INSTRUCTORS:
Dr. Xiaosong Kang. (269) 276-3239
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CLASS HOURS: R 7:00PM-9:20PM. Lectures supported by lab testing.

OBJECTIVE:
This course will introduce general aspects of advanced Hybrid Electric Vehicles (HEV), including architectures, modeling, sizing, sub-system design and hybrid vehicle control. It will cover vehicle dynamics, energy storage sources, electric propulsion systems, power electronics design, and HEV control and communication.

TEXTBOOK:
“Electric and Hybrid Vehicles Design Fundamentals” (2nd Edition), by Iqbal Husain

REFERENCES:
1) “Hybrid Electrical Vehicle Principles and Application with Practical Perspectives” by Chris MI, M. Abul and David Wenzhong Gao
2) “Propulsion System for Hybrid Vehicle” 2nd Edition” by John M. Miller

ASSIGNMENTS: Two to four homework assignments.

DESIGN PROJECT: Details to be announced in class.

GRADING:
30% - two to four individual assignments, 40% - final exam, 30% - design project

FINAL EXAM: Open book with calculator.

TOPICS:
- Lecture 1: Introduction to Hybrid Electric Vehicles
- Lecture 2: Vehicle Mechanics
- Laboratory session in the CAVIDS Hybrid Electric Applied Research Lab
- Lecture 3: HEV Modeling and Simulation
- Lecture 4 & 5: Battery and Energy Storage System
- Lecture 6: HEV Control Strategy
- Project Proposal
- Lecture 7 & 8: Traction Drive System
- Lecture 9: Hybrid Vehicle Communication
- Lecture 10 & 11: Power Electronics in HEV
- Lecture 12: Design Validation and Production of HEV Components
- Project Presentation
- Final