

Electrical Engineering Major Degree Plan

The program leading to a Bachelor of Science degree in electrical engineering is nominally a four-year program. The required program consists of a basic foundation of mathematics, science, computer science, engineering fundamentals, and laboratory and design experiences. Elective courses providing for one or more areas of technical focus, communication skills, and University Studies complete the program and prepare students for productive and rewarding careers in the electrical engineering profession.

Required courses are shown in the accompanying paragraphs; however, because of differences in high school or transfer student preparation, it is strongly recommended that students meet with the college academic advisor to plan a detailed semester-by-semester schedule for completing the preprofessional requirements. Particular attention must be paid to course prerequisites, requiring some students to take longer than four semesters to complete the preprofessional program. Students transferring into the department should consult with the college academic advisor for transfer credit evaluation and proper placement in the curriculum.

AP and CLEP credit may be used to meet some of the required technical and University Studies courses. Details concerning courses acceptable as electives are available from the Electrical and Computer Engineering Department.

Pre-professional Program Suggested Semester Schedule (126 credits)

Freshman Year (30 credits)

Fall Semester (15 credits)

MATH 1210 (QL)* Calculus I	4
CS 1400* Introduction to Computer Science—CS 1	3
ECE 1000* Introduction to Electrical and Computer Engineering	2
University Studies Breadth courses	6

Spring Semester (15 credits)

MATH 1220 (QL)* Calculus II	4
CS 1410 (QI)* Introduction to Computer Science—CS 2	3
PHYS 2210 (QI)* General Physics—Science and Engineering I	4
ECE 2700* Digital Circuits	4

Sophomore Year (32-33 credits)

Fall Semester (16 credits)

MATH 2210 (QI)* Multivariable Calculus	3
MATH 2270 (QI)* Linear Algebra	3
PHYS 2220 (BPS/QI)* General Physics— Science and Engineering II	4
University Studies Breadth courses	6

Spring Semester (16-17 credits)

MATH 2280 (QI)* Ordinary Differential Equations	3
ECE 2250* Electrical Circuits	4
ENGL 2010 (CL2)* Intermediate Writing: Research Writing in a Persuasive Mode	3
Technical Elective course	3-4
University Studies Breadth course	3

*These classes are required for admission to the Professional Engineering Program (PEP).
Courses are listed under the semesters in which they best fit.

Professional Program

Because of the variations in schedules, it is recommended that students meet with an advisor to work out a schedule for their junior and senior years. The following courses are required for students selecting the **Professional Program in Electrical Engineering**.

Suggested Semester Schedule

Junior Year (33-34 credits)¹

Fall Semester (17 credits)

ECE 3620 Circuits and Signals	3
ECE 3710 Microcomputer Hardware and Software	4
ECE 3810** Engineering Professionalism	1
ECE 5530 Digital System Design	3
ENGL 3080 (CI)** Introduction to Technical Communication	3
MATH 5710 Introduction to Probability	3

Spring Semester (16-17 credits)

ECE 3410 Microelectronics I	4
ECE 3640 Signals and Systems	3
ECE 3870 Electromagnetics I	4
Math/Science elective course	3
University Studies Depth Humanities and Creative Arts (DHA) course	2-3

Senior Year (29-30 credits)

Fall Semester (15 credits)

ECE elective courses	15
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Spring Semester (14-15 credits)

ECE 4850 (CI)*** Engineering Communications	2
ECE elective courses	6
University Studies Depth Social Sciences (DSS) course	3
ECE Capstone course***	3-4

¹Some of the junior classes can be delayed until the senior year, but this may limit a student's choice of electives during his or her senior year.

**ENGL 3080 must be taken before or concurrently with ECE 3810.

***ECE 4850 and a capstone course must be taken during the same semester.

Capstone Courses (select 3-4 credits)

ECE 4840 (CI) Engineering Design (F,Sp)	3
ECE 5220 Electrooptical Engineering	3
ECE 5240 Space System Design (Sp)	3
ECE 5340 Mobile Robots (F)	4
ECE 5770 Microcomputer Interfacing (Sp)	4
ECE 5930 ST: Digital Radio (ECE 5660 or 5810 should be taken concurrently) (Sp)	3

Technical Elective Courses (select 28 or more credits)

Electrical Engineering Electives (select 21-25 credits)

ECE 4650 ⁴ Optics I (F)	3
ECE 4680 ⁴ Optics II (Sp)	3
ECE 4740 Computer and Data Communications (F)	3

Also, any ECE 5000-level course (including ECE 5930 when topic relates to electrical engineering) may be counted as an Electrical Engineering Elective.

