

07287



Minnesota State University, Mankato
Curriculum Proposal

Please type or select the requested information. Print completed forms, add appropriate paper attachments, and route through MSU's curricular process for recommendations and decisions.

		(Check all that apply):		Proposal #	<u>355</u>
College:	<u>Science, Engineering and Technology</u>	<input checked="" type="checkbox"/>	Undergraduate	Effective Date of Change:	
Department:	<u>Mechanical Engineering & Civil Engineering</u>	<input type="checkbox"/>	Graduate	Academic Year	<u>06-07</u>
Program:	<u>Mechanical Engineering</u>	CIP #		(For Office Use Only)	
Type of Change	<u>N/A Bulletin Changes</u>			Course Designator	Number of
Proposed:	<u>N/A</u>			and Number	Credits
Title Current:					
Title Proposed:					
24-Char. Abbrev:					
(if applicable)					

Include a course or program description for the Bulletin (30-40 words maximum for courses, 100 for programs):

Rationale or Justification for change:

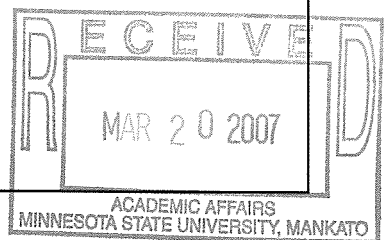
Clarification of admission requirements and change in probation policy.

*****For General Education or Cultural Diversity Courses Only*****

General Education Course:		Cultural Diversity Course:
GE Category #	GE Category Name (Maximum of 3 Categories)	(Please check one.)
<u>N/A</u>		<input type="checkbox"/> Core (At least 75% devoted to topics of race, gender, sexual orientation, age, class, and disabilities as they occur in United States Society.)
<u>N/A</u>		<input type="checkbox"/> Related (At least 25% devoted to the above topics or to a global perspective on topics related to African American, Asian, Hispanic, and Native American inhabitants of the United States.)
<u>N/A</u>		
<p>? For Writing Intensive Courses, attach a description of the kind and quantity of writing.</p> <p>? For Upper Division Courses, include a description of the respects in which it is broad and general rather than narrow and specific, and so suitable as GE.</p> <p>Attach paper copies of the following:</p> <p>a. Syllabus or course outline.</p> <p>b. Course's student learning outcomes associated with each GE competency or CD designation.</p> <p>c. List of strategies to be used to assess students' achievement of each GE competency or CD designation.</p>		

*****For New Courses*****



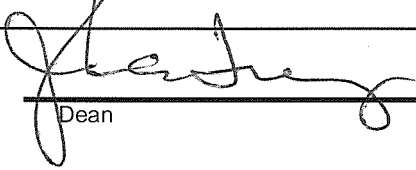
(Check all that apply):	Instructional Type: <u>Lecture</u>	Course will be offered:
<input type="checkbox"/> Course is an elective.	Grading Format: <input type="checkbox"/> Grade <input type="checkbox"/> P/N	<input type="checkbox"/> Fall Semester
<input type="checkbox"/> Course is required for program		<input type="checkbox"/> Spring Semester
<input type="checkbox"/> Pre- or Co-requisites:		<input type="checkbox"/> Summer Session
<input type="checkbox"/> Other courses are being changed or eliminated. (Explain.)		
<input type="checkbox"/> Course content or title is similar to courses in other departments. (Attach copy of letter of agreement with other program(s) contacted. Indicate the nature of the discussions and/or resolution of differences or potential conflicts.)		
<p>Attach paper copies of the following:</p> <p>a. Syllabus or course outline.</p> <p>b. Course's student learning outcomes.</p> <p>c. A list of resources required to offer and support this course.</p> <p>d. A description of how teaching this course will affect department staffing.</p> <p>e. If 400/500 level course, an explanation of added expectations of graduate students.</p>		





