# 1. BASIC INFORMATION

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| **Course** | PROYECTO INTEGRADOR: PROCESOS DE FABRICACIÓN I<br>Manufacturing Process I |
| **Degree program** | GISI. Optativa de las menciones de Mecánica, Tecnologías Industriales, Energía y Automoción |
| **School** | Arquitectura, Ingeniería y Diseño |
| **Year** | Third |
| **ECTS** | 6 |
| **Credit type** | Optional |
| **Language(s)** | English |
| **Delivery mode** | Face to face |
| **Semester** | First |
| **Academic year** | 2019-20 |
| **Coordinating professor** | Carlos Alberto Talayero Giménez de Azcarate |

# 2. PRESENTATION

It is the first course of the module of production, and therefore it is the introduction to the knowledge of manufacturing, as well as the processes involved from the conception of the idea to the final product.

The module develops some key skills. In this course, the student will develop three of these kills and they are relating to the resolution of problems, management and planning skills and teamwork.

The objective of this course is to understand the processes of manufacturing and as well as the costs of production.

Interest for the development of the future profession. It is of great value for the mechanical engineer. Engineers, in their professional career, have to undertake projects from the product design to the final production.

# 3. COMPETENCIES AND LEARNING OUTCOMES

Cross-curricular competencies:

CT3. Teamwork. Ability to integrate and collaborate actively with others, areas and/or organizations for the achievement of common objectives.

CT4. Written / oral communication. Ability to transmit and receive data, ideas, opinions and attitudes to achieve understanding and improvement, being oral which is performed by words and gestures, and written, through writing or graphic props.

Specific competencies:

CE31: applied knowledge of manufacturing, metrology and quality control processes and systems. (literal transcription of the competencies described in the order CIN/351/2009, 9 February)

Competencias específicas:

CE31: Conocimiento aplicado de sistemas y procesos de fabricación, metrología y control de calidad. (transcripción literal de las competencias descritas en la Orden CIN/351/2009, de 9 de febrero)

Learning outcomes: RA1 rating and select manufacturing processes appropriate depending on the type and number of parts. RA2. Analyze the costs associated with each manufacturing process. RA3. Assess the possibilities of improvement of a manufacturing process. The table below shows the relationship between the competencies developed in the course and the results of learning being pursued:

Learining outcome:

- LO1 To evaluate and select manufacturing processes appropriate depending on the type and amount of pieces
- LO2. To analyze the associated costs for each manufacturing process.
- LO3. To evaluate the possible improvement of the manufacturing processes.

The following table shows the relationship between the competencies developed during the course and the learning outcomes pursued:

| Competencies | Learning Outcome |
|---|---|
| CT3, CE31 | LO1. Evaluate and select appropriate manufacturing processes according to the type and quantity of pieces. |
| CT4, CE31 | LO2.Analyze the costs associated with each manufacturing process |
| CT3, CT4, CE31 | LO3.Evaluate the possibilities of improvement of a manufacturing process |

## 4. CONTENT

1. Introduction to manufacturing processes. Workflow management and production volume. Tolerances
2. Manufacturing costs and non-manufacturing costs. Cost analysis and budgets. Productive and non-productive time
3. Manufacturing Quality. Definition. Quality Control and quality assurance. Continuous processes improvement. Quality tools. Metrology
4. Metal Forming and Sheet Metalworking. Bulk deformation processes in metalworking, plastic deformation
5. Joining and Assembly Processes. Joint Technology. Permanent joint and temporary joint
6. Material Removal Processes

## 5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Master class
- Cooperative learning
- Problems based learning
- Project Based Learning
- Oriented academic activities
- Simulation enviorenments

## 6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

**Campus-based mode:**

| Learning Activities | Hours |
|---|---|
| AF1: Resolution of exercises, problems, tests and practical work | 18 |
| AF2: Professor´s exposure and presentations | 18 |
| AF4: Visits to companies and plants | 7 |
| AF5: Laboratory and workshop practices | 14 |
| AF7: Individual or group tutorials | 5 |
| AF9: Preparation of real or simulated projects (through project-based learning methodology) | 45 |

