

30166 - Maintenance Management

Información del Plan Docente

Academic Year	2016/17
Academic center	175 - Escuela Universitaria Politécnica de La Almunia
Degree	425 - Bachelor's Degree in Industrial Organisational Engineering
ECTS	6.0
Course	4
Period	First semester
Subject Type	Optional
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The learning process designed for this subject is based on the following:

This Maintenance Management course is conceived as a set of contents, but divided into four blocks. The first block, brings together concepts of operation of the power components and protective elements. The second and third blocks, form the core of the subject matter must contribute to the formation of the student: static switches, drives and regulators, rectifiers and power inverters. The final block, brings together complementary skills to complete training in Maintenance

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The first three blocks will be dealt with under three fundamental and complementary ways, these are: the theoretical concepts of each teaching unit, solving problems or issues and laboratory practices, supported in turn by another series of activities such as tutorials and seminars and will be tested individually, independent for each of the blocks.

The fourth block will have a different treatment, as the students will work only in groups only in the issues that they were previously assigned, they will be allowed to express their preferences but all topics will be assigned to a group. They will prepare presentation materials and defend their work with a public exhibition, which will be valued by the other students and the teacher.

The teacher / student interaction becomes a reality through a division of work and responsibilities between students and teachers. However, it is taken into account to some extent the students can set the pace of learning according to their needs and availability, following the guidelines set by the teacher.

The organization of teaching involves the active participation of students, and conducted according to the following guidelines:

The organization of the actual teaching will be based on the following guidelines:

* **Lectures** : theoretical activities conducted by the teacher, so that the theoretical support of the subject is given, highlighting the major issues, structuring them on chapters and / or sections and connecting them to each other.

* **Practice Classes** : The teacher deals with problems or study cases to complement the theoretical classes with practical issues:

* **Seminars** : The total group of lectures or practical classes may or may not be divided into smaller groups, as appropriate. They will be used to analyze cases, solve problems, etc. Unlike what happens with the practical classes, the teacher is not the protagonist. He just listens, guides, clarifies, assesses, evaluates. We want to encourage the student participation and try to make continuous assessment easier and learn about the learning performance.

* **Practices**: The total group of master classes will be divided into several shifts, depending on the number of students / enrolled as, but never more than 20 students per shift, so that smaller groups are formed. The practices are carried out in groups of two (or at most three students), while the report-report of activities (according to the teacher) may associate different shifts homonyms groups, to encourage teamwork.

- * **Group tutorials** : Scheduled tracking learning activities in which the teacher meets with a group of students to guide their autonomous learning work and consultancy of targeted work or tasks that require a very high degree of advice from the teacher.
- * **Individual tutorials** : These are made on a one-to-one basis, at the department. They aim to help solving problems that are the students might have, particularly those which for several reasons cannot attend group tutorials or need a more personalized attention. These tutorials may be face-to-face or virtual.

5.2.Learning activities

The program that the student is offered to achieve the expected results includes the following activities...

Face-to-face Generic Activities :

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* **Theoretical classes** : the concepts and procedures of the subject will be developed and practical examples as support will be developed

- **Practical classes** : problems and case studies will be done to complement the theoretical concepts studied

* **Practices**: Students will be divided into several groups not bigger than 20 students being monitored by the teacher.

* **Defense and presentation of topics** : on the particular contents assigned to each group of students, belonging to Block 4

Non-class Generic Activities:

* Study and assimilation of the concepts and procedures outlined in the laboratory.

* Understanding and assimilation of the problems and practical cases solved in practical lessons.

* Organization of seminars, suggested problems solving, etc.

* Organization of laboratory practice work, development of scripts and reports.

* Production of written continuous assessment tests and final exams

Monitored autonomous activities : While attending classes will have been taken into account separately for their idiosyncrasies, they will focus mainly seminars and tutorials under the supervision of the teacher.

Reinforcement activities : With a remarkable non-class nature, through a virtual learning portal (Moodle, e-mail) several activities that reinforce the basic contents of the subject will be carried out. These activities can be customized or not, and will be monitored through the portal.

Scheduling of a teaching week: The course is designed in the Degree verification document with a low experimental load, so the 10 hours per week are distributed as follows:

* Theoretical and practical classes: 3 hours per week (blocks 1, 2 and 3)

5 hours per week (block 4)

* Labs: 1 hour per week

* Other activities: 6 hours per week (blocks 1, 2 and 3)

4 hours per week (block 4)

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Global Schedule distribution: The subject consists of 6 ECTS credits, which represents 150 hours of the student work in the subject during the semester, 10 hours per week for 15 teaching weeks, distributed as follows:

* 48 hours in the classroom: 60% presentation of concepts and 40% of problem solving-type, at a rate of 3 hours per week, except for weeks with control tests when one hour will be reduced and in the last weeks when there will be a two hour increase.

