

**Michigan State University**  
**Department of Mechanical Engineering**

## **ENERGY CONCENTRATION**

(12 Credits)

Mechanical engineers contribute greatly to the development of technologies to convert energy from one form into another. Automobile powertrains convert the chemical energy of fossil or biofuels into the kinetic energy of a moving car. Wind turbines convert the kinetic energy of the wind into electrical energy for the power grid. The fundamental courses of mechanical engineering (e.g., thermodynamics, fluid mechanics, vibrations) provide an essential understanding needed to model, analyze, and design many means of energy conversion. The energy concentration is designed to provide undergraduate students with a more thorough understanding of the analytical, computational, and experimental methods for developing means to convert energy to useful forms from various sources. These skills have applications beyond energy conversion for power generation and apply to many areas of mechanical engineering and other interdisciplinary fields. This concentration is well suited for preparing students for industrial careers, as well as for graduate study.

To complete a Bachelor of Science degree in mechanical engineering with an energy concentration, students must complete the requirements for the B.S. degree, including the following:

- ME 416\* Computer Assisted Design of Thermal Systems 3 credits (Fall Only)
- ME 417\* Design of Alternative Energy Systems 3 credits (Spring Only)

Plus *two courses* from the following list:

- ME 422 Introduction to Combustion 3 credits (Fall Only)
- ME 440 Aerospace Engineering Fundamentals 3 credits (Fall Only)
- ME 442\* Turbomachinery 3 credits (Spring Only)
- ME 444 Automotive Engines 3 credits (Fall Only)

CREDIT DISTRIBUTION: The 12 credits in the concentration will be applied to the Senior Elective requirement (including the “design intensive” course component). Completion of the concentration will be noted on the final transcript.

The asterisk (\*) signifies that the course is design intensive.