

MASTER OF ENGINEERING IN**Electrical Engineering with a Concentration in Microelectronics**

The rapid and accelerating development of microelectronics technology has led to an expansion of the body of knowledge used by electronics engineers and to an increased sophistication of device models and CAD tools used in microelectronics design and manufacturing. To become and remain competitive, electronics engineers need graduate and continuing education that reflects changes in technology, and yet provides the fundamental core needed to contribute to future generations of technology. Rensselaer has both a department and research center committed to microelectronics technology and design: the Electrical, Computer, and Systems Engineering (ECSE) Department, and the Center for Integrated Electronics (CIE).

The M.Eng. program builds upon a strong base of research and education in microelectronics, including the interdisciplinary Microelectronics Manufacturing Engineering program. While this degree program includes some of the same processing-oriented courses as electives, the emphasis is on semiconductor devices. The program is taught by full-time tenure track Rensselaer faculty, augmented by the expertise of some of the best engineers and scientists working at the forefront of the microelectronics industry. The opportunities offered by both online video instruction and new web-based educational tools make the joint instruction and on-site delivery feasible.

ADMISSION REQUIREMENTS

- Bachelor of Science degree in electrical engineering or a closely-related discipline from an accredited undergraduate institution
- Undergraduate GPA of 3.2 or higher
- Grades of "B" or better in courses completed since bachelor's degree
- GRE required
- TOEFL score of 570 or above (required for international students)
- Completed application form
- Official transcripts for all undergraduate and graduate work
- Statement of background and goals as it applies to the program
- Two letters of recommendation
- Resume

GRADUATION REQUIREMENTS

- Matriculated status
- Approved Plan of Study and worksheet
- At least 18 credits must be at the 6000 level
- At least 21 credits must be from Electrical, Computer, and Systems Engineering (up to 6 of these credits can be replaced by courses from related technical areas with the approval of the faculty adviser, e.g. Computer Science, Electric Power Engineering, Materials Engineering, Physics, etc.)
- Minimum 3.0 GPA; minimum 30 credits

PLAN OF STUDY

(minimum of 30 credit hours, must also conform to the graduation requirements listed above)

I. Core Courses (9 credits)

Select at least three courses

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| ECSE-4720 | Solid State Physics |
| ECSE-6230 | Semiconductor Devices and Models I |
| ECSE-6260 | Semiconductor Power Devices |
| ECSE-6290 | Semiconductor Devices and Models II |
| ECSE-696X | Modern Power Devices |
| ECSE 696X | Phys Foundations of Solid-State Devices |

II. Two-Course Sequence to Provide Breadth (6-7 credits)

These must be outside of, and not directly related to, Electrical, Computer, and Systems Engineering and must be approved in advance by the Graduate Program Director. Examples include, but are not limited to:

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|-----------|------------------------------------|
| DSES-6110 | Introduction to Applied Statistics |
| DSES-6230 | Quality Control and Reliability |
| MGMT-6450 | Manufacturing Systems Management |
| MANE-6800 | Manufacturing Systems Integration |

III. Electives (15-16 credits)

Select five courses, possible options include:

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|-------------------------|--|
| EPOW-4080 | Semiconductor Power Electronics |
| ECSE-6270 | Optoelectronics |
| ECSE-6770 | Software Engineering I |
| EPOW-6850 | Electric and Magnetic Fields in Electric Power Engineering |
| MTLE-696X | Advanced Device Processing |
| MTLE-4290/ ECSE-4290 | Electronic Packaging |

NOTE: Some of the courses listed in Sections I, II, and III above may not be available. Also, a student may wish to deviate somewhat from the selections listed here. Substitutions approved by the ECSE Graduate Program Director are permitted, on a case-by-case basis.

Students interested in applying for a research-oriented M.S. degree should notify their Rensselaer point of contact for details on admission, curriculum, and graduation requirements.