285. Spring.*

**NFSC 294 Medical Nutrition Therapy Laboratory I for NTDT 0.3; 1 cr.**  
It is an intensive laboratory course designed to help students learn and practice the application of evidence-based medical nutrition therapy for diseases and disorders discussed in NFSC 292. This is done through the use of self-study modules, case studies, reports and discussions. *Prerequisites: NFSC 240, NFSC 274 and NFSC 285. Corequisite: NFSC 292. Fall.*

**NFSC 295 Medical Nutrition Therapy Laboratory II for NTDT 0.3; 1 cr.**  
It is an intensive laboratory course designed to help students learn and practice the application of evidence-based medical nutrition therapy for diseases and disorders discussed in NFSC 293. This is done through the use of self-study modules, case studies, reports and discussions. *Prerequisites: NFSC 240, NFSC 274 and NFSC 285. Corequisite: NFSC 293. Spring.*

**NFSC 296 Current Topics in Food Sciences and Nutrition 1 cr.**  
Seminar presentation in current topics in food sciences and nutrition. *Prerequisite: NTDT III. Fall and Spring*

**NFSC 298 I Dietetic Internship 0 cr.**  
Supervised training of at least 6 months in all areas of dietetic practice, clinical, food service and community at an affiliated medical facility. *Offered in Spring for Fall graduates and in Summer for Spring Graduates and renewable until completion of internship duration.*

**NFSC 299A Projects in Nutrition and Food Sciences 0 cr.**  
The course is a directed study. It is a tutorial in current topics in nutrition and food sciences that is designed to introduce the students to the skills necessary to execute research projects in their academic discipline. *Prerequisites: NTDT or FSMT III. Fall.*

**NFSC 299B Projects in Nutrition and Food Sciences 2 cr.**  
The course is a directed study. It is a tutorial in current topics in nutrition and food sciences that complements NFSC 299A. It is designed to help guide the students execute a project in their academic discipline. *Prerequisites: NFSC 210, NFSC 299A, CITI. Spring.*

## Core Courses for the BS Degree in Nutrition and Dietetic Coordinated Program (NDCP)

**NFSC 210 Statistics in Nutrition and Food Sciences 2.3; 3 cr.**  
An introduction to the study of statistics as it applies to nutrition and food sciences. Topics include both descriptive and inferential statistics: samples, population and types of data; organizing and graphing data; numerical descriptive measures; probability; discrete random variables and their probability distributions; continuous random variables and the normal distribution; point and interval estimation and hypothesis testing; correlation and simple linear regression; Chi-Square tests. Students will learn to use the computer package SPSS for statistical analysis. *Students cannot receive credit for NFSC 210, STAT 201, STAT 210, STAT 230, ECON 213 or EDUC 227. Fall and Spring.*

**NFSC 221 Basic Nutrition 3.0; 3 cr.**  
The course is a nutritional survey of nutrients, including their food sources, digestion, metabolism, functions and requirements in humans. *Fall and Spring.*

- NFSC 222                      Community Nutrition                      3.0; 3 cr.**  
The course is an introduction to key concepts and current topics in community nutrition. This course 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. Fall.*
- NFSC 224                      Advanced Nutrition Principles and Practices                      0.3; 1 cr.**  
The course explores principles essential for being a successful Registered Dietitian (RD), including code of ethics, scope of dietetics practice, medical coding, and process of nutrition legislation within the United States. Through the use of real-life clinical case study scenarios and role playing, students will use the Nutrition Care Process (NCP) in developing their nutrition care plans, and practice counseling techniques to improve their effectiveness in providing nutrition education and working with an interdisciplinary team. *Prerequisite: NDCP III. Spring.*
- NFSC 225 (A,B)              Job Shadowing                      0 cr.**  
Students will shadow dietitians at different types of facilities covering MNT, Community Nutrition and Foodservice Management. *Prerequisites: NDCP. NFSC 225A is offered in the Winter, and NFSC 225B is offered in the Summer.*
- NFSC 229                      Menu Planning                      0.3; 1 cr.**  
The course explores the principles and techniques of menu planning for healthy persons. Topics include nutrient needs for optimum health, dietary guidelines, food groups, food portion sizes and the use of exchange lists for meal planning and client nutrition education in both the English and Arabic languages. *Prerequisites: NFSC 221 and NFSC 240. Spring.*
- NFSC 240                      Nutritional Status Assessment                      1.3; 2 cr.**  
The course 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. Fall.*
- NFSC 261                      Introductory Biochemistry                      3.0; 3 cr.**  
The course focuses on study of the chemistry of biological compounds, their enzymatic degradation and intermediary metabolism. *Prerequisite: CHEM 208. Fall and Spring.*
- NFSC 265                      Food Chemistry                      3.0; 3 cr.**  
The course focuses on study of the chemical composition and physical and sensory properties of foods. *Prerequisite: CHEM 208. Fall and Spring.*
- NFSC 267                      Food Analysis                      1.3; 2 cr.**  
The course exposes students to laboratory methods for chemical analysis of nutrients and chemicals in food products. *Prerequisites: CHEM 205 and CHEM 209; pre- or corequisite: NFSC 265. Fall and Spring.*
- NFSC 274                      Human Nutrition and Metabolism                      3.0; 3 cr.**  
The course focuses on human physiological needs for energy, carbohydrates, fats, proteins, vitamins and minerals; control of nutrient metabolism. *Prerequisites: NFSC 221, NFSC 261 and PHYL 246. Fall and Spring.*

