

Computer Engineering

The Computer Engineering program at UWF is accredited by the Engineering Accreditation Commission of ABET, Inc. The BSCE prepares students to embark upon a professional career in computer engineering or to begin a graduate program.

Graduates will be known for their accomplishments in the early stage of their careers, and they should be able to do the following:

- Develop computer engineering solutions individually and through interdisciplinary teams within a global and societal context
- Professionally and ethically engage in technical or business activity through engineering ability, communication skills, and knowledge
- Continue professional growth through post-graduate education, continuing education, or professional activity
- Contribute to the Northwest Florida regional economic development

The objective of the program is to provide students with a strong theoretical and practical background in computer hardware and software, along with the engineering analysis, design, and implementation skills necessary to work between the two. A computer engineer is someone with the ability to design a complete computer system—from its circuits to its operating system to the algorithms that run on it. Although it is valid to look at software and hardware separately, a computer engineer must take a more holistic approach. If an electronic device can be called a computer, it must produce mathematically meaningful results. Similarly, any useful theory of computing must be physically realizable. The synthesis of theory and algorithms, which must take place before any useful computing can be achieved, is the job of the computer engineer. To produce such engineers is the mission of this program.

Computer engineering deals with the body of knowledge that forms the theoretical and practical basis for the storage, retrieval, processing, analysis, recognition, and display of information. This area also includes the design and implementation of computer systems and peripheral devices for information handling and engineering applications. The computer engineering curriculum provides a balance of hardware, software, and computer theory and applications with a basic background in electrical engineering. Nine credits of electives are included to permit a student to delve deeply into selected subject matter. Computer engineers find career opportunities in a wide variety of companies or organizations involving the design, development, building, testing, and operation of computer systems. Computer engineers deal with both hardware and software (programming) problems. In designing a computer system, computer engineers must decide how much of the computer logic to put into hardware and how much to put into software. The work of computer engineers and computer scientists overlap and the two are often confused. Computer engineers tend to be more involved with the computer hardware, whereas computer scientists tend to be more involved with the computer software, with less emphasis on hardware.

Program Requirements

Students are required to have a laptop or tablet PC. Please visit department website (<http://uwf.edu/cse/departments/engineering>) for information about minimum hardware configuration, department (<http://uwf.edu/cse/departments/engineering/student-resources/scholarship-information>) scholarships ([http://uwf.edu/cse/](http://uwf.edu/cse/departments/engineering/student-resources/scholarship-information))

departments/engineering/student-resources/scholarship-information/%E2%80%8B)and other useful information.

In addition to the University's general requirements, students seeking the B.S. in Computer Engineering must meet the requirements listed below:

A minimum course grade of "C" or better is required in the Computer Engineering core courses, all computer science courses (COT, CNT, COP prefix), and all courses that serves as prerequisites to other engineering courses. Please see required courses section below for a list of courses that require a minimum grade of a C.

The Computer Engineering curriculum is designed to yield a set of outcomes. Each upper division course within the curriculum contributes to at least one of these outcomes. A list of our current outcomes and how they map to our program can be found here (http://uwf.edu/cutla/curriculum_maps--undergraduates/Computer_Engineering_UG.pdf).

All seniors must complete an exit interview and submit a copy of their senior design report before graduating.

General Education

In addition to the General Education requirements listed on this page, students must satisfy all additional University requirements, including the Gordon Rule, multicultural, and foreign language requirements. With appropriate planning and coordination with an academic advisor, students may satisfy some of the general University requirements through the General Education curriculum. For a complete listing of general degree requirements, refer to the "Graduation and General Degree Requirements (<http://catalog.uwf.edu/undergraduate/universityrequirements>)" section of this catalog.

General Education Curriculum:

Communication

ENC 1101	English Composition I	3
ENC 1102	English Composition II	3

Mathematics

Choose one course from Group A and one Additional course from either Group A or Group B 6

Group A

MAC 1105	College Algebra
MAC 2311	Analytic Geometry and Calculus I
MGF 1106	Mathematics for Liberal Arts I
MGF 1107	Mathematics for Liberal Arts II
STA 2023	Elements of Statistics

Group B

MAC 1105C	College Algebra with Lab
MAC 1114	Trigonometry
MAC 1140	Precalculus Algebra
MAC 2233	Calculus with Business Applications
MAC 2312	Analytic Geometry and Calculus II

Social Sciences

Choose one course from Group A and one additional course from either Group A or Group B 6

