

Master of Science

Engineering with a Concentration in Electrical and Computer Engineering (MS)

The Department offers a Master of Science (M.S.) in Engineering degree with a concentration in Electrical & Computer Engineering. It requires a minimum of 30 credit hours of graduate study. Full-time and part-time students may complete coursework through a combination of on-campus and online courses. Online courses are available synchronously at higher education centers and can be broadcast to any computer with a high-speed Internet connection. Full details on all requirements for graduating with a Master's degree are outlined in a separate section that follows the admission information.

Admission Information

Applicants are expected to hold a B.S. degree in electrical engineering (EE) or computer engineering (CpE) from an accredited institution. Applicants are also expected to have a minimum grade point average of 3.0 (on a 4.0 scale) in both the baccalaureate major area (EE or CpE) and overall. Applicants with a GPA below a 3.0 may be considered for provisional admission, which may require additional prerequisite courses in addition to the graduate degree requirements. The applications are submitted through the Office of Admissions of Old Dominion University. Together with the completed application form, two letters of recommendation from former instructors or employment supervisors, transcripts from all colleges and universities attended, GRE scores, a resume, and a personal statement of objectives are required. TOEFL scores are also required for international applicants. Applicants with academic degrees in areas other than electrical and computer engineering will be considered. Those with degrees in math, physics, computer science, or other engineering fields are encouraged to apply. The linked Bachelor's/Master's degree program in the Frank Batten College of Engineering and Technology at Old Dominion University is designed to provide an opportunity for exceptionally qualified engineering undergraduate students to obtain both a bachelor's and a master's degree in Electrical and Computer Engineering. Typically undergraduate students apply at the end of their junior year for admission to the linked programs.

Accepted students from disciplines other than EE or CpE are required to complete a number of leveling courses to meet prerequisites for graduate studies. All students are required to have one year of college chemistry and one year of calculus-based college physics in addition to Calculus III and Differential Equations courses. Students at Old Dominion University may complete the leveling requirement by earning a minor in electrical or computer engineering with a GPA of 3.0 or greater. Students that have not earned a minor need to meet with the graduate program director to prepare a course plan and determine which pre-requisite courses are needed. In general, three to four leveling courses are needed and they are chosen from the following lists.

List of Possible Courses to Meet the Leveling Requirement

ECE 202	Circuit Analysis II	3
ECE 241	Fundamentals of Computer Engineering	4
ECE 302	Linear System Analysis	3
ECE 303	Introduction to Electrical Power	3
ECE 304	Probability, Statistics, and Reliability	3
ECE 313	Electronic Circuits	4
ECE 323	Electromagnetics	3
ECE 332	Microelectronic Materials and Processes	3

ECE 341	Digital System Design	3
ECE 346	Microcontrollers	3
ECE 381	Introduction to Discrete-time Signal Processing	3

Students interested in taking computer engineering graduate courses may need to take additional leveling computer science courses as indicated below.

List of Possible Computer Science Courses to Meet the Leveling Requirements

CS 350	Introduction to Software Engineering	3
CS 361	Data Structures and Algorithms	3
CS 381	Introduction to Discrete Structures	3

Curriculum Requirements

The M.S. degree requires a minimum of 30 credit hours of graduate study.

The M.S. degree thesis option requires a minimum of 24 credit hours of courses (not including the Graduate Seminar) and 6 credit hours of thesis along with the oral thesis defense examination. Continuation in the M.S. program thesis option is contingent upon identifying a MS thesis advisor after completing 18 credit hours of coursework (which coincides approximately with the end of the second semester of study for full-time students). For the thesis committee, the chair has to be a full time ECE faculty member or a faculty member with an ECE degree in the Batten College of Engineering and Technology (BCET). A faculty member that is not in BCET can still be approved to serve as the advisor but cannot be the committee chair unless they have a joint appointment with ECE. Also, a minimum of 2 full time ECE faculty members and 1 outside ECE member are required on the committee.

The M.S. degree project option requires a minimum of 27 credit hours of courses (not including the Graduate Seminar) and 3 credit hours of Master's project course (ECE 698) that includes an oral defense examination.

The M.S. degree course option requires a minimum of 30 credit hours of courses (not including the Graduate Seminar) and a written comprehensive examination at the end of the course work. The examination is offered every fall and spring semester, and the student needs to pass the examination in no more than two attempts. The second attempt, if necessary, should be taken at the next offered examination.

The M.S. program is available to full-time and part-time students seeking to improve their professional skills in electrical and computer engineering. Students are required to complete at least one course that meets the department's mathematics requirement. The current list of courses that meet this requirement is given next.

ECE 601	Linear Systems	3
ECE 611	Numerical Methods in Engineering Analysis	3
ECE 623	Electromagnetism	3
ECE 651	Statistical Analysis and Simulation	3

The remaining courses are chosen to meet the student's career objectives. To earn a master's degree, a student needs to take at least five courses at the 600 or higher level, no more than 6 credit hours of Independent Study courses (ECE 797), and no more than three courses at the 500 level. Also, no more than three graduate courses can be taken in other departments. The Graduate Program Director, in concurrence with the Chair, can approve exceptions to these requirements under special circumstances. All course selections must be reviewed by the graduate program director, and for the M.S. thesis option, students' course selections should be made in coordination with their research/thesis advisor. The graduate course descriptions are included in the graduate catalog and are also listed on the department's website. Additional graduate courses are offered through Cardinal Education (Home - Cardinal Education (<https://www.cardinaleducation.org/>)). All funded Master's students are required to attend Graduate Seminar.