**NFSC 275                    Quantity Food Production                    1.3; 2 cr.**

It is a course whereby principles and methods of buying, preparing and serving foods for various types of quantity food facilities are considered. Standardization of recipes, cost control, safety and sanitation are practiced. Students demonstrate proficiency with food service equipment and utensils, participate in large-scale recipe preparation, and work in teams to create, plan and produce high quality meal (s) for 40-75 people. *Prerequisites: NFSC 290 and NDCP III. Spring.*

**NFSC 277                    Food Microbiology I                    3.0; 3 cr.**

The course is a survey of microorganisms and their role in causing food spoilage and food poisoning, and the control of microbial spoilage and pathogenic microorganisms in foods. *Fall and Spring.*

**NFSC 279                    Medical Nutrition Therapy Lab I for NDCP                    0.3; 1 cr.**

It is an intensive laboratory course designed to help students learn and practice the application of evidence-based medical nutrition therapy utilizing the nutrition care process for diseases and disorders discussed in NFSC 292. This is done through the use of self-study modules, case studies, reports and discussions. *Prerequisites: NFSC 240, NFSC 274 and NFSC 285. Corequisites: NFSC 292 and NDCP III. Fall.*

**NFSC 285                    Nutrition in the Life Cycle                    2.0; 2 cr.**

The course 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. *Prerequisite: NFSC 221 and NFSC 274. Spring.*

**NFSC 286                    Nutrition in the Life Cycle Lab for NDCP                    0.3; 1 cr.**

The course emphasizes the practical applications of the principles of nutrition and human development in the context of normal physiologic changes that occur throughout the lifecycle. It incorporates problem-based learning through case studies, and employs the nutrition care process for evidence-based implementation of interventions to improve nutrition status and food related behaviors through the life cycle. *Prerequisites: NFSC 221, NFSC 229, NFSC 274, NFSC 285 and NDCP III. Spring.*

**NFSC 287                    Food Processing                    2.0; 2 cr.**

The course focuses on the principle of food spoilage, food preservation and the different methods of food processing. *Prerequisites: NFSC 265, and NTDT III or FSMT III. Fall and Spring.*

**NFSC 288                    Technology of Food Products                    2.3; 3 cr.**

The course focuses on technology and preservation methods of food products. It also includes laboratory exercises in the pilot plant in food preservation, processing, and quality control testing. *Prerequisites: FSMT III, AGRL IV, NTDT III or NDCP III.*

**NFSC 289                    Food Processing Laboratory                    0.3; 1 cr.**

The course involves students in laboratory exercises in the pilot plant in food preservation, preparation, and processing. Pre- or corequisites: NFSC 287. *Prerequisite: NTDT III, NDCP III or FSMT III. Fall and Spring.*

**NFSC 290                    Food Service Management                    2.3; 3 cr.**

The course focuses on techniques of management of functional operation of food service; field trips, self-study modules, reports and discussion. *Prerequisite: NFSC 221; pre- or corequisite: MNGT 215. Fall and Spring.*

- NFSC 292 Medical Nutrition Therapy I 3.0; 3 cr.**  
The course examines selected metabolic diseases, HIV and cancer by covering their etiology, metabolic pathways and the importance of medical nutrition therapy. *Prerequisites: NFSC 240, NFSC 274 and NFSC 285. Fall.*
- NFSC 293 Medical Nutrition Therapy II 3.0; 3 cr.**  
The course is a thorough review of the nutrition care process in the treatment of diet-related diseases. The course prepares students to implement the nutrition care process for various conditions, including but not limited to overweight and obesity, diabetes, cardiovascular, gastrointestinal and renal diseases. It helps students: 1) understand the pathophysiology of selected diseases in which nutritional intervention plays a major role, 2) identify the nutritional needs of patients with disease and 3) develop an appropriate patient nutrition care plan. *Prerequisites: NFSC 274, NFSC 240 and NFSC 285. Spring.*
- NFSC 296 Current Topics in Food Sciences and Nutrition 1 cr.**  
The course is a seminar presentation in current topics in food sciences and nutrition. *Prerequisite: NTDT or NDCP III. Fall and Spring.*
- NFSC 297 Medical Nutrition Therapy Lab II for NDCP 0.3; 1 cr.**  
It is an intensive laboratory course designed to help students learn and practice the application of evidence-based medical nutrition therapy utilizing the nutrition care process for diseases and disorders discussed in NFSC 293. This is done through the use of self-study modules, case studies, reports and discussions. *Prerequisites: NFSC 240, NFSC 274 and NFSC 285. Corequisites: NFSC 293 and NDCP III. Spring.*
- NFSC 299A Projects in Nutrition and Food Sciences 0 cr.**  
The course is a directed study. It is a tutorial in current topics in nutrition and food sciences that is designed to introduce the students to the skills necessary to execute research projects in their academic discipline. *Prerequisites: NTDT or FSMT III. Fall.*
- NFSC 299B Projects in Nutrition and Food Sciences 2 cr.**  
The course is a directed study. It is a tutorial in current topics in nutrition and food sciences that complements NFSC 299A. It is designed to help guide the students execute a project in their academic discipline. *Prerequisites: NFSC 210, NFSC 299A, CITI. Spring.*
- NFSC 283 Nutrition Education and Communication 3 cr.**  
The course focuses on principles of health behavior, learning theories and their application to nutrition education and nutrition counseling practice. Equips students with the necessary communication tools and techniques to help prevent nutrition-related disease and promote health. *Prerequisite: NDCP IV. Fall.*
- NFSC 284 (A, B) Seminar in Clinical Dietetics 1 cr.**  
This course focuses on developing the communication and research skills as well as on strengthening the critical thinking capacities of CP students undergoing an intensive internship program by providing them the opportunity to present and discuss all interesting nutritional issues arising during their CP practicum. It is divided into NFSC 284A and 284B. *Prerequisite: NDCP IV. Fall and Spring.*
- NFSC 298 (W, SU, F, S) Dietetic Practicum 28 cr.**  
The course involves training for a minimum of 1200 hours at an affiliated medical facility. *Prerequisite: NDCP IV.*

