

Electrical & Computer Engineering Curriculum Overview

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Mission:

To prepare students for the profession of Electrical and Computer Engineering – to enable them to solve problems of substance through the application of fundamental principles, disciplined practices and modern methods – to instill the humility of contribution to ventures larger than themselves, and the courage to lead others in the pursuit of such ventures – to inspire an ethic of service to all mankind in the context of a global community – and finally, to instill a lifelong thirst for the knowledge of their craft.

Goals:

Graduates of the Electrical and Computer Engineering program will:

- Attain respect for competence in the skills of engineering practice by solving problems and leading others in the pursuit of solutions.
- Effectively communicate the results of their work.
- Work professionally in team environments to design electrical and computer systems.
- Pursue professional development through life-long learning to better serve in an evolving global society.
- Demonstrate initiative and perform leadership roles in an ethical manner.
- Perceive the impact of their professional decisions on society.

Outcomes:

Students in the Electrical and Computer Engineering programs will demonstrate an ability to:

- Apply knowledge of advanced mathematics, chemistry, physics, and engineering.
- Identify, formulate, and solve electrical engineering problems.
- Design and conduct experiments, as well as to analyze and interpret data.
- Apply the techniques, skills, and modern engineering test equipment and software applications necessary for engineering practice.
- Communicate effectively through written and verbal means.
- Contribute to multidisciplinary / multicultural teams.
- Recognize the need to engage in life-long learning.
- Demonstrate the leadership competencies of self-awareness, self-management, social-awareness, and relationship management.
- Demonstrate an understanding of professional and ethical responsibility.
- Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- Appreciate the impact of engineering solutions in a global, economic, environmental, and societal context.
- Demonstrate knowledge of contemporary issues.

During the first two years, students receive intensive instruction in mathematics and basic physical sciences as well as fundamental principles and techniques of engineering. Students are introduced to the basic tools and problem solving techniques they will use throughout

their career. The final two years are spent in a laboratory intensive environment. In the third year, students begin to apply their knowledge solving discipline-specific engineering problems. Project-based courses begin to develop the ability to apply knowledge in open-ended problems. In the fourth year, more focused courses cover a broad spectrum of electrical and computer engineering topics. A completely open-ended design experience, where students can exercise creativity solving current engineering problems, spans the senior year. Designing, building, testing, and evaluating projects in such application areas as instrumentation and data acquisition, computer network control, SCADA systems security, robotics, wireless communication, and machinery controls is typical of this experience. Constraints such as economics, safety, reliability, aesthetics, ethics, and social impact are considered. This experience builds upon the fundamental concepts of mathematics, basic sciences, the humanities and social sciences, engineering topics, and communication skills developed earlier in the undergraduate experience. The design team experience allows close coordination with an individual faculty member. The scope of the project is designed to match the requirements of practice within the electrical and computer engineering discipline.

Careers for this Major:

Graduates have the option of beginning a career in either the military or civilian life, or attending graduate school. Career choices for ECE graduates are extremely diverse; below is an abbreviated list from "Your Career in the Electrical, Electronics, and Computer Engineering Fields," a website published by the Institute for Electrical and Electronics Engineers (IEEE).

- Signal Processing
- Aerospace and Electronic Systems
- Circuits and Systems
- Communications
- Computers
- Consumer Electronics
- Control Systems
- Industrial Electronics
- Industry Applications
- Instrumentation and Measurement
- Power Electronics
- Power Engineering
- Robotics
- Systems, Man and Cybernetics
- Frequency Control
- Vehicular Technology

The IEEE is the largest professional organization that serves Electrical and Computer Engineers, as well as many other types of engineers in related fields. To see the IEEE website that discusses a broader range of ECE career opportunities, please sample a few videos at this IEEE.tv website (<https://ieeetv.ieee.org/careers>), or visit this website maintained by TryEngineering.org (<http://tryengineering.org/become-an-engineer/electrical-engineering>).

