Program Viewbook

Bachelor of Science in Computer Science (BScCS)

Program Description

The Bachelor of Science in Computer Science (BScCS) program provides students with a strong foundation in computing theory, programming, and applied mathematics to address complex challenges in computer science and related fields. The curriculum integrates core courses such as algorithms, data structures, discrete mathematics, programming paradigms, computer architecture, operating systems, and database systems, alongside advanced study in artificial intelligence, data mining, security, and computability. Supporting courses in calculus, linear algebra, probability, and statistics further strengthen analytical and problem-solving skills. The program emphasizes the design, implementation, and evaluation of computing solutions, effective communication in professional contexts, and the application of legal and ethical principles in computing practice. Students gain practical experience through laboratory work, internships, and a final year graduation project, while also developing the capacity to work collaboratively in teams and take on leadership roles. Elective courses in areas such as web development, human-computer interaction, computer graphics, and advanced algorithms provide opportunities for specialization.

Graduates of this program will be prepared for roles such as Software Developers, Systems Engineers, Testing Engineers, Software Project Managers, Systems Analysts, IT Managers, Database Designers, and Entrepreneurs, as well as for research-oriented careers in computer science and related disciplines.

Program Learning Outcomes (PLOs)

PLO 1: Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.

PLO 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.

PLO 3: Communicate effectively in a variety of professional contexts.

PLO 4: Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

PLO 5: Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

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

PLO 7: Demonstrate knowledge of relevant theories and principles of computing-related solutions in specialized domains.

PLO 8: Assimilate new knowledge and skills into their practice by learning from experiences gained in different contexts of Computer Science.

Program Completion Requirements

The Bachelor of Science in Computer Science (BScCS) degree shall be awarded to a student who is officially enrolled in the program and has fulfilled the following requirements:

- Successful completion of 127 credit hours.
- Achievement of a minimum cumulative GPA of 2.0 on a 4.0 scale.
- Completion of at least 50% of total program credit hours at CUD.
- Completion of the Internship and Graduation Project while enrolled at CUD.

Program Structure

University Requirements Courses	**27 Cr. Hrs.**
Core Courses	**64 Cr. Hrs.**
Major Courses	**36 Cr. Hrs.**
Total	**127 Cr. Hrs.**

List of Courses

I. University Requirement Courses

Course Code		Course Title	Prerequisite	Cr. Hrs.
Compulsory Courses				**18**
LNG	181	English I for Engineering and Computing	None	3
LNG	182	English II for Engineering and Computing	LNG 181	3
GED	190	Emirati Studies	None	3
GED	255	Critical Thinking and Problem Solving	LNG 182 or LNG 172	3
ENT	141	Fundamentals of Innovation and Entrepreneurship 1	None	2
ENT	142	Fundamentals of Innovation and Entrepreneurship 2	ENT 141	1
ENT	241	Entrepreneurship 1	ENT 142	2
ENT	242	Entrepreneurship 2	ENT 241	1
Science Elective Courses (03 Credits): Students are required to select one Course from the following courses				
BIO	102	Biology I	None	3
SHS	103	Chemistry	None	3
SCI	210	Modern Physics	None	3
Humanities Elective Courses (06 Credits): Students are required to select two Courses from the following courses				
GED	103	Head Anatomy Sculpture	None	3
GED	106	Smart Decisions: Data Literacy and Visualization	None	3
GED	110	Modern Art Appreciation	None	3
GED	111	Music Appreciation and Communication	None	3
GED	191	Islamic Studies	None	3
GED	196	Communication Skills in Arabic 1	None	3
GED	205	Psychology in Everyday Life	LNG 182 or LNG 172	3
GED	324	Ethical Reasoning for Today's World	LNG 182 or LNG 172	3
GED	330	Introduction to Canadian Studies	None	3

II. Core Courses

Course Code		Course Title	Prerequisite	Cr. Hrs.
Compulsory Courses				**64**
BCS	101	Elements of Computing	None	3
BCS	102	Introduction to Computing Science I	BCS 101	3
MTH	112	Calculus I	None	3
MTH	113	Calculus II	MTH 112	3
MTH	114	Linear Algebra	MTH 112	3
MTH	120	Discrete Mathematics	None	3
MTH	130	Probability and Statistics	MTH 112	3
MTH	203	Discrete Mathematics for Computing Science	BCS 102, MTH 120	3
BCS	201	Logic for Computing Science	MTH 120	3
BCS	202	Introduction to Computing Science II	BCS 102	3
BCS	203	Software Specifications	BCS 201, BCS 202	3
BCS	206	Information Structures	BCS 202, MTH 203	3
BCS	222	Programming Paradigms	BCS 201, BCS 202	3
ENG	210	Computer Architecture	BCS 202 or ENG 101	4
BCS	305	Software Architecture	BCS 203, BCS 206	3
BCS	306	Database Management Systems	BCS 201, BCS 202	3
BCS	309	Algorithms I	BCS 201 or BAI 201, BCS 206	3
BCS	311	Scientific Computing	BCS 102, MTH 114	3
BCS	323	System-Level Programming	BCS 102	3
BCS	401	Ethics for Computing Professionals	None	3
BCS	480	Internship in Computer Science	90 Credit Hours & CGPA ≥ 2.0	3