## Core Courses for the BS Degree in Food Science and Management (FSMT)

- NFSC 210                    Statistics in Nutrition and Food Sciences                    2.3; 3 cr.**  
An introduction to the study of statistics as it applies to nutrition and food sciences. Topics include both descriptive and inferential statistics: samples, population and types of data; organizing and graphing data; numerical descriptive measures; probability; discrete random variables and their probability distributions; continuous random variables and the normal distribution; point and interval estimation and hypothesis testing; correlation and simple linear regression; Chi-Square tests. Students will learn to use the computer package SPSS for statistical analysis. *Students cannot receive credit for NFSC 210, STAT 201, STAT 210, STAT 230, ECON 213 or EDUC 227. Fall and Spring.*
- NFSC 221                    Basic Nutrition                    3.0; 3 cr.**  
The course is a survey of nutrients, including their food sources, digestion, metabolism, functions and requirements in humans. *Fall and Spring.*
- NFSC 261                    Introductory Biochemistry                    3.0; 3 cr.**  
The course focuses on the chemistry of biological compounds, their enzymatic degradation and intermediary metabolism. *Prerequisite: CHEM 208. Fall and Spring.*
- NFSC 265                    Food Chemistry                    3.0; 3 cr.**  
The course focuses on study of the chemical composition and physical and sensory properties of foods. *Prerequisite: CHEM 208. Fall and Spring.*
- NFSC 267                    Food Analysis                    1.3; 2 cr.**  
The course exposes students to laboratory methods for chemical analysis of nutrients and chemicals in food products. *Prerequisites: CHEM 205 and CHEM 209. Pre- or corequisite: NFSC 265. Fall and Spring.*
- NFSC 272                    Introduction to Food Service and Industries                    1.3; 2 cr.**  
The course is an introduction to food service and the food industry. This course explains the food chain system and describes the food service institutions and different food industries; it also includes visits to different institutions in the food chain. *Prerequisites: Junior Status, FSMT II. Spring.*
- NFSC 277                    Food Microbiology I                    3.0; 3 cr.**  
It is a survey of microorganisms and their role in causing food spoilage and food poisoning, and the control of microbial spoilage and pathogenic microorganisms in foods. *Fall and Spring.*
- NFSC 278                    Food Microbiology II                    2.3; 3 cr.**  
The course focuses on study of the microbiological aspects of food preservation; beneficial utilization of microorganisms in food applications; detection of microbial contamination and hazards of importance to public health. *Prerequisite: NFSC 277. Spring.*
- NFSC 280                    Summer Training in Food Establishments                    1 cr.**  
The course involves students in supervised training in one of the food service institutions or food industries. *Prerequisite: NFSC 272. Summer.*

**NFSC 282 Food Quality Management 3.0; 3 cr.**  
The course covers 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 Practice. *Fall.*

**NFSC 287 Food Processing 2.0; 2 cr.**  
The course focuses on the principle of food spoilage, food preservation and the different methods of food processing. *Prerequisites: NFSC 265, and NTDT III or FSMT III. Fall and Spring.*

**NFSC 288 Technology of Food Products 2.3; 3 cr.**  
The course focuses on technology and preservation methods of food products. It also includes laboratory exercises in the pilot plant in food preservation, processing, and quality control testing. *Prerequisites: FSMT III, AGRL IV, NTDT III or NDCP III.*

**NFSC 289 Food Processing Laboratory 0.3; 1 cr.**  
The course involves students in laboratory exercises in the pilot plant in food preservation, preparation, and processing. *Pre- or corequisites: NFSC 287. Prerequisite: NTDT III, NDCP III or FSMT III. Fall and Spring.*

**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 and FSMT III. Spring.*

**NFSC 296 Current Topics in Food Sciences and Nutrition 1 cr.**  
Seminar presentation in current topics in food sciences and nutrition. *Prerequisite: NTDT III or FSMT III. Fall and Spring.*

**NFSC 299A Projects in Nutrition and Food Sciences 0 cr.**  
The course is a directed study. It is a tutorial in current topics in nutrition and food sciences that is designed to introduce the students to the skills necessary to execute research projects in their academic discipline. *Prerequisites: NTDT or FSMT III. Fall.*