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| AF10: Search for information and / or preparation of written assignment and reports | 13 |
| AF11: Autonomous study | 30 |
| **TOTAL** | **150 h** |

# 7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

| Assessment criteria | Weight (%) |
|---|---|
| Tests to evaluate theoretical / practical cognitive objectives (objective tests, written tests, oral presentations, cases / problems) | 20%-40% |
| Tests to evaluate objectives of skills (Participation in group sessions, Simulation tests, Participation in cases / problems Rol playing, Reports) | 20%-40% |
| Tests to evaluate attitudes (Participation in class, attitudes assessment rubric) | 10%-10% |
| Final examination of competencies-final test of the whole, includes different types of the aforementioned tests) | 20%-40% |

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

## 7.1. First exam period

- Exams, tests and other test and alternative techniques of assessment 35%
- Writing of articles, reports and project and Transversal skills 35% of the final grade
- Homework 30% of the final grade

To pass the course in the first exam period, you must obtain a final course grade of at least 5 out of 10 (weighted average). Minimums needed to pass:

- To obtain 5 points over 10 points of the final exam.
- To obtain 5 points over 10 points of the final project.
- To obtain 5 points over 10 points of the homework.
- In order to be evaluated you must have a minimum of 50% attendance (ATTENDANCE IS VALID ONLY REGISTERED IN THE GRP SYSTEM)

The failed assignments, homework or lab reports during academic year can be submitted on extraordinary session. To pass the course, each assignment shall have, at least, five points out of ten and it is mandatory

to pass all assignments, activities and exams. If the student fails or does not submit some activities these activities will not be considered for the average of the final grade.

In the case, when the student do not reached the minimum required to pass any evaluable activity. The final grade will be:

• The mean average when the mean value is less than or equal to 4

• 4 if the value of the mean average is greater than 4

The grade will be considered as NP (Not Presented) when the student has not delivered any evaluable activity of which they are part of the weighted average.

## 7.2. Second exam period

Assessment activities:

- Realization of different tasks, problems and practical exercises, individually 20%
- Realization of laboratory practices and report 10%
- Realization of a project 20%
- Oral presentations presentation of the project 15%.
- Final exam 35%

To pass the course in the second exam period, you must obtain a final grade of at least 5 out of 10 (weighted average).

In the case, when the student do not reached the minimum required to pass any evaluable activity. The final grade will be:

• The mean average when the mean value is less than or equal to 4
• 4 if the value of the mean average is greater than 4

The grade will be considered as NP (Not Presented) when the student has not delivered any evaluable activity of which they are part of the weighted average.

# 8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

| Assessable activities | Deadline |
|---|---|
| Activity1. Resolution of exercises, problems, tests and practical work | Semana 4-5 |
| Activity 2. Laboratory and workshop practices | Semana 6-15 |
| Activity 3. Project Based Learning) / Preparation of real or simulated projects (through project-based learning methodology). | Semana 16 |
| Activity 4 Assessment test | Last week |

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This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

## 9. BIBLIOGRAPHY


- Introducción a los procesos de fabricación. M. del Mar Espinosa Escudero
- Introduction to Manufacturing Processes 1st Edition, Mikell P. Groover.
- Kents Mechanical Engineers Handbook 11TH Edition, William Kent


## 10. DIVERSITY MANAGEMENT UNIT

Students with specific learning support needs:

Curricular adaptations and adjustments for students with specific learning support needs, in order to guarantee equal opportunities, will be overseen by the Diversity Management Unit (UAD: Unidad de Atención a la Diversidad).

It is compulsory for this Unit to issue a curricular adaptation/adjustment report, and therefore students with specific learning support needs should contact the Unit at unidad.diversidad@universidadeuropea.es at the beginning of each semester.