The Department

The largest department within the college, the Department of Mechanical Engineering recently received the university’s prestigious Teaching Award, highlighting the department’s commitment to the preparation of students.

With a focus on hands-on applications of science and engineering – particularly through the department’s specialized three-course lab and software sequence – mechanical engineering undergraduate students make significant impacts on industry and academia upon arrival.

Graduate students gain insights and help advance the front lines of engineering through unique courses developed by faculty members and through externally-funded research on pressing issues and technological advances.

The department is advancing its national stature with increases in journal publications, emphases on safety and ethics, and aggressive efforts to increase research grants and multi-investigator proposals in areas such as high pressure, energetic, nano- and bio-materials, fluid mechanics, controls, and bioengineering research. In addition, the department is on the forefront of instruction and research on advanced manufacturing techniques, including additive manufacturing, prototyping, and 3D printing.

Research

Led by faculty members who are leaders in their fields of study, graduate and undergraduate students are exposed to the latest advances and perform research in the following areas:

- Bio-Inspired Devices
- Biomechanics
- Biosensors
- Cardiovascular Mechanics
- Computational Fluid Dynamics
- Computational Mechanics
- Control Science and Engineering
- Energetic Materials
- Failure Analysis
- Healthcare Engineering
- High Pressure Materials
- Human–Centric Design Research
- Microfluidics
- Microfluidics
- Multi-Dimensional Flow
- Nanomaterials
- Soft Matter And Complex Fluids
- Wind Energy

Areas of Study

- Bachelor of Science in Mechanical Engineering
- Master of Science in Mechanical Engineering
- Doctor of Philosophy in Mechanical Engineering

By the Numbers

Enrollments (Fall 2014):

- Undergraduate: 567
- Estimated Qualifying Foundational Students: 429
- Master’s: 47
- Doctoral: 89

Faculty Members: 34

Endowed Chairs, Professors, and Fellows: 3

Contacts

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Susan E. Smith
Senior Director, Development and External Relations
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Open Faculty Positions

Dr. Burak Aksak
Assistant Professor
Development of bio-inspired devices for adhesion, sensing, actuation and energy harvesting. Multi-functional, self-sufficient systems that exploit micro/nano structures.

Dr. Ed Anderson, P.E.
Professor
Student Learning, Heat Transfer, Energy Conservation

Dr. Alan Barhorst, P.E.
Professor

Dr. Jordan Berg, P.E.
Professor and Co-Director of Nano Tech Center
Modeling, Design, Control, and Fabrication of Microsystems, Control of Non-Linear Systems, Microsensors, Bifurcations, Unfoldings, and Singularities of Control Systems

Dr. Sukalyan Bhattacharya
Associate Professor
Low Reynolds Number Hydrodynamics, Turbulence and Turbulent Scalar Transport, Statistical Mechanics

Dr. Jerzy Bladowski
Professor and Director of Graduate Program

Dr. Luciano Castillo
Cash Foundation Engineering Chair and Professor

Dr. Jharna Chaudhuri, P.E.
Department Chair and Professor

Dr. Gordon Christopher
Assistant Professor
Interfacial and bulk rheology using microfluidics and other novel techniques

Dr. Hanna Cho
Assistant Professor
Nonlinear dynamics in micro/nanomechanical systems, Multiphysical dynamics arising in scanning probe microscopy systems, Micro/nanomechanical structures

Dr. Ming Chyu, P.E.
Professor and Coordinator of M.Eng. Healthcare Engineering Option
Healthcare Engineering, Thermal Fluid Sciences, Energy Systems

Dr. Stephen Ekwaro-Osire, P.E.
Professor and Associate Dean of Research, Numerical Programs
Engineering Design, Vibrations, Orthopaedic Biomechanics, Engineering Education

Dr. Atila Ertas
Professor

Dr. Zhaoming He
Associate Professor
Heart-Valve Tissue Mechanics, Cardiovascular Mechanobiology, Cardiovascular Medical Devices

Dr. Qing Hui
Associate Professor
Large-Scale Physical Network Systems, Threat Detection and Design Experimental Systems, Cyber-Physical Network Systems, Resilience of Multi-Layer and Multi-Dependent Networks

Dr. Fazle Hussain
President’s Distinguished Chair in Engineering and Science, Senior Advisor to the President, Professor
Vortex dynamics, turbulence, and measurement techniques; Coherent structures in fluid turbulence

Dr. Alexander Idesman
Associate Professor
Computational Mechanics Including: Finite Element Method, Multiscale Approach, Metal Forming, Continuum Mechanics

Dr. Darryl James, P.E.
Professor

Dr. Alan Jankowski
Professor

Dr. Jungkyu (Jay) Kim
Assistant Professor
High-throughput gene/protein analysis, Biosensor and Bioelectronics, Programmable microfluidic platform, Point-of-Care diagnostics, Cell and Tissue engineering and Biomechanics

Dr. Golden Kumar
Assistant Professor
Bio-inspired structures in metals, Materials properties at multiple scales, Unconventional nanofluidic techniques, Environmental and health issues related to nano-materials

Dr. Todd Lillian
Assistant Professor
Biophysics, Dynamics & Vibrations, Cable Dynamics

Dr. Yanzhang Ma
Professor
Diamond Anvil Cell and Laser-Heating High-Temperature Techniques, Stress & Strain Under High-Pressure, Synchrotron X-Ray Measurement, High-Pressure Spectroscopy

Dr. Tim Maxwell
Professor
Automotive Systems, Alternative Fuels, Wind Engineering, Computational Fluid Dynamics

Dr. Hanna Moussa
Assistant Professor
Radiation safety and control, Dose and risk assessment, Radiation protection and detection, Radiation transport and modeling, Radiation shielding, Space radiation

Dr. Michelle Pantoya
Wright Regents Chair and Professor
Energetic Materials, Combustion, Experimental Heat Transfer

Dr. Siva Parameswaran
Professor
High frequency Oscillating Ventilators; Fawake development; Computational models for turbine-turbine interaction; Turbulence models for lift-coefficients for flow around bluff bodies

Dr. Jingjin (Jenny) Qiu
Assistant Professor
Modeling & Simulation of Micro/Nano Flow, Multiscale Composites, Biological Materials

Dr. Jahan Rasty, P.E., M.B.A.
Professor
Materials Performance & Behavior Characterization; Component Failure Analysis & Investigation; Manufacturing; Mechanical Metallurgy; Numerical Modeling of Large-Strain Manufacturing

Dr. Beibei Ren
Assistant Professor
Nonlinear System Control Methods and Algorithm Design; Adaptive Control, Neural Networks, Boundary Control of Systems Modeled by PDEs, Real-time Optimization Using Extremum Seeking

Dr. Darryl James, P.E.
Professor
Biomechanics & bio-inspired systems, Robotics & Multibody Dynamic systems, Human modeling & simulation, Human locomotion, Slips & falls, Spine biomechanics, Human-centric design, Healthcare engineering

Dr. Changdong Yeo
Assistant Professor
Contact Mechanics & Surface Engineering of Micro-/Nano-Scale Systems, Dynamic Adhesive Surface Interactions, Nano-Indentation/Nano-Scratch Techniques

Faculty Research Specializations

Dr. Edward E. Whitacre Jr.
College of Engineering