**NFSC 299B Projects in Nutrition and Food Sciences 2 cr.**  
The course is a directed study. It is a tutorial in current topics in nutrition and food sciences that complements NFSC 299A. It is designed to help guide the students execute a project in their academic discipline. *Prerequisites: NFSC 210, NFSC 299A, CITI. Spring.*

## Core Course for the BS Degree in Agribusiness

**NFSC 252 Introduction to Food Processing 3.0; 3 cr.**  
Technology and processing of foods; includes different technologies applied to preserve and process food from post-harvest stages to being ready for consumption. Processing methods covered relate to cereals, dairy products, meat, poultry, fats and oils, fermentation, fruits and vegetables, as well as beverages. *Fall and Spring.*

## Elective Course neither for Nutrition and Dietetics nor for Food Science and Management

**NFSC 215                      Gender, Food and Nutrition                      3.0; 3 cr.**  
Goal 5 of the United Nations' Sustainable Development Goals (SDGs) aims to “achieve gender equality and empower all women and girls” around the world. While women and girls often have increased nutritional needs during the lifecycle, social norms in many parts of the world frequently lead to gender inequalities in nutrition, which tend to disfavor females. This course discusses nutrition from a gender equality lens and sheds light on their mutually reinforcing relation: improving nutrition is crucial to achieving gender equality and, in turn, improving gender equality contributes to better nutrition. The course will discuss the changing nutritional needs throughout the lifespan, the social and cultural norms affecting food choice, and the prevalent gender disparities in food and nutrition security. The course will also highlight the need to focus on improving nutrition of girls and women as a public health strategy aimed at curbing the growing burden of chronic diseases in modern societies.

**NFSC 220                      Food and Nutrition Awareness                      3.0; 3 cr.**  
The course introduces the discipline of nutrition and assists students in making optimal food choices for better health. *Elective. Fall and Spring.*

**NFSC 223                      Nutrition and Physical Activity                      3.0; 3 cr.**  
Inadequate physical activity and a poor diet are considered to be leading causes of many major diseases. Exercise has potent effects on the metabolism of both macro and micronutrients. Exercise and nutrition together offer a powerful intervention for many health problems, including sarcopenia, metabolic disease and obesity. This course is designed to give students an understanding of the fundamental interactions between exercise, nutrition and health, mainly with lifestyle changes based on current international dietary and physical activity guidelines. *Elective. Fall and Spring.*

**NFSC 252                      Introduction to Food Processing                      3.0; 3 cr.**  
Technology and processing of foods; includes the different technologies applied to preserve and process food from post-harvest stages to being ready for consumption. Processing methods covered relate to cereals, dairy products, meat, poultry, fats and oils, fermentation, fruits and vegetables, as well as beverages. *Elective. Fall and Spring.*

# Department of Landscape Design and Ecosystem Management (LDEM)

Chairperson:	Abunnasr, Yaser
Professors:	Talhok, Salma; Zurayk, Rami
Associate Professor:	Abunnasr, Yaser
Assistant Professors:	Al-Akl, Nayla <sup>1</sup> ; Dreksler, Beata
Adjunct Assistant Professor:	Trovato, Maria Gabriella
Senior Lecturers:	<sup>P</sup> Abboud, Rania; <sup>P</sup> Battikha, George; <sup>P</sup> Khechen, Mona; <sup>P</sup> Stevenson, Graham; <sup>P</sup> Yazigi, Serge
Lecturers:	<sup>P</sup> Bacha, Karim; <sup>P</sup> Badran, Noura; <sup>P</sup> Issa, Maha; <sup>P</sup> Melhem, Wissam; <sup>P</sup> Nader, Halim; <sup>P</sup> Rachid, Dima
Instructor:	Fabian, Monika; <sup>P</sup> Yassine, Sarah Lily

## Undergraduate Program

The mission of the department is to promote a holistic view of landscape and the environment within its students and to equip them 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 interdisciplinary nature, both in teaching and research, with applications in the large Middle Eastern region. To that end, the department builds on the strong linkages established with other academic units within and outside the faculty.

The Bachelor of Landscape Architecture (BLA) program received accreditation by LAAB/ASLA (Landscape Architectural Accreditation Board/ American Society of Landscape Architects) in September 2021 for a period of six years, making it the first BLA program worldwide to be accredited by LAAB outside the USA.

The following design courses are part of the program requirements. There is a grade average requirement for LDEM 202, LDEM 216, LDEM 222, LDEM 204, LDEM 228, LDEM 246, LDEM 241 and LDEM 242. A student should maintain a combined average of 70 (C+ or GPA: 2.3) in two consecutive design studios within a given year. Failure to achieve this will result in the student having to repeat the design studio in which s/he received the lowest grade.

1) On Leave  
P) Part Time

# Course Descriptions

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## Core Courses for the Bachelor of Landscape Architecture (BLA)

### **LDEM 200      Landscape Technical Drawing      4 cr.**

This is a course in descriptive geometry and graphic communication in landscape 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 that cover construction of shades and shadows, as well as representation of open space, trees, and elements of the natural and built landscapes. Students are introduced to the basics of manual and digital drawing techniques. The technical drawing techniques are regulated by a set of worldwide conventions used to clarify and visualize ideas and design process.

