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Welcome

Computer Science is the science of using computers to solve problems. It is about data, programs, computers and people. Computer scientists deal mostly with software and software systems; this includes their theory, design, development, and application. Computer Science is a young discipline that is very rich in challenges and applications due to its applicability in almost all disciplines such as medicine, engineering, natural sciences, media, arts, and entertainment. The problems that computer scientists encounter range from the abstract - determining what problems can be solved with computers and the complexity of the algorithms that solve them - to the tangible - designing applications that perform well on various devices, that are correct, easy to use, and uphold security measures.

Our education in Computer Science will provide you with a wealth of knowledge and practical skills to participate and contribute to the growing and fast changing discipline of computer science. Shaping current and future technology is our aim. This brochure gives you an overview of computer science at AUB and introduces you to the curriculum, ongoing research, and job opportunities. It also includes some quotes given by some current students and alumni.

Why Study Computer Science at AUB

- A first-rate student experience in a beautiful campus overlooking the Mediterranean.
- Top quality teaching that is considered the best among universities in Lebanon and the region.
- Top quality research with strong international reputation and good funding.
- Excellent employment prospects in an expanding national and international job market.
- Solid preparation for industry and graduate studies, local and abroad.
- Excellent financial support in the undergraduate and graduate levels.

Bliss Building: Home of the Computer Science department

Our Students

When I decided to stay in the Middle East to continue my Masters, my first and only choice was AUB. With its exposure, reputation, and interesting courses, I knew that at AUB I would not only benefit on the level of education but also on the level of my future career and research work. And so it was, I graduated from AUB with an impressive record of publications. In October 2009, two weeks before my thesis dissertation, I got called up by CCC, an internationally leading construction consulting company, and I was hired the next day as a Junior Software Developer working on applications that are used by tens of thousands of employees on a daily basis. Fast forward 4 years, and I am a Senior Software Developer and UX Specialist at CCC.

Dr. Shadr Barada, Sophomore

I chose to study computer science because computers have always been a big part of my life. I am currently doing a semester abroad at Boston University, and I have found that the courses and teaching style here is pretty much the same as in AUB. Studying CMPS at AUB also opened a lot of doors for me. I did an internship with Murex Systems and represented AUB in a Hackathon that took place in Abu Dhabi. In my free time, I like to do some volunteering (AUB outdoors, orientation, marathons), and occasionally play the guitar at AUB related events (graduation & ring ceremony).

Rami Hammoud, Senior

I came to AUB to pursue an undergraduate degree in Computer Science, given its reputation as the best university in the country. This degree offered the right balance between establishing a theoretical foundation as well as providing the opportunity to put it into practice. During my second year, I was approached with the opportunity to work as a research assistant, which ended up taking one and a half years. This was by far my most informative and intellectually satisfying experience during my stay at AUB. Since graduating from AUB in 2012, I have received my Master’s degree in Computer Science from Oxford University, and I am now pursuing a Ph.D. in Machine Learning at Georgia Tech.

Karl Geramini, Ph.D., student at Georgia Tech

The analytical and programming skills taught in Computer Science are among the most demanded in today’s industry. I have gladly noticed that every company is willing to hire a student with a CS degree. Whether you enjoy coding, marketing, sales, or consulting, there is always a demand for the logical and analytical skills CS students build. A CS degree is a direct gateway into the technology industry, and is a good base for higher education in Computer Science, Business, and other related fields.

Dina Masri, Junior

I picked computer science as a major because it relates to every technological device we use 24/7. What is special about the department is the amount of exposure, reputation, and interesting courses it provides students with and the excitement of all our faculty members on updated technological topics. Courses are really beneficial; I really liked web programming. Not to forget how important our lab desktops are; they enable us to run really large programs that our own laptops are not always capable of running.

