

COMPUTER ENGINEERING

Degree: Bachelor of Science in Computer Engineering
 Department: Electrical and Computer Engineering
 Building 70, Room 116
 (850) 474-2963
 ece@uwf.edu
 College: Arts and Sciences
 Semester Hours Required for Degree: 126

Faculty: M. Law (UF Chairperson), M. Rashid (Director), M. Bataineh, T. Gilbar, S. Gorman, D. Harrell, M. Khabou, R. Manseur, C. Mathews, X. Millard, W. Weber

The mission of the Department of Electrical and Computer Engineering (ECE) is to offer baccalaureate degree programs in electrical and computer engineering which serve the needs of the West Florida region, the State, and the nation.

The goal of the baccalaureate degree program is to prepare students to embark upon a professional career in computer engineering or to begin graduate study.

The UWF/UF Joint Program in Electrical and Computer Engineering is a cooperative arrangement between the University of West Florida (UWF) and the University of Florida (UF). Courses are taught on the UWF Pensacola and Ft. Walton Beach campuses. The degree is awarded by UF and is identical to the one offered students on the Gainesville campus and is accredited by ABET (Accreditation Board for Engineering and Technology).

The transfer of the electrical and computer engineering programs from UF to UWF will be completed by December 31, 2008. Students graduating from this program after December 2008 will be awarded a UWF degree. All students graduating prior to December 31, 2008 will receive a degree from UF. Students who were admitted to UWF before August 8, 2004, and are not able to complete the degree requirements by December 31, 2008, will have the option of transferring to Gainesville for the completion of the degree from UF.

The objective of the program leading to the degree of Bachelor of Science in Computer Engineering 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 is to 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. Seventeen hours 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 the computer engineers and computer scientists is closely related. Computer engineers tend to be more involved with the computer hardware, whereas computer scientists tend to be more involved with the computer software and less emphasis on hardware.

PROGRAM REQUIREMENTS

The number of applicants who can be accepted is limited by the available classroom and laboratory space, laboratory facilities, and faculty. It is the department's policy to admit the best qualified applicants as demonstrated by high academic achievement within the enrollment limitations discussed above. Admission is directly tied to student's performance in physics and calculus courses, because subsequent work is intimately related to these disciplines. The currently accepted minimum requirements for admission to the program include completion of all eight common prerequisite courses with a grade of "C" or better in each, with an overall GPA of 2.5 (4.0 scale) in Physics courses, an overall GPA of 2.5 (4.0 scale) in Math courses, and an overall GPA of 2.5 (4.0 scale) in Chemistry I and either Chemistry II or Biology. Only the first two attempts (including withdrawals, drops, audits, etc.) will be considered in determining whether the minimum grade of "C" has been achieved and in calculating the overall GPA in common prerequisite areas. During the semester prior to the graduation term, the student's record is officially transferred to Gainesville where it is reviewed to certify that the particular course selections satisfy all graduation requirements.

It is recommended that students have a PC compatible laptop. Students should check with the department for minimum hardware configurations.

The Electrical and Computer Engineering Department publishes a counseling guide which provides detailed information beyond that stated in this *Catalog*.

In addition to general University 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 all electrical engineering courses and labs (EEL prefix), and in all computer science courses and labs (COT, CEN, CIS, CDA or COP prefix) which serve as prerequisites to other EEL and CS courses and labs. A "C" or better is required in EEL 4914C, ENC 3240, and all Computer Science courses.

Students should consult with their academic advisor for courses which may satisfy both the General Studies requirements and common prerequisites.

The computer engineering curriculum is designed to yield fifteen outcomes. Each upper division course within the curriculum contributes to at least one of these outcomes. A student must demonstrate each outcome achievement in at least two courses to satisfy the graduation requirements.

