

MS in Mechanical Engineering

NTU is not accepting applications in Mechanical Engineering at this time while the curriculum is under review.

Mechanical Engineering is concerned with the principles of motion, force, and energy and how they are transformed, usually through machinery, in a safe, efficient, and reliable manner. Subfields of mechanical engineering include mechanics, combustion, fluid mechanics, heat transfer, materials, control, and thermodynamics.

NTU's Master of Science degree program in Mechanical Engineering requires 33 credits, consisting of three types of courses: core, specialization, and elective. The non-thesis curriculum option features specializations that enable students to customize the program to meet their specific needs. The Mechanical Engineering program also offers a thesis option that allows students to gain research experience.

Core courses provide technical literacy applicable to all areas of mechanical engineering. The three required courses represent fundamentals in control theory, engineering mechanics, and statistics. The specialization courses allow students to advance their studies in a particular area of mechanical engineering. Elective courses allow students to tailor the remainder of their program even further to meet their individual educational and career goals.

Completion of the curriculum will take approximately one-and-a-half years of full-time graduate study. Students enrolled through NTU, whose work schedules preclude full-time study, can expect to fulfill the requirements within six years by registering for at least two three-credit courses each academic year.

Admissions Requirements

NTU is currently not accepting applications to this program. The following information is intended for students admitted prior to November 2004.

Students must meet the following eligibility requirements for regular admission into the Mechanical Engineering program:

- BS degree in mechanical engineering from an ABET-accredited engineering program in the United

States or a CEAB-accredited program in Canada; or the equivalent from a foreign institution.

- Cumulative undergraduate G.P.A. of at least 2.9 on a 4.0 scale.

Students who do not meet these requirements may be granted provisional admission into the program, depending on academic background and experience. For additional information about provisional admission status see the Admission section of this bulletin.

Curriculum Overview

Students must complete a minimum of 33 credits, including at least three core courses, six specialization courses, and two additional elective courses.

Core (9 credits)

The core curriculum consists of three courses that allow students to develop knowledge in areas that have general application across the discipline of mechanical engineering. Students complete one course in each of the following areas:

- Controls
- Engineering Mechanics
- Statistics

Students should complete the core courses prior to pursuing specialization and elective courses.

Specializations (18 credits)

Students will select at least six courses from an area of specialization that represents the technical emphasis most compatible with their educational or career goals. Mechanical Engineering specialty areas include the following:

- Dynamics and Controls
- Manufacturing
- Materials
- Mechanical Systems
- Thermal-Fluids

Electives (6 credits)

Students select two additional courses from the NTU graduate catalog to meet the elective requirement and bring their total credits to a minimum of 33. Elective credits are designed to give students the opportunity to tailor the program to their individual and organizational goals and needs.

Students are encouraged to consult with an NTU advisor to confirm they have the appropriate prerequisite knowledge.

Thesis Option

When desirable and appropriate, a thesis option is available for students wanting to pursue in-depth projects or research experience. Six credits toward a thesis count toward fulfillment of the elective requirement. For additional information about the thesis option and guidelines, see the Academic Information section of this bulletin.

Program of Study Plan

Admitted students should submit a Program of Study Plan (PSP) to NTU prior to completion of six semester credit hours. Failure to submit a PSP increases the possibility of students completing duplicate courses or courses that are not applicable to their degree programs. Although NTU cannot guarantee preferred course availability in any given term, the PSP documents do guide course selection from partner universities. It may be necessary for a student to revise an approved PSP when course availability does not comply with the student's needs. The PSP form should be submitted through the NTU Web site.

The following course list illustrates the flexibility available to students who want to specialize in specific areas of Mechanical Engineering. Individual course descriptions may be found on the NTU Web site at www.ntu.edu. *Specific courses and course requirements may change. Updates will be posted on the NTU Web site.*

Core Courses (9 credits)

Students must take the following three courses to satisfy the core requirement:

CT 520	Feedback Control Systems
MA 520	Probability and Statistics for Engineers
ME 517	Vibrations

Specialization Courses (18 credits)

Students select six courses from one specialization area to satisfy this requirement.

Dynamics and Control

ME 710	Advanced Dynamics
ME 711	Advanced Kinematics—Advanced Machines and Mechanisms
CT 711	Dynamics of Controlled Systems
CT 570	Digital Control Systems
CT 712	Linear Systems Theory
CT 741	Nonlinear Control
CT 773	Computer Control of Machines and Processes
CT 780	Robotics

Manufacturing

PD 720	Materials and Manufacturing Considerations in Design
PD 710	Design for Manufacturing and Assembly
PD 525	Integrated Design and Manufacturing
PD 547	Nontraditional Manufacturing Processes
PD 575	Flexible Manufacturing Systems
SP 565	Modern Manufacturing Methods and Systems
SP 720	Advanced Production Control
TO 750	Total Quality Management
CT 773	Computer Control of Machines and Processes

Materials

ME 714	Advanced Machine Design
ME 549	Modeling in Materials Processing
ME 780	Advanced Mechanics of Materials
MS 782	Failure Mechanisms and Analysis
MS 735	Defects in Materials
MP 742	Composite Materials
MS 715	Materials Microstructure
MP 724	Mechanical Behavior of Engineering Materials
ME 598	Nanotechnology

Mechanical Design

ME 710	Advanced Dynamics
ME 711	Advanced Kinematics—Advanced Machines and Mechanisms
ME 714	Advanced Machine Design
ME 516	Vehicle Dynamics
ME 521	Finite Element Analysis with Applications
ME 523	Computer-Aided Analysis and Design of Mechanical Systems
ME 782	Failure Mechanisms and Analysis
PD 720	Materials and Manufacturing Considerations in Design

Thermal-Fluids

ME 541	Intermediate Fluid Mechanics
ME 530	Intermediate Heat Transfer
ME 772	Advanced Thermodynamics
ME 746	Computational Fluid Mechanics
ME 753	IC Engines
ME 754	Gas Turbines and Jet Propulsion
ME 755	Fluid Power—Hydraulics
MA 780	Mathematical Methods for Science and Engineering

Elective Courses (6 credits)

Any two additional graduate-level courses offered by NTU provided the student has the required pre-requisite knowledge specified in the course descriptions.