

## COMPUTER SCIENCE AND ENGINEERING

### Mission Statement

In keeping with the mission of the College of Engineering, the Computer Science & Engineering Department strive for excellence in teaching, research, and public service. Specifically the Department aspires to:

1. Lead the advancement of computer science through internationally recognized research and graduate education, as well as technology transfer to regional industries;
2. Prepare students for full and ethical participation in a diverse society and encourage lifelong learning;
3. To educate undergraduates in the best practices of the field as well as integrate the latest research into the curriculum;
4. Foster the development of problem solving and communication skills as an integral component of the profession;
5. Provide quality learning experiences through small classes, active learning styles of teaching, and opportunities for meaningful interactions between students and faculty.

### Objectives

The Computer Science & Engineering Department has established the following goals for graduates of our program:

1. Our graduates will be equipped with the knowledge and skills necessary to allow immediate employment as computer science and engineering professionals or to secure admission to graduate programs.
2. Our graduates will be prepared to function ethically and responsibly as full participants in our profession and our society.
3. Our graduates will have a thorough knowledge of the basic principles and practices of computing grounded upon the solid foundation of the principles of mathematics and science.
4. Our computer engineering graduates will have a thorough knowledge of the basic principles and practices of engineering based upon a solid foundation of mathematics and science and an ability to apply these principles in the computing domain.
5. Using their knowledge of basic computing principles, our computer science graduates will have acquired a knowledge of major areas of application of those fundamentals.
6. Our information systems graduates will combine a thorough knowledge of basic business principles with the core principles of computing to achieve an understanding of applications at the convergence of these domains.

Three undergraduate degree tracks are offered within Computer Science and Engineering. These tracks are Computer Engineering, Computer Science and Information Systems, which lead to the Bachelor of Science in Computer Engineering, in Computer Science and in Information Systems respectively.

The Computer Engineering track emphasizes the application of engineering principles to the design of computer hardware and software. While all department tracks provide coverage of both computer hardware and software, this track allocates additional time to issues of computer architecture and hardware design. Students in this program also acquire a broad background in engineering science through the study of the engineering core.

The Computer Science track focuses on the theory of computation and computer organization. Additional course work in programming languages, algorithms, software engineering, and a wide range of electives supplement the core coverage of hardware and software.

The Information Systems track combines a basic coverage of hardware and software with a core of business related courses and additional course work in areas such as networks and database. The emphasis in this track is on the application of computing.

Graduates from these programs follow fruitful careers developing either scientific or business application's of computers, as well as in the design of computer systems. They are often involved in the systems level definition of information processing complexes for both manufacturers of computers and for users. A wide and expanding variety of design and applications opportunities characterize this field. The rapid growth and continual change within this field makes it essential for students to acquire a broad foundation in applied mathematics and the physical sciences, and to develop communication skills and to become familiar with the domains of potential computer application in the Humanities and Social Sciences. Research and development opportunities as a computer scientist and engineer, often following graduate education, are present in the areas of computer architecture and VLSI design, artificial intelligence, software engineering, digital data communications, multimedia, robotics, database, networks, user interface, fault-tolerant computing and testing, computer graphics, image processing and computer vision, and simulation.

The schedules which follow indicate how a serious, well prepared student who can devote full time to coursework can satisfy degree requirements in four academic years. Students without a solid foundation and those who cannot devote full time to academics should plan on a slower pace.

### Four-Year Curriculum in Computer Science

In addition to the College's graduation requirements, the department has the policy of not accepting any D grade in department courses.

**Prerequisites (State Mandated Common Prerequisites) for Students Transferring from a Community College:** If a student wishes to transfer without an A.A. degree and has fewer than 60 semester hours of acceptable credit, the student must meet the university's entering freshman requirements including ACT or SAT test scores, GPA, and course requirements.

Students should complete the following **prerequisite courses** listed below at the lower level prior to entering the University. If these courses are not taken at the community college, they must be completed before the degree is granted. Unless stated otherwise, a grade of "C" is the minimum acceptable grade.

