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340059 - PRFA-M4O12 - Manufacturing Processes

Coordinating unit: 340 - EPSEVG - Vilanova i la Geltrú School of Engineering

Teaching unit: 712 - EM - Department of Mechanical Engineering

Academic year: 2019

Degree: BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)

ECTS credits: 6 Teaching languages: Catalan

Teaching staff

Coordinator: MAURICI SIVATTE ADROER

Others: MAURICI SIVATTE ADROER

Opening hours

Timetable: Wednesday from 12:30 to 14:30
Wednesday from 17:00 to 18:00

Degree competences to which the subject contributes

Specific:

1. CE26. Applied knowledge of systems and fabrication process, METROLOGIA and quality control.

Transversal:

2. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
3. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
4. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

Teaching methodology

The sessions are divided into classes of theory, problems and laboratory practice.
The lectures comprise the statements of the basic theoretical concepts of the topics of the course applied examples and exercises as described.
They will also be proposed Exercises that the students will solve individually "on line" through a mobile phone, a tablet or a laptop.
In laboratory practice classes,which will be obligatory to pass the subject ,experimental fellows are developed and is the student, individually or in groups, who must work on the aspects set by the teacher.

Learning objectives of the subject

When finishing the subject the student has to be able to:

- Describe the main processes of formation used at industrial level.
- Use quality management tools and metrology applied to manufacturing processes.

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- Choose the type of manufacturing process of a piece based on the design, material and technological and environmental aspects.
- Use, in a basic way, the machines of the manufacturing processes studied.
- Work in teams effectively, improving communication, distribution of tasks and group cohesion.
- Exhibits effective technical results.

Study load

Total learning time: 150h	Hours large group:	45h	30.00%
	Hours medium group:	0h	0.00%
	Hours small group:	15h	10.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

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Content

Metrology and quality in manufacturing processes.

Learning time: 60h

Theory classes: 16h
Laboratory classes: 8h
Self study : 36h

Description:
Measurement. Errors and uncertainty in the measurement
Dimensional and geometric tolerances. Settings.
Verifiers fixed dimensions. Gauges
Surface Finish

Related activities:
A1 = Learning Assessment.
A2 = Lab.
A3 = Reporting.

Specific objectives:
Calculate adjustments make mounting and control.
Decide surface roughness depending on the application.
Having quality concepts in all phases of the production process; estimate its difficulty and need, and know the different solutions adopted in the industry and the tools available.

Machining processes.

Learning time: 25h

Theory classes: 8h
Laboratory classes: 2h
Self study : 15h

Description:
Machining by chip removal. Features

Related activities:
A1 = Learning Assessment.
A2 = Lab.
A3 = Reporting.

Specific objectives:
Understand the concept of machining machining, advantages, machinery, and basic concepts of calculus.

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Computer aided manufacturing.

Learning time: 25h

Theory classes: 2h
Laboratory classes: 5h
Self study : 18h

Description:
Main concepts of computer aided manufacturing.
ISO programming.

Related activities:
A1 = Learning Assessment.
A2 = Lab.
A3 = Reporting.

Specific objectives:
The student must know the concept of numerical control, their vewntajas, machinery, and basic programming concepts.

Conforming processes by plastic deformation.

Learning time: 15h

Theory classes: 6h
Laboratory classes: 0h
Self study : 9h

Description:
Hot deformation processes
Cold deformation processes

Related activities:
A1 = Evaluation of learning.
A2 = Laboratory practices.
A3 = Presentation of reports.

Specific objectives:
Know the different types of hot deformation, cold deformation and cutting processes, their characteristics and the cases in which they are applicable.

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Conforming processes by casting and molding.	Learning time: 10h Theory classes: 4h Laboratory classes: 0h Self study : 6h

Description:
Foundry. Sand casting
Materials for molds
Molding metal mold

Related activities:
A1 = Learning Assessment.
A2 = Lab.
A3 = Reporting

Specific objectives:
Know the most important molding processes and parameters that define them

Powder Metallurgy.	Learning time: 10h Theory classes: 4h Laboratory classes: 0h Self study : 6h

Description:
Powder Metallurgy
Arc welding, TIG, MIG, resistance
Hard and soft soldering

Related activities:
A1 = Learning Assessment.
A2 = Lab.
A3 = Reporting

Specific objectives:
Know the main features and applications of Powder Metallurgy.
Knowing the different welding technologies.

