COMPUTER ENGINEERING

Computer Engineering (CpE) is a discipline that embodies the science and technology of design, construction, implementation, and maintenance of software and hardware components of computing systems and computer-controlled equipment. Studies in computer engineering integrate fields from both computer science (CS) and electrical engineering (EE).

About this Program

- **College:** Herbert Wertheim College of Engineering (http://catalog.ufl.edu/UGRD/colleges-schools/UGENG/)
- **Degree:** Bachelor of Science in Computer Engineering
- **Credits for Degree:** 126
- **More Info**

To graduate with this major, students must complete all university, college, and major requirements.

Department Information

Electrical engineers study electricity and design electrical systems that solve problems—how to make your smartphones smarter; how to make your refrigerator run more efficiently; coming up with the optimal temperature to heat pizza in your microwave; designing the audio and visual technology that brings movies to life.
Website (https://www.ece.ufl.edu/)

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Map (http://campusmap.ufl.edu/#/index/0722)

Curriculum

- Combination Degrees
- Computer Engineering
- Electrical Engineering
- Electrical Engineering Minor

Computer Engineering (CpE) brings a core competency and unique value of integrated knowledge in both computer software and hardware, providing a balance among computer systems, hardware, and software as well as theory and applications. Specialization in computer engineering is provided via technical electives from the Department of Computer and Information Science and Engineering (www.cise.ufl.edu (http://www.cise.ufl.edu)) and the Department of Electrical and Computer Engineering (www.ece.ufl.edu (http://www.ece.ufl.edu)).

Via elected coursework, students specialize in knowledge areas such as computer architecture, computer system engineering, digital signal processing, embedded systems, intelligent systems, networking and communication, and security. Additionally, cooperative education opportunities help students develop a broader understanding of the industrial applications of computer engineering technologies. Graduates will be prepared to engage in graduate studies in computer engineering or to pursue career paths in many different areas of computing and its applications in high technology environments.

Program Education Objectives

Graduates from the Bachelor of Science in Computer Engineering will:

1. Advance in careers utilizing their education in computer engineering;
2. Continue to enhance their knowledge through graduate or professional studies, self-learning, and on-job training;
3. Become leaders in multidisciplinary and diverse professional environments.

Mission

- To educate undergraduate majors as well as the broader campus community in the fundamental concepts of the computing discipline
- To create and disseminate computing knowledge and technology
- To use expertise in computing to help society solve problems.

Transfer Admission Requirements

Successful transfer applicants must have earned a 2.5 grade point average, based on the first two attempts, in the seven preprofessional courses and have earned a minimum grade of C in each course of Calculus 1, Calculus 2, Calculus 3, Physics with Calculus 1, Physics with Calculus 2, General Chemistry 1, and Differential Equations. Only the first two attempts (including withdrawals) in each course will be considered for admission to or retention in the department.

Transfer students must attend Transfer Preview as part of admissions. Course equivalency appeals must be submitted to earn credit for coursework completed outside of Common Course Numbering for Core CpE coursework and will be reviewed on a case by case basis.

Computer Engineering Requirements

A minimum grade of C is required for each critical-tracking course and the critical-tracking GPA must be a minimum of 2.5.

A minimum grade of C is required in any computer engineering course that is a prerequisite for another computer engineering course and CpE Design 2 CEN 3908C. The prerequisite course and its subsequent course cannot be taken the same term, even if the prerequisite course is being repeated.

Minimum grades of C are required in:

Code	Title	Credits
CDA 3101	Introduction to Computer Organization	3
CEN 3031	Introduction to Software Engineering	3
COP 3502C	Programming Fundamentals 1	4
COP 3503C	Programming Fundamentals 2	4
COP 3504C	Advanced Programming Fundamentals for CIS Majors	4
COP 3530	Data Structures and Algorithm	3
COT 3100	Applications of Discrete Structures	3
EEL 3701C	Digital Logic and Computer Systems	4
EEL 4744C	Microprocessor Applications	4
ENC 3246	Professional Communication for Engineers	3
CpE Design 1		
Select one:		3
CEN 3907C	Computer Engineering Design 1	
EGN 4951	Integrated Product and Process Design 1	
CpE Design 2		
Select one:		3
CEN 3908C	Computer Engineering Design 2	
EGN 4952	Integrated Product and Process Design 2	

Students may opt to take COP 3504C in lieu of COP 3502C and COP 3503C. If elected, students will need to complete an additional 4 credits to complete the degree program.

