Bachelor of Science in Computer Engineering

Program Description

The Computer Engineering program integrates both electronics engineering and computer science in the development of computer systems. Computer Engineers are involved in many hardware and software aspects of computing including design of microcontrollers, computers, and circuit design. These engineers focus not just on how computers work but on how to integrate them into larger systems.

Students learn the fundamentals of circuits, systems, and software associated with the design of programmable systems as used for general purpose computing, communications, control, or signal processing. Because of their broad skills in both hardware and software, students in computer engineering are in high demand for employment after graduation. Computer engineering students are also positioned to pursue graduate programs in either computer science or electronics engineering.

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

Program Mission

The mission of the Computer Engineering program is to produce graduates who have the necessary theoretical background and the technical know-how and skills to create successful innovations and to solve problems in the field and to understand the social and environmental issues that may be involved. Graduates will have a thorough foundation in the basic principles of electrical engineering and information technology and a broad introduction to electronics, the design of digital computer systems, software development, data communications, and networking. Students will be prepared for employment in diverse areas of computer engineering or for further study in a graduate program.

Program Educational Objectives

A few years after earning their degree, our graduates will be:

1. Successful professionals in the theoretical and practical areas of Computer Engineering;

2. Ethical and responsible engineers with sufficient awareness of the impact of engineering solutions in various contexts; and

3. Life-long learners equipped with the skills required for professional practice including functioning in teams and communicating effectively.

Program Learning Outcomes

Graduates of the program will have the ability to:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics;

2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors;

3. Communicate effectively with a range of audiences;

4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts;

5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;

6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions; and

7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

Degree Requirements

The BS in Computer Engineering (CE) requires the completion of 132 credits in the following areas:

Area	Credit
University General Education Requirements	32
School of Engineering and Computing Requirements	32
CE Program Requirements	68

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 **(Writing Intensive)**	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 **(Writing Intensive)**	3
PHIL 100 or ENGL 200	Critical Thinking and Reasoning **(Writing Intensive)** OR Advanced Composition **(Writing Intensive)**	3
MEST 100	Introduction to Islam in World Culture **(Writing Intensive)**	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 **32 Credit Hours**

Course Code	Course Title	Credits
ENGR 107	Introduction to Engineering	2
PHYS 110	University Physics I	3
PHYS 111	University Physics I Lab	1
MATH 114	Calculus II	3
MATH 213	Calculus III	3
MATH 214	Elementary Differential Equations	3
MATH 203	Linear Algebra	3
PHYS 220	University Physics II	3
PHYS 221	University Physics II Lab	1
ENGR 200	Engineering Statistics	3
ENGR 450	Engineering Seminar	1
ENGR 390	Internship I	3
ENGR 391	Internship II	3

CE Program Requirements **68 Credit Hours**

Core Courses **62 Credit Hours**

Course Code	Course Title	Credits
CSCI 211	Object Oriented Programming	3
MATH 225	Discrete Mathematics	3
CSCI 215	Data Structures and Algorithms	3
CSCI 312	Operating System Fundamentals	3
CENG 315	Microprocessors	3
CENG 316	Microprocessors Lab	1
CENG 335	Computer Architecture	3
CENG 336	Computer Architecture Lab	1
CENG 411	Software Engineering	3
CENG 431	Embedded Systems Design	3
CENG 432	Embedded Systems Design Lab	1
CSAI 350	Introduction to Artificial Intelligence	3
CSAI 484	Internet of Things System	3
EEEN 220	Signals & Systems	3
EEEN 221	Signals & Systems Lab	1
EEEN 280	Electric Circuit Analysis I	3
EEEN 281	Electric Circuit Analysis Lab	1
EEEN 331	Digital System Design	3

Course Code	Course Title	Credits
EEEN 332	Digital System Design Lab	1
EEEN 333	Linear Electronics I	3
EEEN 334	Linear Electronics I Lab	1
CSCI 326	Database Systems	3
CSCI 462	Data Communications and Computer Networks	3
CSCI 463	Data Communications and Computer Networks Lab **(Writing Intensive)**	1
CENG 492	Senior Design Project I	2
CENG 493	Senior Design Project II	4

