

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

College of Engineering - Corridor E,
Room E103 (Men's Section)
Phone: (974) 4403-4240 / 4244
Email: cs@qu.edu.qa
Website: <http://www.qu.edu.qa/engineering/computer>

Head

Somaya Al Maaded

Faculty

Professors:

Sebti Foufou, Jihad Jaam, Ali Jaoua, Hasan Krad,
Qutaibah Malluhi, Abbas Amira, Abdelaziz Bouras, Mohsen
Mokhtar Guizani

Associate Professors:

Somaya Al Maaded, Mohammad Saleh, Mohammed
Samaka, Osama A. Shata, Uvais Qidwai, Nasir Rajpoot,
Amr Mohamed

Assistant Professors:

Mohamed Al-Meer, Adel Cherif, Tarek Elfouly, Abdelkarim
Erradi, Rachid Hadjidi, Osama Halabi, Loay Ismail, Khaled
Khan, Ryan Riley, Khaled Shaban, Tamer Elsayed, Aiman
Erbad, Masha'el Al-Sabah, Noora Fetais, Abdulla Khalid
Al-Ali, Noor Al-Maadeed

ABOUT THE DEPARTMENT

The CSE Department offers two distinct undergraduate programs:

•The Computer Science (CS) Program that concentrates on algorithms for processing data, the theory of computation, programming languages, software design and development on a variety of computing platforms, the organization of data in databases of various types and scales, as well as web and mobile application development. CS graduates possess highly employable and varied skills that enable them to work effectively in different domains and provide innovative solutions to challenging problems that affect our society and everyday lives. They can understand, design, implement, use, and administer computing systems efficiently. The program enhances the students' ability to pursue multiple interests in different areas of computing and related disciplines. The CS program at Qatar University was first offered in 1989, as the first computer-related undergraduate educational program offered in Qatar. CS students engage in a broad range of learning and research activities that span the entire spectrum of computer science such as software engineering, database design and development,

networking, mobile computing, web systems, and many others. The program concludes with one year senior design project to design and develop a novel system to help solve realistic problems using emerging technologies. •The Computer Engineering (CE) Program that concentrates on the design and development of computing devices and systems. It combines skills from Electrical Engineering, Computer Science, and Mathematics, and applies them in areas like Networking, Data Communication, Instrumentation, Robotics and Intelligent System Automation. The CE program at Qatar University was first offered in 2002. Graduates of this program are highly demanded in industry, government and academic institutions in Qatar. They have the full ability to work effectively in different sectors and in multidisciplinary areas which include telecommunications, oil and gas, and manufacturing. CE students engage in a broad range of learning and research activities with emphasis on computer architecture and organization, microprocessors, embedded computing, networking, hardware design and interfacing, mobile and wireless communication. This educational experience is culminated by a graduation project where teams are formed to design and engineer innovative hardware and software systems using the latest technologies from robotics, distributed systems, circuit design, networking, and embedded systems to tackle real world problems.

The Computer Engineering Program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org> and the Computer Science Program is accredited by the Computing Accreditation Commission of ABET, <http://www.abet.org>.

BACHELOR OF SCIENCE IN COMPUTER ENGINEERING

Program Educational Objectives

The objective of the major is to graduate students who shall be able to achieve most of the following:

1. Establish successful computer or engineering careers in industry and the government that will advance the economic development of the country, the region, and beyond.
2. Serve industry and government by contributing professionally to help solve interdisciplinary, open-ended, and optimization problems.
3. Contribute effectively to the computing or engineering profession by fostering effective interaction, ethical practices, and communication skills, while pursuing further education through lifelong learning.
4. Qualified graduates will be prepared to pursue advanced studies if they so desire.

Major Declaration

- Students are admitted competitively and must satisfy the minimum high school percentage requirement for the major in the semester of admission. In addition, applicants must either successfully complete all requirements of the Foundation Program or satisfy the University's competency requirements.
- Students who have not obtained the required admission average in the General Secondary school Certificate or its equivalent may be admitted when the Program's capacity allows more intake, provided that they achieve a score of 500 or higher on the TOEFL Test, as well as achieving 550 or higher in the Mathematics Part of the International SAT I Test and score an average of 75% or higher in math and science courses.
- Students may be asked to pass an interview before they get admitted in the major.

Student Outcomes

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- An ability to function on multi-disciplinary teams.
- An ability to identify, formulate, and solve computer engineering problems.
- An understanding of professional and ethical responsibility.
- An ability to communicate effectively.
- The broad education necessary to understand the impact of computer engineering solutions in a global, economic, environmental and societal context.
- A recognition of the need for, and the ability to engage in life-long learning.
- A knowledge of contemporary issues.
- An ability to use the techniques, skills, and modern engineering tools necessary for computer engineering practice.

