



## SCHOLARSHIPS AND FINANCIAL AID

Scholarships administered by the College of Engineering are awarded every year to rising freshman, sophomores, juniors and seniors in Mechanical Engineering. The application process varies for incoming freshman, transfer students and upper-classmen. Students should visit the College of Engineering website, [www.eng.vt.edu](http://www.eng.vt.edu), and the Scholarships link on the Mechanical Engineering website, [www.me.vt.edu](http://www.me.vt.edu), for more information. All freshmen offered admission to the College of Engineering are automatically reviewed for Marshall Hahn Engineering Scholarships and no separate application is required. Rising sophomores and upper-classmen apply for College and Departmental scholarships during the Spring semester each year.

Additional information on loans, grants, and scholarships is available on the Office of Scholarships and Financial Aid website Please follow the appropriate links on the Virginia Tech homepage: <http://www.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.

## COURSEWORK REQUIRED FOR MECHANICAL ENGINEERING DEGREE

### Sophomore

ECPE 3054 Electrical Theory  
EF 2314 Engineering Problem Solving with C++ or ME/MATH 2004 Numerical Methods  
ESM 2104, 2204 Statics, Deformable Bodies  
ESM 2304 Dynamics  
ISE 2214 Manufacturing Processes  
MATH 2224, 2214 Multivariable Calculus, Diff. Eq.  
ME 2024 Intro to ME Design  
ME 2124 Intro to Thermal Fluid Sciences  
STAT 3704 Engineering Statistics  
PHYS 2306 Foundations of Physics & Lab II  
**Total Required Credits = 32 Credit Hours**

### Junior

ECPE 3254 Industrial Electronics  
ME 3514 System Dynamics  
ME 3124 Thermodynamics  
ME 3304 Heat Transfer  
ME 3404 Fluid Mechanics  
ME 3504/4504 Vibrations or Controls  
ME 3614 Mechanical Design  
ME 4005 ME Lab I (writing intensive)  
MSE 2034 Elements of Material Science  
Area 2: Ideas, Cultural Traditions, and Values  
Area 3: Society and Human Behavior  
Technical Elective  
**Total Required Credits = 33 Credit Hours**

### Senior

ME 4015, 4016 Capstone Design Course (Writing Intensive)  
ME 4006 ME Lab II  
ME 4984 CAD in Fluid Thermal Systems  
Technical Electives  
Technical Electives  
Area 2: Ideas, Cultural Traditions, and Values  
Area 3: Society and Human Behavior  
Area 7: Critical Issues in a Global Context  
**Total Required Credits = 33 Credit Hours**



## ADDITIONAL INFORMATION

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

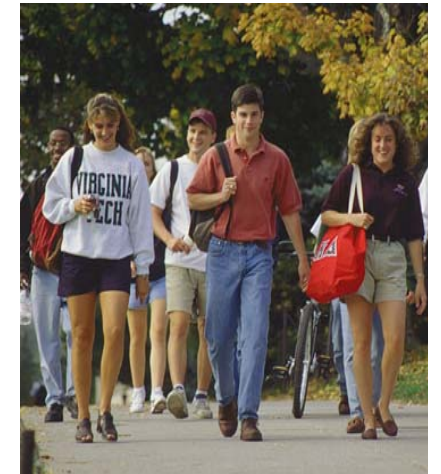
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## MECHANICAL ENGINEERING AT VIRGINIA TECH



## UNDERGRADUATE PROGRAM

*EDUCATING THE ENGINEERS OF TOMORROW*



# MECHANICAL ENGINEERING



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

Virginia Tech is the home of the Commonwealth's leading College of Engineering, known in Virginia and throughout the nation 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 220 undergraduate, 60 masters of Science, and 10 Doctoral degrees annually. Despite its large enrollment, the average undergraduate class size in the department is fewer than 50 students and the department offers many opportunities for undergraduate students beyond the typical classroom educational experience. All ME students are required to participate in hands-on engineering projects, and 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 for undergraduate students to participate in research, where students work with faculty and graduate students on relevant and challenging research topics. The undergraduate 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. Mechanical Engineering at Virginia Tech is a four-year program. All first year engineering students take the same engineering fundamental core courses, including courses in mathematics and physics. Courses specific to Mechanical Engineering begin in the sophomore year. These 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. This background is strengthened and unified through a sequence of engineering and laboratory courses. Instructional laboratories in the junior and senior years provide opportunities for students to learn



Virginia Tech's Mini Baja Team competing at Kansas State in an annual event sponsored by the Society for Automotive Engineers

measurement and instrumentation techniques. Five technical elective classes in the junior and senior years permit students to obtain instruction in technical areas related to individual career plans or preparation for graduate study.

## EMPHASIS ON DESIGN

The Mechanical Engineering Department is committed to providing students with an exceptional experience in both the theory and practice of Mechanical Engineering. The unifying activity in all aspects of mechanical engineering is design. A special emphasis has been placed on the applied design project experience as an integral part of the curriculum. In the senior capstone sequence, students are required to apply classroom knowledge to complex engineering problems requiring teamwork, problem formulation, economic analysis, effective communication, and product realization. These projects are carefully selected and updated to ensure relevancy to industrial needs and practices. The Department encourages the involvement of younger ME students and students outside the Department and College in these projects. The Department also encourages

hands-on student involvement by providing dedicated machine and welding shops that exclusively serve the undergraduate program. The Department employs a full time writing and presentation skills instructor who works with students in laboratory and design courses to develop these important abilities. To ensure the continuing development of graduates, specific instruction is provided in lifelong learning methods, including self-directed and graduate study programs.

## COOPERATIVE EDUCATION PROGRAM

Approximately one-third of all mechanical engineering students participate in the Cooperative Education Program. In this program, students typically alternate semesters of study with semesters of professional employment. This program provides students with an excellent opportunity to gain practical experience, earn money toward their education, and improve their marketability after graduation. Summer internships are also available. Additional information can be obtained from the Cooperative Education program website, accessed through the Career Services Site: <http://www.career.vt.edu/COOP/COOP1.html>.

## UNIVERSITY HONORS PROGRAM

The University Honors Program at Virginia Tech provides assistance for academically talented students to make choices that will serve the long-term interests of the student. The interested student should visit the Honors Program website for additional information (this site can be located through the Virginia Tech homepage, [www.vt.edu](http://www.vt.edu), or <http://www.univhonors.vt.edu>).