Matthew Moussa, Senior Software Developer, CCC

I graduated in 2006 from the Computer Science department at AUB and obtained my Ph.D. at the University of Texas at Austin in 2011. During my three-year program at AUB, I enjoyed the close interaction with CMPS professors and their challenge for excellence. Needless to say that the level and quality of courses I received were in par with international top universities such as The University of Texas at Austin. Courses like algorithms, compilers, and databases not only pushed me to academic research and to pursue my Ph.D., but also helped me obtain expertise needed for my career as a software engineer in world’s top software company, Google Inc.

Shad Aboul Khalek, Google Inc.
Curriculum Highlights

In Computer Science, we do not only teach you the contemporary technologies, we also teach you the skills you will need in order to teach yourself the new technologies of the future. Technology is the fastest growing field today; it is innovative and ever changing. While in Computer Science, you will take theoretical as well as practical courses, both of which aim at enriching your problem solving and analytical skills. Here are some of the subjects you will study.

Programming
You will first get introduced to Java, a high level object oriented language that is widely used in development. Java will be the key language you will learn in much detail. You will also be introduced to C, C++, C#, Prolog, and Python.

Systems and Networking
Computer systems are fundamental topics in computer science. We will cover:

⇒ Operating Systems which consist of a number of coherent complex software that manage the hardware resources and provide services to running applications. Well known operating systems include Windows, Linux, and MAC OS.
⇒ Computer Architecture that describes the various parts of a computer system and the way they interact.
⇒ Compiler Construction that details the steps needed to translate a programming language, such as Java, to a language that can be understood and executed by the computer hardware.
⇒ Computer Networks which lay the fundamentals of communication between distant users.

Web Programming
You will be introduced to another type of programming that deals with designing and developing web sites for the Internet. Web sites can range from simple static sites to complex E-commerce sites and social network services.

Computer Graphics and HCI
Some of the department strengths include graphics and 3D modeling. Good knowledge in graphics is currently needed more than ever due to its applicability in applications and game development, as well as visualization. Graphics is also directly related to Human Computer Interaction (HCI), which deals with designing the best user-interface for specific devices such as laptops, tablets, phones, etc.

Software Engineering
Software engineering is the process of building large, correct and efficient software in a systematic and quantifiable way.

Databases
Databases are the main means of storing organized data. They can be efficiently searched and queried and they constitute an integral component of modern applications.

Theory
Mathematical theory is a key ingredient of Computer Science. Topics of relevance include probability and statistics, numerical computing, reasoning, complexity, limits, and paradigms of computing.

Artificial Intelligence
Artificial intelligence (AI) finds its applications in games and systems that need to act alone without any human intervention. It entails the creation of intelligent machines that work and react like humans.

Curriculum Highlights

What can you study at AUB

Bachelor of Science (BS) in Computer Science
BS in Computer Science is a three-year degree (six regular semesters) that covers a wide range of topics in the computing domain. It provides the foundation for a huge range of professional careers in computing and outside.

Financial Support
AUB has a strong financial aid program to assist its many able and qualified students who could not otherwise meet the cost of tuition. Over 80 percent of students who apply for financial aid at AUB receive such assistance. You are encouraged to visit the Office of Financial Aid webpage for more information.

Admission
Deadline for the admission to Fall semester of the academic year 2014–15 is December 20, 2013 (early admission deadline is Nov. 30, 2013)

Details and application on this link:

Some Program Highlights

Master’s Degree (MS) in Computer Science
The department of Computer Science offers two courses of study leading to an MS degree in Computer Science:

I. a thesis-option that consists of 7 graduate-level courses (21 credits) and a 9-credit research thesis, and
II. a project-option that consists of 9 graduate-level courses and a 3-credit implementation project.

The MS degree normally requires 4 semesters (2 years).

Financial Support
Financial support is available on a competitive basis in the form of Graduate Assistantships that cover the tuition fees. Teaching Assistant positions might also be available. Admission requirements to the MS program in include a BS degree in Computer Science or related field, a statement of purpose, two letters of recommendations, and a score on the TOEFL or IEE that meets University requirements.