Group A

AMH 2020	United States since 1877
ANT 2000	Introduction to Anthropology

ECO 2013	Principles of Economics Macro
POS 2041	American Politics
PSY 2012	General Psychology
SPM 2010	Sport in Global Society
SYG 2000	Introduction to Sociology
Group B	
AMH 2010	United States to 1877
ANT 2400	Current Cultural Issues
ANT 2100	Introduction to Archaeology
CCJ 2002	Survey of Crime and Justice
CPO 2002	Comparative Politics
DEP 2004	Human Development Across the Lifespan
EUH 1000	Western Perspectives I
EUH 1001	Western Perspectives II
FIN 2104	Personal Financial Planning
GEA 2000	Nations and Regions of the World
GEB 1011	Introduction to Business
IDH 1041	Honors Core 2
INR 2002	International Politics
MMC 2000	Principles of Mass Communication
PLA 2013	Survey of American Law
SOW 2192	Understanding Relationships in the 21st Century
SYG 2010	Current Social Problems

Humanities

Choose one course from Group A and one additional course from either Group A or Group B 6

Group A	
ARH 1000	Art Appreciation
LIT 2000	Introduction to Literature
MUL 2010	Music Appreciation
PHI 2010	Introduction to Philosophy
THE 2000	Theatre Appreciation
Group B	
AML 2010	American Literature I
AML 2020	American Literature II
AML 2072	Sex, Money, and Power in American Literature
ARH 2050	Western Survey I: Prehistory to the Medieval Period
ARH 2051	Western Survey II: Renaissance to Contemporary
ART 1015C	Exploring Artistic Vision
ART 2821	Art and Visual Culture Today
CRW 2001	Introduction to Creative Writing
ENL 2010	History of English Literature I
ENL 2020	History of English Literature II
IDH 1040	Honors Core 1
MUH 2930	The Music Experience: Special Topics
PHI 2103	Critical Thinking
PHI 2603	Ethics in Contemporary Society
REL 1300	World Religions

THE 2300	Survey of Dramatic Literature
SPC 2608	Basic Communication Skills

Natural Sciences

Choose one course from Group A and one additional course from either Group A or Group B 6

Group A	
AST 1002	Descriptive Astronomy
BSC 1005	General Biology for Non-Majors
BSC 1085	Anatomy and Physiology I
BSC 2010	Biology I
CHM 1020	Concepts in Chemistry *
CHM 2045	General Chemistry I *
ESC 2000	Introduction to Earth Science
EVR 2001	Introduction to Environmental Science
PHY 1020	Introduction to Concepts in Physics *
PHY 2048	University Physics I **
PHY 2048C	University Physics I - Studio
PHY 2053	General Physics I **
Group B	
ANT 2511	Biological Anthropology
BOT 2010	General Botany
BSC 1050	Fundamentals of Ecology
BSC 1086	Anatomy and Physiology II *
BSC 2011	Biology II
BSC 2311	Introduction to Oceanography and Marine Biology
CGS 2060	Excursions in Computing
CHM 1032	Fundamentals of General Chemistry *
CHM 2046	General Chemistry II *
CIS 2530	Introduction to Cyber Security
GEO 1200	Physical Geography
GLY 2010	Physical Geology *
MCB 1000	Fundamentals of Microbiology *
PHY 2049	University Physics II **
PHY 2054	General Physics II *

* May be taken with or without lab.

** General Physics is non-calculus based and is usually recommended for non-science majors. University Physics is calculus based and is usually recommended for science majors.

*** Although students receive 5 semester hours credit for PHY 2048C, an additional 3 semester science course will be needed to meet General Education requirements.

General Education Electives

Choose an additional course from two of the three areas of Humanities, Social Sciences and Natural Sciences

In order to minimize the number of courses required, students should consult with their academic advisor for courses which will satisfy both the General Education requirements and common prerequisites.

For example, students can take MAC 2311 Analytic Geometry and Calculus I or MAC 2312 Analytic Geometry and Calculus II to complete the Mathematics requirement. The sciences listed in the Common Prerequisites section will also fulfill the General Education Natural Science requirement. To maximize the overlap, one of the two

General Education Electives should be taken in the Natural Sciences, specifically CHM 2045 General Chemistry I, PHY 2048 University Physics I, or PHY 2049 University Physics II.

Common Prerequisites

State mandated common prerequisites must be completed prior to graduation, but are not required for admission to the program. See the Common Prerequisite Manual (<https://dlss.flvc.org/admin-tools/common-prerequisites-manuals>) for course substitutions from Florida colleges and universities.

The following courses require a minimum grade of a "C". Note that the labs are required for Physics and Chemistry, but a "C" is not required (although a passing grade is required).

