COMPUTER ENGINEERING (B.S.)

Objectives

The Computer Engineering curriculum deals with all aspects of designing, building, and programming of computer systems. The curriculum introduces students to both hardware (electronic circuits) and software (programming) of computer systems.

Graduates of the Computer Engineering program will be able to achieve the following three objectives within the first few years after graduation:

1. Employed in the computing profession or closely related field with potential for successful career advancement.
2. For those with an interest in earning advanced degrees, they will have completed or be pursuing advanced degrees.
3. Be informed and involved members of their communities as well as professional organizations and engaged in life-long learning.

Accreditation

The Undergraduate Program in Computer Engineering is accredited by Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), https://www.abet.org.

Notes:
Students are required to take the Mathematics Placement Test to determine if they need to take any math courses before taking MATH 241 CALCULUS I WITH LABORATORY.

Major Requirements

Code	Title	Hours
MATH 241	CALCULUS I WITH LABORATORY	3
MATH 242	CALCULUS II WITH LABORATORY	3
MATH 243	CALCULUS III WITH LABORATORY	3
MATH 244	CALCULUS IV WITH LABORATORY	3
MATH 307	PROBLTY & STATISTICS/ENGINEERG	3
MATH 368	DIFFERENTIAL EQUATIONS	3
CHEM 141 & CHML 141	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB	4
PHY 211 & PHYL 211	General Physics I and GENERAL PHYSICS LAB I	4
PHY 212 & PHYL 212	General Physics II and GENERAL PHYSICS LAB II	4
CSC 118	COMPUTER SCIENCE I	3
CSC 119	COMPUTER SCIENCE II	3
CSC 225	DISCRETE STRUCTURES	3
CSC 228	DATA STRUCTURES & ALGORITHMS	3
CSC 325	OPERATING SYSTEMS	3
ECE 101	Introduction to Electrical and Computer Engineering	2
ECE 212 & ECEL 212	DIGITAL LOGIC and DIGITAL LOGIC LABORATORY	4
ECE 220 & ECEL 220	CIRCUIT THEORY and CIRCUITS LABORATORY	4
CIV 222	ENGINEERING MECHANICS I	3
ECE 252	ENGINEERING ANALYSIS	3
CIV 355	ENGINEERING ECONOMY	3
ECE 312	COMPUTER ORGANIZATION & DESIGN	3
ECE 315	SYNTHESIS WITH HARDWARE DL	3
ECE 330 & ECEL 330	ELECTRONICS and ELECTRONICS LABORATORY	4
ECE 351	SIGNALS AND SYSTEMS	3
ECE 360 & ECEL 360	EMBEDDED MICROPROCESSOR SYSTEM and MICROPROCESSOR LABORATORY	4
ECE 412	COMPUTER ARCHITECTURE	3
ECE 490	SENIOR DESIGN PROJECTS I	3
ECE 491	SENIOR DESIGN PROJECTS II	3
Total Hours		**90**

Elective Courses

Code	Title	Hours
Free Elective		1
ECE 430	DIGITAL VLSI DESIGN	3
ECE 431	Digital System Testing and Design for Testability	3
ECE 345	ELECTROMAGNETIC FIELDS	3
ECE 440	COMMUNICATION SYSTEMS	3
ECE 441	COMPUTER NETWORKS	3
ECE 451	DIGITAL SIGNAL PROCESSING	3
ECE 492	SPCL STDS N ELEC & COMPU ENGIN	1-4
ECE 493	SPCL TPCS N ELECTRL & COMPU EN	1-4
Other courses require Chair's approval		3

Technical Electives for Computer Engineering Majors

Code	Title	Hours
ECE 430	DIGITAL VLSI DESIGN	3
ECE 431	Digital System Testing and Design for Testability	3
ECE 345	ELECTROMAGNETIC FIELDS	3
ECE 440	COMMUNICATION SYSTEMS	3
ECE 441	COMPUTER NETWORKS	3
ECE 451	DIGITAL SIGNAL PROCESSING	3
ECE 492	SPCL STDS N ELEC & COMPU ENGIN	1-4
ECE 493	SPCL TPCS N ELECTRL & COMPU EN	1-4
Other Courses require Chair's approval		