### **LDEM 201      Landscape Descriptive Drawing      4 cr.**

The focus of the studio is to emphasize visual thinking techniques and graphical information representation. Through the use of multiple media to sketch and draw the landscape, students learn to understand their environment through developing skills in mapping information, understanding their relationships and graphically representing it.

### **LDEM 202      Studio I: Landscape Design Fundamentals      4 cr.**

This course is the first of two fundamental design courses (the second is LDEM 216). It is a foundation for subsequent design courses. It introduces students to theories of design through readings, analysis and hands-on projects. The course is structured as a series of short exercises and is divided into two parts:

#### **Part 1: Fundamental Elements of Landscape Design**

This course is an exploration into the modes of space which are two-dimensional surfaces, three-dimensional objects, spatial enclosure and the open continuous landscape. The emphasis is on the media of landform, water, plants and structures as defining agents of human space in the garden and the landscape at large. The form and character of the space is further determined by the context of the site and the nature of spatial geometry with studies of form, pattern, texture, tone and color.

#### **Part 2: Basics of Design**

This studio introduces students to reading and responding to the site. Goals include learning to experience and record the landscape, design in response to the site, think creatively, generate design ideas and understand design as a process, gain knowledge of design precedents and principles, and learn tools and techniques of visual expression. Students will learn through in-class exercises, reading assignments and design projects. Studio time is divided among lectures, field trips, studio design work, desk critiques, pin-ups and presentations.

**LDEM 204                      Studio IV: Cultural Landscape Design                      6 cr.****Part 1: Cultural Landscapes**

The cultural landscape studio introduces students to the process of research, planning, design, and management of historically and culturally significant landscapes through selected real-world site projects. Part one introduces methods of assessment, approaches and policies (local and international), case studies of similar projects as well as historical analysis of the study area.

**Part 2: Historic Preservation and Design**

The course explores landscape design proposals for sites within historically significant areas. Emphasis is on methods of analysis and design development. Graphic and photographic documentation of existing built forms serve as the basis for design proposals. Students engage in the following five steps in the process of their study: 1) Students investigate a landscape's site history using primary and secondary resources. 2) They analyze, document and evaluate existing conditions. 3) They interpret the significance of the natural, historic and cultural importance of the landscape site. 4) They recommend appropriate treatment strategies. 5) Finally, they present the findings of this research process. *Prerequisite: LDEM 222.*

**LDEM 207                      Landscape Architecture History I                      3 cr.**

This course aims to explore significant transformation in landscape architecture history and present a range of information to enable the development of alternative, diverse and nuanced communication tools for issues of the landscape. A series of lectures combined with literature study and a visual and textual project analysis aims to guide students to be able to analyze, evaluate and understand historic landscapes in contemporary society. (open to freshman students)

**LDEM 208                      Landscape Architecture History II                      3 cr.**

The course aims to explore the development of designed landscapes and manifestations of landscape architecture from the 18th century to the present. By investigating the complex relationships between people and their environments, it will shed light on the shaping of outdoor space and the evolution of human settlements within built and natural settings. The course will provide a critical and historical understanding of landscape architecture as ideology, experience, spatial form and profession. It will focus on pioneers within the field and on historical examples of gardens, parks, community spaces and environmental planning strategies, which explain landscape designs as products of cultural, political, social and environmental influences. *Prerequisite for LDEM students only: LDEM 207. (open to freshman students)*

**LDEM 210                      Botany and Plant Ecology for Landscape Architects                      3 cr.**

This course tackles key concepts, principles and current issues in botany, plant ecology and plant conservation and discusses their application to the Middle East region and to landscape architecture. The course is structured to include peer teaching, debates, and discussion of articles and case studies. Upon completion of the course, students will have solid knowledge and a reference base to readily integrate natural and human made vegetation into their designs.

**LDEM 211 Landscape Horticulture 2.3; 3 cr.**

This course covers basic principles of selection and management of landscape plants. Students will learn how to select plants appropriate to site and purpose, and will be introduced to concepts and applications of environmental horticulture and its contribution to the well-being of humans and nature. The course relies on hands-on field projects, site visits, essays and photo-documentation.

**LDEM 214 Landscape and Geomorphology 3 cr.**

This course provides crucial insights on how landforms and hence landscapes develop in space and time. It introduces students to the geomorphological underpinnings of landscape formation and trains them to read the natural and anthropogeomorphic aspects of landscapes.

**LDEM 216 Studio II: Landscape Garden Design 4 cr.**

This course is the second of two design introductory courses. It is a foundation for subsequent courses that explore project design in varied contexts and scales. It introduces students to theory and practice of landscape design and site planning by doing, observing, reading and reflecting. Students apply knowledge acquired from LDEM 202 on real site contexts with an emphasis on site design. Focus is on two dominant landscape design types: the park (public) and the garden (private). Students will analyze case studies and relevant readings pertaining to both landscape typologies. *Prerequisite: LDEM 202.*

**Part 1: The Park**

The focus is on the application of spatial theory and design process to a specific site context. Work will develop map-reading skills at various scales and strengthen drawing, lettering and cross-section representation skills. The emphasis is on landform design in a public park setting (urban and non-urban).

**Part 2: The Garden**

The garden is a personal, direct and intimate expression of landscape architecture. It is explored here as a contemporary art primarily through the design of individual sites and, secondarily, through guided research and discussion sessions which explore important works and design theory in the genre. The emphasis is on developing an informed and creative personal approach that inspires while solving practical problems on real sites. The focus here is on residential gardens or gardens pertaining to institutions.