Opportunities

Computer engineers research, plan, design, develop, modify, evaluate and integrate computer and communication systems. Examples of potential employers are computer and telecommunication hardware manufacturers, telecommunications providers, information technology consulting companies, government agencies, educational and research institutions, and information technology departments throughout the private and public sectors. Sample career titles for Computer Engineering are Computer Engineer, Telecommunications Engineer,

Hardware Circuit Designer, Hardware Engineer, Networks Engineer, Systems Engineer, Research Engineer, and Wireless Communication Engineer.

DEGREE REQUIREMENTS

Major in Computer Engineering

A minimum of 128 credit hours are required to complete the major in Computer Engineering, including the following:

- A minimum of 33 credit hours in core curriculum requirements.
- A minimum of 24 credit hours in college requirements.
- A minimum of 60 credit hours in major requirements.
- A minimum of 9 credit hours in major electives.
- A minimum of 2 credit hours in free electives.

Core Curriculum Requirements (33 CH)

Common package (12 CH)

- ARAB 100 Arabic Language I
- ENGL 202 English Language I Post Foundation
- ENGL 203 English Language II Post Foundation
- DAWA 111 Islamic Culture

Social/Behavioral Sciences package (3 CH)

Any Course in Core Curriculum Program defined social package

Humanities /Fine Arts package (3 CH)

Students must complete a minimum of 3 Credit Hours from courses listed in the Qatar and Gulf History Sub-package, which is part of the Humanities/Fine Arts package.

Natural Science/Mathematics package (3 CH)

- MATH 101 Calculus I

Supplemental College / Program core requirements package (12 CH)

- PHYS 191 General Physics for Engineering I
- PHYS 192 Experimental General Physics for Engineering I
- PHYS 193 General Physics for Engineering II
- PHYS 194 Experimental General Physics for Engineering II
- CHEM 101 General Chemistry I
- CHEM 103 Experimental General Chemistry I

College Requirements (24 CH)

- MATH 102 Calculus II
- MATH 211 Calculus III
- MATH 217 Mathematics for Engineers
- GENG 107 Engineering Skills and Ethics
- GENG 200 Probability and Statistics for Engineers
- GENG 300 Numerical Methods
- GENG 360 Engineering Economics

- ELEC 201 Electric Circuits

Major Requirements (60 CH)

- ELEC 231 Fundamentals of Electronics
- ELEC 351 Signals and Systems
- CMPS 151 Programming Concepts
- CMPS 152 Programming Concepts Laboratory
- CMPS 205 Discrete Structures for computing
- CMPS 251 Object-Oriented Programming
- CMPS 252 Object-Oriented Programming Laboratory
- CMPE 261 Digital Logic Design
- CMPE 262 Digital Logic Design Laboratory
- CMPE 263 Computer Architecture and Organization I
- CMPS 303 Data Structures
- CMPE 363 Computer Architecture and Organization II
- CMPE 364 Microprocessors based Design
- CMPE 365 Microprocessors based Design Laboratory
- CMPE 370 Computer Engineering Practicum
- CMPS 405 Operating Systems
- CMPS 406 Operating Systems Laboratory
- CMPS 411 Software Engineering
- CMPE 455 Data Communication and Computer Networks I
- CMPE 456 Data Communication and Computer Networks I Laboratory
- CMPE 457 Data Communication and Computer Networks II
- CMPE 462 Computer Interfacing
- CMPE 476 Digital Signal Processing
- CMPE 478 Digital Signal Processing Laboratory
- CMPE 498 Design Project I
- CMPE 499 Design Project II

Major Electives (9 CH)

Students must complete a minimum of 9 credit hours in major elective courses by taking a maximum of 3 credit hours in the Common Electives sub-package, and the remaining required credit hours from the CE Electives sub-package:

Common Electives Sub-package (0-3 CH)

Students can take up to 3 credit hours from the following list of courses:

- CMPS 373 Computer Graphics
- CMPS 454 Wireless Networks and Applications
- CMPS 465 Parallel and Distributed Systems
- CMPE 475 Artificial Intelligence
- CMPE 480 Computer Vision
- CMPE 482 Multimedia Networks
- CMPS 485 Computer Security

CE Electives Sub-package (6-9 CH)

Students must complete a minimum of 6 to 9 CH from the following courses:

- CMPS 351 Fundamentals of Database Systems
- CMPE 399 Practical Training
- CMPE 470 Modern Computer Organization
- CMPE 471 Selected Topics in Computer Engineering
- CMPE 474 Artificial Neural Networks
- CMPE 481 Modeling and Simulation of Digital Systems
- CMPE 483 Introduction to Robotics
- CMPE 485 Fundamentals of Digital Image Processing
- CMPE 487 Hardware Software Co-Design

Free Electives (2 CH)

Students must complete a minimum of 2 credit hours from courses offered outside the College, excluding MATH P100 course.