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Curriculum Proposal

Signature Page

Department		
<input checked="" type="checkbox"/> Recommended (Category/ies _____)		1 March 2007
<input type="checkbox"/> Not Recommended (Category/ies _____)	Department Chair	Date
Comments:		
College Curriculum Committee		
<input checked="" type="checkbox"/> Recommended (Category/ies _____)		3/9/07
<input type="checkbox"/> Not Recommended (Category/ies _____)	Committee Chair	Date
Comments:		
College Dean		
<input type="checkbox"/> Recommended (Category/ies _____)		3/19/07
<input type="checkbox"/> Not Recommended (Category/ies _____)	Dean	Date
Comments:		
General Education Subcommittee		
<input type="checkbox"/> Recommended (Category/ies _____)		
<input type="checkbox"/> Not Recommended (Category/ies _____)	General Education Subcommittee Chair	Date
Comments:		
Undergraduate Curriculum and Academic Policy Committee		
<input type="checkbox"/> Recommended (Category/ies _____)		
<input type="checkbox"/> Not Recommended (Category/ies _____)	UCAP Faculty Chair	Date
Comments:		
Faculty Association Graduate Committee		
<input type="checkbox"/> Recommended		
<input type="checkbox"/> Not Recommended	Faculty Association Graduate Chair	Date
Comments:		
Graduate Dean		
<input type="checkbox"/> Recommended		
<input type="checkbox"/> Not Recommended	Graduate Dean	Date
Comments:		
Academic Affairs Council		
<input type="checkbox"/> Recommended (Category/ies _____)		
<input type="checkbox"/> Not Recommended (Category/ies _____)	Assistant Vice President	Date
Comments:		
Senior Vice President and Vice President for Academic Affairs		
<input type="checkbox"/> Approved (Category/ies _____)		
<input type="checkbox"/> Not Approved (Category/ies _____)	Sr. Vice President / Vice Pres. Academic Affairs	Date
Comments:		

Department of Mechanical & Civil Engineering
Minutes of Meeting
2/23/2007

The meeting started at 1:02 p.m. with all department members present.

0. Minutes: The minutes of the two previous meetings of 1/30/07 and 2/6/07 were approved for issue.

1. Announcements:

- C. Johnson announced that research release time applications are due February 28.
- There was continuing discussion of the graduate faculty status. This included the idea of release time and the cycle times for applying for graduate faculty status.
- K. Chou brought up the selection process for the Dean search. The evaluations will be done by departments.
- D. Nykanen requested we announce the MAX Scholarship in our classes.
- P. Tebbe reminded department members there will be a graduate coffee hour this coming Tuesday, February 27.
- V. Nikolic raised some questions regarding graduate faculty status. There are levels of graduate faculty status. For the regular level, the department members are grandfathered and automatically become graduate faculty if they were previously graduate faculty. A next level of research graduate faculty will require the faculty apply for this. C. Johnson hopes to form a department committee to address the graduate faculty status question soon.
- J. Wilde announced that in two weeks the Civil Engineering Department will be hosting a Regional Conference involving eight other universities and a large number of students.

2. Bulletin Change: J. Wilde reviewed the proposed bulletin changes for the Civil Engineering Program that had earlier been forwarded to department members. There was some discussion of this in the area of the probationary status and a wording change was made. A motion was made by P. Tebbe that the same bulletin description be applied to Mechanical Engineering. This was seconded by J. Wilde. The motion passed.

C. Johnson suggested that the department keep a record of documents that are discussed in the meeting and acted on, such as the new bulletin change. The department will ask J. Willaert to keep a copy of attachments for the department record. It will not be necessary to attach these to emails to the larger CSET minutes distribution.

3. Teaching Assignments: C. Johnson handed out a listing of teaching assignments for the coming academic year. There was general discussion regarding the load assignment for various courses, especially labs. There is concern about staffing the courses in Spring 2008 as two department members will be on sabbatical. C. Johnson will request an additional person for Spring 2008. K. Chou suggested that people consider indicating courses they would be interested in teaching in rotation to fill in for the sabbatical leave faculty. The need to fill in for faculty who are on sabbatical will be a continuing need. C. Johnson requested department members let him know if we have any comments or questions regarding the teaching assignments.

The meeting adjourned at 1:57 p.m.

Respectfully submitted,

Vance Browne

MECHANICAL ENGINEERING

Mechanical Engineering

College of Science, Engineering & Technology
 Department of Mechanical and Civil Engineering
 205 Trafton Science Center E • 507-389-6383
 Fax: 507-389-5002

Web site: me.mnsu.edu

Chair: Saeed Moaveni, Ph.D., P.E.

Vance Browne, Ph.D., P.E.; Aaron S. Budge, Ph.D.; Karen C. Chou, Ph.D., P.E.; Jerzy Fiszdon, Ph.D., P.E.; Charles W. Johnson, Ph.D., P.E.; Vojin Nikolic, Ph.D.; Deborah K. Nykanen, Ph.D., P.E.; Jin Park, Ph.D.; Patrick A. Tebbe, Ph.D., P.E.; W. James Wilde, Ph.D., P.E.

