

Mechanical Engineering

Accredited by the Engineering Accreditation Commission of ABET,
 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 - telephone (410) 347-7700.

University Requirements (23-24)

| | |
|---|-----|
| Writing, Rhetoric and American Cultures (WRA) | 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 201, | |
| MMG 301, PLB 105, PSL 250, ZOL 141 | 3-4 |

College Requirements (30)

| | |
|---|---|
| CEM 141 General Chemistry | 4 |
| *EGR 100 Introduction to Engineering Design | 2 |
| *EGR 102 Introduction to Engineering Modeling | 2 |
| 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 |

Major Requirements (54)

| | |
|--|---|
| CE 221 Statics | 3 |
| CEM 161 Chemistry Laboratory I | 1 |
| ECE 345 Electronic Instrumentation and Systems | 3 |
| ME 201 Thermodynamics | 3 |
| ME 222 Mechanics of Deformable Solids | 4 |
| ME 280 Graphic Communications | 2 |
| ME 332 Fluid Mechanics | 4 |
| ME 361 Dynamics0 | 3 |
| ME 371 Mechanical Design I | 3 |
| ME 391 Mechanical Engineering Analysis | 3 |
| ME 410 Heat Transfer | 3 |
| ME 412 Heat Transfer Laboratory | 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 |

*EGR 100 and EGR 102 are required for all students matriculating at MSU beginning Fall Semester, 2008. Students who matriculate before Fall 2008 must complete CSE 131 in place of EGR 102.

A. 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 423 | Intermed Mech of Deformable Solids | 3 |
| ME 425 | Experimental Mechanics | 3 |
| ME 426 | Introduction to Composite Materials | 3 |
| ME 432 | Intermediate Fluid Mechanics | 3 |
| ME 440 | Aerospace Engineering Fundamentals | 3 |
| ME 444 | Automotive Engines | 3 |
| ME 457 | Mechatronic Sys Modeling & Simulation | 3 |
| ME 464 | Intermediate Dynamics | 3 |
| ME 465 | Computer Aided Optimal Design | 3 |
| ME 477 | Manufacturing Processes | 3 |
| ME 478 | Product Development | 3 |
| ME 486 | Int'l Networked Teams/ Engr Design | 3 |
| ME 490 | Independent Study in Mechanical Engr | 1-3 |
| ME 491 | Selected Topics in Mechanical Engr | 1-4 |
| ME 494 | Biofluid Mechanics and Heat Transfer | 3 |
| ME 495 | Tissue Mechanics | 3 |
| ME 497 | Biomechanical Design | 3 |

Additional Senior Elective choices can be found in the ME Bulletin which is the undergraduate newsletter for Mechanical Engineering majors.

B. Design-Intensive courses (a minimum of 3 credits):

| | | |
|--------|--------------------------------------|---|
| ME 416 | Computer Ast Desn of Thermal Systems | 3 |
| ME 417 | Design of Alternative Energy Systems | 3 |
| ME 442 | Turbomachinery | 3 |
| ME 445 | Automotive Powertrain Design | 3 |
| ME 456 | Mechatronic System Design | 3 |
| ME 465 | Computer Aided Optimal Design | 3 |
| ME 475 | Computer Aided Design of Structures | 3 |

Concentrations:

The Department offers concentrations in engineering mechanics, and manufacturing engineering to students wishing an area of specialization in their degree. The concentrations 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 a concentration may require more than 128 credits. Upon completion of the required courses for one of these concentrations, certification will appear on the student's official transcript.

Biomechanical Engineering Concentration (16)

| | | |
|---------|--------------------------|---|
| BS 111 | Cells and Molecules | 3 |
| PSL 250 | Introductory Physiology. | 1 |

Select nine credits from the following courses (9 credits):

| | | |
|---------|--------------------------------------|-----|
| ME 494 | Biofluid Mechanics and Heat Transfer | 3 |
| ME 495 | Tissue Mechanics | 3 |
| ME 497 | Biomechanical Design | 3 |
| ME 490 | Independent Study in Mechanical Engr | 1-4 |
| ME 491 | Selected Topics in Mechanical Engr | 1-4 |
| MSE 425 | Biomaterials and Biocompatibility. | 3 |

Engineering Mechanics Concentration (12)

| | | |
|--------|---|---|
| ME 423 | Intermed Mechanics of Deformable Solids | 3 |
| ME 425 | Experimental Mechanics | 3 |
| ME 464 | Intermediate Dynamics | 3 |
| ME 475 | Computer Aided Design of Structures | 3 |

Manufacturing Engineering Concentration (13)

| | | |
|--------|-------------------------------------|---|
| EC 210 | Economics Principles Using Calculus | 3 |
| 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 |
| MSE 426 | Introduction to Composite Materials | 3 |

Global Engineering (12)

Complete all requirements above except Senior and Design-Intensive Electives and 12 credits of approved mechanical engineering courses from a MSU co-sponsored Study Abroad institution. At least 3 credits must include a team design project.

Other Electives (Variable)

Total Credits Required for Degree **128**

The requirements listed on opposite page apply to students admitted to the major of Mechanical Engineering in the Department of Mechanical Engineering beginning Fall 2008. 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.

Mechanical Engineering Sample Program

| Freshman Year | | | | Sophomore Year | | | |
|---------------|--------------|--------------|-----------|-----------------|-----------|-----------------|-----------|
| Fall | Credits | Spring | Credits | Fall | Credits | Spring | Credits |
| Bioscience | 3/4 | CEM 161 | 1 | CE 221 | 3 | IAH 20X | 4 |
| CEM 141 | 4 | EGR 102 | 2 | Elective | 3 | ME 201 | 3 |
| EGR 100 | 2 | MTH 133 | 4 | ME 280 | 2 | ME 222 | 4 |
| ISS 2XX | 4 | PHY 183 | 4 | MTH 234 | 4 | MSE 250 | 3 |
| MTH 132 | 3 | WRA 1XX | 4 | PHY 184 | 4 | MTH 235 | 3 |
| Total | 16/17 | Total | 15 | Total | 16 | Total | 17 |
| | | | | | | | |
| Junior Year | | | | Senior Year | | | |
| Fall | Credits | Spring | Credits | Fall | Credits | Spring | Credits |
| Elective | 3 | ECE 345 | 3 | ME 410 | 3 | ME 412 | 2 |
| ISS 3XX | 4 | Elective | 2 | ME 451 | 4 | ME 461 | 4 |
| ME 361 | 3 | IAH 2XX | 4 | ME 471 | 3 | ME 481 | 3 |
| ME 391 | 3 | ME 332 | 4 | Senior Elective | 3 | Senior Elective | 3 |
| STT 351 | 3 | ME 371 | 3 | Senior Elective | 3 | Senior Elective | 3 |
| Total | 16 | Total | 16 | Total | 16 | Total | 15 |

**Program Educational Objectives for the Undergraduate Program
 in Mechanical Engineering
 Department of Mechanical Engineering
 Michigan State University
 (Approved by the Department Faculty February 17, 2005)**

Objective 1: *Our graduates will be competent engineers practicing in a diverse range of activities.*

Objective 2: *Our graduates will use their mechanical engineering education as an impetus for personal & professional growth.*

Objective 3: *Our graduates will have achieved a noteworthy level of workplace responsibility through understanding their environment and capabilities, including the importance of knowledge management.*

Objective 4: *Our graduates will be independent thinkers who take ownership in identifying problems and determining effective solution strategies in a timely manner.*