

## **Bachelor of Science in Computer Science**

### **Program Description**

The Bachelor of Science in Computer Science (CS) degree program provides a solid foundation in computing and technology related sciences, along with exploration of the various disciplines of liberal arts and humanities. By examining the latest industry tools and techniques and developing valuable experience and professional skills in areas such as object-oriented programming, database systems, and network security, students are equipped with the in-depth understanding of their chosen professions.

The CS program aims to develop and prepare individuals for rewarding, cutting- edge careers in software engineering, system administration, and management. Furthermore, the CS graduates will be well trained to handle the problems faced in industry, academia, and daily life.

***The Bachelor of Science in Computer Science is overseen by the School of Engineering and Computing and is designed to satisfy QF Emirates Level 7 requirements.***

### **Program Mission**

The Bachelor of Science in Computer Science aims to provide students with high-quality education covering a broad and well-integrated knowledge in the concepts and methodologies underlying the analysis, design, and utilization of computer software, algorithms, and systems. The graduates of the program will be well versed in computer technology and its impact on the global society.

### **Program Educational Objectives**

A few years after graduation, our alumni will be:

1. Innovators in applied areas of computer science, effectively accomplishing software-related projects to meet market needs, and actively engaging in research.
2. Professionals making informed judgments and creating a positive technological impact with awareness of the ethical and legal issues of computer science.
3. Leaders in the computing field capable of working in teams, communicating effectively, and engaging in life-long learning and community service.

### **Program Learning Outcomes**

Graduates of the program will have the ability to:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions;
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;
3. Communicate effectively in a variety of professional contexts;
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles;
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline; and

6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

### **Degree Requirements**

The BS in Computer Science (CS) requires the completion of 127 credits in the following areas:

Area	Credit
University General Education Requirements	32
School of Engineering and Computing Requirements	26
CS Program Requirements	66
Free Electives	3

### **University General Education Requirements**

### **32 Credit Hours**

The program requires completion of the General Education Component. For information relating directly to the General Education requirements, please review the catalog section entitled, "General Education Component." You must speak with your advisor to ensure that the General Education Component requirements are satisfied. **The fifth writing intensive course for the BS Computer Engineering is CSCI 463 Data Communication and Computer Networks Laboratory.**

Course Code	Title	Credits
ARAB 101 or ARAB 110	Arabic Language and Culture for Non-Native Learners I OR Arabic Language and Culture for Native Arabic Speakers I	3
ENGL 101	Composition ( <b>Writing Intensive</b> )	3
CSCI 112	Introduction to Computer Programming	3
CSCI 113	Introduction to Computer Programming Lab	1
UNIV 100	University First-Year Transition	1
UNIV 200	Innovation, Entrepreneurship, and Sustainability ( <b>Writing Intensive</b> )	3
PHIL 100 or ENGL 200	Critical Thinking and Reasoning ( <b>Writing Intensive</b> ) OR Advanced Composition ( <b>Writing Intensive</b> )	3
MEST 100	Introduction to Islam in World Culture ( <b>Writing Intensive</b> )	3
UAES 200	Survey of United Arab Emirates Studies	3
MATH 113	Calculus I	3
Gen Ed	Social and Behavioral Sciences Course	3
ENVS 102	Sustainability and Human-Environment Relations	3

### **School of Engineering and Computing Requirements**

### **26 Credit Hours**

Course Code	Course Title	Credits
PHYS 110	University Physics I	3

Course Code	Course Title	Credits
PHYS 111	University Physics I Lab	1
MATH 114	Calculus II	3
MATH 213	Calculus III	3
PHYS 220	University Physics II	3
PHYS 221	University Physics II Lab	1
MATH 203	Linear Algebra	3
ENGR 200	Engineering Statistics	3
CSCI 390	Internship I	3
CSCI 391	Internship II	3

### CS Program Requirements

**66 Credit Hours**

#### Core Courses

**60 Credit Hours**

Course Code	Course Title	Credits
CSCI 104	Introduction to Computing	3
CSCI 211	Object Oriented Programming	3
MATH 225	Discrete Mathematics	3
CSCI 215	Data Structures and Algorithms	3
CSCI 232	Computer Organization	3
CSAI 350	Introduction to Artificial Intelligence	3
CSAI 351	Data Science	3
CSCI 315	Design and Analysis of Algorithms	3
CSCI 326	Database Systems	3
CSCI 312	Operating System Fundamentals	3
CSCI 372	Compiler Design	3
CSCI 388	Programming Languages	3
CENG 335	Computer Architecture	3
CENG 336	Computer Architecture Lab	1
EEEN 331	Digital Systems Design	3
EEEN 332	Digital Systems Design Lab	1
CENG 411	Software Engineering	3
CSCI 462	Data Communications and Computer	3
CSCI 463	Data Communications and Computer Networks <b>Lab (Writing Intensive)</b>	1
CENG 461	Network Security	3
CSCI 492	Senior Design Project I	2
CSCI 493	Senior Design Project II	4