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Math and Science Electives (select 3-7 credits)

MATH 3310 Discrete Mathematics (F,Sp,Su).....	3
MATH 4200 (CI) Foundations of Analysis (F,Sp).....	3
MATH 4310 (CI) Introduction to Algebraic Structures (F,Sp).....	3
MATH 5210 Introduction to Analysis I (F).....	3
MATH 5220 Introduction to Analysis II (Sp).....	3
MATH 5270 Complex Variables (Sp).....	3
MATH 5310 Introduction to Modern Algebra (Sp).....	3
MATH 5340 Theory of Linear Algebra (F).....	3
MATH 5410 Methods of Applied Mathematics (F).....	3
MATH 5420 Partial Differential Equations (Sp).....	3
MATH 5460 Introduction to the Theory and Application of Nonlinear Dynamical Systems (Sp).....	3
MATH 5510 Introduction to Topology (Alt F).....	3
MATH 5610 Computational Linear Algebra and Solution of Systems of Equations (F).....	3
MATH 5620 Numerical Solution of Differential Equations (Sp).....	3
MATH 5720 Introduction to Mathematical Statistics (Sp).....	3
MATH 5760 Stochastic Processes (F).....	3
AP Biology.....	4
BIOL 1610 Biology I (F).....	4
BIOL 2420 Human Physiology (F,Sp,Su).....	4
BIOL 3300 General Microbiology (F,Sp).....	4
AP Chemistry.....	8
CHEM 1210 Principles of Chemistry I (F,Sp).....	4
CHEM 1215 Chemical Principles Laboratory I (F,Sp).....	1
CHEM 1220 (BPS) Principles of Chemistry II (F,Sp,Su).....	4
CHEM 2310 Organic Chemistry I (F).....	4
CHEM 3700 Introductory Biochemistry (Sp).....	3
CHEM 3710 Introductory Biochemistry Laboratory (Sp).....	1
PHYS 2710 Introductory Modern Physics.....	3
PHYS 3550² Intermediate Classical Mechanics.....	3
PHYS 3600 Electromagnetism I.....	3
PHYS 3700³ Thermal Physics.....	3
PHYS 3710 Intermediate Modern Physics.....	3
PHYS 3750 Foundations of Wave Phenomena.....	3
PHYS 4600 Electromagnetism II.....	3
PHYS 4650⁴ Optics I.....	3

PHYS 4680⁴ Optics II.....	3
PHYS 4700 Quantum Mechanics I.....	3
PHYS 4710 Quantum Mechanics II.....	3
WILD 2200 (BLS) Ecology of Our Changing World (F,Sp).....	3

Technical Electives (select 0-4 credits)

CS 2420 (QI) Algorithms and Data Structures—CS 3 (F,Sp,Su).....	3
CS 2450 (CI) Introduction to Software Engineering I (F,Sp).....	3
CS 2810 Computer Systems Organization and Architecture I (F,Sp).....	3
CS 3100 Operating Systems and Concurrency (F,Sp).....	3
CS 3450 Introduction to Software Engineering II (F,Sp).....	3
CS 4700 Programming Languages (F,Sp).....	3
CS 5000 Theory of Computability (Sp).....	3
CS 5050 Advanced Algorithms (F,Sp).....	3
CS 5100 Graphical User Interfaces and Windows Programming (Sp).....	4
CS 5200 Distributed and Network Programming (F).....	4
CS 5300 Compiler Construction (F).....	4
CS 5400 Computer Graphics I (F).....	4
CS 5450 Multimedia Systems (Sp).....	4
CS 5500 Parallel Programming (Sp).....	3
CS 5600 Intelligent Systems (F).....	4
CS 5650 CVPRIP I: Computer Vision, Pattern Recognition, and Image Processing (F).....	3
CS 5700 Object-Oriented Software Development (F).....	3
CS 5800 Introduction to Database Systems (F).....	3
CS 5850 Systems Analysis (Sp).....	3
CEE 4200 Engineering Economics (F).....	2
ECE 4250 Internship/Co-op (F,Sp,Su).....	3
ENGR 2010² Engineering Mechanics Statics (F,Sp).....	2
ENGR 2030 Engineering Mechanics Dynamics (F,Sp,Su).....	3
ENGR 2140 Strength of Materials (F,Sp,Su).....	2
MAE 2160 Material Science (F,Sp).....	3
MAE 2300³ Thermodynamics I (Sp,Su).....	3

²Students cannot receive credit for both Engineering Mechanics *and* Analytical Mechanics.

³Students cannot receive credit for both Engineering Thermodynamics *and* Thermal Physics.

⁴Students cannot receive credit for both ECE Optics *and* PHYS Optics.