Some courses required for the major may also meet General Education Requirements thereby transferring maximum hours to the university.

	COP	XXXX*
3	MAC	X311
4	MAC	X312
4	PHY	X048/X048L
4	PHY	X049/X049L
4	or PHY	X049C

\*Introductory Programming in Ada, C, C++, or PASCAL or equivalent language.

*Natural Sciences:*  
XXX XXXX\*\*

6  
\*\*Two (2) science courses for science majors.

Please be aware of the immunization, foreign language, continuous enrollment policies of the university, and qualitative standards required.

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## Department Admissions Requirements

Transfer students must have completed the equivalent USF Composition I & II, Engineering Calculus I & II and General Physics I & II (with labs) with a grade point average of 3.00 or higher in all courses.

### Semester I

MAC 2281	Engineering Calculus I	4
ENC 1101	Composition I	3
EGN 3000	Fundamentals of Eng	1
	Science Elective	3
	Social Science Elective	3
	Total	14

### Semester II

MAC 2282	Engineering Calculus II	4
PHY 2048	General Physics I	3
PHY 2048L	General Physics I Lab	1
ENC 1102	Composition II	3
COP 2510	Programming Concepts	3
	Total	14

### Summer Semester

MAC 2283	Engineering Calculus III	4
PHY 2049	General Physics II	3
PHY 2049L	General Physics II Lab	1
	Historical Perspectives Elect	3
	Total	11

### Semester III

CDA 3100	Computer Organization	3
COT 3100	Intro Discrete Str	3
COP 3514	Program Design	3
	Historical Perspectives Elect	3
	Total	12

### Semester IV

EEL 4851	Data Structures	3
CDA 3201	Computer Logic Design	3
CDA 3201L	Computer Logic Design Lab	1
EGN 4450	Linear Systems	2
STA 4442	Intro to Probability	3
	Fine Arts Elective	3
	Total	15

### Semester V

CDA 4205	Computer Architecture	3
COP 4600	Operating Systems	3
	CS&E Theory Elective	3
	Science Elective	3
	Social Science Elective	3
	Total	15

### Semester VI

	CS&E Theory Elective	3
	CS&E Software Elective	6
	CS&E Elective	6
	Total	15

### Semester VII

ENC 3211	Engr. Communications	3
	ALAMEA Elective	3
	CS&E Elective	6
	Total	12

### Semester VIII

CIS 4250	Ethical Issues	3
	Humanities, Social Science or Fine Arts Elective	3
	CS&E Elective	6
	Total	12

## Four-Year Curriculum in Computer Engineering

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#### Communications:

ENC 1101/1102 English I and II (6)

#### Humanities & Social Sciences:

Humanities Courses (6)

Social Science Courses (6)

Humanities or Social Sciences (3)

#### Mathematics:

##### USF

MAC 2281

MAC 2282

MAC 2283

MAP 2302

\*or MAC 2281, MAC 2282, MAC 2283

#### Natural Sciences:

##### USF

CHM 2045

CHM 2045L

PHY 2048

PHY 2048L

PHY 2049

PHY 2049L

\*or CHS 1440 Chemistry for Engineers

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##### C/C

MAC 2311\* (4)

MAC 2312\* (4)

MAC 2313\* (4)

MAP 2302 (3)

##### C/C

CHM 1045\* (3)

CHM 1045L\* (1)

PHY 2048 (3)

PHY 2048L (1)

PHY 2049 (3)

PHY 2049L (1)

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### Semester I

MAC 2281	Engineering Calculus I	4
ENC 1101	Composition I	3
EGN 3000	Fundamentals of Engineering	1
	Social Science Elective	3
	Historical Perspectives Elect.	3
	Total	14

