MECHANICAL ENGINEERING

What is Mechanical Engineering?
Mechanical engineering is one of the broadest engineering fields. Mechanical engineers are found in virtually all productive industries, from aircraft and automotive to consumer products and building equipment. In these jobs, mechanical engineers design products, machines, and processes for manufacturing. They analyze, test, and develop these products, machines and manufacturing processes to attain the best performance and durability within cost and time limits.

WSU Mechanical Engineering
Wichita State’s mechanical engineering program prepares students for numerous job possibilities through a broad course of study that covers not only the technical aspects required, but the ethical, professional, communication, economic, and business skills needed to be a successful practicing engineer. Modern laboratories and a wide variety of computer facilities provide students with hands-on experience in experimental work and computer-aided design and engineering. Mechanical engineering students at WSU benefit from its strong Cooperative Education program and close proximity to related industry, which provide co-op and internship opportunities.

Mechanical Engineering Jobs
- design, development, and manufacture of automotive engines and vehicle systems
- design, development and manufacture of gas turbine and other aircraft engines
- design and construction of electrical power plant energy conversion and generating systems
- design, development and manufacture consumer products, such as refrigerators, washers, and electric drills, to the manufacturing systems for producing facial tissue and processed foods and packaging of these items
- design and specification of heating, air conditioning, and ventilating systems used in aircraft, automobiles and buildings
- analysis of the complex flow of gases and fluids such as air flow in aircraft inlet ducts and fluid flow in hydraulic and pumping systems
- study of heat flow, ranging from boilers and automotive radiators to heat management problems in orbiting spacecraft
- study of globalization, moral, ethical, economic, and business issues related to mechanical engineering

Admission
When you choose to major in mechanical engineering, your faculty advisor will help you plan your course of study and will outline specific requirements for degree completion.

Educational Objectives
The Mechanical Engineering program at WSU is committed to:
- educating students to be successful mechanical engineers in their professions in a global environment
- preparing students to pursue life-long learning
- preparing students for real-world problems by working on industry-based projects

Other Activities
There are many activities and associations available to students out of the classroom. WSU hosts student sections of the American Society of Mechanical Engineers (ASME), Pi Tau Sigma National Honor Society, the Society of Automotive Engineers (SAE), the Society of Women Engineers (SWE), and the Society of Manufacturing Engineers (SME). Formula SAE and Baja SAE are international collegiate design competitions where students can design, build, and compete with formula-style or off-road vehicles.

Related Programs
All of Wichita State’s engineering programs - aerospace, biomedical, computer, electrical, engineering technology, industrial, manufacturing, and mechanical - share a math/science background and technical orientation. Graduate programs leading to a master’s and doctoral degrees are offered in aerospace, electrical, industrial and mechanical engineering, as well as master’s programs in engineering management, computer networking, and computer science.

For more information
If you have further questions or would like to schedule a campus visit, please contact:
Office of Admissions
(316) 978-3085
wichita.edu/admissions
wichita.edu/visit

KSDegreeStats.org
Education Requirements

**Basic Skills** (9 hours minimum)
- College English Composition (Eng. 100 or 101 and 102) - 6 credit hours
- Public Speaking (Communication 111) - 3 credit hours

*Must be completed in the first 48 college hours and a C or better.*

**Mathematics and Natural Sciences**
- Calculus I, II and III - 13 credit hours
- Ordinary Differential Equations - 3 credit hours
- University Physics I and II - 8 credit hours
- General Chemistry I - 5 credit hours
- Natural Science Elective - 3 credit hours

**Fine Arts, Humanities, and Social and Behavioral Sciences** (18 hours minimum)
- One introductory course from a fine arts discipline - 3 credit hours
- One introductory course from a humanities discipline - 3 credit hours
- One introductory course from a social and behavioral sciences discipline - 3 credit hours
- One introductory course from a second social and behavioral sciences or humanities discipline - 3 credit hours
- One further study course from one of the two disciplines in the division, humanities or social and behavioral sciences, in which two introductory courses are taken - 3 credit hours
- Philosophy 385 Engineering Ethics - 3 credit hours

**Major Requirements**
- Statics & Dynamics - 6 credit hours
- Thermodynamics I - 3 credit hours
- Computer Applications - 3 credit hours
- Engineering Graphics - 3 credit hours
- Design of Machinery - 3 credit hours
- Mechanics of Materials - 3 credit hours
- Circuits I - 4 credit hours
- Engineering Economy - 3 credit hours
- Materials Engineering - 4 credit hours
- Materials Engineering Lab - 1 credit hour
- Mechanical Engineering Lab - 3 credit hours
- Mechanical Engineering Design I - 3 credit hours
- Fluid Mechanics - 3 credit hours
- Heat Transfer - 3 credit hours
- Mechanical Engineering Systems Lab - 3 credit hours
- Mechanical Control - 3 credit hours
- Mechanical Engineering Elective - 3 credit hours
- Thermal Design Elective - 3 credit hours
- Mechanical Design Elective - 3 credit hours
- Technical Electives - 9 credit hours
- Thermal/Fluids Elective - 3 credit hours

**Faculty**

**Ikram Ahmed** (PhD). Transport phenomena in materials processing, Computational Fluid Dynamics and Heat Transfer (CFD&HT), computational techniques in complex geometries.


**Davood Askari** (PhD). Synthesis, characterization, and applications of carbon nanotubes and nanocarbons, metallic nanoneedles, and hydrophobic thin films; Fabrication, testing, and modeling of composites and nanocomposites; design of solids.

**Fadi Alsaleem** (PhD). Fault detection and online monitoring for HVAC systems, Smart Home, Big data analysis and use in energy prediction and optimization. Predictive adaptive controller for HVAC, Nonlinear dynamics of electrostatic MEMS devices and its application in sensing and actuation, MEMS reliability.

**Ramazan Asmatulu** (PhD). Nanotechnology, bio/nanotechnology, fuel cells, supercapacitors, structural health monitoring, hydrogel-based targeted drug delivery.


**Brian Driessen** (PhD). Controls, dynamics, optimization, scalability and robustness aspects of control implementation.

**Shuang Gu** (PhD). Advanced ion-conducting polymer electrolytes for electrochemical applications, redox-flow batteries, Electrochemical activation of natural gas for liquid-fuel production, Electrochemical reduction of nitrogen gas for green and sustainable agriculture.

**Gisuk Hwang** (PhD). Thermo-fluid transport, conversion and storage systems, heat and mass transfer in porous media for sustainable energy systems, fuel cells, heat pipe, pool boiling.

**David Koert** (PhD). Fuel tank safety, combustion and combustion chemistry, alternative fuels, flammability of materials, and air pollution control.

**Hamid Lankarani** (PhD). Mechanical Engineering design, impact dynamics, crashworthiness, multibody dynamics, structures, biomechanics, and occupant protection.

**Bin Li** (PhD). Design, synthesis, and manufacturing of new polymeric materials for sustainable energy and electronic applications.

**Rajeev Nair** (PhD). Laser-based flexible fabrication, laser surface texturing, design and mechanical analysis of stents/orthopedic devices.

**Muhammad M. Rahman** (PhD). Phase change heat transfer, thermal management, renewable power generation, energy storage, modeling and simulation, refrigeration and air conditioning.

**T.S. Ravigururajan** (PhD, PE). Thermal management in material processing.

**Yimesker Vihun** (PhD). Theoretical kinematics, robotics, control system design, spatial mechanisms, exoskeletons for rehabilitation and prosthetics.

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For more information on Mechanical Engineering at WSU visit wichita.edu/mechanical or call (316) 978-3425.