Adjunct Faculty: William J. Billett, P.E.; Herman A. Dharmarajan, Ph.D., P.E., DEE; William R. Douglass, P.E.; D. Joseph Duncan, P.E.; Theodore V. Galambos, Ph.D., P.E.; Jon A. Huseby, P.E.; Peter Kjeer; Mark R. Knoff, Ph.D., P.E.; Timothy O. Loose, P.E.; Omid Monseni, Ph.D., P.E.; Ken R. Saffert, P.E.; Chad Suprenant, P.E.

Mechanical Engineering (ME) is essential to a wide range of activities that include the research, design, development, manufacture, management, and control of engineering systems, subsystems, and their components.

Mechanical engineers use the fundamentals of engineering mechanics, energy, thermal-fluid sciences, and material sciences to design and analyze mechanical systems that perform useful tasks required by society. For example, mechanical engineers work with the design and function of machines, devices, and structures in the areas of manufacturing, processing, power generation, and transportation (air, land, sea, and space). As a result of a rapidly expanding technology in recent years, mechanical engineers have become more versed in computer-aided design; robotics; bioengineering; environmental engineering; solar, wind, and ocean energy sources; and space exploration. The breadth of the field provides the graduate with many possibilities for a satisfying career.

Typically, mechanical engineers are employed by the manufacturing, power, aerospace, automotive, computer hardware and software, and processing industries. Careers are also available in design and development organizations as well as in many federal and state agencies. The department will make any reasonable effort to accommodate people with disabilities.

Accreditation

The Mechanical Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; telephone: (410) 347-7700.

Program Objectives: The Mission of the Mechanical Engineering program at Minnesota State Mankato is to provide a broad-based education that will enable graduates to enter practice in the mechanical engineering profession, serving the needs of the State of Minnesota and the Nation.

Graduates of the Mechanical Engineering program at Minnesota State Mankato will be prepared:

1. with a strong technical foundation to practice mechanical engineering, or to pursue graduate studies;
2. to become registered professional engineers;
3. to communicate technical information effectively with the public, their peers, customers, and employers;
4. with an understanding of the need for life-long learning and of the importance for community and professional involvement; and
5. with an awareness of cultural, societal, and professional issues.

The program mission and educational objectives are fully compatible with the mission of Minnesota State Mankato and the College of Science, Engineering, and Technology. Program objectives are monitored by the constituencies (mechanical engineering profession through the program's Industrial Advisory Board and employers, alumni, students, and faculty of the program).

Other important features of the mechanical engineering program at Minnesota State Mankato include the following:

- Students are required to take the Fundamentals of Engineering exam in their senior year - a precursor to professional registration.

- Students are encouraged to work in engineering related areas for exposure to industrial practice. Internships are strongly recommended.
- Senior students must participate in a full academic year design experience working in a team similar to development teams in industry and government. Industrial sponsored projects are offered when available.

Recommended high school preparation is two years of algebra, one year of geometry, one-half year of trigonometry, one-half year of college algebra, and a year each of physics and chemistry. Engineering drafting and a computer language such as BASIC are also recommended. Without this background it may take longer than four years to earn the degree.

Admission to Program is necessary before enrolling in 300- and 400-level courses. Admission to program is granted by the department. Near the end of the sophomore year, students should submit applications for admission to the mechanical engineering program. Application to the program may be obtained from the Department of Mechanical and Civil Engineering or downloaded from the department homepage.

Admission to the program is based on GPA and performance in selected courses and is subject to approval by the Department of Mechanical and Civil Engineering. Only students admitted to the program are permitted to enroll in upper-division ME courses. No transfer credits are allowed for upper-division ME courses. For any exceptions to this policy, special written permission must be obtained and will be reviewed by the department. The department makes a special effort to accommodate transfer students. Transfer students are encouraged to contact the department as soon as possible to facilitate a smooth transition. If local information is insufficient, please write, call or visit the department.

Before being admitted to upper division mechanical engineering courses, a student must complete a minimum of 51 credits, including the following courses: General Physics (calculus based) 10 credits; Calculus and Differential Equations 16 credits; Introduction to Engineering 2 credits; Computer Graphics Communication 1 credit; Geometric Dimensioning and Tolerancing 1 credit; Introduction to Problem Solving and Engineering Design 2 credits; Engineering Mechanics (Statics and Dynamics) 6 credits; Electrical Engineering (Circuits, including lab) 4 credits; Chemistry 5 credits; and English Composition 4 credits. Moreover, students are required to take a diagnostic test. The purpose of the test is to identify areas of weakness so that we can provide future improvement in those areas.

