

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

Program Educational Objectives

1. The expected accomplishments of graduates of the Bachelor of Science in Computer Science program at Qatar University are: Establish successful computing careers in business, industry, and/or government that will contribute to the economic development of the country, the region, and beyond.
2. Apply analytical, design, and implementation skills to formulate and to solve innovatively computing, business, and interdisciplinary problems.
3. Contribute effectively to society and the computing 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 capacity allows more intake provided that they achieve a score of 500 or higher in 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.

Student Outcomes

By the time of graduation, students will be able to demonstrate:

- An ability to apply knowledge of computing and mathematics appropriate to the discipline.
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
- An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
- An ability to function effectively on teams to accomplish a common goal.
- An understanding of professional, ethical, legal, security and social issues and responsibilities.
- An ability to communicate effectively with a range of audiences.
- An ability to analyze the local and global impact of computing on individuals, organizations, and society.
- Recognition of the need for, and an ability to engage in,

continuing professional development.

- An ability to use current techniques, skills, and tools necessary for computing practice.
- An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
- An ability to apply design and development principles in the construction of software systems of varying complexity.

Opportunities

Computer Science is a very versatile field. Therefore, the program gives graduates a wide range of distinguished career opportunities. Computer Science graduates are sought after by almost all kinds of industries, including gas and oil, telecommunications, media, security, medicine, and many others within Qatar, the region, and beyond. Examples of job titles for computer science include Software Engineer, System Administrator, Application Developer, Systems Programmer, System Analyst, IT Security Specialist, Network Administrator, Database Administrator, IT Consultant, Multimedia Specialist and Web System Manager.

DEGREE REQUIREMENTS

Major in Computer Science

A minimum of 120 credit hours are required to complete the major in Computer Science, including the following:

- A minimum of 33 credit hours in Core Curriculum requirements.
- A minimum of 21 credit hours of college requirements.
- A minimum of 46 credit hours in major requirements.
- A minimum of 15 credit hours of major electives.
- A minimum of 5 credit hours of additional compulsory courses.

Core Curriculum Requirements (33 CH)

Common package (15 CH)

- ARAB 100 Arabic Language I
- ARAB 200 Arabic Language II
- 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 (6 CH)

- A minimum of 3 CH in any course listed in the CCP defined Qatar and Gulf History sub-package

- A minimum of 3 CH in any Course in the CCP defined Humanities/Fine arts package, other than courses in the Qatar and Gulf History sub-package

Natural Science/Mathematics package (3 CH)

Any Course in the CCP defined Natural Science / Mathematics package.

Supplemental College / Program core requirements package (6 CH)

- MATH 101 Calculus I
- MATH 102 Calculus II

College Requirements (21 CH)

- MATH 231 Linear Algebra
- 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
- GENG 200 Probability and Statistics for Engineers
- GENG 300 Numerical Methods

Major Requirements (46 CH)

- CMPS 200 Computer Ethics
- CMPS 205 Discrete Structures for Computing
- CMPS 151 Programming Concepts
- CMPS 152 Programming Concepts Laboratory
- CMPS 251 Object-Oriented Programming
- CMPS 252 Object-Oriented Programming Laboratory
- CMPS 303 Data Structures
- CMPS 311 Object Oriented Modeling
- CMPE 263 Computer Architecture and Organization I
- CMPS 323 Design and Analysis of Algorithms
- CMPS 351 Fundamentals of Database Systems
- CMPS 352 Fundamentals of Database Systems Laboratory
- CMPS 356 Software Development of Enterprise Applications
- 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
- CMPS 493 Senior Project I
- CMPS 499 Senior Project II

Major Electives (15 CH)

Students must complete a minimum of 15 credit hours in major elective courses by taking a maximum of 6 credit hours in the Common Electives sub-package, and the remaining required credit hours from the CS Electives sub-package.

Common Electives Sub-package (0-6 CH)

Students can take up to 6 credit hours from the following list of courses:

- CMPS 373 Computer Graphics
- CMPS 453 Data Mining
- 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

CS Electives Sub-package (9-15 CH)

Students must complete 9 to 15 CH from the following courses:

- CMPE 261 Digital Logic Design
- CMPS 345 Automata and Formal Languages
- CMPS 393 Modeling and Simulation
- CMPS 399 Practical Training
- CMPS 433 Multimedia Systems
- CMPS 445 Compiler Construction
- CMPS 451 Database Management Systems
- CMPS 453 Data Mining
- CMPS 466 Information Retrieval
- CMPS 497 Special Topics in Computing
- CMPS 312 Mobile Application Development

Common Electives Sub-package (0-6 CH)

To satisfy the major Electives package requirements, students can complete a maximum of 6 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

Major Supporting Requirements (5 CH)

Students must complete a minimum of 5 credit hours in additional required courses including:

- MAGT 101 Principles of Management
- CMPS 307 Introduction to Project Management and Entrepreneurship