

Academic Year/course: 2022/23

## 66429 - Advanced vehicle design

### Syllabus Information

**Academic Year:** 2022/23

**Subject:** 66429 - Advanced vehicle design

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 536 - Master's in Mechanical Engineering

**ECTS:** 4.5

**Year:** 1

**Semester:** Second semester

**Subject Type:** Optional

**Module:**

## 1. General information

## 2. Learning goals

## 3. Assessment (1st and 2nd call)

## 4. Methodology, learning tasks, syllabus and resources

### 4.1. Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It promotes student continuous work and focuses on practical aspects of calculation and optimization of advanced automotive systems. A wide range of teaching and learning tasks are implemented, such as:

Lectures with the whole class group cover theoretical and descriptive aspects of the course contents as well as the design criteria, calculation procedures and examples of solved cases corresponding to different vehicle systems treated in the course.

In practice sessions, vehicle bodies and its components are designed and optimized as well as thermal and hybrid engines of vehicles, through the handling of numerical and experimental techniques. Real design variables are handled.

The evaluation focuses on the practical aspects of design and calculation of the studied systems. The criteria used in the evaluation process are explained in the previous section of this course guide.

### 4.2. Learning tasks

The course includes the following learning tasks:

- **Lectures** A01 (10 hours) and **problem-solving and case studies** A02(12.5 hours). They are distributed along the 15 weeks of the semester. In them, the class group is given the description of the vehicle systems. It is also explained the design, calculation and applicable test procedures and some case studies.
- **Laboratory sessions** A03 (20 hours). They are taught in small groups, in the computer room or experimental laboratory. In them, students will develop skills in solving real problems and interpretation of results. Further information regarding laboratory sessions will be on the website (EINA and course website).
- **Special laboratory sessions** A04 (2.5 hours).
- **Assignments** A05 (35 hours).
- **Tutorials for assignment supervision** A06 (5 hours).

- **Study** A07 (55 hours).
- **Evaluation tests** A08 (2.5 hours).

### **4.3. Syllabus**

The course will address the following topics:

Topic 1. Alternative Internal Combustion Engines

Topic 2. Electric and hybrid power plans

Topic 3. Design of vehicle bodies

### **4.4. Course planning and calendar**

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website.