For transfer students the distribution of credits specified in the previous paragraph may vary, but the total credits must satisfy departmental transfer requirements. Transfer students should contact the department for individual evaluation.

All courses and credits shown above must be completed before enrollment in 300-level engineering courses. All of the above courses except internship credits must be taken for grade. It is not acceptable for the student to take any of these courses on a pass/no credit basis. A grade of "C" or better must be achieved in each course. To be considered for admission, the student must have a cumulative GPA of 2.5 for all science, math, ME and EE courses. Admission to the Mechanical Engineering Program is selective and subject to approval of the Mechanical Engineering Academic Standards Committee. Failure to submit an application could result in the student being denied admission to the program and registration in junior or higher level classes in the ME program. If a student is denied admission to the Mechanical Engineering Program, he/she can reapply to the program for admission in subsequent years. If the applicant has attended Minnesota State Mankato only, the application form is submitted to the Department of Mechanical and Civil Engineering along with a copy of that student's Minnesota State Mankato transcript obtained from "The Hub". Pre-engineering students at Minnesota State Mankato are not guaranteed admission to the junior-level ME Program. If the applicant has any transfer credits from another college or university, or expects to be admitted as a transfer student, all transfer courses/credits must be evaluated by the Office of Admissions at Minnesota State Mankato. The transfer student will need to refer to the Supplemental Information and/or the Minnesota State Mankato Undergraduate Bulletin

MECHANICAL ENGINEERING

for information about procedures that need to be followed when making application for admission as a transfer student. Applicants for admission to the program must also submit a complete plan of study.

MECHANICAL ENGINEERING BSME

Required (Special General Education, 23 credits):

The Bachelor of Science in Mechanical Engineering degree does NOT adhere to the 44 credits of general education required by other programs. Rather, it requires a special distribution of communication, humanities and social science courses. Courses should be chosen to simultaneously satisfy the university cultural diversity requirement.

Required Communication Courses (7 credits):

ENG 101 Composition (4) AND
SPEE 102 Public Speaking (3) OR
SPEE 233 Public Speaking for Technical Professionals (3) OR
ENG 271 Technical Communication (4)

Required Humanities and Social Science Courses (minimum 16 credits):

In the interest of making engineers fully aware of their social responsibilities and better able to consider related factors in the decision-making process, course work in the humanities and social sciences is required as an integral part of our mechanical engineering program. To satisfy this requirement, the course selected must provide both breadth and depth and not be limited to a selection of unrelated introductory courses. Not all courses in humanities and social sciences are acceptable, i.e. skill developing courses are not acceptable. Courses should be chosen to simultaneously satisfy the university cultural diversity requirement. Each student should discuss with his/her mechanical engineering advisor selection of courses to meet this requirement. All students are urged to discuss this plan with their mechanical engineering advisors early in their academic career. An updated list of acceptable courses is posted in the department office and on the web.

Specifically, the minimum requirements consist of (a) three credits of microeconomics or macroeconomics, (b) at least 6 credits in the humanities area, and (c) at least 6 credits in the social science area; again, (a), (b), and (c) must total at least 16 credits.

To provide the measure of depth to the course of study, at least three credits at the 300 level or above must be included in the 16 credit requirement. At least one upper-division course must follow in the same subject area.

Required for Major (Prerequisites, 47 credits):

Mathematics (16 credits):

MATH 121 Calculus I (4)
MATH 122 Calculus II (4)
MATH 223 Calculus III (4)
MATH 321 Ordinary Differential Equations (4)

Physics (10 credits):

PHYS 221 General Physics I (5)
PHYS 222 General Physics II (5)

Chemistry (5 credits):

CHEM 201 General Chemistry I (5)

Electrical Engineering (4 credits):

EE 230 Circuits Analysis I (3)
EE 240 Evaluation of Circuits (1)

Mechanical Engineering (12 credits):

ME 101 Introduction to Engineering-Mechanical (2)
ME 103 Computer Graphics Communication (1)
ME 113 Geometric Dimensioning and Tolerancing (1)
ME 201 Introduction to Problem Solving and Engineering Design (2)
ME 212 Statics (3)
ME 214 Dynamics (3)

Required for Major (52 credits):

EE 244 Introduction to Digital Systems (2)
EE 253 Logic Circuits Lab (1)

ME 206 Materials Science (3)
ME 223 Mechanics of Materials (3)
ME 241 Thermodynamics (3)
ME 291 Engineering Analysis (3)
ME 321 Fluid Mechanics (3)
ME 324 Heat Transfer (3)
ME 329 Applied Thermodynamics (3)
ME 333 Manufacturing Processes (3)
ME 336 Mechanical Engineering Experimentation I (2)
ME 341 Linear Systems (3)
ME 417 Design of Machine Elements (3)
ME 420 Computer Aided Engineering (3)
ME 428 Design Project I (3)
ME 436 Mechanical Engineering Experimentation II (2)
ME 438 Design Project II (3)
ME 463 Automatic Controls (3)
ME 466 Mechanical Engineering Experimentation III (2)
ME 492 Mechanical Engineering Seminar (1)

Required for Major (Electives, 6 credits):

Consult with your advisor for selection of electives:

ME Elective
ME Elective

Required Minor: None.

