

Mechanical Engineering

Department Information

- **Interim Department Chair:**
Chad Ulven, Ph.D.
- **Graduate Coordinator:**
Yechun Wang, Ph.D.
- **Department Location:**
111 Dolve Hall
- **Department Phone:**
(701) 231-8671
- **Department Email:**
ndsu.me.gradprogram@ndsu.edu
- **Department Web Site:**
www.ndsu.edu/me/ (<http://www.ndsu.edu/me/>)
- **Application Deadline:**
February 15 for fall semester; September 15 for spring semester. Applications received after the deadline will still be considered, but preference is given to those submitted by the deadline.
- **Credential Offered:**
Ph.D., M.S.
- **Test Requirement:**
GRE recommended
- **English Proficiency Requirements:**
TOEFL iBT 71, IELTS 6; Duolingo 105

The Department of Mechanical Engineering offers graduate programs leading to the Master of Engineering (M.ENGR), Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees. Graduate work may be concentrated in a variety of areas including engineering mechanics, fatigue and fracture, biomechanics and biomaterials, thermal systems, fluid mechanics, energy, controls and mechatronics, or engineering materials with an emphasis on plastics, composite materials, and nanomaterials.

Graduates from a regionally accredited institution in the United States (or equivalent) with a baccalaureate degree in Mechanical Engineering or a closely related field are welcome to apply to the graduate program.

Admission consideration is primarily dependent upon:

- Undergraduate GPA and other activities;
- Graduate Record Examination (GRE) scores (international students);
- Duolingo, TOEFL, or IELTS scores (international students); and
- Area of interest.

To be admitted full standing, applicants must have a cumulative GPA of 3.0 (on a 4-point scale). International students must provide both GRE general test scores and language test scores such as Duolingo, TOEFL, or IELTS. Minimum requirement for admission consideration are 100 for Duolingo, 71 for TOEFL iBT, or 6.0 for IELTS score, and a 300 on the GRE (combined quantitative and verbal) with a minimum quantitative score of 155.

Financial Assistance

Research and/or teaching assistantships may be available to qualified students. Applicants are considered based on scholarship, potential to undertake advanced study and research, and financial need. The availability of research and teaching assistantships is contingent upon current funding levels.

In addition to the stipend, graduate assistants receive a graduate tuition waiver. Tuition waivers cover base tuition for NDSU graduate credits only. Students are responsible for differential tuition, student fees, and tuition for non-graduate level credits taken or Cooperative Education credits.

Mechanical Engineering - M.Engr

The Master of Engineering (M.Engr.) degree in Mechanical Engineering (ME) is a coursework-only master's degree targeted towards working professionals; i.e., those with baccalaureate degrees in mechanical engineering or related disciplines who are working full-time in industry.

To earn the degree, students will be required to complete 30 credits of coursework at the 600 or 700 level, but will not be required to complete a research-based thesis or comprehensive project-based paper. Students pursuing this degree option will be able to enroll in the same courses currently offered by the ME Department for students enrolled in the M.S. options.

Students enrolled in the M.Engr. program will not be eligible to receive a Teaching or Research Assistantship (TA/RA) from the department, nor will they be eligible for a tuition waiver.

Mechanical Engineering - M.S.

The minimum credits required for the M.S. degree in Mechanical Engineering is 30. The M.S. degree can be earned with either of two options: the thesis option or the comprehensive study option.

With the thesis option, a student must complete 21-24 credits of graduate courses in mechanical engineering and a master's thesis of 6 to 9 credits of ME 798 Master's Thesis. At the conclusion of the graduate program, the student will be examined orally on the thesis and course work.

With the comprehensive study option, a student must complete 27 credits of graduate courses in mechanical engineering and a master's paper of no more than 3 credits of ME 797 Master's Paper. At the conclusion of the graduate program, the student must pass a comprehensive oral examination on the master's paper and course work.

For more detailed information on the requirements for the M.S. degree, contact the department.

Mechanical Engineering - Ph.D.

The Ph.D. program requires the completion of 90 credit hours of graduate study beyond the baccalaureate degree (60 credits beyond the M.S. degree). In addition to the credit requirements for the M.S. degree, the Ph.D. degree requires a minimum of 24 course credits and a minimum of 24 credits of research-based dissertation. The remaining 12 credits may consist of any approved graduate level credits.

Code	Title	Credits
Didactic Courses		24
Courses numbered 601-689 or 700-989		
Dissertation Research		24
ME 899	Doctoral Dissertation	
Any approved graduate level credits		12
Total Credits		60

After the majority of course work has been completed, each student is required to pass a series of written qualifying exams on core subjects. After passing the written exams, an oral preliminary exam will be administered focusing on the student's proposal for the dissertation research. At the conclusion of the Ph.D. program, each student is required to pass a comprehensive oral final examination primarily focused on the dissertation. This exam may also cover material from course work, particularly courses fundamental to the dissertation. For more detailed information on the requirements for the Ph.D. degree, contact the department.

