FOCUS AREAS

**Design**

This FA provides an in-depth background in the computational methods commonly used in modeling, analysis, synthesis, simulation, and design optimization of mechanical, thermal, and fluid systems. Developing an understanding of how design/analysis software functions and gaining a working knowledge of commonly used software solutions form the centerpiece of this FA. Students working towards the design FA are required to participate in the Program for Enhanced Design Experience (PEDE) or Virtual International Project Team (VIPT) enhanced design projects.

FA Coordinator: Professor Sharif Rahman

**Energy & Environment**

This FA provides advanced education in the increasingly important area of energy production, utilization, and its environmental impact, with particular attention to emerging technologies. It also provides a solid foundation in transport process modeling and an introduction to environmental engineering.

Engineers working in this area must possess not only the fluid dynamics and heat and mass transport modeling abilities typical of mechanical engineers, but also a level of understanding of the sustainability of engineered systems.

FA Coordinator: Professor Al Ratner

**Manufacturing**

Manufacturing covers a broad range of processes and modeling/simulation/experimentation activities all focused on the conversion of materials into products. As of now in the U.S., especially in the Midwest, manufacturing represents one of the largest industrial sectors. Examples include vehicle and equipment manufacturing and metal, polymer, ceramic and glass processing. This FA provides students with an advanced education in manufacturing and material process principles, modeling, design and control, quality control, material behaviors, automation and robotics.

FA Coordinator: Professor Hongtao Ding

**Robotics & Autonomous Systems**

Autonomy is a multidisciplinary field encompassing robotics, dynamic systems, cyber-physical systems, sensing, control, and network science.

Applications include self-driving cars, medical and assistive robots for surgery and rehabilitation, industrial co-robots for human-robot collaboration, and unmanned aerial, ground, and underwater vehicles.

FA Coordinator: Professor Venanzio Cichella

Further questions and inquiries about the tailored FA program, please contact the Mechanical Engineering Departmental Office at ME-dept@uiowa.edu