ECE5025 - Power Electronics

This course is specifically targeted at engineers interested or working in the area of energy conversion and utilization at the vehicular level, and more specifically towards hybrid electric vehicles (HEV), fuel cell vehicles, and plug-in hybrid electric vehicles.

Topics focus on the fundamentals of power electronics, covering converter/inverter circuits, magnetic and capacitive components, power switching devices, PWM methods, control strategies, and grid connecting issues for P-HEV.

The course will cover the circuit design, control strategy study, simulation, and system level optimization of power electronics systems in vehicle applications with the advanced use of computer-aided tools such as PSIM.

42 graduate-level lectures on selected Powertrain topics such as:

- Power electronic circuits & analysis methods of the circuits
- Passive & active components of vehicle power electronics
- Pulse width modulation scheme impact on EMI & NVH
- Power grid system distribution & PHEV issues
- Simulation skills & basic power electronics circuit design
- Case studies and future technical challenges

Prerequisites: Bachelor’s degree in Mechanical or Electrical Engineering and a solid background (at the undergraduate level or entry-level graduate) in electric circuits are required.

Ohio State University's Advanced Propulsion course series includes international collaboration with Asian partner, University of Hong Kong.