



Sultan Qaboos University
College of Science

Department of Computer Science (DCS)



Bachelor in Computer Science with Specializations

(Cohorts 2021-2025)

Accredited by the Computing Accreditation

Commission of ABET, <http://www.abet.org>



SCAN ME

Computer Science Degree Program (Cohorts 2021 -2025)

UNIVERSITY REQUIREMENTS (12 credits)

Course code	Course Title	Credits
ARAB1060 or ARAB1019	Arabic	2
HIST1010 or ISLM1010	Oman & Islamic Civilization Islamic Culture	2
SOCY1005 or SOCY1007	Oman: State and People Omani Contemporary Society (<i>for non-Omani</i>)	2
	University Electives	6

COLLEGE REQUIREMENTS (3 credits)

Code	Title	Credits
LANC2058	Communication in Science	3

COLLEGE ELECTIVES (16 Credits)

Code	Title	Credits
BIOL2101	General Biology I	4
CHEM2101	General Chemistry I	4
COMP2101*	Introduction to Computer Science	4
ERSC2101	Introduction to Geology	4
MATH2107*	Calculus I	4
PHYS2101	General Physics I	4
STAT2101*	Introduction to Statistics	4

*COMP2101, MATH2107 and STAT2101 are required for Computer Science Major

DEPARTMENTAL REQUIREMENTS (12 Credits)

Code	Title	Credits
COMP2202	Fundamentals of Object-Oriented Programming	3
COMP3203	Introduction to Data Structures & Algorithms	3
COMP3401	Introduction to Software Engineering	4
COMP4100	Ethics and Skills for Computing Professionals	2

DEPARTMENTAL ELECTIVES (9 Credits)

Computer Science students are required to select a minimum of 9 credits from the elective courses in the Department of Computer Science.

MAJOR REQUIREMENTS (42 Credits)

Code	Title	Credits
Computer Science: 30 credits		
COMP3205	Database Systems	3
COMP3501	Computer Organization & Assembly Language	3
COMP3502	Computer Networks	3
COMP3600	Intelligent Systems	3
COMP3700	Introduction to Web Computing	3
COMP4204	Advanced Data Structures and Algorithms	3
COMP4445	Summer Training	0
COMP4501	Fundamentals of Operating Systems	3
COMP4509	Introduction to Computer Security	3
COMP5101	Comparative Programming Languages	3
ECCE3206	Digital Logic Design	3
Math: 12 credits		
MATH2108 or MATH2109	Calculus II	3
MATH2201	Linear Algebra I	3
MATH3340	Discrete Mathematics for Computer Science	3
STAT2102	Introduction to Probability	3

MAJOR ELECTIVES (9 credits)

A student can choose not to follow any specialization. In this case, the 37 credits of Specialization Requirements (22 credits) + Specialization Electives (6 credits) + Major Electives (9 credits) can be allocated as follows: 4 credits for a final year project (COMP5900 / 5490 / 5590 or 5690) and 33 credits for Major Electives.

If a student does not follow a specialization, he/she can have an optional minor (18 credits), or take elective courses from the College of Science including Computer Science, Math and/or Science courses.

Student should take at least 2 credits from a natural science course (BIOL, CHEM, ERSC or PHYS) that includes laboratory work.

SPECIALIZATION REQUIREMENTS (22 Credits)

Web and Software Development Specialization

Code	Title	Credits
COMP4206	Mobile Applications Development	3
COMP4402	Software Testing	3
COMP4701	Web Application Development	3
COMP5402	Requirements Engineering	3
COMP5405	Software Patterns	3
COMP5701	Web Services	3
COMP5490	Project in Web and Software	4

Cybersecurity and Computing Infrastructure Specialization

Code	Title	Credits
COMP4506	Systems and Networks Programming	3
COMP4515	Mobile Networks	3
COMP5504	Distributed Systems	3
COMP5507	Cryptography and Network Security	3
COMP5509	Penetration Testing and Ethical	3
COMP5511	Computer Forensics	3
COMP5590	Project in Cybersecurity & Computing	4

Intelligent Systems and Data Science Specialization

Code	Title	Credits
COMP4603	Machine Learning	3
COMP4605	Computer Vision	3
COMP4609	Deep Learning Fundamentals	3
COMP5602	Pattern Recognition and Analysis	3
COMP5605	Mobile Robotics	3
COMP5606	Natural Language Processing	3
COMP5690	Project in Intelligent Systems and Data	4

CAREER PATHS: The three specializations have a wide variety of career paths including the following:

Web and Software Development	Cybersecurity & Computing Infrastructure	Intelligent Systems and Data Science
Software Developer, Software Tester, Software Project manager, Database Developer, Web Developer, Web Service Developer, SOA Architect, Mobile Application Developer, Multimedia Programmer, Embedded Systems Developer	Information Security Officer, Computer System Security Administrator, Data Centre Technician, Network Administrator, System Administrator, IT technician	Data Analyst, Data Scientist, Artificial Intelligence Engineer, Machine Learning Engineer, Robot Programmer, Software Game Programmer, Research Scientist



For more information, please visit our website at

<http://www.squ.edu.om/science/Departments/Computer-Science>

Or contact us on the address:

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ABOUT THE DEPARTMENT

The Department of Computer Science (DCS) was established in 1995. The Department's vision is:

To become a regionally leading and an internationally recognized Department of Computer Science.