Admission
Regular application deadline is April 1, 2014 (early admission deadline is Feb 7, 2014). Online application and details on this link https://graduateadmissions.aub.edu.lb/
Computer Science is a discipline that is continuously changing in a remarkably fast pace. To cope with such a rate of change, during the first 2 years of the BS degree, students cover fundamental yet challenging courses in computer science, enabling them to be introduced during the third year to some of the grand research challenges in data mining, software design and reliability, wireless communication and network security, human computer interaction, theoretical computer science, and computer graphics. After the BS degree, students have an option to do postgraduate studies with one of the Department’s research groups, or move on to another top research institute in Europe, North America, or elsewhere. The Department has many main research areas, each with a number of research groups. Here is an overview of a few.

Information Retrieval and Data Mining
The department has strong and novel research in data mining. Here is a list of some ongoing projects:

- **Sentiment Mining**: There is an increased interest in determining people’s opinions when, among other examples, seeking to buy products, sensing the public opinion on certain issues, or identifying trends. Our pioneering research in sentiment mining aims to build a search engine where a user enters a query and gets back opinions and summaries related to the entered query.
- **Emotion recognition**: This project is concerned with designing automated tools to accurately recognize emotions. Hence, emotions are often the driving force behind people’s motivations, actions, and well-being. Emotion recognition can also be used for public safety by detecting suspicious anxious or fearful behaviors indicative of potential criminal activity.
- **Structured-information retrieval**: Utilizing structured data such as RDF data can significantly improve the performance of difficult information retrieval tasks. In this project, we develop many techniques to utilize RDF data for question answering, entity summarization as well as to improve the effectiveness of traditional information retrieval tasks.
- **Search Personalization**: Personalization has been deemed one of the major challenges in information retrieval with a significant potential for providing better search experience to the user. In this project, we develop adaptive personalization techniques that perform careful personalization in various contexts such as Web search, social media search, and entity search.

Software Design and Reliability
Our research in software engineering tackles emerging challenges in software building. Projects include:

- **High Level Modeling Language for the Android Platform**: The mobile application market is exploding. The goal of this project is to propose a high-level modeling language for developing mobile applications on the Android Platform.
- **Runtime verification/enforcement of component-based systems**: Runtime enforcement is an increasingly popular and effective dynamic validation technique aiming at ensuring the correct runtime behavior of systems. The goal of this project is to propose a runtime enforcement of specifications on component-based systems modeled in the BIP (Behavior, Interaction and Priority) framework.
- **Correct-by-Construction Component-based Design**: Architectures depict design principles that allow thinking on a higher plane and avoiding low-level mistakes. They provide means for ensuring correctness by construction by enforcing global properties characterizing the coordination between components. The goal of this project is to study and implement a framework that supports rigorous techniques for achieving correctness by construction in a system design.

Networking & Security
In a world of increasing mobility, there is a growing need for people to communicate with each other and have timely access to information regardless of the location of the individuals or the information. Our research on wireless communication accesses new routing protocols that are capable of supporting seamless connectivity to mobile users with quality of service (QoS) constraints. We also have strong research in network security that aims to develop effective techniques to stop malicious users from gaining access to victim’s PC via the network. Focus is given to stopping man-in-the-middle attacks and designing trust-based systems to rate users according to their trustworthiness.

Job Opportunities & Salaries
With the broad skills acquired by computer science students during their 3 year program, it is common for them to mostly work as software architects, software engineers, system analysts, system administrators, and consultants in software companies or institutions with IT departments such as Universities and Banks. Recently, many of our graduates are also opening their own startups.

A typical salary for a fresh computer science graduate ranges from 15,000 US dollars to 30,000 US dollars in Lebanon on average, and can be around 90,000 US dollars in the USA on average. These figures can be even higher for big software corporations. Many of our graduates are being locally hired by CCT & Murex, and internationally by Google & Microsoft.