* 15 hours of supervised laboratory practice: Weeks 1 to 15 in sessions of 1 hour.

* 15 hours of seminars and group tutorials: to complete the practical activities of each block and particularly for the preparation of block 4 (see table calendar in activities and resources)

* 66 hours of personal study: a rate of 4 hours in each 15-week semester, to develop work, exercising, studying theory, etc ... (in the table below the recommended distribution schedule is set)

* 6 hours of testing (3 tests in 2 hours), to be done in weeks: 3rd, 7th and 12th.

5.3.Program

Essential contents of the subjects for achieving the learning outcomes

Theoretical contents

The theoretical contents are based on four blocks (numbers 1-4) preceded by an introductory block 0 to Maintenance. The choice of the contents of the blocks has been made seeking the clarification of the final goal, so that with the gathering of contents, the student achieves a structured knowledge, easily understandable by Industrial Organization Engineers.

Each of the blocks consists of units, with a temporary assignment of one or two weeks of the course, these units gather the contents needed to the acquisition of preset learning outcomes, according to the following relationship

Block 0: INTRODUCTION

- General Overview of Maintenance.
- Reliability, Management of Historic, machines, facilities.
- Concept Map

Block 1: OVERVIEW TECHNICAL MAINTENANCE

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1. Evolution and structure maintenance

- * Function, objectives, types
- * Maintenance Companies
- * Industries with own maintenance
- * Breakdowns, management and treatment. The organization of intervention.
- * Contrast versus preventive corrective maintenance
- * Technical documentation: facilities, systems, machines, elements, ..
- * Historic Bank. . .

2. Management Software

- * Databases
- * Management Historic
- * Storage Management and shopping
- * Expert systems.

Block 2: OPTIMIZATION OF MAINTENANCE MANAGEMENT

3. Reliability and Quality

- * Reliability. "Maintainability". RCM
- * Availability of installations
- * Quality. Types of machine breakdowns
- * The Japanese method of maintenance: TPM

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4. Store and equipment maintenance

- * Supplies. Homologation of suppliers
- * Organization and warehouse control
- * Parts Catalog
- * Inventory control and orders
- * Management tools and tooling

5. Optimization of economic management

- * The cost of comprehensive maintenance
- * Cost analysis
- * Maintenance Productivity
- * Outsourcing of maintenance

Block 3: PLANNING AND MAINTENANCE PROCESSES

6. Organization of preventive maintenance.

- * Concepts and Types
- * Human Resources (HR) and materials
- * Optimizing maintenance shop
- * Inspections and periodic reviews.

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7. Predictive Maintenance

- * Based on vibration analysis
- * Based on analysis of oils
- * Based on temperature. Thermography
- * Further analysis and application examples.

8. Energy and environmental Maintenance

- * Energy production processes
- * Consumption control
- * Integrated use of a installations
- * Environmental maintenance

Block 4: CASE STUDY IN MACHINERY AND EQUIPMENT

9. Case Studies machines

- * Maintenance of mechanical elements
- * Maintenance of electrical and electronic
- * Maintenance of pneumatic and hydraulic elements
- * Maintenance of computer equipment
- * . . .

10. Case Studies in installations

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Practice 3								1	1	1	1	1					5
Practice 4													1	1	1		3
Test 1			2														2
Test 2							2										2
Test 3												2					2
Global Test																	(3)
Seminars / Tutorials	1		1	1	1			1	1	1	1		2	2	2		15
Exercises / Jobs	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2		15
Personal study	5	5	5	5	5	5	5	5	5	5	5	5	2	2	2		66
Total	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	150

The dates of the global assessment tests will be published officially in <http://www.eupla.es/secretaria/academica/examenes.html>. its duration is included but is not included in the computation of 150 hours.

Written assessment tests in the process of continuous assessment will be related to the theoretical and practical aspects of the following topics:

- Test 1: Items 1 and 2 (Block 1)
- Test 2: Items 3, 4 and 5 (Block 2)
- Test 3: Items 6, 7 and 8. (Block 3)

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The issues on which the work of block 4 (Items 9 and 10) will be developed will be allocated for the development of Block 2 (weeks 4th to 7th), carrying out delivery until the end of the week 12th and exposure during final weeks (13th to 15th), during the course dates will be specified.

5.5. Bibliography and recommended resources

Bibliography

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- ois. Teoría y práctica del mantenimiento industrial / por François Monchy ; versión castellana y prólogo de Manuel Fraxanet de Simón . - [1a. ed.] Barcelona : Masson, 1990

Resources

Material	Soporte
Theory notes Transparencies Problems	Paper / repository
Theory notes Transparencies Problems Links of interest	Digital / Moodle Email
Maintenance management software	Pc's laboratory
Technical manuals	Paper / repository Digital/Moodle

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PC computers	Equipment Computer Rooms
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