This course gives an overview of state of the art on cars alternative propulsion systems. It covers a description of components, system architectures and operation. The course also considers the modeling and simulation of these systems and at the end of the course, students should be able:
- to know the basics principles, components and operation of alternative propulsion systems
- to model and simulate the performance of these systems
# 220119 - Alternative Propulsion Vehicles

## Content

### Module 1: Introduction to Alternative Propulsion Vehicles

**Description:**
This introduces basics on alternative propulsion vehicles. It is mainly focused on pure electric and hybrid (petrol-electric) vehicles.

- System architectures.
- Energy Accumulators.
- State of the art of current technologies is presented as future trends as well.

**Related activities:**
- Final exam

**Learning time:** 12h 30m
- Theory classes: 5h
- Self study: 7h 30m

### Module 2: Principles of Electric Drives

**Related activities:**
- Final exam

**Learning time:** 12h 30m
- Theory classes: 5h
- Self study: 7h 30m

### Module 3: Laboratory of Electric Machines and Drives

**Description:**
This module is devoted to practice implementation of electric drives.


**Related activities:**
- Homework related to Module 3
- Final exam

**Learning time:** 25h
- Theory classes: 10h
- Self study: 15h

### Module 4: Modeling & Simulation

**Description:**
This module is devoted to the modeling and simulation of pure electric/hybrid vehicles using Matlab/Simulink. The model is useful for system sizing and design and to predict the vehicle performance.

**Related activities:**
- Final exam

**Learning time:** 25h
- Theory classes: 10h
- Self study: 15h
The final grade depends on the following assessment criteria:

- Laboratory work related to Module 3: 30%
- Assignments related to Module 4: 30%
- Final exam: 40%

Unsatisfying results of the Final exam could be repeated in an exam to be allocated during the period of the final exams. Students with grades lower than 5 points (unsatisfactory) can retake the exam. The new grade, if it is equal or higher than 5 points, will substitute with the Final exam grade with 5 points.

Qualification system

Bibliography

Basic:


Complementary:


Others resources: