

## 340059 - PRFA-M4012 - Manufacturing Processes

Coordinating unit:	340 - EPSEVG - Vilanova i la Geltrú School of Engineering
Teaching unit:	712 - EM - Department of Mechanical Engineering
Academic year:	2018
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, 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.



## 340059 - PRFA-M4012 - Manufacturing Processes

- 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%

## 340059 - PRFA-M4012 - Manufacturing Processes

### Content

<p>- Metrology and quality in manufacturing processes.</p>	<p>Learning time: 37h Theory classes: 12h Practical classes: 0h Laboratory classes: 4h Self study : 21h</p>
<p>Description: Measurement. Errors and uncertainty in the measurement Dimensional and geometric tolerances. Settings. Verifiers fixed dimensions. Gauges Surface Finish</p> <p>Related activities: A1 = Learning Assessment. A2 = Lab. A3 = Reporting.</p> <p>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.</p>	
<p>- Conforming processes by plastic deformation and machining.</p>	<p>Learning time: 35h Theory classes: 10h 30m Practical classes: 0h Laboratory classes: 3h 30m Self study : 21h</p>
<p>Description: Hot deformation process Cold deformation processes i cut Machining by chip removal. Features</p> <p>Related activities: A1 = Learning Assessment. A2 = Lab. A3 = Reporting.</p> <p>Specific objectives: Know the different types of deformation processes in hot, cold deformation i cut, its features and where they apply. Understand the concept of machining machining, advantages, machinery, and basic concepts of calculus.</p>	

## 340059 - PRFA-M4012 - Manufacturing Processes

<p>- Computer aided manufacturing.</p>	<p>Learning time: 35h Theory classes: 10h 30m Practical classes: 0h Laboratory classes: 3h 30m Self study : 21h</p>
<p>Description: Main concepts of computer aided manufacturing. ISO programming.</p> <p>Related activities: A1 = Learning Assessment. A2 = Lab. A3 = Reporting.</p> <p>Specific objectives: The student must know the concept of numerical control, their vewntajas, machinery, and basic programming concepts.</p>	
<p>- Conforming processes by casting and molding.</p>	<p>Learning time: 18h 30m Theory classes: 6h Practical classes: 0h Laboratory classes: 2h Self study : 10h 30m</p>
<p>Description: Foundry. Sand casting Materials for molds Molding metal mold</p> <p>Related activities: A1 = Learning Assessment. A2 = Lab. A3 = Reporting</p> <p>Specific objectives: Know the most important molding processes and parameters that define them</p>	

## 340059 - PRFA-M4012 - Manufacturing Processes

<p>- Powder Metallurgy.</p>	<p>Learning time: 18h 30m Theory classes: 6h Practical classes: 0h Laboratory classes: 2h Self study : 10h 30m</p>
<p>Description: Powder Metallurgy Arc welding, TIG, MIG, resistance Hard and soft soldering</p> <p>Related activities: A1 = Learning Assessment. A2 = Lab. A3 = Reporting</p> <p>Specific objectives: Know the main features and applications of Powder Metallurgy. Knowing the different welding technologies.</p>	
<p>(ENG) Proves d'avaluació individual</p>	<p>Learning time: 6h Guided activities: 6h</p>
<p>Description: Each student will make two single assessment tests and rump work to be presented in public.</p>	

## 340059 - PRFA-M4012 - Manufacturing Processes

### Planning of activities

A1. LEARNING ASSESSMENT	Hours: 5h Theory classes: 5h
<p>Description: Training for the acquisition of knowledge and individual study activities.</p> <p>Support materials: Statement of the test.</p> <p>Descriptions of the assignments due and their relation to the assessment: Resolution in writing or oral, justified, and individual test questions.</p> <p>Specific objectives: Assess the level of knowledge and competencies of the subject. Resolution in writing or an oral test, i justified individual issues.</p>	
A2. PRACTICE	Hours: 11h Theory classes: 11h
<p>Description: Development of a laboratory experimental work, scheduled and guided by Professor embodiment.</p> <p>Support materials: Reports preparatory process of the realization of the lab.</p> <p>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.</p> <p>Specific objectives: Recognize and apply some of the concepts studied in the theory activities. Explain and describe the practical phenomena observed in the laboratory.</p>	
A3. QUESTIONNAIRES	Hours: 1h Theory classes: 1h
<p>Description: Exercises will be proposed that students will solve in class individually "online" through a mobile phone, a tablet or a laptop.</p> <p>Specific objectives: Reinforce the lessons learned in class.</p>	

### 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

## 340059 - PRFA-M4012 - Manufacturing Processes

### 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 M<sup>a</sup>. 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.