CHM 2045+L	General Chemistry I (+Lab) *	4
MAC 2311	Analytic Geometry and Calculus I *	4
MAC 2312	Analytic Geometry and Calculus II *	4
MAC 2313	Analytic Geometry and Calculus III	4
MAP 2302	Differential Equations	3
PHY 2048+L	University Physics I (+Lab) *	4
PHY 2049+L	University Physics II (+Lab)	4
Total Hours		27

* Indicates common prerequisites which can be used to satisfy General Education requirements.

Note that students may begin taking engineering courses prior to completing all of these math and science prerequisites, but they must complete those math and science courses (with a minimum of a "C" grade) listed as prerequisites to any engineering classes they wish to take.

Major

COP 3014	Algorithm and Program Design ^{+, c}	3
COP 3530	Data Structures and Algorithms I ^{+, c}	3
COP 4534	Data Structures and Algorithms II ^{+, c}	3
COP 4634	Systems & Networks I ^{+, c}	3
COP 4635	Systems & Networks II ^{+, c}	3
COT 3100	Discrete Structures ^{+, c}	3
EEE 3308+L	Electronic Circuits I (+Lab) ^{+, c}	4
EEL 3111+L	Circuits I (+Lab) ^{+, c}	4
EEL 3112	Circuits II ^{+, c}	3
EEL 3135	Discrete-Time Signals and Systems ^{+, c}	3
EEL 3701+L	Digital Logic and Computer Systems (+Lab) ^{+, c}	4
EEL 4712+L	Digital Design (+Lab) ^{+, c}	4
EEL 4713	Digital Computer Architecture ⁺	3
EEL 4744+L	Microprocessor Applications (+Lab) ^{+, c}	4
EGM 4313	Intermediate Engineering Analysis ^{+, c}	3
EGN 3204	Engineering Software Tools ^{+, c}	1
EGS 4032	Professional Ethics ⁺	3
EGN 4950	Capstone Design I ^{2, +, c}	1
EGN 4952L	Capstone Design II ^{2, +, c}	2
Advisor approved EEL/EEE electives ^{1, +}		12
Choose one of the following		3
EEE 3396	Solid-State Electronic Devices ⁺	

or EEE 431(VLSI Circuit Design

Total Hours 72

¹EEL/EEE Elective restrictions: These electives must begin with the EEL or EEE

prefix and cannot be otherwise required for the program. Please see your

department advisor about current limits for the number of credits of certain

repeatable, variable credit courses that will apply to these electives (eg, EEL

4905, EEL 4949, and EEL 4940). Certain pre-approved Mechanical Engineering courses may also apply. See your adviser for details.

²Note that EGN 4950 Capstone Design I and EGN 4952L Capstone Design II is the senior design project. This final project is the culmination of the engineering education. As such, this sequence of courses must be taken in the last 2 semesters of a student's program. Seniors must see the academic advisor in order to register for them. Note that even though they aren't prerequisites, we highly recommend that our students complete both EEL 4744 (<http://catalog.uwf.edu/undergraduate/electricalengineering>) Microprocessor Applications and EEE 3308 (<http://catalog.uwf.edu/undergraduate/electricalengineering>) Electronic Circuits I prior to taking EGN 4950 Capstone Design I.

Major-Related

EGS 3441	Engineering Statistics	3
Advisor-approved Engineering or Computer Science Elective ^{3, +}		3
EGS 1006	Introduction to Engineering ⁴	1
Total Hours		7

³ It is recommended that students who have no programming experience take EEL

4834 or a lower division programming course prior to taking COP 3014 to fulfill this requirement

⁴ Students may take an advisor approved elective in place of introduction to engineering.

^c Minimum grade of "C" is required in these courses. Note: C- is not acceptable. Other courses may also require a C if they are prerequisites to electives that you choose.

+ Courses included in the major GPA

Computer Engineering

A computer engineering minor provides an opportunity for students majoring in other areas to take a limited number of computer engineering courses to complement their majors. The minor in computer engineering is open to all UWF students with the exception of computer and electrical engineering majors. Students applying for the minor must have a declared major.

Students may not take a course and its prerequisite during the same semester.

Students must complete the common prerequisite courses with a grade of "C" or better in each.

Students seeking the Minor in computer engineering must have a minimum course grade of "C" or better in the required engineering courses and their prerequisites.

Prerequisites

MAC 2311 Analytic Geometry and Calculus I 4

Choose one of the following:

COP 3014 Algorithm and Program Design 3

or EEL 4834 Programming for Engineers

Requirements

EEL 3701+L Digital Logic and Computer Systems (+Lab) 4

EEL 4744+L Microprocessor Applications (+Lab) 4

EEL 4712+L Digital Design (+Lab) 4

EEL 4713 Digital Computer Architecture 3

Total Hours 15