

Vehicle Engineering

Academic Year: (2023 / 2024)

Review date: 28-04-2023

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

This course will introduce the student to the knowledge of new technologies that have appeared in the world of motor vehicles and railways.

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

Different typologies of vehicles will be announced, among which will be taken into account automobile, railway, special off road vehicles, etc.

They will study the different components and elements that are part of these, with special emphasis on new technologies such as electric cars, hybrids, gas or autonomous vehicles for example.

They will learn the basic principles and components of railway vehicles

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. Dynamics, traction, braking and suspension.

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 Gauchia Babez Daniel García-Pozuelo Ramos Beatriz López Boada María Jesús López Boada Julio Fuentes Losa Automóviles y ferrocarriles , Universidad Nacional de Educación a Distancia .