Technical Electives **6 Credit Hours**

Course Code	Course Title	Credits
CSCI 415	Introduction to Parallel Programming	3
CSCI 450	Information Security and Privacy	3
CENG 435	Parallel Computer Architectures	3
CENG 437	Introduction to Robotics	3
CENG 461	Network Security	3
CENG 401	Network Servers & Architecture	3
CSCI 499	Special Topics in Computing	3
EEEN 431	Digital Circuit Design	3
EEEN 481	Concepts of Multimedia Processing and Transmission	3
ENGR 399	Undergraduate Research Project	3

BS in Computer Engineering Four-Year Sample Schedule

First Year, First Semester			First Year, Second Semester		
Course Code	**Course Title**	**Credits**	**Course Code**	**Course Title**	**Credits**
PHYS 110	University Physics I	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
PHYS 111	University Physics I Lab	1	CSCI 112	Introduction to Computer Programming	3
ENGL 101	Composition	3	CSCI 113	Intro. to Computer Programming Lab	1
ENGR 107	Introduction to Engineering	2	MATH 114	Calculus II	3
MATH 113	Calculus I	3	PHYS 220	University Physics II	3
ENVS 102	Sustainability and Human-Environment Relations	3	PHYS 221	University Physics II Lab	1
UNIV 100	University First-Year Transition	1	MEST 100	Introduction to Islam in World Culture	3
Subtotal =		**16**	**Subtotal =**		**17**
Second Year, First Semester			**Second Year, Second Semester**		
Course Code	**Course Title**	**Credits**	**Course Code**	**Course Title**	**Credits**
MATH 225	Discrete Mathematics	3	CSCI 215	Data Structures and Algorithms	3
CSCI 211	Object-Oriented Programming	3	EEEN 220	Signals & Systems	3
EEEN 280	Electric Circuit Analysis I	3	EEEN 221	Signals & Systems Lab	1
EEEN 281	Electric Circuit Analysis Lab	1	EEEN 331	Digital System Design	3
MATH 213	Calculus III	3	EEEN 332	Digital System Design Lab	1
ENGR 200	Engineering Statistics	3	MATH 203	Linear Algebra	3
			PHIL 100 Or ENGL 200	Critical Thinking and Reasoning or Advanced Composition	3
Subtotal =		**16**	**Subtotal =**		**17**
Second Year, Summer Semester					
Course Code	**Course Title**	**Credits**			
ENGR 390	Internship I	3			
Third Year, First Semester			**Third Year, Second Semester**		
Course Code	**Course Title**	**Credits**	**Course Code**	**Course Title**	**Credits**
CENG 335	Computer Architecture	3	CENG 315	Microprocessor	3
CENG 336	Computer Architecture Lab	1	CENG 316	Microprocessor Lab	1
CSCI 326	Database Systems	3	MATH 214	Elementary Differential Equations	3
EEEN 333	Linear Electronics I	3	CSCI 462	Data Comm. and Computer Networks	3
EEEN 334	Linear Electronics Lab I	1	CSCI 463	Data Comm. and Computer Networks Lab	1
CSCI 312	Operating System Fundamentals	3	UAES 200	Survey of United Arab Emirates Studies	3
			UNIV 200	Innovation, Entrepreneurship, and Sustainability	3
Subtotal =		**14**	**Subtotal =**		**17**
Third Year, Summer Semester					
Course Code	**Course Title**	**Credits**	**Course Code**	**Course Title**	**Credits**
ENGR 391	Internship II	3			
Fourth Year, First Semester			**Fourth Year, Second Semester**		
Course Code	**Course Title**	**Credits**	**Course Code**	**Course Title**	**Credits**
ENGR 450	Engineering Seminar	1	CENG 493	Senior Design Project II	4
CSAI 484	Internet of Things System	3	CENG 431	Embedded Systems Design	3
Gen Ed	Social and Behavioral Sciences	3	CENG 432	Embedded Systems Design Lab	1
CENG 411	Software Engineering	3		Technical Elective I	3
CENG 492	Senior Design Project I	2		Technical Elective II	3
CSAI 350	Introduction to Artificial Intelligence	3			
Subtotal =		**15**	**Subtotal =**		**14**
Total 132 Credits					