**LDEM 217 Soils in the Landscape 2.3; 3 cr.**

This course will examine soils as integral components of the landscape and as a medium for landscaping activities. It is designed to help students 1) acquire a good understanding of the relationship between geology, landform, soil, vegetation and landscape, and 2) implement management actions essential in landscaping, such as soil preparation, soil amendment and fertilization. Emphasis will be placed on soils as a component of Mediterranean ecosystems and land mosaics with special focus on soil resources in Lebanon. Labs and field trips will be organized in order to observe and analyze soils in the environment, and to manipulate soil substrates for optimizing plant growth. *Prerequisite for LDEM students only: LDEM 214.*



**LDEM 228                      Studio V: Urban Landscape Design                      6 cr.**

The focus of this studio is site design in the urban context. As such, it will enable students to explore the particular challenges of designing in complex urban environments. By their nature, urban environments have multiple layers and meanings and are influenced by an array of forces. Urban landscapes are an amalgam of myriad social, cultural, political, economic and ecological processes on physical space. Designing in the urban context therefore requires sensitivity to these many layers and influences. Creative response to the challenges of urban environments requires careful attention to the landscape narratives students choose to tell, and how users of a space learn and discover new things from a site. *Prerequisites: LDEM 204 and LDEM 222.*

**Part 1: Understanding and Analyzing Urban Landscape Systems**

The purpose here is to briefly overview basic concepts of urbanism (transportation, infrastructure, zoning laws, real estate markets, economic development, social issues and so on) with strong emphasis on understanding urban open spaces and networks through readings. Students will analyze case studies of similar contexts and analyze urban landscape systems pertaining to the study area.

**Part 2: Study Area**

An application of urban design theories to various scales of urban design, with special focus on civic scale design elements and spatial and functional requirements. The end goal is to design a landscape system or site with an urban context.

**LDEM 231                      Sustainable Water Management Techniques                      3 cr.**

The course will focus on water as a scarce resource in Lebanon and the region. Students will be exposed to theoretical and practical aspects of sustainable water resources management as related to landscape design, namely in the areas of demand efficient water use and management. Students will learn about efficient indigenous and exotic landscape irrigation, surface and subsurface drainage design, rainwater harvesting and water conservation. *Offered in the summer term only.*

**LDEM 241                      Studio VII: Landscape Capstone Project I                      4 cr.**

This course is intended to assist students in selecting an individual capstone project, finding and organizing appropriate information needed for the project, and establishing parameters and questions for the design and development of the project. The studio focuses on an approved design problem requiring individual work, which will serve as a comprehensive examination. Preparation and presentation include a written and graphic problem statement, analysis and detailed plans or other approaches approved by the instructor. *Prerequisites: LDEM 228 and LDEM 246.*

**LDEM 242                      Studio VIII: Landscape Capstone Project II                      6 cr.**

This course includes the Final Year Project (FYP), conducted with a faculty advisor, and includes collection, analysis and interpretation of project information. The final studio covers a variety of projects that may include landscape design projects involving fine arts, urban design and town planning. Students are expected to achieve a comprehensive understanding of ideas, processes and concepts. This is the capstone project where students demonstrate their acquired design skills and knowledge. They are expected to develop their design, produce presentation drawings and defend their ideas orally at a professional level. Students are assessed by department faculty. Note: This course fulfills the capstone writing intensive requirement for the Landscape Architecture major. *Prerequisite: LDEM 241.*

**LDEM 246                      Studio VI: Natural Landscape Design                      6 cr.**

This course examines the relationship between ecological landscape design and natural elements/resources. The emphasis is on understanding natural and human/cultural systems and the interactions across. Of primary importance is understanding of ecological processes that occur within. Students will learn the significance of these systems and their potential contribution to sustainable environments while highlighting the threats and opportunities from anthropogenic impacts. As a design studio, students will explore landscape planning and design from the regional to the site-development scale and they will learn how to integrate ecological design and planning frameworks within their design proposals to balance human use and ecological integrity. This will require the ability to synthesize information about natural features, cultural resources, and development patterns to create spatial landscape strategies that address the unique problems and opportunities of a chosen study area. *Prerequisites: LDEM 218, LDEM 228.*

**LDEM 247                      Site Engineering I                      3 cr.**

This is the first of the three courses in the LDEM Site Engineering sequence. This course focuses on the study of techniques essential to the horizontal and vertical development of site designs; emphasis on grading, cut and fill calculation, storm-water drainage and management, erosion control, road alignments and earthwork. This is a lecture course with intensive exercises for engineering calculation and drawing techniques.