III. Major Courses

Course Code		Course Title	Prerequisite	Cr. Hrs.
Compulsory Courses				**33**
BCS	221	Communication Networks	BCS 102	3
BCS	301	Operating Systems	BCS 206, ENG 210 or BAI 201	4
BCS	303	Security Principles and Practices	BCS 221	4
BCS	304	Data Mining	BCS 202, MTH 130, MTH 114, MTH 203	3
BCS	307	Digital Systems	ENG 210	4
BCS	402	Computability and Complexity	BCS 203, BCS 309	3
BCS	403	Advanced Database Systems	BCS 206, BCS 306	3
BCS	407	Artificial Intelligence	SWS 111 or BCS 206, BCS 222	3
BCS	417	Computer Science Graduation Project	Completed 90 Credit Hours	6
Elective Courses (03 Credits): Students are required to select one course from the following courses				
SWS	215	Web Development	BCS 306	3
BSD	311	Human Computer Interaction	BCS 206	3
BCS	400	Network Operating Systems	BCS 301	3
BCS	406	Computer Graphics	BCS 206, MTH 114	3
BSD	404	Algorithms II	BCS 203, BCS 309	3

Eight Semesters Study Plan

Semester	Course Code		Course Title	Prerequisite	Cr. Hrs.
1	LNG	181	English I for Engineering and Computing	None	3
	BCS	101	Elements of Computing	None	3
	MTH	112	Calculus I	None	3
	ENT	141	Fundamentals of Innovation and Entrepreneurship 1	None	2
	GED	190	Emirati Studies	None	3
	Total				**14**
2	LNG	182	English II for Engineering and Computing	LNG 181	3
	BCS	102	Introduction to Computing Science I	BCS 101	3
	MTH	113	Calculus II	MTH 112	3
	MTH	120	Discrete Mathematics	None	3
	ENT	142	Fundamentals of Innovation and Entrepreneurship 2	ENT 141	1
	XXX	XXX	Science Elective	None	3
	Total				**16**
3	MTH	114	Linear Algebra	MTH 112	3
	MTH	130	Probability and Statistics	MTH 112	3
	MTH	203	Discrete Mathematics for Computing Science	BCS 102, MTH 120	3
	BCS	201	Logic for Computing Science	MTH 120	3
	BCS	202	Introduction to Computing Science II	BCS 102	3
	ENT	241	Entrepreneurship 1	ENT 142	2
	Total				**17**
4	ENG	210	Computer Architecture	BCS 202 or ENG 101	4
	BCS	203	Software Specifications	BCS 201, BCS 202	3
	BCS	206	Information Structures	BCS 202, MTH 203	3
	BCS	221	Communication Networks	BCS 102	3
	BCS	222	Programming Paradigms	BCS 201, BCS 202	3
	ENT	242	Entrepreneurship 2	ENT 241	1
	Total				**17**
5	XXX	XXX	Humanities Elective (1)		3
	BCS	301	Operating Systems	BCS 206, ENG 210 or BAI 201	4
	BCS	303	Security Principles and Practices	BCS 221	4
	BCS	304	Data Mining	BCS 202, MTH 114, MTH 130, MTH 203	3
	BCS	311	Scientific Computing	BCS 102, MTH 114	3
	Total				**17**
6	BCS	305	Software Architecture	BCS 203, BCS 206	3
	BCS	306	Database Management Systems	BCS 201, BCS 202	3
	BCS	307	Digital Systems	ENG 210	4
	BCS	309	Algorithms I	BCS 201 or BAI 201, BCS 206	3
	BCS	323	System-Level Programming	BCS 102	3
	Total				**16**
7	GED	255	Critical Thinking and Problem Solving	LNG 182 or LNG 172	3
	BCS	401	Ethics for Computing Professionals	None	3
	BCS	402	Computability and Complexity	BCS 203, BCS 309	3
	BCS	417	Computer Science Graduation Project	Completed 90 Cr. Hrs.	6
	Total				**15**
8	BCS	417	Computer Science Graduation Project (Cont.)	Completed 90 Cr. Hrs.	--
	XXX	XXX	Humanities Elective (2)		3
	BCS	403	Advanced Database Systems	BCS 206, BCS 306	3
	BCS	407	Artificial Intelligence	SWS 111 or BCS 206, BCS 222	3
	XXX	XXX	Program Major Elective		3
	Total				**12**
Internship to be taken in summer after completion of 90 Cr. Hrs. and CGPA 2.0 or more.					3
Total Credit Hours					**127**