

## FELLOWSHIPS AND FINANCIAL AID

Fellowships administered by the College of Engineering are awarded every year to students in Mechanical Engineering. The application process varies and students should visit the College of Engineering website, [www.eng.vt.edu](http://www.eng.vt.edu), and the Fellowships link on the Mechanical Engineering website, [www.me.vt.edu](http://www.me.vt.edu), for more information. All applicants offered admission to the Mechanical Engineering Department are automatically considered for Graduate Teaching Assistantships. Applicants should contact professors within their areas of interest with a resume for Graduate Research Assistantships. Graduate teaching, research and project assistantships will range from approximately \$1,480 to \$1,560 per month for normal appointments during the '03-'04 academic year. In addition, supplemental fellowships of \$3,000 to \$8,000 per year are available, depending upon the student's academic record. The ME department assumes the responsibility of paying the tuition of all supported (GTA and GRA) students. Additional information on loans, grants, and scholarships is available on the Office of Scholarships and Financial Aid website: <http://www.finaid.es.vt.edu/>

## MISSION OF MECHANICAL ENGINEERING DEPARTMENT

Virginia Tech's Mechanical Engineering Department serves its students, alumni, the Commonwealth of Virginia and the nation through a variety of academic, community service, and research programs.

The Mechanical Engineering Department educates the engineers of tomorrow by integrating classroom theory and practical hands-on projects, by emphasizing the process of learning and critical thinking, and by promoting professional relationships among the university, the business community, and engineering colleagues.

## MECHANICAL ENGINEERING GRADUATE COURSE OFFERINGS

### Fall

#### Advanced Undergraduate Courses

4204 Internal Combustion Engines  
4554 Advanced Technology Motor Vehicles  
4624 Finite Element Practice in Mechanical Design  
4634 Introduction to Computer-Aided Design and Manufacturing  
4724 Engineering Acoustics  
4734 Mechatronics

#### Graduate Courses

5135 Vehicle Propulsion  
5304 Conduction Heat Transfer  
5404 Fluid Dynamics\*  
5505 Advanced Control Engineering  
5514 Vibration of Mechanical Systems  
5714 Digital Signal Processing for Mechanical Measurements\*  
5724 Advanced Instrumentation and Signal Processing\*  
5754 Advanced Impact Biomechanics  
5984 SS: Smart Structures  
5984 SS: Communication in Engineering Research  
6754 Computational Modeling in Impact Biomechanics

\*Will be televised

### Spring

#### Advanced Undergraduate Courses

4224 Aircraft Engines and Gas Turbines  
4424 Thermodynamics of Fluid Flow  
4524 Introduction to Robotics and Automation  
4534 Land Vehicle Dynamics

#### Graduate Courses

5104 Thermodynamics: Foundations & Applications  
5214 Combustion  
5254 Fuel Cell Systems  
5314 Convective Heat and Mass Transfer  
5324 Radiation Heat Transfer  
5424 Turbomachinery  
5506 Advanced Control Engineering  
5534 Experimental Modal Analysis  
5614 Advanced Kinematics  
5634 Finite Elements in Machine Design  
5644 Rapid Prototyping  
5734 Advanced Engineering Acoustics  
5744 Methods of Mechanical Engineering Analysis (valid for Math credit)  
6405/AOE 5144 Advanced Internal Flow  
6704 Advanced Vibrations

## ADDITIONAL INFORMATION

The interested student should visit the Mechanical Engineering web page for more information regarding the graduate program: [www.me.vt.edu](http://www.me.vt.edu).

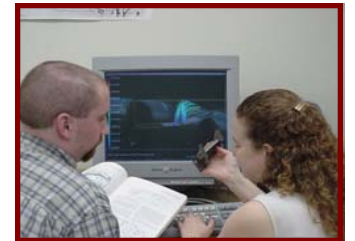
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## MECHANICAL ENGINEERING AT VIRGINIA TECH



## GRADUATE PROGRAM



# **MECHANICAL ENGINEERING GRADUATE PROGRAM**



Of the many engineering disciplines, mechanical engineering is the broadest, encompassing a wide variety of engineering fields and many specialties. Although it is commonly assumed that mechanical engineers are automotive engineers, in fact, mechanical engineers are employed in an enormous range of technical areas including: acoustics, air-conditioning, automatic controls, computer-aided design, energy management, fluid dynamics, tribology, robotics, biomechanics, and turbomachinery, just to name a few. Mechanical engineering is a challenging, rewarding, and highly respected profession, a profession the Department of Mechanical Engineering at Virginia Tech supports through its commitment to excellence in its teaching, research, scholarship, and service missions.

