

ECE 438 – Electric and Hybrid Vehicles

Catalog Description: History of electric traction. Introduction to electric and hybrid-electric vehicle configurations. Vehicle mechanics. Energy sources and storage. Range prediction. Motor for HEVs. Electric drive components. Vehicle transmission system.

Credits: 4 **Terms Offered:** Spring of alternate years

Prerequisites: ENGR 202, ENGR 212

Courses that require this as a prerequisite: None

Structure: Two 100-minute lectures per week

Instructors: T. Brekken (primary), A. von Jouanne (secondary)

Course Content:

- Vehicle physics
- Hybrid and electric vehicle topologies
- Energy storage
- Basic machines and control

Measurable Student Learning Outcomes:

At the completion of the course, students will be able to...

1. **Analyze** current and future designs of electric and hybrid vehicles (ABET Outcomes: h, i, j, m)
2. **Analyze** vehicle kinetic performance (ABET Outcome: A, c, e, m, n)
3. **Identify** characteristics of different energy sources (ABET Outcomes: A, C, h, J, m)
4. **Analyze** characteristics of various electric motors (ABET Outcomes: A, C, h, m, n)
5. **Identify** appropriate power electronic controllers (ABET Outcomes: A, C, h, k, m)
6. **Identify** appropriate IC engine performance (ABET Outcomes: m)
7. **Design** hybrid configurations (ABET Outcomes: A, C, k, m)

Graduate students are expected to prepare a technical report and presentation, and present to class

Learning Resources:

- *Electric and Hybrid Vehicles: Design Fundamentals*, Iqbal Husain, CRC Press

Students with Disabilities:

Accommodations are collaborative efforts between students, faculty and Services for Students with Disabilities (SSD). Students with accommodations approved through SSD are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through SSD should contact SSD immediately at 737-4098.

Link to Statement of Expectations for Student Conduct:

<http://oregonstate.edu/admin/stucon/achon.htm>

Revised: 5/24/07