

MECHANICAL ENGINEERING

The mechanical engineer deals with the broad areas of heat, energy, force and motion, and their effects on a multitude of products. Mechanical engineers may be involved in the design of large industrial machinery, power plants, automobiles and aircraft, robots, biomedical devices and equipment, precision measurement and data acquisition equipment, nanotechnology and new materials, among others. Within these areas, the mechanical engineer enjoys considerable professional flexibility.

The Program

The demand for mechanical engineers with a good technical education has been high for many years. The Department of Mechanical Engineering at North Dakota State University offers an education that enables its graduates to take their places in all facets of the profession. The department has graduated more than 3,200 mechanical engineers who are working throughout the United States and many other parts of the world. The Bachelor of Science degree in Mechanical Engineering is accredited by the Engineering Accreditation Commission of ABET (www.abet.org).

Curriculum

The standard curriculum allows students flexibility in choosing courses that reflect their interests within the broad areas of mechanical engineering. These include mechanics, materials and nanotechnology, biomedical engineering, alternative energy sources, fluid dynamics, robotics and more. ME students also have the opportunity to pursue minors in coatings and polymeric materials, biomedical engineering, and robotics, among others, which can enhance their educational experience.

The coatings and polymeric materials minor prepares students for careers that require specialized polymers training, such as the manufacturing of coatings to enhance and preserve vehicles, structures and machines. NDSU's Department of Coatings and Polymeric Materials is internationally renowned. Only five other universities in the U.S. offer programs in coatings and employment opportunities far exceed the number of graduates.

The biomedical engineering minor provides an opportunity for specialized training in one of the highest demand fields today. It prepares graduates to be able to contribute to the global demand for medical technologies and innovations.

The robotics minor is designed to give students the skills needed to design and develop robotic devices, and use those devices to solve real-life problems. The minor provides depth of content in subjects including microprocessor programming, sensors and instrumentation, actuation systems, control principles, and robot manipulation. Graduates from this program may work in a wide range of industries including automotive, aerospace, drone manufacturers, packaging systems, precision agriculture, energy and mining, among others.

Undergraduate students who excel in our program may consider advancing towards a master's degree by applying for our Accelerated Master's Program. This option gives the student a jump-start on the Master of Science curriculum requirements while they finish their Bachelor of Science degree by allowing 6 credits of coursework to be applied to both degrees.

The Faculty and Facilities

The Department of Mechanical Engineering is housed in Dolve Hall, which is part of an eight-building engineering complex. Laboratories and classrooms are well-suited and equipped for teaching and research. Students have access to PC computer clusters and facilities located in Dolve Hall to assist them in their laboratory and class work. The faculty offers a variety of expertise and extensive experience in teaching and research.

High School Preparation

To enroll in the mechanical engineering curriculum for the freshman year, students should have two years of high school algebra and one year of trigonometry, as well as a year in chemistry and physics. Students without these courses may take them at NDSU to better prepare academically for a specific engineering curriculum.

Selective Admission

The Department of Mechanical Engineering has minimum admission requirements for new freshmen and transfer students.

New freshmen must have a minimum high school grade point average (GPA) of 3.2 or have a minimum math ACT of 26 or SAT math sub score of 590.

Transfer students must have a minimum cumulative grade point average (GPA) of 2.7.

All new students who meet mechanical engineering admission requirements are initially admitted to the basic program in mechanical engineering. After completing 50 credits of specified courses with a minimum GPA of 2.5, minimum engineering GPA of 2.7 and no grade below a C, students are eligible for admission to the professional program. The engineering GPA is calculated based on specific core engineering courses.

Students who do not meet the minimum admission criteria will be placed in mechanical engineering under the advisement of a general engineering advisor until minimum admission criteria have been met.

Career Opportunities

Recent graduates have found employment in companies throughout the United States. The average starting salary is approximately \$62,000. A sampling of companies hiring NDSU graduates includes: 3M, American Crystal Sugar, Angus Palm, Applied Engineering, Arctic Cat Inc., Black and Veatch, Bobcat, Boeing, Cargill, Caterpillar, Daktronics, Horsch Anderson, Integrity Windows, John Deere, Montana Dakota Utilities, Parker-Hannifin, Puget Sound Naval Shipyard and Xcel Energy.

Cooperative Education Program

Students in mechanical engineering are encouraged to participate in the Cooperative Education Program at NDSU. It consists of one or more four-month sessions of work experience after completion of the sophomore year. This optional industry experience provides students with hands-on opportunities not available in the classroom, and makes students more marketable to employers after graduation. Students who register for co-op credits and successfully complete the program may apply those credits towards graduation as technical elective coursework.

Mechanical Engineering Plan of Study

Please note this is a sample plan of study and not an official curriculum. Actual student schedules for each semester will vary depending on start year, education goals, applicable transfer credit, and course availability. Students are encouraged to work with their academic advisor on a regular basis to review degree progress and customize an individual plan of study.

Freshman			
Fall	Credits	Spring	Credits
MATH 165 Calculus I	4	MATH 166 Calculus II	4
ENGL 110 College Composition I	4	ENGL 120 College Composition II	3
CHEM 121 General Chemistry I	3	CHEM 122 General Chemistry II	3
Gen Ed Humanities & Fine Arts/Gen Ed Cultural Diversity	3	ME 212 Fundamentals of Visual Communication for Engineers	3
Gen Ed Social & Behavioral Sciences/Gen Ed Global Perspectives	3	ME 221 Engineering Mechanics I	3
		Gen Ed Wellness	2
	17		18
Sophomore			
Fall	Credits	Spring	Credits
MATH 129 Basic Linear Algebra	3	MATH 266 Introduction to Differential Equations	3
MATH 259 Multivariate Calculus	3	COMM 110 Fundamentals of Public Speaking	3
IME 330 Manufacturing Processes	3	PHYS 252 University Physics II and 252L University Physics II Laboratory	5
ME 222 Engineering Mechanics II	3	ME 213 Modeling of Engineering Systems	3
ME 223 Mechanics of Materials	3	ME 351 Thermodynamics	3
Gen Ed Humanities & Fine Arts	3		
	18		17
Junior			
Fall	Credits	Spring	Credits
ECE 301 Electrical Engineering	3	ECE 303 Electrical Engineering II	3
ENGL 321 Writing in the Technical Professions	3	ECE 306 Electrical Engineering Lab I	1
ME 331 Materials Science and Engineering	4	ENGR 402 Engineering Ethics and Social Responsibility	1
ME 352 Fluid Dynamics	3	ME 361 Introduction to Mechanical Engineering Profession	1
Technical Elective	3	ME 442 Machine Design I	3
		ME 454 Heat and Mass Transfer	3
		Technical Elective	3
	16		15
Senior			
Fall	Credits	Spring	Credits
ME 421 Theory of Vibrations	3	ME 412 Engineering Measurements	3
ME 443 Machine Design II	3	ME 462 Design Project II	3
ME 457 Thermal Systems Laboratory	3	Technical Elective	3
ME 461 Design Project I	3	Technical Elective	3
Technical Elective	3	Gen Ed Social & Behavioral Sciences	3
	15		15
Total Credits: 131			

Degree Notes:

- Total degree credits required to graduate: 129
- Total credits listed above may exceed minimum credit requirements for graduation.

View NDSU equivalencies of transfer courses at: www.ndsu.edu/transfer/equivalencies

For Further Information

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