

## 30051 - Vehicle Design and Architecture

### Syllabus Information

**Academic year:** 2024/25

**Subject:** 30051 - Vehicle Design and Architecture

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

**Degree:** 436 - Bachelor's Degree in Industrial Engineering Technology

**ECTS:** 6.0

**Year:** 4

**Semester:** First semester

**Subject type:** Optional

**Module:**

### 1. General information

The main objective of this subject is to present the basic principles of the design of road vehicles from the point of view of their dynamic behavior. The content is divided into the three fundamental modes of operation of vehicles: longitudinal, lateral and vertical behavior. At the end of the course the student is also able to understand the transcendence of the vehicle and its systems in the development of the industry and society in general.

The subject is abstracted from political content and does not enter into ideologies of mobility or sustainability.

The subject is developed with notes that will be provided by the teachers.

### 2. Learning results

To know and understand the fundamental principles of vehicle design from a functional point of view Know and understand the interaction between the vehicle and its environment

To understand the characteristics of the different types of vehicles (cars, heavy vehicles) and their adaptability for the transport of people and goods.

Know the advantages and disadvantages of the use of different materials in vehicles, as well as the constructive aspects involved in the use of one or the other.

To know the basic principles of primary and secondary safety in motor vehicles

### 3. Syllabus

1. Dynamic behavior of the automobile:

- Longitudinal dynamics
- Lateral dynamics
- Vertical dynamics

2. Basic regulations applied to automobiles (national and European environment)

3. Vehicle typologies and architectures

4. Automotive systems design (elements of the suspension system and kinematic and dynamic behavior of the vehicle)

5. Primary and secondary security

### 4. Academic activities

1 Lectures with presentation of theoretical contents and application examples.

2 Practical classes that include dynamic evaluation of small vehicles and, when possible, passenger cars.

3. On-site or virtual visits to companies/institutions related to vehicle management and safety.

### 5. Assessment system

1. Individual written test consisting of short questions and problems. It will represent 85% of the final grade ( requires a minimum of 5 points out of 10)

2. Academic work that will account for 15% of the final grade

3. Compulsory practices whose assessment is passed through the delivery of assigned work (not included in the final grade)