

320146 - PF - Manufacturing Processes

Coordinating unit:	205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering		
Teaching unit:	712 - EM - Department of Mechanical Engineering		
Academic year:	2019		
Degree:	BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)		
ECTS credits:	6	Teaching languages:	Catalan, Spanish

Teaching staff

Coordinator:	José Antonio Ortiz Marzo
Others:	José Antonio Ortiz Marzo Carlos Díaz

Opening hours

Timetable:	Schedule to be agreed
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Prior skills

It is not necessary that students have any prior special training due to the specific nature of the subject.

Degree competences to which the subject contributes

Transversal:

1. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
3. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
4. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

Teaching methodology

- Theoretical sessions and resolution of exercises.
- Practice sessions in the laboratory.
- Independent work and exercises.

Learning objectives of the subject

Introduce concepts, techniques and methodologies in the area of manufacturing.
Provide an overview of the relationship between design and manufacturing.
Familiarization and use technical language typical of industrial environment.



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Study load

Total learning time: 150h	Hours large group:	30h	20.00%
	Hours medium group:	0h	0.00%
	Hours small group:	30h	20.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

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Content

<p>TOPIC 1: Metrology and verification</p>	<p>Learning time: 23h</p> <p>Theory classes: 4h Practical classes: 2h Laboratory classes: 2h Self study : 15h</p>
<p>Description:</p> <ul style="list-style-type: none"> 1.1. Systems of units 1.2. Tolerances and adjustments 1.3. Surface states, roughness 1.4. Measuring instruments 1.5. Errors in the measurement <p>Related activities: AVMV</p> <p>Specific objectives:</p> <ul style="list-style-type: none"> - To know and use the different measurement tools, as well as their particular application and manipulation. 	
<p>TOPIC 2. Machining processes</p>	<p>Learning time: 45h</p> <p>Theory classes: 10h Practical classes: 5h Laboratory classes: 5h Self study : 25h</p>
<p>Description:</p> <ul style="list-style-type: none"> · Introduction machining processes · Turning · Drilling and reaming. Threading · Milling · Grinding · Sawed and smoothed · Gears manufacturing <p>Related activities: AVMEC</p> <p>Specific objectives:</p> <ul style="list-style-type: none"> - To know and differentiate the different machines and accessories available in the workshop. - To learn the correct way of using it, as well as the basic safety and behavior norms in a mechanical workshop. 	

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<p>TOPIC 3: Joining and cutting processes</p>	<p>Learning time: 16h Theory classes: 3h Practical classes: 1h 30m Laboratory classes: 1h 30m Self study : 10h</p>
<p>Description:</p> <ul style="list-style-type: none"> · Electric arc welding · Resistance welding · Oxyacetylene welding · Cutting processes: by Water, laser, flame cutting · Gluing processes <p>Related activities: AVUT</p> <p>Specific objectives: To know and differentiate the different machines and accessories available in the workshop. To learn the correct way of using them, as well as the basic rules of security and behavior in a mechanical workshop</p>	
<p>TOPIC 4: Other processes of transformation</p>	<p>Learning time: 14h 30m Theory classes: 3h Practical classes: 1h 30m Self study : 10h</p>
<p>Description:</p> <ul style="list-style-type: none"> · Hot forming (Casting, Forging, Sintering, Lamination, Extrusion) · Cold forming (Cutting, drawing, bending) · EDM (Electrical Discharge Machining) 	

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<p>TOPIC 5: Numerical Control (CNC)</p>	<p>Learning time: 22h 30m Theory classes: 5h Laboratory classes: 2h 30m Self study : 15h</p>
<p>Description:</p> <ul style="list-style-type: none"> · Definition · Machines with CNC · Classifications CNC · Components of machines with CNC · Axes and reference systems · Programming · Languages used · ISO programming language · Common types of functions · Scheduling workflows. <p>Related activities: AVCNC</p> <p>Specific objectives: To know the different programming tools available. To know the different CNC machines available.</p>	
<p>TOPIC 6: Thermoplastics. Transformation processes</p>	<p>Learning time: 22h 30m Theory classes: 5h Practical classes: 2h 30m Self study : 15h</p>
<p>Description:</p> <ul style="list-style-type: none"> · Injection · Mould making · Basic criteria for the design of parts · Extrusion · Compression molding · Foams · Pultrusion · Blowing · Rapid Prototyping processes <p>Specific objectives: To understand the possibilities of transformation of the thermoplastics aimed at product design.</p>	

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Planning of activities

AVMV: METROLOGY LAB

Description:
Measuring objects, using different tools available.

AVMEC: MECHANICAL WORKSHOP

Description:
Step by different workstations where you can do various tasks such as turning operations, milling

AVUT: MECHANICAL WORKSHOP

Description:
Step by different workstations where you can perform welding and cutting.

AVCNC: MECHANICAL WORKSHOP

Description:
Solve basic problems of programming and the application to the machine.

Qualification system

Written tests: 25% first test, /25% final test.
Work in group-based on problem solving: 25%
Report /s activities linked AVMV, AVMEC, AVUT, AVCNC: 25%

The result of unsatisfactory Activity first test can redirect through a written test to be held on the day fixed for the final exam scheduled on the same track (3 hours). This test can be accessed by students with a grade of less than 5 self assessment). The rating of the test will be between 0 and 10, will have the weight corresponding to that activity. The grade for the application of renewal replace the initial qualification provided that it is superior.

For those students who meet the requirements and submit to the reevaluation examination, the grade of the reevaluation exam will replace the grades of all the on-site written evaluation acts (tests, midterm and final exams) and the grades obtained during the course for lab practices, works, projects and presentations will be kept. If the final grade after reevaluation is lower than 5.0, it will replace the initial one only if it is higher. If the final grade after reevaluation is greater or equal to 5.0, the final grade of the subject will be pass 5.0.

Bibliography