POLICIES/INFORMATION

GPA Policy. To maintain satisfactory progress in the upper-division mechanical engineering program, a student must: (1) maintain a GPA of 2.3 for all upper-division engineering courses required for the major; and (2) achieve a GPA of at least 2.0 each semester.

P/N Grading Policy. P/N credit may not be applied to any course in the mechanical engineering curriculum except for internship credits and courses designated as P/N only.

Probation Policy. A student who does not maintain satisfactory progress as defined above will be placed on academic probationary status for a maximum of one semester. During the probationary period, the student must maintain satisfactory progress and in addition: (a) must complete at least 8 credits for grade from the prescribed ME curriculum; and (b) shall not receive a degree without first conforming to the satisfactory progress criteria. A student who does not maintain satisfactory progress during the probationary period will not be allowed to continue in the program. The student may later reapply for admission to the program.

Refer to the College policies regarding required advising for students on academic probation.

Appeals. A student has the right to appeal a department decision in writing. The department will consider such appeals individually.

Course Repeat Policy. Only the first 12 semester credits of repeated classes will be exempted from GPA calculation.

COURSE DESCRIPTIONS

ME 101 (2) Introduction to Engineering - Mechanical

To prepare students for a career in engineering with emphasis on mechanical; introduce the engineering fundamentals and the skills necessary to have a successful learning experience; and to prepare students for engineering education and profession through interactions with upper-class engineering students and practitioners.

ME 102 (1) Introduction to Engineering II

A continuation of ME 101 covering historical and global perspectives, engineering discipline and functions, professional aspects of engineering, ethical aspects of engineering, creativity and innovation, basics of personal computers-word processing and spreadsheets, introduction to problem solving.
Variable

Mechanical Engineering

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Department of Mechanical and Civil Engineering
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Web site: me.mnsu.edu

Mankato

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Mankato

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For transfer students the distribution of credits specified in the previous paragraph may vary, but the total credits must satisfy departmental transfer requirements. Transfer students should contact the department for individual evaluation. Transfer students must take a minimum of 12 credits at MSU prior to being considered for full admission to the program.

All courses and credits shown above must be completed, for grade, before enrollment in 300-level engineering courses. All of the above courses except internship credits must be taken for grade. It is not acceptable for the student to take any of these courses on a pass/no credit basis. A grade of "C" or better must be achieved in each course. To be considered for admission a grade of C or better must be achieved in each course, and a the student must have a cumulative GPA of 2.5 for all science, math, ME and EE courses listed above. All courses taken from the list above (including those for repeated courses) will be considered in the computation of the GPA for admission to the program. Transfer credits will not be used in the computation of the GPA for admission to the program. Admission to the Mechanical Engineering Program is selective and subject to approval of the Mechanical Engineering Academic Standards Committee. Failure to submit an application could result in the student being denied admission to the program and registration in junior or higher level classes in the ME program. If a student is denied admission to the Mechanical Engineering Program, he/she can reapply to the program for admission in subsequent years. If the applicant has attended Minnesota State Mankato only, the application form is submitted to the Department of Mechanical and Civil Engineering along with a copy of that student's Minnesota State Mankato

mark up

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MECHANICAL ENGINEERING BSME

Required (Special General Education, 23 credits):

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SPEE 233 Public Speaking for Technical Professionals (3) OR

ENG 271 Technical Communication (4)

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Required for Major (Prerequisites, 47 credits):

Science and Mathematics(31):

Mathematics (16 credits):

MATH 121 Calculus I (4)

MATH 122 Calculus II (4)

MATH 223 Calculus III (4)

MATH 321 Ordinary Differential Equations (4)

Physics (10 credits):

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PHYS 222 General Physics II (5)

Chemistry(5):

CHEM 201 General Chemistry I (5)

Engineering Science(16):

Electrical Engineering (4 credits):

EE 230 Circuits Analysis I (3)