### Semester II

MAC 2282	Engineering Calculus II	4
ENC 1102	Composition II	3
PHY 2048	General Physics I	3
PHY 2048L	General Physics I Lab	1
CHM 2045	General Chemistry I	3
CHM 2045L	General Chemistry Lab	1
	Total	15

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## Summer Semester

MAC 2283	Engineering Calculus III	4
PHY 2049	General Physics II	3
PHY 2049L	General Physics II Lab	1
COP 2510	Programming Concepts	3
Total		11

## Semester III

CDA 3100	Computer Organization	3
COT 3100	Intro Discrete Str	3
COP 3514	Program Design	3
Social Science	Elective	3
MAP 4302	Differential Equations	3
Total		15

## Semester IV

EEL 4851	Data Structures	3
CDA 3201	Computer Logic Design	3
CDA 3201L	Computer Logic Design Lab	1
EGN 3443	Engineering Statistics	3
EGN 3373	Electrical Sys. I	3
EGN 4450	Linear Systems	2
Total		15

## Semester V

CDA 4205	Computer Architecture	3
EGN 4930	Eng. Econ. with Social & Global Implications	3
ALAMEA	Elective	3
EGNXXXX	Eng. Electronic Materials	3
CS&E	Hardware Elective	4
Total		16

## Semester VI

COP 4600	Operating Systems	3
CS&E	Theory Elective	3
CS&E	Hardware Elective	3
Science	Elective	3
Fine Arts	Elective	3
Total		15

## Semester VII

ENC 3211	Comm. For Engineers	3
Historical	Perspectives Elect.	3
CS&E	Elective	7
Total		13

## Semester VIII

CIS 4910	Senior Project	2
CIS 4250	Ethical Issues	3
CS&E	Elective	9
Total		14

## Four-Year Curriculum in Information Systems

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4	MAC	X311
4	MAC	X312
4	PHY	X048/X048L
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4	or	
4	PHY	X049C

\*Programming in Ada, C, C++, or PASCAL or equivalent language.

Natural Sciences:  
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\*\*Two (2) science courses for science majors.

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Transfer students must have completed the equivalent USF Composition I & II, Engineering Calculus I & II and General Physics I & II (with labs) with a grade point average of 3.00 or higher in all courses.

### Semester I

MAC 2281/2233	Calculus I	4
ENC 1101	Composition I	3
AGC 2021	Principles of Accounting I	3
Social Science	Elective	3
Total		13

### Semester II

MAC 2282/2234	Calculus II	4
ENC 1102	Composition II	3
PHY 2048/2053	Physics I	3
PHY 2048L/2053L	Physics I Lab	1
COP 2510	Programming Concepts	3
Total		14

### Summer Semester

PHY 2049/2054	Physics II	3
PHY 2049L/2054L	Physics II Lab	1
ECO 2013	Macroeconomics	3
STA 2023	Intro to Statistics	3
Total		10

### Semester III

CDA 3100	Computer Organization	3
COT 3100	Intro Discrete Str	3
COP 3514	Program Design	3
ECO 2023	Microeconomics	3
Historical	Perspectives Elect	3
Total		15

### Semester IV

EEL 4851	Data Structures	3
MAN 3023	Principles of Management	3
ALAMEA	Elective	3
Science	Elective	3

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Social Science Elective 3  
Total 15

## Semester V

COP 4600 Operating Systems 3  
EGN XXXX Engineering Econ. with Social  
and Global Implications 3  
EGN 4450 Linear Systems 2  
ENC 3211 Comm. For Engineers 3  
CS&E Software Elective 3  
Total 14

## Semester VI

CEN 4020 Software Engineering 3  
Fine Arts Elective 3  
CS&E Software Elective 3  
CS&E Elective 6  
Total 15

## Semester VII

Historical Perspectives Elect 3  
CS&E Theory Elective 3  
CS&E Software Elective 3  
Science Elective 3  
Total 12

## Semester VIII

CEN 4022 Software System Development 3  
CIS 4250 Ethical Issues 3  
CS&E Elective 6  
Total 12