Design

This EFA 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 EFA.

Students working towards the design EFA are required to participate in the PEDE or VIPT enhanced design projects.

For more information, contact Professor KK Choi at kkchoi@engineering.uiowa.edu

Manufacturing

This EFA provides students with advanced education in production systems and process engineering including:

- Design and operation of manufacturing systems;
- Equipment selection; Plant layout; Process and production planning; Concurrent engineering; Intelligent systems;
- Manufacturing and material processing selection; Modeling; Design and Control; Tooling Design; Quality Control; Material Behavior; Robotics

For more information, contact Professor Hongtao Ding at hongtao-ding@uiowa.edu

Energy & Environment

This EFA 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.

For more information, contact Professor Al Ratner at albert-ratner@uiowa.edu

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.