## **THE DEPARTMENT OF MECHANICAL ENGINEERING**

Virginia Tech is the home of the Commonwealth's leading College of Engineering,

for its excellent programs in engineering education, research, and public service. The Department of Mechanical Engineering is one of the largest departments within the College, awarding approximately 200 undergraduate, 40 masters of Science, and 10 Doctoral degrees annually. Despite its large enrollment, the average graduate class size in the department is fewer than 20 students and the department offers many opportunities for graduate students beyond the typical classroom educational experience. The ME department at Virginia Tech has one of the largest, most active ASME (American Society of Mechanical Engineers) student sections in the United States. In addition, the department offers opportunities in the Cooperative Education Program, professional conferences and internships. The graduate program in Mechanical Engineering at Tech is consistently ranked in the top 10-15% of Mechanical Engineering Departments in the nation by *U.S. News and World Report*.

## **THE CURRICULUM**

Mechanical Engineering is a profession that requires specific skills acquired through education and training. Courses provide a broad background in design methodology, engineering economics, computer programming, electronics, solid and fluid mechanics, manufacturing processes, system modeling, machine design, thermodynamics, heat transfer, statistics and materials. The M.S. requires a minimum of 30 semester credits, including at least six semester credits of research and thesis and three semester credits of mathematics. The expectation is that students will finish in 15 to 18 months. The Ph.D. plan of study requires a minimum of 90 semester credits beyond the B.S., including at least 30 semester credits of research and dissertation and nine semester

credits of mathematics. Although most students complete the MS degree before entering the Ph.D. program, the MS degree requirement may be waived if sufficiently justified. Each student, in cooperation with his or her advisory committee, develops a plan of study that will include courses appropriate to the student's individual interests and needs. For more details on the ME Department and requirements, please visit our website at: <http://www.me.vt.edu>

## **EMPHASIS ON RESEARCH**

The Mechanical Engineering Department research expenditures average over \$4.5 million per year. The department has a number of specialized laboratories on and off campus. There is over 66,000 sq. ft. devoted to research and teaching activities with five research centers headquartered in the department. They are the Center for Turbomachinery and Propulsion Research, the Energy Management Institute, the Center for Automotive Fuel Cell Systems, the Center for Intelligent Material Systems and Structures, and the Vibration and Acoustics Laboratories. In addition, many faculty members are actively involved in interdisciplinary centers including the Center for Adhesive and Sealant Science, the Center for Biomedical Engineering, the Polymer Materials Interfaces Laboratory, the Center for Composites Materials and Structures, the Virginia Tech Transportation Institute, the Manufacturing Systems Engineering Center, the Center for Energy and the Global



Students and professors work on a fuel cell stack in the Center for Automotive Fuel Cell Systems.

Environment, and the Center for Power and Electronic Systems. The activities of these centers, combined with the many different research activities within the department, offer extremely diverse choices of research topics. For more information, please go to <http://www.me.vt.edu/research/index.html>

## **AREAS OF EXPERTISE**

Acoustics & Noise Control	Magnetic Bearings
Atmospheric Radiation	Microwave Processing
Biomedical Engineering	Modal & Vibration
Combustion & Air Pollution	Robotics & Kinematics
Computer Aided Design	Rotor Dynamics
Dynamics & Controls	Smart Materials Systems & Structures
Energy Systems	Thermodynamics
Fluid Mechanics	Tribology/Biotribology
Heat Transfer	Turbo & Propulsion
Machine Design	Vehicle Dynamics



Facility for testing louvered fins for compact heat exchangers.