

# ELECTRICAL ENGINEERING

<http://www.ee.rit.edu>

## PROGRAM OVERVIEW FOR EMPLOYERS

Electrical engineering at RIT addresses the high-technology needs of business and industry by offering an academic program that includes integrated circuits, digital signal processing, microwave electronics, optical electronics, bioelectronics, radiation and propagation, power electronics, control systems, communications, circuit theory, CAD, solid-state devices, MEMs, robotics, and pattern recognition. State-of-the-art laboratory facilities are an integral component of courses including a number in studio-style lecture laboratories. The co-op requirement enhances student knowledge acquired in the classroom and laboratory. Students are presented with design experiences in a number of courses beginning with a practicum in their first year, culminating with a senior team-based capstone project.

### Degree(s) Awarded

Bachelor of Science; Master of Science; Bachelor of Science/Master of Science Dual Degree

**Options/Emphasis Areas:** Computer Engineering Option, Biomedical Engineering Option, Premed Emphasis, Analog & Mixed Signal Emphasis

### Enrollment

Approximately 550 students are enrolled in the undergraduate program.

### Cooperative Education Component

Undergraduate students are required to complete five 10-week co-op work assignments. BS/MS students complete four co-op work assignments.

### Salary Information (Avg/Range)

Co-op:	\$15.62	\$8.00 - \$28.85
BS:	\$52,000	\$30,000 - \$65,000
MS:	\$72,400	\$65,000 - \$78,000

### Equipment & Facilities

The department of electrical engineering has a complete range of specialized laboratories with up-to-date equipment for teaching and research. These labs are available for student use and include:

- RF/Analog/Mixed-Signal Laboratory
- The Pentium Lab
- Semiconductor Lab
- CEDA Lab (Center for Electronic Design Automation)
- Computer Architecture Lab
- Digital Signal Processing Lab
- Photonics Lab
- High Frequency Lab
- Advanced Electromagnetics Lab
- Robotics Lab
- Electromagnetic Energy Conversion Lab
- Electronics Lab
- Graduate Lab
- Studio Labs (3)
- Integrated Circuit Design Lab
- MEMs Lab

### Accreditation

The electrical engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

### Student Skills & Capabilities

**End of Second Year:** Design, analyze, and simulate simple digital and lumped parameter electrical circuits using a workstation environment. Use of MATLAB. C programming and assisting with systems analyses.

**Middle of Third Year:** Design and simulate simple electronic circuits using PSpice. Exposed to the principles of AC circuit design and analysis.

**End of Third Year:** Work with concepts of electromagnetic coupling and radiation. Design, evaluate, and simulate small electronic systems using PSpice based software and MATLAB. A course in Linear Systems prepares the student to analyze and design circuitry for transient behavior with the Laplace transform and for frequency response with Fourier techniques. Ability to participate in basic quality control work.

**Middle of Fourth Year:** Assist in attacking problems involving electromagnetic emission and coupling of signals as well as simple energy conversion applications. Analyze sampled analog and digital systems using Z-transform and the MATLAB/SIMULAB software.

**End of Fourth Year:** Design analog motion control systems using the MATLAB/SIMULAB software. Design and lay out digital logic circuits. Analyze simple analog and digital communications systems as well as optical components and systems.

**Middle of Fifth Year:** Increased the level of competence in a more specialized area of expertise (e.g., electronic design, control systems, communications, digital system design). Capable of work as an entry-level electrical engineer with the consequent increase of professional responsibility.

# Electrical Engineering

## Course Sequence BS degree

### First Year

Digital Systems  
College Chemistry I  
Calculus I - III  
University Physics I & II  
Univ. Phys. Lab I  
Liberal Arts (Core)  
Electrical Engineering Freshman Practicum

### Second Year

Scientific Applications (C)  
Circuits I with Lab  
Microcomputer Systems with Lab  
Statics & Dynamics  
Calculus IV  
Differential Equations  
Engineering Mathematics  
University Physics III & Lab  
Modern Physics I  
Liberal Arts (Core)  
Optional Free Elective  
Electrical Engineering Sophomore Practicum  
Intro to Semiconductor Devices

### Third Year

Circuits II  
Electronics I, II with Labs  
Linear Systems I  
Electromagnetic Fields I  
Probability & Statistics  
Complex Variables  
Cooperative Education (2 quarters)  
Computer Architecture with Lab

### Fourth Year

Control Systems Design  
Communication Systems  
Digital Electronics with Lab  
Linear Systems II  
Electromagnetic Fields II with Lab  
Liberal Arts (Concentration)  
Cooperative Education (2 quarters)  
Professional Electives

### Fifth Year

Professional and Free Electives  
Senior Design Part I & II  
Liberal Arts (Concentration & Senior Seminar)  
Cooperative Education (1 quarter)  
Mechatronics

### Courses within Options

#### Biomedical Engineering

Fundamental Electrophysiology  
Biomedical Instrumentation  
Biology, Physiology, Anatomy  
Professional Electives include:  
Biomedical Sensors and Transducers I  
Biomedical Signal Processing  
Biorobotics/Cybernetics

#### Computer Engineering

Advanced C Programming  
Microcomputer Software I  
  
Professional Electives include:  
Embedded Microcontroller  
DSP Architecture  
Physical Implementation of ICs  
Microcomputer Software II

#### BS/MS

Standard first two years.  
Must maintain GPA of 3.4.  
Professional Electives - 16 Quarter Credits  
Graduate Electives - 20 Quarter Credits  
Thesis or Graduate Paper

#### Mixed Signal Emphasis

Graduate Electives include:  
Random Signals & Noise  
High Performance Semi Devices  
Analog/Digital Data Conversion

#### Premed Emphasis

Professional Electives Include:  
Biomedical Sensors & Transducers  
Biomedical Signal Processing

### Selected Employers of Electrical Engineering Co-op and Graduating Students:

Analog Devices, Boeing, Bosch Security Systems, Bose Corp., Eastman Kodak, Harris Corporation, IBM, Intel, Lockheed Martin, Micron Technologies, Microsoft, Microwave Data Systems, MKS/ENI Technologies, Motorola, Redcom Laboratories, Sensis Corp., Silicon Laboratories, Texas Instruments, Xerox.

### Contact Us:

We appreciate your interest in hiring RIT co-op, graduating students or alumni. For your convenience, you can access information and services through our web site at <http://www.rit.edu/recruit>.

### Maria Pagani Wiegand, Maureen P. Arquette, Program Coordinators

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