**LDEM 248                      Site Engineering II - Construction Material                      3cr.**

This is the second of the three courses in the LDEM Site Engineering sequence. This course will serve as a capstone to landscape architectural construction with emphasis on understanding and preparing complete sets of construction documents for landscape architecture projects. It includes methods and procedures necessary for transforming a design idea into a set of construction drawings that is accurate, precise and clearly understood; and the principles, processes and techniques of site engineering for the “hard” and “soft” elements of landscape architecture and surfaces, including wood construction, free-standing and retaining walls, pavement, steps, decks, lighting and planting irrigation. Students will also implement their designs through hands-on experience. *Prerequisite: LDEM 247.*

**LDEM 249                      Site Engineering III - Design Implementation                      4.6; 4cr.**

This is the third and last of the three courses in the LDEM Site Engineering sequence. This course includes presentation and classification of landscape construction and materials: in particular, material types and measurement standards of construction elements. Floor elements, such as paving materials, pedestrian ways, stairs and ramps, are emphasized. Border and enclosure elements, such as walls and fences, are studied. Shelter elements, such as pergolas and gazebos, are explored. Water elements, such as ponds, waterfalls, pools and fountains, are studied. Outdoor space, furniture and ornaments, such as benches, litterbins, lighting elements, pedestrian bridges and decks, are focused upon. Interactions between materials, buildings, spaces and humans will be explored. Research studies and case studies will be conducted for designing original landscape construction and material. This studio course will focus on lectures, exercises and projects dealing with landscape equipment, and design methods. In addition, students have exposure to measuring quantities and defining specifications. *Prerequisites: LDEM 247 and LDEM 248. Offered in the Summer term only.*

**LDEM 251                      Geographic Information System (GIS)                      2.3; 3 cr.**  
 This course acquaints students with classical and modern methods of landscape analyses as well as assessment and changes in landscape structure using ArcGIS and its extensions. Students will be gradually introduced to the subject both to acquire and integrate geographic data, and to learn how to analyze and interpret the results. All topics are demonstrated on selected tasks. The goal of this course is to explore various approaches to modeling landscape pattern and change. The focus is on the design and use of computerized geographic information systems for land planning and design decisions and on understanding, describing and predicting land-use and land-cover. The course will move between social and ecological processes and applications of the models. Students will learn to evaluate the trade-offs associated with use of a particular modeling approach within a given situation, and to implement (at least minimally) several of the approaches discussed.

**LDEM 252                      Computer Aided Design                      4.5; 3cr.**  
 This is an introductory course that covers Computer Aided Design digital drawings to develop skills for landscape architects to communicate, create and implement. The course includes lectures and computer labs focused on learning the basic commands for drawing in two dimensions including: absolute and relative coordinates; working in layers, paper and model space; manipulation of text and plotting. The focus is on understanding the software environment and basic applications of AutoCAD and on using relevant tools of this graphic design software to develop high quality landscape design graphic outputs, such as diagrams, perspectives, sections, plans and 3D models. These skills will enable students to employ computer graphic design tools in landscape architecture studios throughout the rest of their degree courses. *Offered in the Summer term only.*

**LDEM 260                      Contemporary Issues in Landscape Architecture                      3 cr.**  
 This course addresses recent trends in landscape architecture that cover the multitude of approaches, in order to broaden the students' theoretical knowledge, encourage their critical and analytical abilities, and sharpen their understanding of systems and the landscape as a cultural expression. The course discusses recent interventions by landscape architects in different parts of the world and assesses them in relation to their natural, cultural and socioeconomic contexts. At the same time, students are asked to critically evaluate the current open space situation in Beirut and discuss ideas and approaches related to it. *Prerequisites (for LDEM students only): LDEM 207 and LDEM 208.*

**LDEM 263                      Landscape Appreciation and Site Analysis                      3 cr.**  
 This course introduces students to specific landscapes of Lebanon and teaches them how to read spaces by analyzing the interrelationship between natural conditions, human settlement and land use over time. The course is based on an integrated view of the landscape, taking into consideration both natural and cultural components. Students will be exposed to different approaches to perceiving, reading and interpreting the landscape. *Prerequisite: LDEM 291.*

**LDEM 265                      Landscape Management                      3 cr.**  
 This course is designed to help students acquire the necessary knowledge to produce landscape management manuals. Students will also have the opportunity to learn about the various aspects and issues related to landscape management by reading and discussing peer-reviewed articles related to the field or observing the management of actual projects. *Prerequisites: LDEM 211, LDEM 217 and LDEM 231.*

**LDEM 290 Professional Practice 3 cr.**

The course discusses the professional practice of landscape architecture. It is structured to give students an overview of the professional opportunities, roles and responsibilities within which graduates of the program will most likely practice their trade. The course will be structured as a series of lectures, workshops, discussions and presentations from practicing landscape architects, engineers and other professionals who will expose students to different aspects of the trade. It introduces basic issues in the practice and profession of landscape architecture, challenging the student to critically examine professional, ethical, economic, political, social and other issues in the current practice. It covers the different typologies of landscape projects, firms and clients, and introduces the full cycle of a landscape project from award and conception to construction and site supervision.

**LDEM 291 Surveying and Base Plan Development 2.3; 3 cr.**

The course focuses on the fundamentals of plane surveying: basic measurement of distance, angles and elevations. It also focuses on the use of basic surveying equipment, such as total stations, levels and tapes, theodolites field notes; and basic computations, such as traverse closure and determination of areas. It is comprised of lectures and studio projects dealing with earthwork estimating, storm water management, site surveys, site layout, and horizontal and vertical road alignment. Students will survey a site, collect and analyze data and transform measurements into a base plan essential for any design process. This will include features such as topographic contours, spot levels, structures, vegetation, water ways and utilities.

