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: 2017
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: Monday from 13:30 to 14:30
Monday 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.
A class of problems, the teacher presents exercises applying the concepts they studied in classes of theory i proposed to solve them other students, individually or in groups.

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.
- Choose the type of manufacturing process of a piece based on the design, material and technological and environmental aspects.
340059 - PRFA-M4O12 - Manufacturing Processes

- 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.

<table>
<thead>
<tr>
<th>Study load</th>
<th>Hours large group:</th>
<th>45h</th>
<th>30.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Hours small group:</td>
<td>15h</td>
<td>10.00%</td>
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<tr>
<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
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</tbody>
</table>
### Content

<table>
<thead>
<tr>
<th>Topic</th>
<th>Learning time</th>
<th>Description</th>
<th>Related activities</th>
<th>Specific objectives</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td><strong>- Conforming processes by plastic deformation and machining.</strong></td>
<td><strong>35h</strong></td>
<td>Hot deformation process. Cold deformation processes i cut. Machining by chip removal. Features.</td>
<td>A1 = Learning Assessment. A2 = Lab. A3 = Reporting.</td>
<td>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.</td>
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### Conforming processes by casting and molding.

**Learning time:** 18h 30m  
Theory classes: 6h  
Practical classes: 0h  
Laboratory classes: 2h  
Self study: 10h 30m

**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:** 18h 30m  
Theory classes: 6h  
Practical classes: 0h  
Laboratory classes: 2h  
Self study: 10h 30m

**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.
### - Computer aided manufacturing.

<table>
<thead>
<tr>
<th>Learning time:</th>
<th>35h</th>
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<tbody>
<tr>
<td>Theory classes:</td>
<td>10h 30m</td>
</tr>
<tr>
<td>Practical classes:</td>
<td>0h</td>
</tr>
<tr>
<td>Laboratory classes:</td>
<td>3h 30m</td>
</tr>
<tr>
<td>Self study:</td>
<td>21h</td>
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</tbody>
</table>

**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.

### (ENG) Proves d’avaluació individual

<table>
<thead>
<tr>
<th>Learning time:</th>
<th>6h</th>
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<tr>
<td>Guided activities:</td>
<td>6h</td>
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**Description:**
Each student will make two single assessment tests and rump work to be presented in public.
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, 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. REPORTING

| Hours: 4h |
| Theory classes: 4h |

**Description:**
Work related to the contents of the course team. It will focus on the fabrication process of a commercial item that is manufactured using different processes and / or different materials and / or various heat treatments.

**Descriptions of the assignments due and their relation to the assessment:**
Work on paper and public presentation.

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**Qualification system**

The training activities of learning and individual student study will be evaluated through written or oral tests: 800%.
The training activities related to practical work is assessed by the following parameters: personal attitude, individual work developed, reporting on individual or team activities: 15%.
They teamwork assessed through paper and conducting a public presentation: 5%
340059 - PRFA-M4O12 - 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:


Complementary:

