Hybrid electric vehicle engineering

Continuing education for professional engineers

Michigan Tech’s Hybrid Electric Vehicle (HEV) curriculum provides advanced knowledge and hands-on labs in the design, analysis, control, calibration, and operating characteristics of HEVs. This coursework has been selected by the Michigan Academy of Green Mobility for training automotive engineers.

Propulsion Systems for HEVs

These courses, EE/MEEM 4295 and 5295 together with their associated laboratory courses 4296 and 5296, undertake a comprehensive study of hybrid electric vehicle performance and system optimization. Powertrain component analysis and modeling techniques focusing on power flows and losses are developed to quantify vehicle performance over drive cycles. Students will develop vehicle and subsystem requirements in the form of a Vehicle Technical Specification (VTS) and develop a vehicle model for simulation. These tools are applied to design and develop the control and calibration for the hybrid powertrain to meet the VTS.

Classroom seats in the Detroit area

Contact Marlene Lappeus for more information:
tel 906-487-4518; email mmlappeu@mtu.edu.

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Unemployed or in transition?

Contact the Engineering Society of Detroit at 248-353-0735.

All others please contact:
Marlene Lappeus, Academic Advisor
tel 906-487-4518; email mmlappeua@mtu.edu

Courses listed below in red will be available through online learning.
EE—Electrical and Computer Engineering MEEM—Mechanical Engineering
MY—Materials Science and Engineering CM—Chemical Engineering ENT—Enterprise

Fall semester offerings
MEEM 4200 Principles of Energy Conversion
MEEM 5290 Principles of Energy Conversion
MEEM 4295 Intro to Propulsion Systems for HEV*
MEEM 4296 Intro to Propulsion Systems for HEV Laboratory*
EE 4295 Intro to Propulsion Systems for HEV*
EE 4296 Intro to Propulsion Systems for HEV Laboratory*
MEEM 5200 Advanced Thermodynamics
MEEM 5220 Fuel Cell Technology
MEEM 4260 Fuel Cell Technology
MEEM 5250 Internal Combustion Engines II
MEEM 4700 Dynamic Systems and Controls
MEEM 5670 Experimental Design in Engineering
MEEM 5700 Dynamic Measurement/Signal Analysis
CM 3974 Fuel Cell Fundamentals
CM 5760 Vehicle Battery Cells and Systems*
MY 5760 Vehicle Battery Cells and Systems*
EE 5221 Advanced Electric Machines
EE 3120 Electric Energy Systems
EE 4227 Power Electronics
EE 4228 Power Electronics Lab
EE 4221 Power System Analysis 1
EE 4261 Classical Control Systems
EE 4900 Design Fundamentals

Spring semester offerings
MEEM 5295 Advanced Propulsion Systems for HEV*
MEEM 5296 Advanced Propulsion Systems for HEV Lab*
EE 5295 Advanced Propulsion Systems for HEV*
EE 5296 Advanced Propulsion Systems for HEV Lab*
EE 3221 Intro to Motor Drives
MEEM 4750/5750 Distributed Embedded Control Systems*
EE 4750/5750 Distributed Embedded Control Systems*
MEEM 4220 Intro to IC Engines
EE 3120 Electric Energy Systems
EE 4222 Power System Analysis 2
ENG 3200 Thermodynamics/Fluid Mechanics
MEEM 4700 Dynamic Systems and Control
MEEM 4901/4911 Senior Capstone Design*
EE 4900/4910 Senior Capstone Design*
MY 3978 Hydrogen Measurements Lab*
ENT 3978 Hydrogen Measurements Lab*
ENT Enterprise Courses

*dual-listed in two departments