

ELECTRICAL ENGINEERING

<http://www.eme.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, Biomedical Engineering, Renewable Energy, Robotics, Control Systems, Communications, Devices & IC, MEMs, Analog and Mixed Signal.

Enrollment

Approximately 500 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:	\$16.50	\$10.00 - \$26.00
BS:	\$56,000	\$50,000 - \$80,000
MS:	\$66,000	\$60,000 - \$75,000
BS/MS:	\$68,000	\$64,000 - \$75,000

Equipment & Facilities

The department of electrical & microelectronic 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:

- Robotics
- Senior Design
- Ph.D. Microsystems
- Control Systems
- Computer Architecture/Bio-Tech Studio
- PC / Cadence Design Center
- Freshman Practicum Studio
- RF Electromagnetic/Antenna Design
- Electromagnetic Theory and Applications (ETA)
- General Purpose Studio Lab
- Graduate Research Lab
- DSP and Signal Processing Graduate Research Lab
- Digital Design/Embedded Systems Studio
- RF/Analog
- Biomedical Wet Lab
- Analog Devices Integrated Microsystem
- RF Shield Test and Measurement

Accreditation

The electrical engineering program is accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, Telephone (410) 347-7700.

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

Digital Systems
College Chemistry I
Calculus I - III
Physics I & II with Lab
Liberal Arts (Core)
Electrical Engineering Freshman Practicum
Writing

Second Year

Programming (C) and MATLAB
Circuits I, II with Lab
Microcomputer Systems with Lab
Multivariable Calculus IV
Differential Equations
Engineering Mathematics
University Physics III with Lab
Free and Restr Science Electives
Semiconductor Devices I

Third Year

Electronics I, II with Labs
Linear Systems I, II
Electromagnetic Fields I, II with Lab
Complex Variables
Free Electives

Fourth Year

Control Systems Design with Lab
Communication Systems with Lab
Computer Architecture with Lab
Digital Electronics with Lab
Individual Design Experience
Probability and Statistics for Engineers
Liberal Arts
Free Elective
Professional Electives

Fifth Year

Professional Electives
Senior Design I & II
Liberal Arts (Concentration)
Mechatronics

Courses within Options:

Biomedical Engineering

Fundamental Electrophysiology
Biomedical Instrumentation
Biomedical Sensors and Transducers I
Biomedical Signal Processing

Robotics

Advanced Programming for Engineers
Robotics Systems
Principles of Robotics
Advance Robotics

Communications

Dig Filters & Signal Proc
Communication Networks
Digital Data Communications

Control Systems

State Space Control Sys
Biorobotics/Cybernetics
Artificial Intelligence
Principles of Robotics

Digital & Computer Engineering

Advanced C Programming
Microcomputer Software I
Embedded Microcontroller
DSP
Physical Implementation of ICs

Renewable Energy

Intro to Clean & Renewable Energy
Energy Conversion
Power Electronics
Electrical Power Transmission & Distribution

Devices and Integrated Circuits

Analog Electronic Design
Adv Semiconductor Dev
Power Electronics
Design of Digital Systems
Analog Filter Design

MEMs

MEM's Design
MEMS Systems Evaluation

BS/MS

Standard first two years.
Must maintain GPA of 3.4.
Professional Electives - 12 Quarter Credits
Graduate Electives - 32 Quarter Credits
Thesis or Graduate Paper

BS/MS Options/Emphasis:

Biomedical Engineering
Computer Engineering
Analog and Mixed Signal

Professional Electives:

Electromagnetic Fields & Optics

Modern Optics for Engineers
Microwave Circuit Theory
Antenna Theory and Design

Signal Processing

Dig Filters & Signal Proc
Analog Filter Design

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

Advanced Micro Devices, Analog Devices, Anaren Microwave, Apple Inc., BAE, Boeing, Bosch Security Systems, Bose Corp., Boston Scientific, Carestream Health, Cisco, Fisher Price, GE, General Dynamics, Harris Corporation, Honeywell, IBM, Intel, ITT, J&J, L-3 Global Communications, Lockheed Martin, Lutron, Micron Technologies, Microsoft, Northrop Grumman, Redcom Laboratories, SRC, Sensis Corp., Siemens, Syracuse Research Corp., Texas Instruments, Toyota, TE Connectivity, Welch Allyn, 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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