Accreditation:

The Electrical and Computer Engineering curriculum is accredited by the Engineering Accreditation Commission (EAC) of ABET, <http://www.abet.org>, 415 N. Charles Street, Baltimore, MD 21201, Telephone: (410) 347-7700

Major

B.S. in Electrical and Computer Engineering - Curriculum Map 2019-2020 Catalog

Print PDF Curriculum Map (http://catalog.norwich.edu/residentialprogramscatalog/collegeofprofessionalschools/thedavidcrawfordschoolofengineering/electcomp/Elec_ENG.pdf)

Course	Cr. Comp.	Course	Cr. Comp.
FRESHMAN			
Fall		Spring	
CH 103 General Chemistry I (General Education Lab Science)	4	EG 110 Introduction to Engineering II	3
EG 109 Introduction to Engineering I	3	EE 200 Engineering Programming	3
EN 101 Composition and Literature I	3	EN 102 Composition and Literature II	3
MA 121 Calculus I (General Education Math)	4	MA 122 Calculus II (General Education Math)	4
		General Education History/Literature/Arts & Humanities/Social Science (http://catalog.norwich.edu/archives/2019-20/residentialprogramscatalog/generaleducationgoals)	3
Fall Semester Total Cr.:	14	Spring Semester Total Cr.:	16
SOPHOMORE			
Fall		Spring	
EE 215 Fundamentals of Digital Design	4	EE 356 Electrical Circuits II	3
EE 204 Electrical Circuits I	3	EE 357 Electronics I	3
MA 223 Calculus III	4	EE 359 Electrical Engineering Laboratory	1
PS 211 University Physics I (General Education Lab Science)	4	MA 224 Differential Equations	4
General Education History/Literature/Arts & Humanities/Social Science (http://catalog.norwich.edu/archives/2019-20/residentialprogramscatalog/generaleducationgoals)	3	PS 212 University Physics II	4
		General Education Leadership (http://catalog.norwich.edu/archives/2019-20/residentialprogramscatalog/generaleducationgoals)	1-3
Fall Semester Total Cr.:	18	Spring Semester Total Cr.:	16-18
JUNIOR			
Fall		Spring	
EE 321 Embedded Systems	4	EE 303 Electromagnetic Field Theory I	3
EE 350 Linear Systems	3	EE 323 Computer Architecture or 478 Control Systems	3
EE 366 Electronics II	4	EE 373 Electrical Energy Conversion	4
MA 306 Discrete Mathematics	3	EG 206 Thermodynamics I	3
General Education History/Literature/Arts & Humanities/Social Science (http://catalog.norwich.edu/archives/2019-20/residentialprogramscatalog/generaleducationgoals)	3	EN 204 Professional and Technical Writing	3
Fall Semester Total Cr.:	17	Spring Semester Total Cr.:	16
SENIOR			
Fall		Spring	
EE 491 Electrical System Design I (Capstone)	3	EE 411 Infrastructure Control Systems ¹	4
EE 459 Electric Power Systems ¹	3	EE 478 Control Systems or 323 Computer Architecture	3
EE 463 Communication Systems	4	EE 486 Digital Signal Processing ¹	3
EG 450 Professional Issues (General Education Ethics)	3	EE 487 Digital Signal Processing Lab	1
MA 311 Statistical Methodology	3	EE 494 Electrical System Design II	3

		General Education History/Literature/ Arts & Humanities/Social Science (http://catalog.norwich.edu/archives/2019-20/residentialprograms/catalog/generaleducationgoals)	3	
Fall Semester Total Cr.:		16	Spring Semester Total Cr.:	
TOTAL CREDITS FOR THIS MAJOR: 130-132				

¹ Students must complete at LEAST two of the following three courses: EE 411, EE 486, EE 459. Students may choose to complete all three courses, or they may choose two of the three and select one technical elective from the following approved courses: EE 468, EE 490, EG 301, EG 303, EG 350, EG 400, EG 447, ME 307, CS 301, MA 303, MA 310, MA 312, MA 380, MA 405, MA 407, PS 334, PS 356, PS 341, PS 426.

Students who complete all degree requirements, but do not have a minimum 2.0 cumulative GPA must complete at least 50 percent of all subsequent course work in technical material (subject to approval by the Director of the David Crawford School of Engineering).