Curriculum Map

Course	Title	Hours
Freshman		
Fall		
CSC 118	COMPUTER SCIENCE I	3
ECE 101	Introduction to Electrical and Computer Engineering	2
ENG 104 or ENG 103 or ENG 111	COMPOSITION I or English Composition I with Co-requisite Support or COMPOSITION & LITERATURE FOR L	3
MATH 241	CALCULUS I WITH LABORATORY	3
UNIV 100	UNIVERSITY SUCCESS	2
Humanities & Fine Arts Option		3
	Hours	**16**

Spring

ECE 212 & ECEL 212	DIGITAL LOGIC and DIGITAL LOGIC LABORATORY	4
ENG 105 or ENG 112	COMPOSITION II or COMPOSITION	3
MATH 242	CALCULUS II WITH LABORATORY	3
PHY 211 & PHYL 211	General Physics I and GENERAL PHYSICS LAB I	4
Pathway Option		3
	Hours	**17**

Sophomore

Fall

CSC 119	COMPUTER SCIENCE II	3
ECE 220 & ECEL 220	CIRCUIT THEORY and CIRCUITS LABORATORY	4
MATH 243	CALCULUS III WITH LABORATORY	3
PHY 212 & PHYL 212	General Physics II and GENERAL PHYSICS LAB II	4
Pathway Option		3
	Hours	**17**

Spring

ECE 312	COMPUTER ORGANIZATION & DESIGN	3
ECE 330 & ECEL 330	ELECTRONICS and ELECTRONICS LABORATORY	4
ECE 252	ENGINEERING ANALYSIS	3
MATH 244	CALCULUS IV WITH LABORATORY	3
UNIV 200	CIVIC ENGAGEMENT	1
Pathway Option		3
	Hours	**17**

Junior

Fall

CIV 222	ENGINEERING MECHANICS I	3
CSC 225	DISCRETE STRUCTURES	3
ECE 315	SYNTHESIS WITH HARDWARE DL	3
ECE 360 & ECEL 360	EMBEDDED MICROPROCESSOR SYSTEM and MICROPROCESSOR LABORATORY	4
MATH 368	DIFFERENTIAL EQUATIONS	3
	Hours	**16**

Spring

CIV 355	ENGINEERING ECONOMY	3
CSC 228	DATA STRUCTURES & ALGORITHMS	3
ECE 351	SIGNALS AND SYSTEMS	3
ECE 412	COMPUTER ARCHITECTURE	3
MATH 307	PROBLTY & STATISTICS/ENGINEERG	3
	Hours	**15**

Senior

Fall

CHEM 141 & CHML 141	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB	4
CSC 325	OPERATING SYSTEMS	3
ECE 490	SENIOR DESIGN PROJECTS I	3
Technical Elective I		3
Humanities & Fine Arts Option		3
	Hours	**16**

Spring

ECE 491	SENIOR DESIGN PROJECTS II	3
Technical Elective II		3
Technical Elective III		3
Social & Behavioral Science Option		3
	Hours	**12**
	Total Hours	**126**

Notes:

- Candidates that transfer 12 or more hours of college credit are exempt from UNIV 100 UNIVERSITY SUCCESS; however, the student must take 2 hours of general electives to replace the UNIV course.
- Students are required to take the Mathematics Placement Test to determine if they need to take any math courses before taking MATH 241 CALCULUS I WITH LABORATORY (C).
- Online Graduation Clearance (**to be completed during the graduating semester only**).

Code	Title	Hours
Technical Electives		
Students must choose nine (9) hours of technical electives from the following list of courses:		
ECE 345	ELECTROMAGNETIC FIELDS	3
ECE 430	DIGITAL VLSI DESIGN	3
ECE 431	Digital System Testing and Design for Testability	3
ECE 440	COMMUNICATION SYSTEMS	3
ECE 451	DIGITAL SIGNAL PROCESSING	3
ECE 492	SPCL STDS N ELEC & COMPU ENGIN	3
ECE 493	SPCL TPCS N ELECTRL & COMPU EN	3
Other courses require Chair's approval		
Total Hours		**21**

Student Learning Outcomes

Each student who graduates from the Undergraduate Program in Computer Engineering will have:

1. An ability to identify, formulate, and solve complex computer engineering problems by applying principles of computer engineering, science, and mathematics.

2. An ability to apply Computer 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. An ability to communicate effectively with a range of audiences.

4. An ability to recognize ethical and professional responsibilities in computer engineering situations and make informed judgments, which must consider the impact of Computer engineering solutions in global, economic, environmental, and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use Computer engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.