

Mechanical Engineering

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1. 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 161, BS 162, ENT 205, MMG 201,	
MMG 301, PLB 105, PSL 250, ZOL 141	3-4

2. 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

3. Major Requirements: (66)

A. Complete all of the following courses: (54)

CE 221 Statics	3
CEM 161 Chemistry Laboratory I	1
ECE 345 Electronic Instrumentation and Systems	3
ME 280 Graphic Communications	2
ME 201 Thermodynamics	3
ME 222 Mechanics of Deformable Solids	4
ME 332 Fluid Mechanics (W)	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 Laboratory (W)	2
ME 451 Control Systems (W)	4
ME 461 Mechanical Vibrations (W)	4
ME 471 Mechanical Design II	3
ME 481 Mechanical Engr Design Projects (W)	3
MSE 250 Materials Science and Engineering	3
STT 351 Probability and Statistics for Engineering	3

C. Senior Electives: (9)

Complete a minimum of nine credits from the following:

ME 416 Computer Asstd Design of Thermal Sys	3
ME 417 Design of Alternative Energy Systems	3
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 440 Aerospace Engineering Fundamentals	3
ME 442 Turbomachinery	3
ME 444 Automotive Engines	3
ME 445 Automotive Powertrain Design	3
ME 456 Mechatronic System Design	
ME 457 Mechatronic Sys Modeling & Simulation	3
ME 464 Intermediate Dynamics	3
ME 465 Computer Aided Optimal Design	3
ME 475 Computer Aided Design of Structures	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 in Product Dev	3

D. Design-Intensive courses. Complete a minimum of three *additional* credits from: (3)

ME 416 Computer Ast Design of Thermal Sys	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)

To earn a Bachelor of Science degree in Mechanical Engineering with a biomechanical engineering concentration, students must complete requirements 1., 2., 3.a., 3.b., and 3.d. above and the following:

Both of the following courses (7):

BS 161	Cells and Molecular Biology	3
PSL 250	Introductory Physiology	4

Select nine credits from the following courses (9):

ME 494	Biofluid Mechanics and Heat Transfer	3
ME 495	Tissue Mechanics	3
ME 497	Biomechanical Design in Product Dev	3
MSE 425	Biomaterials and Biocompatibility	3
<i>ME 490 and ME 491 may be used, subject to Department approval.</i>		

Engineering Mechanics Concentration (12)

To earn a Bachelor of Science degree in Mechanical Engineering with a engineering mechanics concentration, students must complete requirements 1., 2., and 3.a., and 3.b. above and the following:

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

Manufacturing Engineering Concentration (13)

To earn a Bachelor of Science degree in Mechanical Engineering with a manufacturing engineering concentration, students must complete requirements 1., 2., 3.a., 3.b., and 3.d. above and the following:

All of the following courses (10):

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):

CHE 472	Composite Materials Processing	3
ECE 415	Computer Aided Manufacturing	3
MSE 426	Introduction to Composite Materials	3

Global Engineering (12)

To earn a Bachelor of Science degree in Mechanical Engineering with a global engineering concentration, students must complete requirements 1., 2., 3.a., and 3.b. above 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.

The requirements listed on opposite page apply to students admitted to the major of Mechanical Engineering in the Department of Mechanical Engineering beginning Summer 2011. 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 201-210	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	3	ME 461	4	ME 451	4
ME 361	3	IAH 211 or higher	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	17	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.*