



Industrial  
Processes I

Degree in Mechanical  
Engineering

2018-19



UNIVERSIDAD  
NEBRIJA

## TEACHER GUIDE

**Subject:** Materials

**Qualification:** Degree in Industrial Design Engineering and Product Development

**Academic Year:** 2018-19

**Character:** Mandatory

**Language:** Spanish

**Modality:** Presential

**Credits:** 6

**Course:** 4º

**Semester:** 1º

**Teachers/Teaching Staff:** Alberto Franco

### 1. SKILLS AND LEARNING OUTCOMES

#### 1.1. Skills

Basic knowledge of production and manufacturing systems

#### TRANSVERSAL SKILL

- CT1 Analysis and synthesis
- CT2 Troubleshooting
- CT3 Oral and written communication of knowledge in own language
- CT4 Oral and written communication of knowledge in a foreign language
- CT7 Capacity to organize and plan
- CT8 Decision making

#### COMPETENCIAS SISTÉMICAS

- CS1 Applying knowledge
- CS2 Self-study and self-employment
- CS3 Plan changes that improve global systems
- CS4 Research skills
- CS6 Creativity

#### COMPETENCIAS PERSONALES Y PARTICIPATIVAS

- CP1 Objectivation, identification and organization
- CP2 Critical thinking
- CP3 Teamwork
- CP4 Working in an international context
- CP5 Personal relations
- CP7 Leadership

#### 1.2. Learning outcomes

- Students have demonstrated that they possess and understand the basic knowledge of the manufacturing and production processes.

- Students have demonstrated that they possess and understand the applied knowledge of manufacturing, metrology and quality control systems and processes.

- That the students have the ability to gather the necessary data for the design and selection of the manufacturing process, as well as the influence on the mechanical and physical properties,

applying judgments and design and analysis criteria that guarantee a good performance and a good response in service of the manufactured assembly.

- The students will be able to transmit the solutions of the proposed design problem, as well as the description of the manufacturing process of each part of the set, using with ease the concepts and ideas acquired in this matter, as well as their graphic and analytical representations.

- Who have developed learning skills that allow them to undertake the end-of-degree project with autonomy.

## 2. CONTENTS

### 2.1. Prerequisites

To have studied the subjects of Fundamentals of Materials Science

### 2.2. Description of contents

In the manufacture of any engineering element, it is essential to decide how to obtain that element and how to modify and assemble it. The subject of industrial processes is aimed at describing manufacturing processes without machining.

### 2.3. Detailed Content

<p><b>I.</b></p> <p><b>Introduction. Manufacturing within the company and environment of the manufacturing processes.</b></p> <p>Supply Chain.</p> <p>Tight production, continuous flow, cellular,.....</p> <p>Manufacturing economics, costs.</p> <p>Quality and competitiveness. Quality assurance and management</p> <p><b>II.</b></p> <p><b>Welding and joining processes</b></p> <p>Introduction. Different systems</p> <p>Welding fundamentals.</p> <p>Welding methods</p> <p>Finishing and surface treatment</p> <p><b>III.</b></p> <p><b>Plastic deformation forming processes</b></p> <p>Deformation forming: plastic deformation fundamentals, work hardener, recrystallization</p> <p>Lamination</p> <p>Forging and extrusion.</p> <p>Stretching and drawing</p> <p>Sheet metal forming: cutting and punching.</p> <p>Sheet metal forming: bending</p> <p>Sheet metal forming: drawing</p> <p><b>IV.</b></p> <p><b>Manufacture by Casting</b></p> <p>Introduction. Foundry. Materials. Applications</p> <p>Moulding methods. General concepts.</p> <p>Disposable moulds.</p> <p>Design Aspects in Moulding</p>
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#### 2.4. Targeted Activities

During the course you will be able to develop 5 practices of 3 hours of duration. It is obligatory to hand in the internship report in all those cases in which it is required of the student.

### 3. EVALUATION SYSTEM

#### 3.1. Rating System

The system of final grades will be expressed numerically, in accordance with the provisions of art. 5 of Royal Decree 1125/2003, of 5 September (BOE 18 September), which establishes the European Credit System and the system of grades in official university degrees and their validity throughout the national territory.

