

COMPUTER ENGINEERING, BACHELOR OF SCIENCE

The aim of HBKU's Bachelor of Science in Computer Engineering program is to produce globally competitive computer engineering professionals for Qatar, the region, and the wider world.

The program is built on HBKU's unique model of developing interdisciplinary programs that draw on the expert knowledge of its partner institutions alongside its own faculty. This means that students are able to take courses provided by Texas A&M University at Qatar and Carnegie Mellon University in Qatar in addition to the comprehensive range of course offerings from HBKU.

For more information, click here (<https://www.hbku.edu.qa/en/cse/bs-computer-engineering/>).

Requirements

Minimum hours required to complete program 128 CH

Code	Title	Hours
Core Courses		
CPEN 111	Introduction to Computer Engineering	3
CPEN 127	Concepts of Mathematics	3
CPEN 151	Fundamentals of Programming and Computer Science	4
CPEN 152	Principles of Imperative Computing	3
CPEN 213	Introduction to Computer Systems	4
CPEN 217	Probability Theory and Random Processes	3
CPEN 300	Embedded System Design	3
CPEN 330	Data Structures	3
CPEN 344	Digital Signal Processing	4
CPEN 391	Internship	0
CPEN 410	Senior Design Project I	4
CPEN 411	Senior Design Project II	4
ENGR 110	Introduction to Programming	3
ENGR 210	Introduction to Innovations and Technology Entrepreneurship	1
ENGR 482	Engineering Ethics	3
ELEN 214	Electrical Circuit Theory	4
ELEN 248	Digital Systems Design	4
ELEN 314	Signals and Systems	3
ELEN 325	Electronics	4
ELEN 350	Computer Architecture and Design	4
ENGL 114	Composition and Rhetoric	3
ENGL 220	Technical Writing	3
MATH 161	Engineering Mathematics I	4
MATH 162	Engineering Mathematics II	4
MATH 261	Engineering Mathematics III	3
MATH 318	Differential Equations	3
MATH 321	Topics in Applied Mathematics	3
PHYS 216	Newtonian Mechanics for Engineering and Science	3
PHYS 217	Electricity and Magnetism for Engineering and Science	3
PHYS 226	Experimental Physics and Engineering Laboratory I: Mechanics	1

PHYS 227	Experimental Physics and Engineering Laboratory II: Electricity and Magnetism	1
Subtotal		95
University Core Curriculum Areas		18
Student must take required credits from each area		
<i>Area 1: Identity and Communication (6 credits)</i>		
ARAB 150	Arabic for Professional Communication	
ISLM 105	Scriptural Ethics	
COMM 110	Language, Identity, and Communication in Qatar	
COMM 115	Language and Islamic Identities	
<i>Area 4: Social and Behavioral Sciences (3 Credits)</i>		
PSYC 101	Introduction to Psychology	
HELT 115	Health and Wellness in Modern Society	
SOCI 101	Introduction to Sociology	
ECON 110	Economic Principles	
POLS 135	International Relations of the Gulf	
POLS 136	Perspectives in Gulf Studies	
POLS 137	Policy Analysis, Design and Implementation	
POLS 140	Global Grand Challenges	
SOCI 105	AI and Society	
SOCI 115	Comparative Theories and Methods	
LAW 103	Law and Technology	
<i>Area 5A: Humanities (3 Credits)</i>		
ARAB 152	Arabic Linguistics	
HIST 107	World History	
HUMN 111	Data Methods for Digital Humanities	
ISLM 106	Philosophy, Theology, and Ethics	
FIN 101	Ethical Finance	
HUMN 116	Beyond Oil, Gucci, and Karak	
<i>Area 5B: Creative Expression (3 credits)</i>		
ENGL 115	Creative and Digital Writing	
HUMN 105	Global Cinema	
HUMN 113	Art and Visual Culture	
HUMN 114	Cinema and Musical Culture in the Arab World	
ISLM 117	Islamic Art and Architecture	
LITR 110	World Literature and the Modern World	
<i>Area 6: Leadership and Civic Engagement (3 Credits)</i>		
HUMN 110	Moral Reasoning and Decision-Making	
SOCI 111	Community Service and Engagement	
SOCI 117	Technology, Innovation, and Society	
SOCI 137	Global Citizenship and Social Responsibility	
SOCI 140	Global Citizenship through Environmental Humanities	
SOCI 142	Impactful Leadership and Social Innovation for a Sustainable Future	
Engineering Electives		
Select five of the following:		15
CPEN 418	Introduction to Scientific Visualization	
CPEN 453	ICT Accessibility	
CPEN 460	Computer Networks	
CPEN 462	Cybersecurity Fundamentals	
CPEN 464	Introduction to Machine Learning	
ELEN 420	Linear Control Systems	
ELEN 429	Machine Learning for Signal Processing	
ELEN 438	Power Electronics	

ELEN 449	Microprocessor Systems Design	
ELEN 446	VLSI Design	
ELEN 455	Digital Communications	
ELEN 489	Selected Topics in Electrical Engineering	
Subtotal		33

Total Hours 128

Study Plan

Freshman

First Semester	Hours
ENGR 110 Introduction to Programming	3
MATH 161 Engineering Mathematics I	4
CPEN 111 Introduction to Computer Engineering	3
ENGL 114 Composition and Rhetoric	3
UCC : Univ. Core Elective	3
Semester Hours	16

Second Semester

CPEN 127 Concepts of Mathematics	3
MATH 162 Engineering Mathematics II	4
PHYS 216 Newtonian Mechanics for Engineering and Science	3
PHYS 226 Experimental Physics and Engineering Laboratory I: Mechanics	1
UCC: Univ. Core Elective	3
Semester Hours	14

Sophomore

First Semester	Hours
CPEN 151 Fundamentals of Programming and Computer Science	4
ENGR 210 Introduction to Innovations and Technology Entrepreneurship	1
MATH 261 Engineering Mathematics III	3
PHYS 217 Electricity and Magnetism for Engineering and Science	3
PHYS 227 Experimental Physics and Engineering Laboratory II: Electricity and Magnetism	1
ELEN 248 Digital Systems Design	4
Semester Hours	16

Second Semester

CPEN 152 Principles of Imperative Computing	3
MATH 321 Topics in Applied Mathematics	3
MATH 318 Differential Equations	3
ELEN 214 Electrical Circuit Theory	4
UCC: Univ. Core Elective	3
Semester Hours	16

Junior

First Semester	Hours
ELEN 314 Signals and Systems	3
ELEN 325 Electronics	4
ENGL 220 Technical Writing	3
CPEN 213 Introduction to Computer Systems	4
CPEN 217 Probability Theory and Random Processes	3
Semester Hours	17

Second Semester

CPEN 300 Embedded System Design	3
CPEN 330 Data Structures	3
CPEN 344 Digital Signal Processing	4
ELEN 350 Computer Architecture and Design	4
UCC: Univ. Core Elective	3
Semester Hours	17

Third Semester

CPEN 391 Internship	0
Semester Hours	0

Senior

First Semester

CPEN 410 Senior Design Project I	4
ENGR 482 Engineering Ethics	3
TA : Technical Area Elective	3
TA : Technical Area Elective	3
TA : Technical Area Elective	3
Semester Hours	16

Second Semester

CPEN 411 Senior Design Project II	4
TA : Technical Area Elective	3
TA : Technical Area Elective	3
UCC: Univ. Core Elective	3
UCC: Univ. Core Elective	3
Semester Hours	16
Total Hours	128