

Vehicle Engineering

Academic Year: (2024 / 2025)

Review date: 03-04-2024

Department assigned to the subject: Mechanical Engineering Department

Coordinating teacher: SANZ SANCHEZ, SUSANA

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Theory of vehicles. Railroads and automobiles. Railway engineering

Knowledge of machine elements

OBJECTIVES

In this course is to introduce students to the new technologies that have appeared in the field of automotive and railway vehicles.

It is expected that after taking the course they will fix previously studied concepts and acquire specific knowledge about vehicle engineering.

Different types of vehicles will be introduced, among which automobiles, railways, rail vehicles, etc. will be taken into account.

The different components and elements that form part of these vehicles will be studied. Alternatives to internal combustion vehicles will be shown: autonomous vehicles, hybrid vehicles and electric vehicles. We will look in depth at pollutant emissions from vehicles, explaining the greenhouse effect, types of pollutants, pollutants associated with vehicles and methods for mitigating them.

As well as sustainable urban mobility.

DESCRIPTION OF CONTENTS: PROGRAMME

1. INTRODUCTION
- 2.- VEHICLES. History and evolution
- 3.- On Board Diagnostics of vehicles
- 4.- POLLUTANT EMISSIONS. Environment, polluting factors, plans, measurements.
- 5.- ELECTRIC VEHICLES. Components, propulsion, batteries and security.
- 6.- GAS VEHICLES. Types and design.
- 7.- HYBRIDIZATION OF VEHICLES. Transformations, legalization and inspection.
- 8.- EXTRAORDINARY VEHICLES. Dynamics and peculiarities, functionality.
- 9.- AUTONOMOUS VEHICLES.
- 10.- RAILWAY VEHICLES.
- 11.- SUSTAINABLE URBAN MOBILITY

LEARNING ACTIVITIES AND METHODOLOGY

The learning activities will include:

- Master classes in the classroom, where the knowledge that students should acquire will be presented. To facilitate their development the students will receive the class notes and will have basic reference texts, which will facilitate them to follow the classes and develop the subsequent work.
- When necessary for the understanding of the theory, exercises will be presented for its resolution by

the student that will serve as a self-assessment and to acquire the objective skills of the subject.

- Laboratory practices. There will be two in which it will try that the student acquires knowledge and skills that in a classroom would not be possible because of the volume of students.
- Activities. Finally, visits are made to companies in the sector in order that the student knows first hand some aspects related to the subject.

The visits, rehearsals and classes by prestigious speakers of the sector, will depend on the number of students enrolled and the disposition of the speakers.

- Tutorial regime. In the tutorials related to the work, they will be collective, having to assist the members of the team.

ASSESSMENT SYSTEM

% end-of-term-examination:	60
% of continuous assessment (assignments, laboratory, practicals...):	40

The evaluation system includes continuous assessment of student work and assessment through a final written examination, which will assess overall the knowledge, skills and abilities acquired throughout the course.

Depending on the extent and / or difficulty of the assignments used for continuous assessment, the percentages may vary: 40% -70% (continuous assessment) and 60% -30% (written exam).

It is required that the grade of the exam is superior to 3,5/10 in order to pass.

The attendance to the practices are obligatory.

BASIC BIBLIOGRAPHY

- A. Gauchia, D. García-Pozuelo, B. L. Boada, M^a J. L. Boada, E. Olmeda, V. Díaz, J. Fuentes Automóviles y Ferrocarriles: Problemas Resueltos, Universidad Nacional de Educación a Distancia .
- F. Aparicio, C. Vera Alvarez, V. Díaz López. Teoría de los vehículos automóviles, Sección de publicaciones de la ETSII..
- Francisco Javier González Fernández, Julio Fuentes Losa Ingeniería ferroviaria, Universidad Nacional de Educación a Distancia.
- M. Arias-Paz Manual de automóviles, Dossat 2000 2006 .
- Thomas D. Gillespie Fundamentals of vehicle dynamics, Society of Automotive Engineers .
- Vicente Díaz López Ester Olmeda Santamaría Antonio Gauchi a Babe Daniel Garcí a-Pozuelo Ramos Beatriz López Boada Mari a Jesu s López Boada Julio Fuentes Losa Automóviles y ferrocarriles , Universidad Nacional de Educación a Distancia .