A CpE major grade point average (GPA) is calculated as the average of the grades of all CpE program courses and the CISE and ECE department courses taken by the student. CpE students must maintain a cumulative, college, upper-division and CpE major GPA minimum of 2.0.

All graduating seniors must complete an exit survey with their advisor before graduating.

Critical Tracking

Critical Tracking records each student's progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites (https://cpm.flvc.org/advance-search/) may be used for transfer students.

Semester 1

- Complete 1 of 6 critical-tracking courses with a minimum grade of C within two attempts: MAC 2311, MAC 2312, MAC 2313, MAP 2302, PHY 2048, PHY 2049
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 2

- Complete 2 additional critical-tracking courses with a minimum grade of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 3

- Complete 1 additional critical-tracking course with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 4

- Complete 1 additional critical-tracking course with minimum grades of C within two attempts
- 2.5 GPA required for all 7 critical-tracking courses
- 2.0 UF GPA required

Semester 5

- Complete EEL 4744C with a minimum grade of C
- Complete all critical-tracking course with minimum grades of C within two attempts
- 2.5 GPA required for all 7 critical-tracking courses
- 2.0 UF GPA required

Semester 6

- 2.0 departmental GPA required
- 2.0 UF GPA required

Semester 7

- 2.0 departmental GPA required
- 2.0 UF GPA required

Semester 8

- 2.0 departmental GPA required
- 2.0 UF GPA required

Model Semester Plan

Students are expected to complete the General Education International (GE-N) and Diversity (GE-D) requirements. This is often done concurrently with another general education requirement, typically GE-C, H, or S.

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student's academic record and scheduling availability of courses. Prerequisites still apply.

Course	Title	Credits
Semester One		
Quest 1 (Gen Ed Humanities)		3
COP 3502C	Programming Fundamentals 1	4
EGN 2020C	Engineering Design & Society	2
MAC 2311	Analytic Geometry and Calculus 1 (**Critical Tracking**; State Core Gen Ed Mathematics)	4
	Credits	**13**
Semester Two		
COP 3503C	Programming Fundamentals 2	4
COT 3100	Applications of Discrete Structures	3
MAC 2312	Analytic Geometry and Calculus 2 (**Critical Tracking**; State Core Gen Ed Mathematics)	4
PHY 2048	Physics with Calculus 1 (**Critical Tracking**; Gen Ed Physical Sciences)	3
	Credits	**14**

Summer After Semester Two

EEL 3701C	Digital Logic and Computer Systems	4
State Core Gen Ed Composition (Writing requirement, 6,000 words)		3
State Core Social and Behavioral Sciences (Writing requirement)		3
	Credits	**10**

Semester Three

Quest 2 (Gen Ed Social and Behavioral Sciences with Diversity; Writing Requirement)		3
CDA 3101	Introduction to Computer Organization	3
COP 3530	Data Structures and Algorithm	3
MAC 2313	Analytic Geometry and Calculus 3 (**Critical Tracking**; Gen Ed Mathematics)	4
PHY 2049	Physics with Calculus 2 (**Critical Tracking**; Gen Ed Physical Sciences)	3
	Credits	**16**

Semester Four

CEN 3031	Introduction to Software Engineering (**Critical Tracking**)	3
EEL 4744C	Microprocessor Applications (**Critical Tracking**)	4
MAP 2302	Elementary Differential Equations (**Critical Tracking**)	3
MAS 3114	Computational Linear Algebra	3
	Credits	**13**

Semester Five

COP 4600	Operating Systems	3
EEL 3111C	Circuits 1	4
EEL 4712C	Digital Design (**Critical Tracking**)	4
STA 3032	Engineering Statistics	3
Enrichment elective; Writing Requirement		1
	Credits	**15**

