ME7383 - Electromechanical Energy Conversion & Storage Systems for Automotive Applications

The second graduate course in the Advanced Propulsion certificate program focuses on the emerging field of battery storage and fuel cells for automotive systems.

This course provides an indepth technology analysis and modeling of advanced batteries (Li-ion) and fuel cells (PEM). Special emphasis will be given to the energetics of the entire process, including upstream fuel processing. The numerous challenges of fuel cell systems use in automotive applications, ranging from fuel storage, fuel processing, thermal management and cost are also addressed.

26 graduate-level lectures provide a well-to-wheel analysis:

- Principles of electrochemistry
- Modeling & control of battery cells
- Fuel cell stacks & systems
- Fuels for fuel cell systems
- Modeling of fuel cell systems
- Control of fuel cell systems
- Energy management strategy for fuel cell vehicles

Prerequisites: Basic undergraduate knowledge in electrical systems, thermodynamics, and system analysis is required. Matlab and Simulink software is used to complete a project centered on modeling an entire fuel cell vehicle.

Ohio State University’s Advanced Propulsion certificate includes international collaboration with European partner, Swiss Federal Institute, ETH faculty member Dr. Lino Guzella.