**Technical Electives****6 Credit Hours**

Course Code	Course Title	Credits
CENG 437	Introduction to Robotics	3
CSCI 411	Computer Graphics	3
CSCI 412	Computer Graphics Lab	1
CSCI 415	Introduction to Parallel	3
CSCI 416	Human Computer Interaction	3
CENG 435	Parallel Computer Architectures	3
EEEN 481	Concepts of Multimedia Processing and Transmission	3
CENG 401	Network Servers & Architecture	3
CSCI 450	Information Security and Privacy	3
CSCI 499	Special Topics in Computing	3
ENGR 399	Undergraduate Research Project	3

**Free Electives****3 Credit Hours**

Students must complete one course (3 credits) of free electives.

## BS in Computer Science Four-Year Sample Schedule

First Year, First Semester			First Year, Second Semester		
Course Code	Course Title	Credits	Course Code	Course Title	Credits
CSCI 104	Introduction to Computing	3	ARAB 101 Or ARAB 110	Arabic Language and Culture for Non-Native Learners I OR Arabic Language and Culture for Native Arabic Speakers I	3
ENGL 101	Composition	3	CSCI 112	Introduction to Computer Programming	3
MATH 113	Calculus I	3	CSCI 113	Intro. to Computer Programming Lab	1
PHYS 110	University Physics I	3	MATH 114	Calculus II	3
PHYS 111	University Physics I Lab	1	PHYS 220	University Physics II	3
UNIV 100	University First-Year Transition	1	PHYS 221	University Physics II Lab	1
			MEST 100	Introduction to Islam in World Culture	3
Subtotal =		14	Subtotal =		17
Second Year, First Semester			Second Year, Second Semester		
Course Code	Course Title	Credits	Course Code	Course Title	Credits
CSCI 211	Object Oriented Programming	3	CSCI 215	Data Structures and Algorithms	3
MATH 213	Calculus III	3	EEEN 331	Digital Systems Design	3
MATH 225	Discrete Mathematics	3	EEEN 332	Digital Systems Design Lab	1
CSCI 232	Computer Organization	3	MATH 203	Linear Algebra	3
UNIV 200	Innovation, Entrepreneurship, and Sustainability	3	ENGR 200	Engineering Statistics	3
			PHIL 100 Or ENGL 200	Critical Thinking and Reasoning or Advanced Composition	3
Subtotal =		15	Subtotal =		16
Second Year, Summer Session					
Course Code	Course Title	Credits			
CSCI 390	Internship I	3			
Subtotal =		3			
Third Year, First Semester			Third Year, Second Semester		
Course Code	Course Title	Credits	Course Code	Course Title	Credits
CENG 335	Computer Architecture	3	Gen Ed	Social and Behavioral Sciences	3
CENG 336	Computer Architecture Lab	1	CSCI 372	Compiler Design	3
ENVS 102	Sustainability and Human-Environment Relations	3	CSCI 462	Data Comm. and Computer Networks	3
CSCI 326	Database Systems	3	CSCI 463	Data Comm. and Computer Networks Lab	1
UAES 200	Survey of United Arab Emirates Studies	3	CSCI 388	Programming Languages	3
CSCI 312	Operating System Fundamentals	3	CSCI 315	Design and Analysis of Algorithms	3
Subtotal =		16	Subtotal =		16
Third Year, Summer Session					
Course Code	Course Title	Credits	Course Code	Course Title	Credits
CSCI 391	Internship II	3			
Subtotal =		3			
Fourth Year, First Semester			Fourth Year, Second Semester		
Course Code	Course Title	Credits	Course Code	Course Title	Credits
CSAI 350	Introduction to Artificial Intelligence	3	CSCI 493	Senior Design Project II	4
CENG 411	Software Engineering	3	CENG 461	Network Security	3
CSCI 492	Senior Design Project I	2	CSAI 351	Data Science	3
	Free Elective	3		Technical Elective II	3
	Technical Elective I	3			
Subtotal =		14	Subtotal =		13
Total 127 Credits					