The Department of Computer Science mission is to:

- *Provide high quality undergraduate and graduate education in the field of computer science,*
- *Conduct quality scholarly activities leading to research output of international standard, and*
- *Provide computer science expertise, resources and services to the Sultanate of Oman.*

The department has developed and maintained over the years a solid curriculum for its B.Sc. in Computer Science program, using as references IEEE and ACM guidelines and ABET accreditation criteria. Undergraduate computer science students have access, through instruction and laboratory experiences, to a wide range of subjects in different areas of computer science including: software engineering, web engineering, systems and networking, cybersecurity, image processing, computer vision, intelligent systems, machine learning, and mobile computing. The program includes an industrial summer training in government and private institutions as well as a final year project offering senior students training on solving real-life problems and preparing them for their upcoming professional life.

The B.Sc. in Computer Science program is regularly revised to offer the best possible experience to students. The program is accredited by ABET since Fall 2015.

The department has adopted the following Program Educational Objectives (PEOs) and Student Outcomes (SOs) to make the program more effective, and to fulfill the defined Vision & Mission.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

The Computer Science program at SQU aims that, few years after their graduations, its B.Sc. in Computer Science students will:

PEO1	Become successful computer science professionals and practitioners who can interact and collaborate effectively in various work environments.
PEO2	Engage in ongoing lifelong learning and be able to pursue graduate studies at respectable universities.
PEO3	Contribute productively to the IT needs of the society, be socially responsible, and become mature societal leaders locally and globally.

STUDENT OUTCOMES (SOs)

The Computer Science program at SQU enables the students to achieve at the time of graduation the following student outcomes:

SO_1:	Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
SO_2:	Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
SO_3:	Communicate effectively in a variety of professional contexts.
SO_4:	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
SO_5:	Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
SO_6:	Apply computer science theory and software development fundamentals to produce computing-based solutions.

PROGRAM STRUCTURE

The Department of Computer Science offers a Bachelor of Science degree in Computer Science with specializations. The curriculum is designed to allow students to acquire focused knowledge and skills in selected areas of specialization relevant to the job market needs. The program offers the following specializations:

- ❖ **Web and Software Development**
- ❖ **Cybersecurity and Computing Infrastructure**
- ❖ **Intelligent Systems and Data Science**

The BSc. Degree* is a four-year program comprising 122 credits; out of which 22 credits are for Specialization Requirements courses and 6 credits for Specialization Electives courses. The other 94 credits are distributed into University Requirements (6 credits), University Electives (6 credits), College Requirements (3 credits), College Electives (16 credits), Department Requirements (12 credits), Major Requirements (42 credits) and Major Electives (9 credits). A Computer Science student can take a minor of 18 credit hours out of the Major Electives in any program from the College of Science or in an approved minor program from other colleges.

During summer and semester breaks, the students are encouraged to take part in our Industrial Training program in various organizations in the Sultanate to gain experience with practical aspects of computing.

MAJOR ENTRY REQUIREMENTS

To apply for a major in the College of Science, the students must not be under probation and need LANC2058 and 3 introductory science courses. The students who are willing to major in Computer Science should satisfy the following requirements:

Courses Required to Choose Major (in addition to LANC2058)	Minimum Departmental Requirements
COMP2101 + 2 Introductory Science Courses	C in COMP2101

* More details on the BSc in computer science degree plan are provided on the back of this brochure

SPECIALIZATION ENTRY REQUIREMENTS

In order to apply for a specialization, the student must complete at least 2 out of the following 3 courses. Each of these 3 courses is required for admission to one of the 3 specializations:

Web and Software Development	Cybersecurity and Computing Infrastructure	Intelligent Systems and Data Science
COMP3401	COMP3502	COMP3600

Criteria for Admission to the Specializations: Student preferences, Grade in the specialization admission course, Cumulative GPA, Availability of seats.

ACADEMIC ADVISING

Academic advisors in the department are provided with degree work plans, student academic records, and a chart of course prerequisites in order to successfully guide students to complete their degrees on time.

CAREER OPPORTUNITIES

Computer Science is one of the most exciting and rapidly growing professions worldwide. Numerous studies have estimated that the field continues to be among the top two or three in demand. The supply of educated graduates, although increasing every year, is far exceeded by the demand for professionals at all levels. For the last several years, computer science graduates with a bachelor's degree have commanded the highest starting salary among all undergraduates. Computer scientists offer expertise in the effective and efficient use of computers for industry, business, government, research and education.

The field of computer science has an exceptionally bright future. The three offered specializations open doors for expanding career paths (*see sample career paths on the back of this brochure*) in which the job demand is exploding.

Facilities Available in DCS

- The DCS has five teaching computer labs. Each lab contains 35 PCs running under windows and Linux environments. Ceiling mounted LCD projectors are available in all these labs. The DCS has one Open Access computer lab (Lab 18) containing 60 PCs. These PCs are configured for both Windows and LINUX environments. This lab is a multi-purpose lab used for student assignments, workshops, tutorials, and teaching. Also, the DCS has allocated one lab (Lab 17) for Computer Science major students.
- The DCS has two extra specialized Labs: Software Engineering lab, and Network and Security lab. The Network and Security lab is fully equipped with a smart board and networking devices. The Software Engineering lab is fully equipped with software related to Software Engineering. These two labs are used for teaching as well as for student projects and faculty research activities.
- Four resource rooms are also available for the students working on their projects. Two of these resource rooms are for the B.Sc. students. Every project student is provided with a separate PC.
- Three rooms for postgraduate students equipped with PCs and printers: Male Ph.D./M.Sc. room; Female Ph.D. room and Female M.Sc. room.
- The DCS has one conference room used to hold meetings, seminars, final year project (FYP) presentations, and other events.