ELECTRICAL ENGINEERING MAJOR

Program Director: Donald Yeung, Ph.D.

The Bachelor of Science degree in Electrical Engineering degree program at the University of Maryland is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s) and Similarly Named and Engineering Programs.

Electrical engineers create innovative technology solutions in a wide range of areas, from handheld communications to solar panels; from cardiac pace makers to autonomous robots; from wireless networks to bio-engineered sensors that detect dangerous pathogens; and intelligent surveillance systems that perform face and motion recognition. Employers visiting campus seek out electrical engineering students for recruitment more than any other major at the University of Maryland.

Electrical engineers have been uniquely responsible for developing many of the innovations that have brought us modern life and are urgently needed today to help solve a variety of global problems, including challenges related to energy, communications, health care, global warming, and national security. Electrical engineering underpins all other engineering disciplines, encompassing biomedical devices technology, micro- and nanoelectronics, information systems, wireless communications and signal processing, power systems, lasers and optics, electronic devices, computer software-hardware integration, and control systems. Electrical engineers led revolutions in the music and telecommunications industries, and are poised to lead the next revolutionary innovations in nanotechnology, robotics, and other advanced technologies.

Program Educational Objectives

Broadly stated, the **Program Educational Objectives (PEOs)** for the undergraduate major in electrical engineering pertain to the accomplishments and performance of our students within a few years from graduation. These objectives are determined in consultation with the various constituencies of the electrical engineering program and agreed upon and approved by a consensus of the faculty.

Within a few years from graduation, a graduate of electrical engineering will have engaged in professional development, and will have attained any of the following program educational objectives:

1. Achieve advanced technical expertise and/or advance to a leadership position in industry or government
2. Earn a graduate degree from a respected graduate program in computer engineering, electrical engineering, or related field
3. Become an innovator and/or entrepreneur in computer engineering, electrical engineering, or related space
4. Use their professional knowledge, skills and abilities, as well as their sense of ethical responsibility, to make a positive impact on societal and environmental concerns and/or to improve the climate for diversity, equity and inclusiveness within the profession

Student Learning Outcomes

A comprehensive set of Student Learning Outcomes (SLOs) has been derived from the Program Educational Objectives (PEOs). These SLOs comprise the knowledge and skills all Electrical Engineering students are expected to possess by the time they graduate so the PEOs can be accomplished. The SLOs are:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

REQUIREMENTS

Requirements for the Electrical Engineering major include thorough preparation in mathematics, physics, chemistry, and engineering science. Elective courses must include both Electrical Engineering courses and technical courses outside the department. Students must earn a grade of "C-" or higher in all engineering, mathematics, and science courses, as well as the prerequisites for these courses. A sample program is shown below.

Freshman Year

First Semester	Credits	Second Semester	Credits
CHEM135	3	ENES100[1]	3
ENEE101[1]	3	ENEE150[2]	3
ENEE140	2	MATH141	4
ENGL101	3	PHYS161	3
MATH140	4	General Education[3]	3
	15		**16**

Sophomore Year

First Semester	Credits	Second Semester	Credits
ENEE290	4	ENEE205	4
ENEE244	3	ENEE222	4
MATH241	4	ENEE245	2
PHYS260 & PHYS261	4	PHYS270 & PHYS271	4
		General Education[3]	3
	15		**17**

Junior Year

First Semester	Credits	Second Semester	Credits
ENEE304	3	ENEE200	3
ENEE323	4	ENEE305	2
ENEE350	3	ENEE324	3
ELECTIVE- General Technical Electives[4]	3	ENEE382	4

General Education[3]		3	General Education[3]		3
		16			**15**
Senior Year					
First Semester	**Credits**		**Second Semester**	**Credits**	
ELECTIVE - EE Electives[5]		11	ELECTIVE - EE Electives[5]		11
General Education[3]		3	Professional Writing (ENGL39x)		3
		14			**14**
Total Credits 122					

1 ENEE101 and ENES100 cannot be taken in the same semester. Students may take these courses consecutively within their first year in the order of choice.
2 Students must complete ENEE140 or pass the exemption exam or AP CS exam before taking ENEE150.
3 Note: Please see http://4yearplans.umd.edu.
4 Must come from list of courses approved for general technical electives.
5 Must come from a list of courses approved for EE electives. At least 3 credits must come from Category A; at least 2 credits must from Category B; and at least 3 credits must come from Category C. Up to 7 credits can come from approved non-ENEE courses that are appropriate for the area of interest chosen by the student. Non-ENEE courses may not be used to fulfill the Category B or C requirements.

Technical Elective Requirements

Effective Fall 2024, all entering BSEE students must:

1. Distribute their 22 credits of EE technical electives among the following course categories:

Category	Electives	Credits
Category A	Advanced Theory and Applications	minimum of 3 credits
Category B	Advanced Laboratory	minimum of 2 credits
Category C	Capstone Design	minimum of 3 credits

   Note: ENEE499, Senior Projects in Electrical and Computer Engineering, may be used to satisfy either the Category A or the Category B requirement subject to approval by the faculty supervisor and the Associate Chair; it cannot be used as a Category C course. The maximum number of ENEE499/ENEE499L credits that may be applied towards EE technical elective requirements is five, except for students in the departmental honors program, who may take up to six credits.
2. Distribute their 3 credits of general technical electives as follows:
   a. The 3 credits may be any upper-level course (300 level or higher) from the math, engineering, and basic science disciplines whose courses start with the following prefixes and who do not appear on the list of unacceptable courses available from the Undergraduate Studies Office: AMSC, BCHM, BIOE, BSCI, CHEM, CMSC, ENAE, ENCE, ENCH, ENEE, ENES, ENFP, ENMA, ENME, ENNU, ENRE, MATH, PHYS, and STAT. The most up-to-date list of approved and unacceptable courses will always be available from the Undergraduate Studies Office and on the ECE website.
   b. The 3 credits may be any upper-level course (300 level or higher) whose prefix is not given in the list above, assuming that the student:
      i. completes the application to allow the course to count as a general elective,
      ii. demonstrates how this course complements the student's professional goals, and
      iii. receives the signed approval of the Associate Chair for Undergraduate Education.

If you have any questions about how these requirements affect your current selection of senior EE electives, please contact an advisor.

GRADUATION PLANS

Click here (https://eng.umd.edu/advising/four-year-plans/) for roadmaps for graduation plans in the A. James Clark School of Engineering.

Additional information on developing a graduation plan can be found on the following pages:

- http://4yearplans.umd.edu
- the Student Academic Success-Degree Completion Policy (https://academiccatalog.umd.edu/undergraduate/registration-academic-requirements-regulations/academic-advising/#success) section of this catalog