EE 240 Evaluation of Circuits (1)

Mechanical Engineering (12 credits):

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ME 103 Computer Graphics Communication (1)

Make up

ME 113 Geometric Dimensioning and Tolerancing (1)
ME 201 Introduction to Problem Solving and Engineering Design(2)
ME 212 Statics (3)
ME 214 Dynamics (3)

Required for Major (52 credits):

EE 244 Introduction to Digital Systems (2)
EE 253 Logic Circuits Lab (1)
ME 206 Materials Science (3)
ME 223 Mechanics of Materials (3)
ME 241 Thermodynamics (3)
ME 291 Engineering Analysis (3)
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ME 324 Heat Transfer (3)
ME 329 Applied Thermodynamics (3)
ME 333 Manufacturing Processes (3)
ME 336 Mechanical Engineering Experimentation I (2)
ME 341 Linear Systems (3)
ME 417 Design of Machine Elements (3)
ME 420 Computer Aided Engineering (3)
ME 428 Design Project I (3)
ME 436 Mechanical Engineering Experimentation II (2)
ME 438 Design Project II (3)
ME 463 Automatic Controls (3)
ME 466 Mechanical Engineering Experimentation III (2)
ME 492 Mechanical Engineering Seminar (1)

Required for Major (Electives, 6 credits):

Consult with your advisor for selection of electives:

ME Elective(3)

ME Elective(3)

Consult with your advisor for selection of electives.

Required Minor: None.

POLICIES/INFORMATION

GPA Policy. To Satisfactory Progress. Once admitted to the mechanical engineering program, a student must maintain satisfactory progress in the upper-division Mechanical Engineering program, a student must by: maintaining a cumulative GPA of 2.3 for all upper-division engineering courses required for the major; and (2) achieving a GPA of at least 2.0 each semester for all courses required for the major. All courses, including repeated courses, will be used in the GPA calculations above.

P/N Grading Policy. P/N credit may will not be applied to any course in used to meet the mechanical engineering curriculum except for internship credits and courses designated as P/N-only degree requirements.

Probation Policy. Once admitted to the program, a A student who does not maintain satisfactory progress as defined above will be placed on academic program probationary status for a maximum of one semester. During the probationary period, the student must maintain achieve satisfactory progress and, in addition: (a) must complete at least 8 credits, approved by the department, of upper-division engineering courses for grade from the prescribed Mechanical Engineering curriculum; and (b) shall not receive a degree without first conforming to the satisfactory progress criteria. A student who does not maintain satisfactory progress during the probationary period will not be allowed to continue in the program. The student may later reapply for admission to the program. If readmitted, only probationary status will be granted, and continuation in the program will be based on performance in courses specified in a contract with the department.

Refer to the College policies regarding required advising for students on academic probation.

Appeals. A student has the right to may appeal a any department decision in writing. The department will consider such appeals individually.

Course Repeat Policy. Only the first 12 semester credits of repeated classes will be exempted from GPA calculation.

For the most up-to-date list of Mechanical engineering courses, please visit our web site at me.mnsu.edu.

Mechanical Engineering

College of Science, Engineering & Technology
Department of Mechanical and Civil Engineering
205 Trafton Science Center E • 507-389-6383
Fax: 507-389-5002
Web site: me.mnsu.edu

New

Chair: Charles W. Johnson, Ph.D., P.E.

Vance Browne, Ph.D., P.E.; Aaron S. Budge, Ph.D.; Karen C. Chou, Ph.D., P.E.; Jerzy Fiszdon, Ph.D., P.E.; Saeed Moaveni, Ph.D., P.E.; Vojin Nikolic, Ph.D.; Deborah K. Nykanen, Ph.D., P.E.; Jin Park, Ph.D.; Patrick A. Tebbe, Ph.D., P.E.; W. James Wilde, Ph.D., P.E.

Adjunct Faculty: William J. Billett, P.E.; Herman A. Dharmarajan, Ph.D., P.E., DEE; William R. Douglass, P.E.; D. Joseph Duncan, P.E.; Theodore V. Galambos, Ph.D., P.E.; Jon A. Huseby, P.E.; Peter Kjeer; Mark R. Knoff, Ph.D., P.E.; Timothy O. Loose, P.E.; Omid Monseni, Ph.D., P.E.; Ken R. Saffert, P.E.; Chad Suprenant, P.E.