**LDEM 292 Internship (Practicum) 2 cr.**

The objective of the landscape architecture internship is to offer students the opportunity to broaden their educational experiences by actively participating in a professional landscape architecture, planning and/or engineering office environment. The intention is to provide an opportunity for exploring the world of landscape architectural practice through professional and reflective activities that address educational goals and objectives. *Prerequisites: LDEM III standing and LDEM 290. Offered in the summer term only.*

## Elective Courses for the Bachelor of Landscape Architecture

**LDEM 203/  
ENSC 202/  
ARCH 060L The Environment and Sustainable Development 3 cr.**

This course is an introduction to sustainable development which include concepts, goals, and economic and social aspects. Also, environmental issues associated with development that involve natural resource management, population, food production and energy, are emphasized. The institutional framework, standards and policies, emerging technological applications and their impacts, resolution of environmental conflicts, and future trends will be explored.

**LDEM 209 Plant Biology 2.3; 3 cr.**

An introduction to botany and 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 at providing applications and insights relevant to landscape students.

**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 230 Water and the Environment 3 cr.**  
 This is an introductory course addressing the interactions between water and the natural environment, and the role of human activities in these interactions. This course covers a broad range of topics, including climate change, the hydrologic cycle, watershed hydrology, runoff generation, groundwater, point and nonpoint sources of pollution, best management practices and a multitude of water quality issues. Local, regional and international case studies will be covered to foster a better understanding of water quality and quantity concepts, applications and principles. *Open to all senior level students except LDEM students.*

**LDEM 254/ ARCH 061L Regional and Community Studies 1.3; 3 cr.**  
 The department will identify a community-driven project in which local and possible international students will participate. The target community will be selected at least 6 months prior to the start of the summer term. The selection process will depend on input from outreach activities performed by the department and by other academic units with which the department coordinates closely, such as NCC and CCECS. This course focuses on applied knowledge and is thus taught by doing, as in by creating a design that is ready to be applied as well as a full proposal. Landscape designed elements are thus site/context dependent; therefore, applied ecology and cultural landscape history are important to concept development. Students enrolled in the course will work fourteen days on site with community partners and stay with local families during that period, and spend 1 week on campus working on the design and proposal. Working together in groups, students will create a practical design. Using a combination of lectures, discussions, interactions with nature, hands-on projects and community immersion, students will analyze the local environment and design holistic systems that meet the needs of people while respecting the needs of nature.

**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 on 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 Nature: Theoretical Perspectives and Applications 3 cr.**  
 This course investigates the relationship between people and nature and seeks to deepen students' sense of connection with the natural world. There is a large body of literature that sheds light on the beneficial effects of nature. Students will learn about theories that explain how nature, outdoor green spaces and gardening have a positive impact on our lives and well-being. They will be introduced to current research findings and be trained in reading and comprehending peer reviewed articles related to this field. Students will learn basic research methods and use these to implement class projects to gain first-hand experience of people's response to nature.

**LDEM 264 Interior Landscaping 2.3; 3 cr.**

This course is an introduction to the principles and practices of interior landscaping with an emphasis on plant selection and handling, environmental conditions, specifying and maintaining healthy plant materials, developing portfolios of interior planting designs and details for proper installation of drainage and irrigation, and fixed or movable containers. The course also includes design compositions of planned interior landscapes in a creative and aesthetic environment and the availability of plant material on the market. *Prerequisite for LDEM students only: LDEM 211 or equivalent.*

**LDEM 270 Ornamental Plants for Dry Landscapes 3 cr.**

This course is 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 development under such dry conditions. *Prerequisite for LDEM students only: LDEM 210 and LDEM 211 or equivalent.*

**LDEM 271/  
ARCH 073/  
CIVE 686/  
MECH 681 Environmentally responsive buildings 3 cr.**

This course enhances knowledge pertaining to design aspects and application possibilities of climate responsive and environmentally friendly buildings. The impact of using construction building materials throughout the lifecycle of projects will also be discussed. At the end of the course, students will be equipped with the necessary knowledge that will enable them to make informed decisions regarding green projects in their careers (Prerequisite for LDEM students: LDEM III or LDEM IV or graduate standing and consent of instructor).

**LDEM 272 Landscape Architecture: Gender, Women and Inclusion 3 cr.**

The course places the concept of inclusion and gender at the center of explorations of landscape architecture. It investigates the complex relationships between people and their environments, and the ways in which people read, experience, define and create landscapes. It places an emphasis on the role of women in particular, and the way in which women have shaped, and have been shaped by, their physical environments. It looks at women as users, as thinkers and community leaders, as well as designers, and highlights their overall influence on landscape theory and practice from these different perspectives.

**LDEM 298 Special Topics in Landscape Architecture: Project/Workshop 1; 2 or 3 cr.**

The project/workshop course provides opportunities for students to participate in hands-on experiences, gain new skills and be exposed to real projects. Students will work on issues and applications that are not included in regular courses. General prerequisites will be identified whenever the project/workshop course is offered. The topic, format, and prerequisites will vary; therefore, it might be repeated for credits.

**LDEM 299 Special Topics in Landscape Architecture: Tutorial 1; 2 or 3 cr.**

The tutorial provides 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. It covers special topics developed under the direction of a faculty member on a tutorial basis. The topic, format, and prerequisites will vary; therefore, it might be repeated for credits.