Semester Six

ENC 3246	Professional Communication for Engineers (State Core Gen Ed Composition (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext); Writing Requirement: 6,000 words)	3
State Core Humanities with International or Writing Requirement		3
Enrichment elective		3
Technical electives		6
	Credits	**15**

Semester Seven

Select one CpE Design 1 course:		3
CEN 3907C	Computer Engineering Design 1	
EGN 4951	Integrated Product and Process Design 1	
Select one Gen Ed Physical and Biological Sciences course:		4
AST 3018	Astronomy and Astrophysics 1	
& AST 1022L	and Astronomy Laboratory	
BSC 2005	Biological Sciences	
& 2005L	and Laboratory in Biological Sciences	
BSC 2010	Integrated Principles of Biology 1	
& 2010L	and Integrated Principles of Biology Laboratory 1	
CHM 2045	General Chemistry 1	
& 2045L	and General Chemistry 1 Laboratory	
CHM 2095	Chemistry for Engineers 1	
& CHM 2045L	and General Chemistry 1 Laboratory	
GLY 2010C	Physical Geology	
Enrichment elective		3
Technical electives		6
	Credits	**16**

Semester Eight

Select one CpE Design 2 course:		3
CEN 3908C	Computer Engineering Design 2 (**Critical Tracking**)	
EGN 4952	Integrated Product and Process Design 2 (**Critical Tracking**)	
EEL 3135	Introduction to Signals and Systems	4
EGS 4034	Engineering Ethics and Professionalism	1
Technical electives		6
	Credits	**14**
	Total Credits	**126**

Technical Electives

At least 12 technical elective credits must be from the CISE and/or ECE department(s).

Qualifying technical electives include, unless otherwise excluded:

- 4000-level or higher CpE program courses
- 4000-level or higher CISE courses
- 3000-level CAP prefix CISE courses
- 3000-level or higher ECE courses
- 4000-level or higher Mathematics Dept. courses
- 3000-level or higher Physics Dept. courses
- 4000-level or higher Statistics Dept. courses
- Other courses approved by program coordinator

The following courses do not qualify as technical electives (i.e., are excluded):

- Required courses
- EEL 3000, EEL 3003, EEL 3834, EEL 3872

Students should check prerequisites when planning their major electives. Students should discuss electives with an advisor in the department. Individual study, co-op, internship, research, and special topics credits must be approved.

Academic Learning Compact

The Bachelor of Science in Computer Engineering is concerned with the theory, design, development and application of computer systems and information processing techniques. Students will be equally proficient working with computer systems, hardware and software, as with computer theory and applications.

The Computer Engineering BS Program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org (https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.abet.org%2F&data=05%7C01%7CDMAYH%40eng.ufl.edu%7C71f1da0d2bb2405acf0908db1519ea82%7C0d4da0f84a314d76ace60a62331e1b84%7C0%7C0%7C638126973271573797%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=Dc6bpEcUU8fM3vMsOTj6pGPQgyLzoSeoS8v2s%2BFVnBE%3D&reserved=0), under the General Criteria and the Program Criteria for Electrical, Computer, Communications, Telecommunication(s) and Similarly Named Engineering Programs.

Before Graduating Students Must

- Pass assessment according to department rubric of student performance on a major design experience.
- Pass assessment in one or more core courses of individual assignments targeted to each SLO.
- Complete requirements for the baccalaureate degree, as determined by faculty.

Students in the Major Will Learn to

Student Learning Outcomes | SLOs

Content
1. Apply knowledge of mathematics and science to computer engineering problems.
2. Design and conduct computer-engineering experiments, analyzing and interpreting the data.

Critical Thinking
3. Design a computer engineering system, component or process to meet desired needs within realistic economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability constraints.

Communication
4. Communicate technical data and design information effectively in writing and in speech to other computer scientists and engineers.

Curriculum Map

I = Introduced; R = Reinforced; A = Assessed

Courses	SLO 1	SLO 2	SLO 3	SLO 4
CEN 3031				I, A
CEN 3908C	A	A	A	A
EEL 3135	I, A	I, A		
EEL 3701C			I	

Assessment Types

- Assignments
- Exams
- Reports
- Exit survey