Mechanical Engineering (ME) is essential to a wide range of activities that include the research, design, development, manufacture, management, and control of engineering systems, subsystems, and their components. Mechanical engineers use the fundamentals of engineering mechanics, energy, thermal-fluid sciences, and material sciences to design and analyze mechanical systems that perform useful tasks required by society. For example, mechanical engineers work with the design and function of machines, devices, and structures in the areas of manufacturing, processing, power generation, and transportation (air, land, sea, and space). As a result of a rapidly expanding technology in recent years, mechanical engineers have become more versed in computer-aided design; robotics; bioengineering; environmental engineering; solar, wind, and ocean energy sources; and space exploration. The breadth of the field provides the graduate with many possibilities for a satisfying career.

Typically, mechanical engineers are employed by the manufacturing, power, aerospace, automotive, computer hardware and software, and processing industries. Careers are also available in design and development organizations as well as in many federal and state agencies. The department will make any reasonable effort to accommodate people with disabilities.

Accreditation

The Mechanical Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; telephone: (410) 347-7700.

Program Objectives: The Mission of the Mechanical Engineering program at Minnesota State Mankato is to provide a broad-based education that will enable graduates to enter practice in the mechanical engineering profession, serving the needs of the State of Minnesota and the Nation.

Graduates of the Mechanical Engineering program at Minnesota State Mankato will be prepared:

1. with a strong technical foundation to practice mechanical engineering, or to pursue graduate studies;
2. to become registered professional engineers;
3. to communicate technical information effectively with the public, their peers, customers, and employers;
4. with an understanding of the need for life-long learning and of the importance for community and professional involvement; and
5. with an awareness of cultural, societal, and professional issues.

The program mission and educational objectives are fully compatible with the mission of Minnesota State Mankato and the College of Science, Engineering, and Technology. Program objectives are monitored by the constituencies (mechanical engineering profession through the program's Industrial Advisory Board and employers, alumni, students, and faculty of the program).

Other important features of the mechanical engineering program at Minnesota State Mankato include the following:

- Students are required to take a department-administered diagnostic test in their junior year. The purpose of this test is to provide feedback which will be used to strengthen the curriculum and to improve the preparation of students.
- Students are required to take the Fundamentals of Engineering exam in their senior year - a precursor to professional registration.
- Students are encouraged to work in engineering related areas for exposure to industrial practice. Internships are strongly recommended.
- Senior students must participate in a full academic year design experience working in a team similar to development teams in industry and government. Industrial sponsored projects are offered when available.

Recommended high school preparation is two years of algebra, one year of geometry, one-half year of trigonometry, one-half year of college algebra, and a year each of physics and chemistry. Engineering drafting and a computer language such as BASIC are also recommended. Without this background it may take longer than four years to earn the degree.

Admission to Program is necessary before enrolling in 300- and 400-level courses. Admission to program is granted by the department. Near the end of the sophomore year, students should submit applications for admission to the mechanical engineering program. Application to the program may be obtained from the Department of Mechanical and Civil Engineering or downloaded from the department homepage. Failure to submit an application will result in the student being denied registration in upper division courses in the Mechanical Engineering Program

Admission to the program is based on GPA and performance in selected courses and is subject to approval by the Department of Mechanical and Civil Engineering. Only students admitted to the program are permitted to enroll in upper-division ME courses.

Generally, no transfer credits are allowed for upper-division mechanical engineering courses. For any exceptions to this policy, special written permission must be obtained and will be reviewed by the department. The department makes a special effort to accommodate transfer students. Transfer students are encouraged to contact the department as soon as possible to facilitate a smooth transition. Please feel free to write, call or visit the department.

Before being admitted to upper division mechanical engineering courses, a student must complete a minimum of 51 credits, including the following courses: General Physics (calculus based) 10 credits; Calculus and Differential Equations 16 credits; Introduction to Engineering 2 credits; Computer Graphics Communication 1 credit; Geometric Dimensioning and Tolerancing 1 credit; Introduction to Problem Solving and Engineering Design 2 credits; Engineering Mechanics (Statics and Dynamics) 6 credits; Electrical Engineering (Circuits, including lab) 4 credits; Chemistry 5 credits; and English Composition 4 credits. Moreover, students are required to take a diagnostic test. The purpose of the test is to identify areas of weakness so that we can provide future improvement in those areas.

For transfer students the distribution of credits specified in the previous paragraph may vary, but the total credits must satisfy departmental transfer requirements. Transfer students should contact the department for individual evaluation. Transfer students must take a minimum of 12 credits at MSU prior to being considered for full admission to the program.

