Mechanical Engineering

University Requirements (23-23)
- Writing – American Thought and Language (ATL) 4
- Integrative Studies in Humanities (IAH) 8
- Integrative Studies in Social Sciences (ISS) 8
- Bioscience (one of the following):
  - BS 110, BS 111, ENT 205, MMG 205 3
  - MMG 301, PLB 105, PSL 250, ZOL 141 4

College Requirements (29)
- CEM 141 General Chemistry I 4
- CSE 131 Technical Computing and Problem Solving 3
- MTH 132 Calculus I 3
- MTH 133 Calculus II 4
- MTH 234 Multivariable Calculus 4
- MTH 235 Differential Equations 3
- PHY 183 Physics for Scientists & Engineers I 4
- PHY 184 Physics for Scientists & Engineers II 4

Bachelor of Science Major Requirements (55)
- CEM 161 Chemistry Laboratory I 1
- ECE 345 Electronic Instrumentation & Systems 3
- ME 180 Engineering Graphics Communications 3
- ME 201 Thermodynamics 3
- ME 221 Statics 3
- ME 222 Mechanics of Deformable Solids 4
- ME 332 Fluid Mechanics 4
- ME 361 Dynamics 3
- ME 371 Mechanical Design I 3
- ME 391 Mechanical Engineering Analysis 3
- ME 410 Heat Transfer 3
- ME 412 Heat Transfer Lab 2
- ME 451 Control Systems 4
- ME 461 Mechanical Vibrations 4
- ME 471 Mechanical Design II 3
- ME 481 Mechanical Engineering Design Projects 3
- MSE 250 Materials Science and Engineering 3
- STT 351 Probability and Statistics for Engineering 3

Senior Electives (12)
A minimum of 12 credits must be taken from the list below, including at least one Design-Intensive Course:
- ME 422 Introduction to Combustion 3
- ME 432 Intermediate Fluid Mechanics 3
- ME 444 Automotive engines 3
- ME 490 Independent Study in Mechanical Egr 1-3
- ME 491 Selected Topics in Mechanical Egr 1-4

Design Intensive Courses:
- ME 414 Vehicle Thermal System Design 3
- ME 416 Comp Assisted Design of Thermal Sys 3
- ME 442 Turbomachinery 3
- ME 445 Automotive Powertrain Design 3
- ME 475 Comp Aided Design of Structures 3

Options:
The Department offers options in engineering mechanics, and manufacturing engineering to students wishing an area of specialization in their degree. The options are available to, but not required of, any student enrolled in the Bachelor of Science degree program in mechanical engineering. NOTE: Completing the Bachelor of Science degree in mechanical engineering with an option may require more than 128 credits. Upon completion of the required courses for one of these options, certification will appear on the student's official transcript.

Manufacturing Engineering Option (13)
- ME 372 Machine Tool Laboratory 1
- ME 477 Manufacturing Processes 3
- ME 478 Product Development 3
- Select one of the following courses (3 credits):
  - CHE 472 Composite materials Processing 3
  - ECE 415 Computer Aided Manufacturing 3
  - 3 Introduction to Composite Materials 3
- Select one of the following courses (3 credits):
  - CE 375 Cost Engineering and Engineering Ethics 3
  - EC 210 Economic Principles Using Calculus 3

Note: Economics 210 is required for students pursuing the Master of Science Degree in Manufacturing Management.

Engineering Mechanics Option (12)
- ME 423 Intermediate Mechanics of Deformable Solids 3
- Select three of the following courses (9 credits):
  - ME 424 Computational Mechanics 3
  - ME 425 Experimental mechanics 3
  - ME 432 Intermediate Fluid Mechanics 3
  - ME 464 Intermediate Dynamics 3

Other Electives (Variable)

Total Credits Required for Degree 128

1 If PHY 231 is taken in place of PHY 183, PHY 233B must also be completed. If PHY 232 is taken in place of PHY 184, PHY 234 B must also be completed.

The requirements listed above apply to students admitted to the major of Mechanical Engineering in the Department of Mechanical Engineering beginning Fall, 2003. The department of Mechanical Engineering (ME) constantly reviews program requirements and reserves the right to make changes as necessary. Consequently, each student is strongly encouraged to consult with his/her advisor to obtain assistance in planning an appropriate schedule of courses. Students who have questions about mechanical Engineering should contact the mechanical Engineering Department Advising Office, 2560 Engineering Building, phone (517) 355-3338.

Some courses may have prerequisites, which are not otherwise required in the program. Students should check course descriptions to ensure they are aware of prerequisites.
## Program Objectives

The undergraduate program in mechanical engineering must ensure that our graduates are very well prepared to enter into and continue progressing in the mechanical engineering profession. To achieve these goals, the program must provide a sufficiently broad and deep base of mathematics; physical science; engineering science; and computer, laboratory, design, and communication experience. The program must also provide breadth, depth, and a balanced view of the engineering principles in both the thermal/fluids area and the mechanical systems area, including the design and realization of such systems. In addition, the program must demonstrate the ability of graduates to apply multivariate calculus, statistics, differential equations, and linear algebra to the solution of mechanical engineering programs. Graduates must be prepared for entry into the engineering profession through a major design experience based on the knowledge and skills acquired in earlier course work. This experience should incorporate engineering standards and realistic constraints that include most of the following considerations: economics, sustainability, manufacturability, health and safety, social, ethical, and environmental.

In summary the program must integrate knowledge and skills acquired in a diverse set of courses to achieve the following abilities in its graduates:

(a) An ability to apply knowledge of mathematics, science and engineering

(b) An ability to function on multi-disciplinary teams

(c) An ability to identify, formulate, and solve engineering problems

(d) An ability to communicate effectively

(e) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

(f) An ability to design a system, component, or process to meet desired needs

(g) An ability to design and conduct experiments, as well as to analyze and interpret data

Additionally, through the culture of the program and the attitude of the faculty the program must achieve the following abilities in its graduates:

(h) An understanding of professional and ethical responsibility

(i) A recognition of the need for, and an ability to engage in life-long learning

(j) An understanding of the impact of engineering solutions in a global/societal context as provided by a broad education

(k) A knowledge of contemporary issues