Graduate Seminar Series

In addition to the 30 credits of Master's coursework and/or 90 credits of Ph.D. coursework, students are required to enroll in the department's graduate seminar series, ME 790, for each semester of their graduate study but not to exceed three semesters, per degree. ME 790 is offered as a one (1) credit, required course and grades will be given only as pass/fail. The Master of Engineering degree is exempt from this requirement.

Fardad Azarmi, Ph.D.

University of Toronto, 2008

Research Interests: Thermal Spray Coatings, Thin Film, Multiscale Engineering Analysis, Finite Element Analysis, Failure in Materials, Corrosion, Materials Characterization, High Temperature Materials, Composite Structures, Metal Foams, Functionally Graded Materials

Jordi Estevadeordal, Ph.D.

University of Houston, 1996

Research Interests: Advanced Laser Techniques, Thermo-Fluid and Spray Diagnostics, 3D particle Image Velocimetry, Phosphorescence, Infrared Thermography, Filtered Rayleigh Scattering, Bio-Fluid Measurements

Adam Gladen, Ph.D.

University of Minnesota, 2014

Research Interests: Renewable Energy, Solar Thermal Energy, Energy Storage - in particular Thermochemical Energy Storage, Thermodynamics, Solar Thermochemistry, Heat transfer, Radiative Transfer in Participating Media, Solar Reactor Design

Inbae Jeong, Ph.D.

Korea Advanced Institute of Science and Technology, 2017

Research Interests: Robotics and Artificial Intelligence

Long Jiang, Ph.D.

Sichuan University, 2003

Research Interests: Nanoscale Materials Synthesis and Applications, Materials from Renewable Resources, Nanocomposites, Carbonaceous Materials, Polymeric Materials Processing and Functionalization

Alan R. Kallmeyer, Ph.D.

University of Iowa, 1995

Research Interests: Theoretical, Computational, and Experimental Solid Mechanics, Fatigue and Fracture of Engineering Materials, Composite Materials

Ghodrat Karami, Ph.D.

Imperial College of Science and Technology, University of London, 1984

Research Interests: Multiscale Computational Solid Mechanics, Biomechanics, Cellular Mechanics, Micromechanics Characterization of Composites, Continuum Mechanics, Structural Mechanics, Nonlinear and Large Deformation and Analysis, Thermoelastic Analysis

Majura Selekwa, Ph.D.

Florida A&M University, 2001

Research Interests: Robotics, Machine Intelligence, Soft computing Applications, Numerical Methods and Numerical Optimization, Optimal and Robust Control, Smart Actuation Control Systems, Real-Time Control in Mechatronics

Prakash Selvakumar, Ph.D.

Nagoya University, Japan, 2012

Biomaterials, Regenerative Medicine, Tissue-Engineered Vascular Grafts, Microvasculature, Decellularized Extracellular Matrix, Bioceramics, Cancer and Vascular Biology.

Yildirim Bora Suzen, Ph.D.

Wichita State University, 1998

Research Interests: Computational Fluid Dynamics, Aerodynamics, Modeling of Industrial Transport Processes, Transition and Turbulence Modeling, Active/Adaptive Flow Control, Turbo machinery, Multiprocessor CFD

Annie X.W. Tangpong, Ph.D.

Carnegie Mellon University, 2006

Research Interests: Vibrations and Dynamics, Tribology, Friction Damping in Rotating Structures, Friction Damping in Nano- and Bio-materials

Chad A. Ulven, Ph.D.

University of Alabama at Birmingham, 2005

Research Interests: Advanced Composites Materials Development, Environmentally Friendly Materials Processing, Nondestructive Evaluation, Impact/High Strain Rate Characterization of Advanced Materials

Jessica L. Vold, Ph.D

North Dakota State University, 2012

Research Interests: Additive Manufacturing Materials, Polymer Matrix Composites, Torrefaction of Lignocellulosic Materials, Bio-Based Composite Materials, Mechanical Testing, Material Characterization

Xinnan Wang, Ph.D.

University of South Carolina, 2008

Research Interests: Experimental Biomechanics, Synthesis of Nanomaterials, Nanomechanical Characterization, Nanomanipulation

Yechun Wang, Ph.D.

University of Maryland, 2007

Research Interests: Microfluidics, Biofluid Mechanics, Computational Fluid Dynamics, Numerical Analysis, and Characterization of Organic Coatings

Xiangfa Wu, Ph.D.

University of Nebraska-Lincoln, 2003

Beijing Institute of Technology, 1998

Research Interests: Nanofabrication and Nanomaterials, Advanced Composites, Fracture and Impact Mechanics

Yan Zhang, Ph.D.

Iowa State University, 2013

Research Interests: Experimental Fluid Dynamics, Advanced Flow Diagnostic Techniques, Wind Engineering and Wind Hazard Mitigation, Bio-Fluid Mechanics and Cardiovascular Hemodynamics Modeling