All courses and credits shown above must be completed, for grade, before enrollment in 300-level engineering courses. To be considered for admission a grade of C or better must be achieved in each course, and a the student must have a cumulative GPA of 2.5 for all courses listed above. All courses taken from the list above (including those for repeated courses) will be considered in the computation of the GPA for admission to the program. Transfer credits will not be used in the computation of the GPA for admission to the program. Transfer students should refer to the Supplemental Information in the Undergraduate Bulletin for information about procedures to be followed when applying for admission to the university. If a student is denied admission to the Mechanical Engineering Program, he/she can reapply to the Mechanical Engineering Program for admission in subsequent years.

MECHANICAL ENGINEERING BSME

Required (Special General Education, 23 credits):

The Bachelor of Science in Mechanical Engineering degree does NOT adhere to the 44 credits of general education required by other programs. Rather, it requires a special distribution of communication, humanities and social science courses. Courses may be chosen to satisfy the university cultural diversity requirement concurrently.

Required Communication Courses (7 credits):

ENG 101 Composition (4) AND

SPEE 102 Public Speaking (3) OR

SPEE 233 Public Speaking for Technical Professionals (3) OR

ENG 271 Technical Communication (4)

Required Humanities and Social Science Courses (minimum 16 credits):

To satisfy this requirement, the course selected must provide both breadth and depth and not be limited to a selection of unrelated introductory courses. Not all courses in humanities and social sciences are acceptable. Each student should discuss with his/her mechanical engineering advisor the selection of courses to meet this requirement early in their academic career. An updated list of acceptable courses is posted in the department office and on the web site.

Specifically, the minimum requirements consist of at least 6 credits in the humanities area, and (b) at least 9 credits in the social science area, of which 3 credits must be either microeconomics or macroeconomics; (a), and (b) must total at least 16 credits.

To provide the measure of depth to the course of study, at least three credits at the 300 level or above must be included in the 16 credit requirement. At least one upper-division course must follow a course in the same subject area.

Science and Mathematics(31):

MATH 121 Calculus I (4)

MATH 122 Calculus II (4)

MATH 223 Calculus III (4)

MATH 321 Ordinary Differential Equations (4)

PHYS 221 General Physics I (5)

PHYS 222 General Physics II (5)

CHEM 201 General Chemistry I (5)

Engineering Science(16):

EE 230 Circuits Analysis I (3)

EE 240 Evaluation of Circuits (1)

ME 101 Introduction to Engineering-Mechanical (2)

ME 103 Computer Graphics Communication (1)

ME 113 Geometric Dimensioning and Tolerancing (1)

ME 201 Introduction to Problem Solving and Engineering Design(2)

ME 212 Statics (3)

ME 214 Dynamics (3)

Required for Major (52 credits):

EE 244 Introduction to Digital Systems (2)

EE 253 Logic Circuits Lab (1)

ME 206 Materials Science (3)
ME 223 Mechanics of Materials (3)
ME 241 Thermodynamics (3)
ME 291 Engineering Analysis (3)
ME 321 Fluid Mechanics (3)
ME 324 Heat Transfer (3)
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ME 333 Manufacturing Processes (3)
ME 336 Mechanical Engineering Experimentation I (2)
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ME 438 Design Project II (3)
ME 463 Automatic Controls (3)
ME 466 Mechanical Engineering Experimentation III (2)
ME 492 Mechanical Engineering Seminar (1)
ME Elective(3)
ME Elective(3)
Consult with your advisor for selection of electives.

Required Minor: None.

POLICIES/INFORMATION

Satisfactory Progress. Once admitted to the mechanical engineering program, a student must maintain satisfactory progress in the upper-division Mechanical Engineering program by: (1) maintaining a cumulative GPA of 2.3 for all upper-division engineering courses; and (2) achieving a GPA of at least 2.0 each semester for all courses required for the major. All courses, including repeated courses, will be used in the GPA calculations above.

P/N Grading Policy. P/N credit will not be applied to any course used to meet the mechanical engineering degree requirements.

Probation Policy. Once admitted to the program, a student who does not maintain satisfactory progress as defined above will be placed on program probationary status for a maximum of one semester. During the probationary period, the student must achieve satisfactory progress and, in addition: (a) must complete at least 8 credits, approved by the department, of upper-division engineering courses for grade from the prescribed Mechanical Engineering curriculum; and (b) shall not receive a degree without first conforming to the satisfactory progress criteria. A student who does not maintain satisfactory progress will not be allowed to continue in the program. The student may later reapply for admission to the program. If readmitted, only probationary status will be granted, and continuation in the program will be based on performance in courses specified in a contract with the department.

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