

Mechanical Engineering



Career Profile

Mechanical engineering is one of the broadest fields of engineering, including areas such as automated manufacturing, efficient use of energy, and the design of mechanical systems. Mechanical engineers have many interests, ranging from small machines to nuclear power plants, heating and air conditioning to robotics, and automobiles to spacecraft. Every manufactured product has been made possible due to the knowledge and resourcefulness of a mechanical engineer. Mechanical engineers are involved in the design, development, and manufacture of such diverse types of equipment as the Space Shuttle, racecars, or air conditioning systems.

Accreditation

The South Dakota School of Mines and Technology is accredited by the Higher Learning Commission of the North Central Association of Colleges and Secondary Schools, the recognized accrediting agency for the north central states. In 2006, the HLC voted to continue accreditation of the School of Mines. The School of Mines has been accredited since 1925.

The mechanical engineering curriculum is also accredited by the Engineering Accreditation Commission of ABET, Inc.

Faculty

Chair: Dr. Michael Langerman

Professors: Dr. Gregory Buck, Dr. Daniel Dolan, Dr. Vojislav Kalanovich, Dr. Lidvin Kjerengtroen, and Dr. Wayne Krause

Associate Professors: Dr. Umesh Korde and Dr. Karim Muci

Assistant Professors: Dr. Linxia Gu and Dr. Myung-Keun Yoon

Instructor: Mr. Jason Ash

Labs and Facilities

Department laboratories include equipment for materials testing, mechanical systems and instrumentation, thermal and fluid systems, integrated manufacturing/controls and robotic systems, and vibrations. Laboratories are updated with personal computers, peripherals, and data acquisition equipment.

Features and Strengths

The Mechanical Engineering department provides students with a high-quality education and a supportive atmosphere to learn and grow. Many of the faculty members are involved in cutting-edge research or consult on industrial problems. The faculty commitment to teaching reinforces the learning environment between the student and professor, and provides more personal attention than is available in larger institutions.

Program Overview

The curriculum in mechanical engineering is designed to give students a thorough knowledge of the basic principles in major areas of mechanical engineering: control systems, mechanical systems, and thermal-fluid systems. The curriculum also develops various aspects of problem-solving skills including defining the problem, working toward a solution, and arriving at an adequate answer; communication and effective presentation skills; an appreciation of the constraints that exist in industry with emphasis on the time and cost factors of engineering; and understanding of engineering theory by hands-on laboratory experience.

Students select from course electives that best reflect their interests and career objectives. General areas include manufacturing, thermal science/energy, and mechanical systems/design.

Outcomes

- School of Mines mechanical engineering graduates received salary offers that average more than \$54,000.
- 96 percent of 2005-06 School of Mines mechanical engineering graduates were placed in their field or entered a graduate program within a year of graduation.
- 80 percent of graduates gain real-life experience through internships and co-ops.
- Companies hiring mechanical engineering graduates include Boeing, Caterpillar, Honda, and Raytheon.

Student Organizations

Students at the School of Mines also have a variety of opportunities for extra-curricular activities that range from music, intramurals, and drama to ski and snowboarding clubs, and more than 75 other clubs and

professional student organizations. These are important activities for our students and we encourage them to take full advantage of out-of-classroom events. Mechanical engineering students are encouraged to participate in the student chapter of the American Society of Mechanical Engineers.

The Center for Advanced Manufacturing and Production (CAMP) is designed to teach students engineering, science and design skills, as well as the ability to work in teams. Team members design, build, market and raise the money for their projects. All students are welcome to work on CAMP projects.

Research

Students have the opportunity to be involved in research with professors conducting work on projects such as fiber reinforced thermoplastic composites, funded by the United States Department of Energy; lightweight space structures, funded by the United States Department of Defense; and more.

Curriculum Listing

<http://catalog.sdsmt.edu>

MECHANICAL ENGINEERING CURRICULUM/CHECKLIST

FRESHMAN YEAR¹

First Semester

MATH 123	Calculus I	4
CHEM 112	General Chemistry I	3
CHEM 112L	General Chemistry I Lab	1
ME 110	Intro to Mechanical Engr.	2
ENGL 101	Composition I	3
PE	Physical Education ²	1
Humanities or Social Sciences Elective(s)		3
TOTAL		17

Second Semester

MATH 125	Calculus II	4
PHYS 211	University Physics I	3
CSC 150	Computer Science I	1
PE	Physical Education ²	1
Humanities or Social Sciences Elective(s)		6
TOTAL		17

SOPHOMORE YEAR

First Semester

EM 214	Statics	3
ENGL 279	Technical Communications I	3
ME 262	Product Development	4
MATH 321	Differential Equations	4
Humanities or Social Sciences Elective(s)		3
TOTAL		17

Second Semester

ME 221*	Dynamics of Mechanisms	3
ME 211*	Intro to Thermodynamics	3
PHYS 213	University Physics II	3
PHYS 213L	University Physics II Lab	1
MET 231	Properties of Materials Lab	1
MET 232	Properties of Materials	3
ME 216*	Mechanics of Materials	3
TOTAL		17

For More Information contact:

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JUNIOR YEAR

First Semester

MATH 225	Calculus III	4
ENGL 289	Technical Communications II	3
ME 316*	Solid Mechanics	3
EE 301	Introductory Circuits, Machines, and Systems	4
ME 331*	Thermo Fluid Dynamics	3
TOTAL		17

Second Semester

ME 313*	Heat Transfer	3
ME 352*	Intro to Dynamic Systems	3
MATH 373	Intro to Numerical Methods	3
ME 322*	Machine Design I	3
ME 351*	Mechatronics and Meas Syst	4
ME 312*	Thermodynamics II	3
TOTAL		19

SENIOR YEAR³

First Semester

ME 477	Mechanical Engr Design I	2
IENG 302	Engineering Economics	3
MATH 381	Probability/Statistics	3
ME 4XX	Mechanical Engr Elective #1	4
ME 481	Advanced Prod. Dev. Lab I	1
ME 4XX	Mechanical Engr Elective #2	3
TOTAL		16

Second Semester

ME 479	Mechanical Syst Design II	2
ME 482	Advanced Prod. Dev. Lab II	2
ME 4XX	Mechanical Engr Elective #3	3
ME 4XX	Mechanical Engr Elective #4	3
Humanities or Social Sciences Elective(s)		4
Free Elective		2
TOTAL		16

136 credits required for graduation

* A grade of C or better required for graduation

Curriculum Notes

¹ Many courses are prerequisites for other courses, and their sequencing is important. A faculty advisor should be consulted for any deviation from the above schedule.

² Music ensemble courses may be substituted for physical education courses for qualified students. Any other substitutions must be approved in advance by the physical education department chair.

³ Total design content of senior year mechanical engineering electives must be a minimum of three (3) hours.

