

MECHANICAL ENGINEERING

<http://www.rit.edu/~mecheng/>

PROGRAM OVERVIEW FOR EMPLOYERS

Professional courses are offered in the areas of thermal systems, applied mechanics, manufacturing, materials science, systems analysis, computer-aided graphics and design, robotics, automotive engineering, aerospace engineering, bioengineering, and energy and the environment. Laboratories are equipped to provide extensive experimentation in these areas. Students are prepared for engineering positions in design, development, research, or manufacturing, in a diversity of work environments. All students complete a broad core of mechanical engineering coursework, emphasizing solid-body mechanics and thermal-fluid sciences. The undergraduate program in Mechanical Engineering offers an unparalleled opportunity for hands-on and laboratory experience. Technical electives during the final two years allow each student to emphasize his/her area(s) of interest. In the 3rd year students are introduced to an engineering design project requiring a team-based approach to an open-ended problem. In the 5th year students complete a capstone, multi-disciplinary, team-based design and build project (over a period of six months)*. Students are very active in professional society activities, including design competitions, e.g. 2001 Formula SAE team finished 1st in Australasia Car Competition, and consistently place near the top in the national Formula SAE Competitions, and the UK Competition. Students took first place in the 2007 ASME/NASA Moonbuggy Competition, and regularly finish in the top-10 in the SAE Aero Heavy Lift Competition, and Micro Air Vehicle Competition.

Degree(s) Awarded

Bachelor of Science (5 year), Bachelor/Master of Science dual degree, Bachelor/Master of Engineering dual degree, Master of Science, Master of Engineering

Enrollment

Approximately 730 full-time and 4 part-time undergraduates, 85 dual degrees, 25 full time ME and 51 full time MS students enrolled.

Cooperative Education Component

BS program requires 5 quarters of co-op. BS/MS and BS/ME programs require 4 quarters of co-op. Students available for 3 or 6 month co-ops, year around, beginning third year. Typical 6 month co-op: June-November or December-May.

Salary Information (Avg/Range)

Co-op:	\$15.09	\$6.25 - \$28.00
BS:	\$52,000	\$35,000 - \$70,000
BS/MS:	\$66,600	\$52,000 - \$72,000

Equipment & Facilities

- Extensive computer availability including three modern PC labs, system dynamics lab, and a measurement, instrumentation, and control lab
- Robotics lab, with a variety of robots and microrobots
- Complete machine tool lab including manual and CNC machines
- Design Studio labs
- Vibration spectrum analyzer
- Computational Fluid Dynamics lab
- Thermo-fluid laboratory experiments
- Subsonic wind tunnel
- Copper Vapor Laser Particle Imaging Velocimetry (PIV)
- Proton Exchange Membrane Fuel Cell Laboratory

- Biomedical Device Engineering Laboratory
- Thermoelectric systems and technology laboratory
- Bioengineering Laboratory
- Extensive advanced material testing equipment (universal testing machine, torsion tester, digital strain gauge testing, x-ray diffraction, atomic force microscope)
- Thermal analysis and microfluidics laboratory
- Engine Performance / Dyno Testing laboratory
- Composite materials laboratory
- Refrigeration laboratory

Accreditation

The mechanical engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). The program and its options are evaluated using the program criteria for mechanical engineering.

Student Skills & Capabilities

- Engineering graphics and CAD/Pro E
- Use of computers as an engineering tool, including data analysis and system modeling via PC applications and other commercially available software such as MATLAB, LabView, and ANSYS
- Machine design
- Finite Element Analysis
- Thermal-fluid sciences
- Application of machine tools and fabrication processes
- Solid-body mechanics (statics and dynamic/kinematics)
- Materials testing and selection
- "Hands-on" assembly/testing
- Turbomachinery
- Heat transfer
- Aerodynamics and Aerostructures
- Automotive engine performance
- Mechanics of Materials

Mechanical Engineering

Course Sequence BS degree

1st & 2nd Years:

MIC Lab
Calculus, Differential Equations,
Matrices & BVP
Engineering Statistics
Chemistry (Incl. energy conversion
electrochemistry)
Thermodynamics
Fluid Mechanics*
University Physics*
Materials Processing*
Problem Solving with Computers* (incl.
PC-applications)
Mechanics of Materials*; Statics
Dynamics
Engineering Design Graphics*
Science Elective I

3rd & 4th Years:

Materials Science*
Science Elective II
Design of Machine Elements
Advanced Computational Techniques
Heat Transfer
System Dynamics* (modeling, analysis,
and design)
Circuits I*
Numerical Methods
Technical Electives*
Four (4) co-op quarters
Cornerstone Design*
Transport Phenomena*

5th Year:

Senior Design Project** (6 month, team-
based working solution to an actual
multi-disciplinary problem)
Technical Electives*
One (1) co-op quarter

3 Free Electives
9 Liberal Arts Courses

BS/MS (dual degree) Program

All undergraduate courses, plus:
Nine (9) grad courses, Thesis

BS/ME (dual degree) Program

All undergraduate courses, plus:
Twelve (12) grad courses

Both Dual Degree Programs:

Three courses common undergrad/grad
Four (4) co-op quarters

*Laboratory/major project required

Option Courses (Take all in 4th & 5th years; available to other students separately as electives as space is available):

Aerospace

Intro to Aerospace Engineering
Aerostructures*
Aerodynamics
Propulsion
Flight Dynamics
Fatigue & Fracture
Composites*
Orbital Mechanics

Automotive

Intro to Automotive Design & Manufacturing
Vehicle Dynamics
Vibrations*
Internal Combustion Engines
Control Systems
Fuel Cell Technology
Tribology
Powertrain

Bioengineering

Contemporary Issues in Bioengineering
Biomaterials
Fundamentals of Particulate Behavior in Biological Sys
Biomechanics
Biomedical Device Engineering

Energy & the Environment

Contemporary Issues in Energy & the Environment
Refrigeration & Air Conditioning
Advanced Thermodynamics
Fuel Cell Technology
Alternative Fuels and Energy Efficiency

** Senior Design Projects

To view recent projects, please visit <http://edge.rit.edu/content/Resources/public/Project%20Archives>

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

Bausch and Lomb, Boeing, Borg Warner Automotive, Corning, Delphi, Dresser Rand, General Electric, General Motors, Goulds Pumps, Honda R&D, IBM, Impact Technologies, Johnson & Johnson, Lockheed Martin, McNeil Consumer Products, Moog, NASA, Parker Hannifin, Pratt & Whitney, Toyota, Xerox, and dozens more!

Contact Us:

We appreciate your interest in hiring RIT co-op, graduating students or alumni. We will make every effort to make your recruiting endeavor a success. Call our office and ask to speak with Lisa Monette or Sarah Burke, the program coordinators who work with the Mechanical Engineering program. For your convenience, you can access information and services through our web site at <http://www.rit.edu/recruit>.

Lisa A. Monette, Sarah W. Burke

Program Coordinators

Office of Cooperative Education and Career Services
RIT, Bausch & Lomb Center, 57 Lomb Memorial Drive, Rochester NY 14623-5603
Lisa: 585.475.7413; Sarah: 585.475.7887
lamoce@rit.edu; swboce@rit.edu