Graduate Programs in Mechanical Engineering

The Department of Mechanical Engineering offers courses of study leading to the Master of Science (MS) and Doctor of Philosophy (PhD) degrees. Departmental faculty have developed research activities in the following areas of specialization:

- Materials Science and Engineering (including Composites; Nano- and Bio-Composites; Nanotechnology);
- Energy and Thermal-Fluid Sciences (including Alternative Fuels and Fuel Safety; Bio-Fluids and Bio-Heat Transfer; Computational Fluid Dynamics and Heat Transfer);
- Mechanical Systems Analysis and Design (including Vehicle Crashworthiness and Impact Dynamics; Mechanical Design); and
- Robotics and Control (including biosensors and biomedical devices; non-linear control).

State of the art research laboratories within the department complement the above activities. In addition, many departmental faculty members are associates of Wichita State's National Institute for Aviation Research (NIAR). This association makes NIAR facilities available for the research activities of these faculty and their graduate students.

Research facilities include the Computational Fluid Dynamics Laboratory (CFD lab) with a linux based network, the Crash Dynamics Laboratory, the Shock and Vibration Laboratory, the Computer Integrated Manufacturing Laboratory, and the Mechatronics Laboratory.

Departmental facilities in the Engineering Research building include the Nanotechnology Laboratory, the Nanocomposites and Biocomposites Laboratory, the Biodynamics Laboratory, the BioDevice Laboratory, the Acoustic Measurements and Materials Characterization Laboratory, the Advanced Joining Processes and Assembly Laboratory, the Controls Laboratory, and Fuel and Fire Safety.

ME Department’s programs and efforts are influenced by the concentration of technology-oriented industries in the Wichita area. Particular attention is given to scheduling classes so that engineers employed by local industry may pursue a graduate degree in mechanical engineering.

Admission Requirements

In addition to the general admission requirements for all engineering students, admission to the MSME program requires an undergraduate degree in engineering or physical sciences, a grade point average of 3.0/4.0 for the last two years of undergraduate work, or First Class standing, and a statement of purpose indicating research interests. Scores for the General Test of the Graduate Record Examination (GRE) are strongly recommended to be considered for graduate assistantship positions.

In addition to the general admission requirements for all engineering students, admission to the PhDME program requires a grade point average of 3.25/4.0 in all graduate coursework. Official (general) GRE scores are required. Applicants must also submit two letters of recommendation from graduate faculty and a statement of purpose indicating their research interests.

For both programs, non-native speakers of English must provide a TOEFL score of at least 550 paper or 79 internet based, OR an overall band score of 6.5 on the IELTS examination.

Degree and Examination Requirements

The MSME degree requires the completion of one of three options:

(1)The thesis option requires a minimum of 24 hours of course work plus a minimum of 6 hours of thesis. Candidates in the thesis option must pass an oral examination over the thesis.

(2)The directed project option requires a minimum of 30 hours of course work plus a minimum of 3 hours of directed project. Candidates in the directed project option must give an oral presentation and submit a written report on their directed project.

(3)The course work option requires a minimum of 33 hours of course work. Candidates in the course work option must pass a written examination.

To ensure the proper breadth of coursework, the PhD-ME plan of study must include at least 15 hours in the major; 18 hours outside the major field which will include 6 hours in a minor area.
(defined by the advisory committee); a minimum of 6 hours of mathematics/statistics. A plan of study normally contains about 60 credit hours, including courses from the master's degree, and 24 hours of dissertation. 60 percent of the hours beyond the master's work must be at the 800-900 level. Candidates must pass the comprehensive examination that will cover their major and minor fields. After the dissertation is completed, the student must defend the dissertation.

Faculty

The faculty of the department of mechanical engineering and their areas of specialization are listed below.

**Ikramuddin Ahmed**, PhD, University of Texas at Austin. Computational Methods in Transport Phenomena; Inverse Heat Transfer; Nanostructured Thermal Spray Coatings; Coatings for Composites, Sustainability & Energy

**Davood Askari**, PhD, University of Hawaii at Manoa. Mechanical Engineering Design; Multifunctional Composites and Nanocomposites; Nanomaterials; 3-D Nanostructures; Thin Films; Analytical and Numerical Modeling

**Ramazan Asmatulu**, PhD, Virginia Polytechnic Institute. Nanomaterials (nanoparticles, nanofibers, nanoflakes, nanofilms, nanotubes, and nanocomposites); Energy Systems (solar and fuel cells, hydrogen production, supercapacitors and wind energy); Biomaterials (targeted drug delivery, scaffolding, and hydrogels); Corrosion (surface coatings and protections); Composites (modeling of composites, electrically and thermally conductive composites, self-healing of composites, high impact energy composites, and flame retardant composites); and Filtration (nanomembranes, flocculation and coagulation)

**Brian Driessen**, PhD, Georgia Institute of Technology. Control Theory and Design; Dynamic Systems; Robotics; Optimization and Trajectory Generation; Scalability and Robustness of Control Implementation

**David Koert**, PhD, Drexel University. Combustion and Combustion Chemistry; Alternative Fuels; Air Pollution Control; High Temperature Processes and Material Properties, and Flammability of Materials

**Gisuk Hwang**, PhD, University of Michigan. Thermal-Fluid in Porous Media; Thermal Management Systems; Heat Pipes; Thermoelectricity; Fuel Cells; Flow Battery; Surface Sciences; and Molecular Dynamics Simulation

**Hamid Lankarani**, PhD, University of Arizona. Mechanical Engineering Design; Impact Dynamics; Crashworthiness; Multibody Dynamics; Structures; Biomechanics; and Occupant Protection

**Bin Li**, PhD, Washington State University. Polymers; Nanocomposites; Organic Electronic and Energy Materials; Natural Resources for Energy Storage and Transfer; Interfaces; Sustainable Materials Design and Fabrication

**Rajeev Nair**, PhD, Iowa State University. Design-Mechanical Analysis of Stents/Bio Devices; Laser-Based Flexible Fabrication; Pulsed Laser Deposition; Tribology of Nano/Micro Coatings; Laser Surface Texturing; Synthesis and Characterization of Nanomaterials.

**T. S. Ravigururajan**, PhD, PE, Iowa State University. Heat Transfer Enhancement; HVAC; Microscale Heat Transfer; Biothermal and Biodevice Applications; Alternative Energy and Power Storage Devices

For More Information

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