29750 - Measurement and Maintenance

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	434 - Bachelor's Degree in Mechanical Engineering
ECTS	6.0
Year	4
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

A teaching program of 30 hours of lectures, 6 hours of problems, 18 hours of laboratory practice and 6 hours dedicated to visits to local companies, as well as the development of a works of interest (60 hours). These jobs are sometimes collectively made in groups of 3 or 4 students and in other cases, individually.

In sessions with the whole group the more theoretical aspects are addressed in the form of master class and are completed with immediate applications: trouble-type. It is intended to provide students with sufficient advance the

documentation for each subject, in order that the student knows the contents on the subject to be treated, which favor a more participatory class.

The practice sessions are done in 3 hours. Each group is scheduled to perform practices Monday through Friday. As in the theoretical teaching, students have in advance the script of practices.

Both classroom sessions and lab will equip the student knowledge and skills to perform different case studies. These cases have been raised so that each group of students will apply throughout the course different techniques working on a company that will be given at the beginning of the course. This company will keep throughout all sessions. On it different situations for the application of knowledge indicated in the established modules that reflect real situations, in which the student must apply the appropriate technique and take appropriate decisions to the situation in question will arise.

The evaluation is focused on the more practical aspects. It aims to promote both teamwork and individual effort and has made planning for the hours of dedication are balanced each week.

5.2.Learning tasks

The course includes 6 ECTS organized according to:

- Lectures

- Laboratory sessions

- Guided assignments

- Autonomous work

- Tutorials

Lectures: the professor will explain the theoretical contents of the course and solve illustrative applied problems. These problems and exercises can be found in the problem set provided at the beginning of the semester. Lectures run for 3 weekly hours. Although it is not a mandatory activity, regular attendance is highly recommended.

Laboratory sessions: sessions will take place every weeks. Students will work together in groups actively doing tasks such as practical demonstrations, measurements, calculations, and the use of graphical and analytical methods.

Guided assignments: students will complete assignments, problems and exercises related to concepts seen in laboratory sessions and lectures. They will be submitted at the beginning of every laboratory sessions to be discussed and analyzed. If assignments are submitted later, students will not be able to take the assessment test.

Autonomous work: students are expected to spend about 90 hours to study theory, solve problems, prepare lab sessions, and take exams.

Tutorials: the professor's office hours will be posted on Moodle and the degree website to assist students with questions and doubts. It is beneficial for the student to come with clear and specific questions.

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5.3.Syllabus

Theoretical and practical agenda

1. Geometrical Product Specification. Tolerances
2. Design in precision engineering
3. Coordinate Measuring
4. Verification of production systems
5. Industrial view. Non-contact measurement and reverse engineering
6. Predictive maintenance techniques and their applications.

Lab practices

1. Industrial Metrology
2. Calibration techniques and equipment in dimensional metrology
3. Coordinate Measuring
4. Verification of production systems
5. Non-contact measurement and Reverse Engineering
6. Techniques of predictive maintenance

5.4.Course planning and calendar

For further details concerning the timetable, classroom and further information regarding this course please refer to the "Escuela de Ingeniería y Arquitectura " website (https://eina.unizar.es/)

5.5.Bibliography and recommended resources

[BB: Basic Bibliography / BC: Additional Bibliography]

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- [BB] CEM. ?Guía para la expresión de la incertidumbre de medida?, ISO, 1998
- [BB] Dounce Villanueva, Enrique.. La productividad en el mantenimiento industrial / Enrique Dounce Villanueva. . Tercera edición. México D.F. : Larousse - Grupo Editorial Patria, [2014]
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- [BB] Pfeifer, Tilo. Production Metrology / Pfeifer, T . Ed. Oldenbourg, 2002
- [BB] Reverse engineering : an industrial perspective / edited by Vinesh Raja, Kiran J. Fernandes London : Springer, cop. 2008
- [BB] Sánchez Pérez, Angel Ma.. Elementos de metrología / Angel Ma. Sánchez Pérez, Javier Carro de Vicente-Portela Madrid : Universidad Politécnica de Madrid, D.L.1996
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- [BC] Sevilla, L . Metrología Dimensional / Sevilla, L., Martín, M.J Universidad de Málaga, 2002.

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