

Academic Year: ( 2019 / 2020 )

Review date: 24/04/2020 14:37:56

Department assigned to the subject: Mechanical Engineering Department

Coordinating teacher: LOPEZ BOADA, BEATRIZ

Type: Electives ECTS Credits : 3.0

Year : 4 Semester :

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

Machine mechanics.

**OBJECTIVES**

By the end of this subject, students will be able to have:

1. A systematic understanding of the key aspects and concepts of machine design and testing.
2. The ability to apply their knowledge and understanding to identify, formulate and solve problems of machine design and testing using established methods;
3. The ability to apply their knowledge and understanding to develop and realise mechanical designs to meet defined and specified requirements;
4. An understanding of methodologies in machine design and testing, and an ability to use them.
5. Workshop and laboratory skills in machine design and testing .
6. The ability to combine theory and practice to solve problems of machine design and testing ;
7. An understanding of applicable techniques and methods in machine design and testing , and of their limitations;

**DESCRIPTION OF CONTENTS: PROGRAMME**

Running gear.  
 Retardation forces.  
 Traction and braking.  
 Lateral train dynamics.  
 Derailment.  
 Wheel-Rail contact.  
 Railway Track.  
 Mathematical Modelling of track dynamics.  
 Railway electrification system.

**LEARNING ACTIVITIES AND METHODOLOGY**

Lectures will be explained in big groups, exercises for understanding the lectures will be solved, labs will be carried out and a project in groups will also be done. In addition, 2 labs will be carried out:

Lab 1: Track design.  
 Lab 2: Visit to a railway instalation.

**ASSESSMENT SYSTEM**

<b>% end-of-term-examination/test:</b>	60
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	40

The work done by the student will be evaluated by following the Bologna criteria. The work carried out by a technical report in group (4 person). The evaluation consists on:

<b>% end-of-term-examination/test:</b>	60
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	40
* Theoretical basis	
* Technical information included in inform.	
* Report delivered	

Final evaluation:

- \* The final evaluation consists on a exam with a teorical and a practical part.
- \* The students with a grade in report greater than 7 will not have to do the exam and the final grade will be the grade of report.
- \* For the rest of student, they will have to do an exam and they will have to obtain a grade greater than 4. The Final grade will be obatin with the 40% of report grade an 60% of final exam.

The laboratory sessions are obligatory. Do not pass the laboratory sessions will imply to fail the subjet.

#### BASIC BIBLIOGRAPHY

- A. Gauchía, D. Garcia-Pozuleo, B.L. Boada, M.J.L.Boada, E. Olmeda y V. Diaz Automóviles y Ferrocarriles: problemas resueltos, UNED, 2014
- Iwnicki, S. Handbook of railway vehicle dynamics , CRC/Taylor & Francis,, 2006
- V. Diaz, E. Olmeda, A. Gauchía, D. Garcia-Pozuleo, B.L. Boada y M.J.L.Boada Automóviles y Ferrocarriles, UNED, 2012

#### ADDITIONAL BIBLIOGRAPHY

- Bonnett, Clifford F. Practical railway engineering , Imperial College Press, 2005
- Javier González, Rosario Romera, Jesús Carretero, José M. Pérez Optimal railway infrastructure maintenance and repair policies to manage risk under uncertainty with adaptive control, Working papers. Statistics and Econometrics , 2006