(ENG) Proves d'avaluació individual	Learning time: 5h Guided activities: 5h

Description:
Each student will make two single assessment tests and rump work to be presented in public.

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Planning of activities

A1. LEARNING ASSESSMENT

Hours: 5h
Theory classes: 5h

Description:
Training for the acquisition of knowledge and individual study activities.

Support materials:
Statement of the test.

Descriptions of the assignments due and their relation to the assessment:
Resolution in writing or oral, justified, and individual test questions.

Specific objectives:
Assess the level of knowledge and competencies of the subject. Resolution in writing or an oral test, i justified individual issues.

A2. PRACTICE

Hours: 11h
Theory classes: 11h

Description:
Development of a laboratory experimental work, scheduled and guided by Professor embodiment.

Support materials:
Reports preparatory process of the realization of the lab.

Descriptions of the assignments due and their relation to the assessment:
For each session of laboratory practice, a document of the work done will be delivered according to the conditions specified in each particular case.

Specific objectives:
Recognize and apply some of the concepts studied in the theory activities.
Explain and describe the practical phenomena observed in the laboratory.

A3. QUESTIONNAIRES

Hours: 1h
Theory classes: 1h

Description:
Exercises will be proposed that students will solve in class individually "online" through a mobile phone, a tablet or a laptop.

Specific objectives:
Reinforce the lessons learned in class.

Qualification system

The training activities of learning and individual student study will be evaluated through written or oral tests: 75%.
Training activities related to exercises resolved in class by students: 5%
The training activities related to practical work is assessed by the following parameters: personal attitude, individual work developed, reporting on individual or team activities: 20%.
Only the written tests, corresponding to 75% of the final mark, will be Reassessable

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Regulations for carrying out activities

The conditions for completion of each test shall be specified in each case, in good time.

Bibliography

Basic:

Lasheras Esteban, José Mª. Tecnología mecánica y metrotecnia. San Sebastián: Editorial Donostiarra, 1984. ISBN 8470630873.

Coca Rebollero, Pedro; Rosique Jiménez, Juan. Tecnología mecánica y metrotecnia. Madrid: Pirámide, 1996. ISBN 8436816633.

DeGarmo, Ernest Paul; Temple Black, J.; Kohser, Ronald A. Materiales y procesos de fabricación. 2a ed. Barcelona [etc.]: Reverté, 1988. ISBN 8429148221.

Kalpakjian, Serope; Schmid, Steven R. Manufactura, ingeniería y tecnología. 7a ed. Ciutat de Mèxic: Pearson, 2014. ISBN 9786073227353, 9786073227421.

Groover, Mikell P. Fundamentos de manufactura moderna : materiales, procesos y sistemas [on line]. 3a ed. México [etc.]: Prentice-Hall Hispanoamericana, 2007 [Consultation: 27/03/2017]. Available on: <http://site.ebrary.com/lib/upcatalunya/docDetail.action?docID=10515063&p00=fundamentos%20de%20manufactura%20moderna>. ISBN 9789701062401.

Complementary:

Vivancos Calvet, Joan. Máquinas herramientas con Control Numérico : fabricación asistida por Computador (C.A.M.), fabricación flexible, fabricación integrada por Computador (C.I.M.). Barcelona: ETSEIB. Centre Publicacions d'Abast, 1994.

Vivancos Calvet, Joan. Tecnologías de fabricación : procesos de fusión y moldeo y de deformación. Barcelona: ETSEIB.CPDA, 1998. ISBN 8484982815, 8484982823.

Reina Gómez, Manuel. Soldadura de los aceros : aplicaciones. 4a ed. Madrid: Weld-Work, 2003. ISBN 8460774872.