Program Outcomes

1. Knowledge of mathematics through differential and integral calculus, and advanced topics in differential equations, linear algebra, and complex variables.
2. Knowledge of core computer engineering topics.
3. An ability to use modern engineering techniques, skills, and tools, including computer-based tools for analysis.
4. An ability to apply knowledge of mathematics, science, and engineering to the analysis of computer engineering problems.
5. An ability to design and conduct scientific and engineering experiments, as well as to analyze and interpret data.
6. Knowledge of probability and statistics, including computer engineering applications.
7. An ability to identify, formulate, and solve novel computer engineering problems, including the planning, specification, design, implementation, and operation of systems, components, and/or processes that meet performance, cost, time, safety, and quality requirements.
8. An ability to function on multi-disciplinary teams, where possible.
9. An understanding of professional and ethical responsibility
10. An ability to communicate effectively in writing and to convey technical material through oral presentation and interaction with an audience.
11. The broad education and knowledge of contemporary issues necessary to understand the impact of computer engineering solutions in a global and societal context.
12. A recognition of the need for, and an ability to engage in life-long learning.
13. Knowledge of discrete mathematics
14. Knowledge of the fundamental theory and practice of computer science and electrical engineering, as it applies to computer hardware and software, and the understanding of the interaction between hardware and software.
15. Understanding of all the elements required to design a complete computer system (hardware and software).

Course descriptions are listed alphabetically by prefix in the back of this *Catalog*.

General Studies (30 sh)

Assumes Advanced Placement Credits in ENC 1101 and ENC 1102 by UF. Must include a course in literature, ECO 2013, EUH 1001, PHI 2603, and either a Fine Arts or Behavioral Science.

Common Prerequisites (30 sh)

State mandated common prerequisites must be completed prior to admission to the program. Courses in brackets indicate substitutes from Florida public community/junior colleges and universities.

+ CHM 2045/L	General Chemistry I/Lab	4
	[CHS x440]	
+ MAC 2311	Analytic Geometry & Calculus I	4
	[MAC x311, x281]	
+ MAC 2312	Analytic Geometry & Calculus II	4
	[MAC 2312, x282]	
MAC 2313	Analytic Geometry & Calculus III	4
	[MAC 2313, x283]	
MAP 2302	Differential Equations	3
	[MAC x302]	
+ PHY 2048/L	University Physics I/Lab	4
PHY 2049/L	University Physics II/Lab	4
	<i>Choose one:</i>	
CHM 2046	General Chemistry II	3
	or Biological Science	3

+ Indicates common prerequisites which can be used to satisfy General Studies requirements.

Computer Requirement (3 sh)

CIS 3020	Introduction to CIS	3
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Major (60 sh)

CEN 3031	Introduction to Software Engineering	3
CDA 3101	Introduction to Computer Organization	3
COP 3530	Data Structure and Algorithms	3
COP 4600	Operating Systems	3
COT 3100	Applications of Discrete Structures	3
EEL 3111	Circuits I	3
EEL 3112	Circuits II	3
EEL 3135	Discrete-Time Signals & Systems	3
EEL 3303L	Electric Circuits Laboratory	1
EEL 3304	Electronic Circuits I	3
EEL 3396	Solid-State Electronic Devices	3
EEL 3701	Digital Logic & Computer Systems	3
EEL 4304L	Electronics Laboratory	1
EEL 4712/L	Digital Design/Lab	4
EEL 4713/L	Digital Computer Architecture/Lab	4
EEL 4744/L	Microprocessor Applications/Lab	4
EEL 4914C	Electrical Engineering Design	3
EGN 4034	Professional Ethics	1
	EEL electives	9
	Maximum of 3 sh in EEL 4949 and maximum of 4 sh in EEL 4905, and maximum of 7 sh in EEL 4905/4949 combination). Consult the Department for the current list of approved EEL Elective courses.	

Major-Related (17 sh)

EEL 4834	C++ Programming for Electrical Engineering	3
EGM 2500	Engineering Mechanics: Statics	2
ENC 3240	Technical Writing	3
MAS 3105	Linear Algebra	3
STA 4321	Introduction to Mathematical Statistics I	3
	Computer Science Elective	3
	Consult the department for the current list of approved technical elective courses	

Upper Division Electives (0 sh)