- 0 - 4.9 Suspense (SS)
- 5.0 - 6.9 Approved (AP)
- 7.0 - 8.9 Notable (NT)
- 9.0 - 10 Outstanding (SB)

The honourable mention ("Matricula de Honor") may be awarded to students who have achieved a grade of 9.0 or higher. The number of mentions may not exceed 5% of the students enrolled in a subject in the corresponding academic year, unless the number of students enrolled is less than 20, in which case only one "honourable mention" may be awarded..

#### 3.2. Evaluation Criteria

Summons Ordinary

Evaluation System	Percentage
Participation, internships, projects or coursework	20%
Midterms.	20%
Final exam.	60%

Summons Extraordinary

Sistemas de evaluación	Porcentaje
Participation, internships, projects or coursework	20%
Final exam.	80%

#### 3.3. Restrictions

In order to be able to do the weighted sum of the above grades, it is necessary to: attend classes for at least 80% of the hours attended, and obtain at least 4.5% in the corresponding final exam. The student with the lowest grade will be considered a failing grade.

The non-presentation of the practices or the lack of unjustified attendance to more than one one supposes the automatic failure of the subject in the ordinary and extraordinary convocation, since the practices are not repeatable, therefore it is necessary to attend at least 4 practices to be able

to pass the subject, in those cases the average grade will be made with the qualification of the practices to which it has attended. Obtaining a grade of less than 5 in the internship is the failure of the course in the ordinary call for applications, the rest of the grades being kept only for the extraordinary call for applications in that year.

The notice of approved practices for subsequent calls will be retained.

In the different training actions, not only will the knowledge that the student possesses be evaluated, but also the specific and general competences as a whole will be evaluated.

#### Minimum grade

In order to be able to average with the above weightings it is necessary to obtain at least a score of 4.5 in the final test.

#### Assistance

A student who, unjustifiably, fails to attend more than 25% of the classes may be deprived of the right to take the exam in the ordinary school year.

#### Writing rules

Special attention will be paid to the work, practices and written projects, as well as to the presentation and content of the exams, taking care of the grammar and spelling aspects. Failure to comply with the minimum acceptable levels may result in points being deducted from this work.

#### Participation

The participation, internship, project or work grade will be calculated with a weighted sum of Attendance, Presentation of the project, internship report and qualification of the reports. Likewise, it is the teacher's power to request and evaluate again the practices or written works, if these have not been delivered on time, have not been approved or wish to improve the grade obtained in ordinary notice.

### **3.4. Plagiarism warning**

The Universidad Antonio de Nebrija will not tolerate plagiarism or copying under any circumstances. The reproduction of paragraphs from audit texts other than those of the student (Internet, books, articles, works by colleagues...) will be considered plagiarism when the original source is not cited. The use of quotations cannot be indiscriminate. Plagiarism is a crime.

If this type of practice is detected, it will be considered a Serious Foul and the penalty provided for in the Student Regulations may be applied.

## **4. BIBLIOGRAFY**

#### Basic Bibliografy:

- Bralla, J. (1999). Handbook of product Design for manufacturing. Nueva York: McGraw-Hill.
- Groover, M. P. (2007). Fundamentos de manufactura moderna. México DF: McGraw-Hill.
- Kalpajian, S. y Schmid, S.R. (2002). Manufactura, Ingeniería y Tecnología. México DF: Pearson
- Lasheras, J. M. (2000). Tecnología Mecánica y Metrotécnia. San Sebastian: Donostiarra.
- Miguélez, M. H., Cantero, J. L., Canteli J. A. y Filippone J. G. (2005). Problemas resueltos de Tecnología de Fabricación. Madrid: Thompson.
- Reina Gómez, M. (2003). Soldadura de aceros: aplicaciones.
- Los guiones de las sesiones que estarán disponibles en el campus virtual.

## 5. TEACHER'S DATA

Name and surname	Alberto Franco
Departament	Departamento de Ingeniería Industrial
Académic Degree	Ingeniero Industrial
E-mail:	afranco@nebrija.es
Teacher's place	Campus de la Dehesa de la Villa. Despacho de Asociados
Tutoring	Contact the teacher on request by email.
Brief curriculum	Ingeniero Industrial por la UPM y Master Sc en Materiales por la Universidad de Manchester (GB). Ha desarrollado su labor profesional en las áreas de calidad, producción y dirección de operaciones en empresas internacionales de los sectores siderúrgico, auxiliar de automoción y bienes de equipo. Profesor de la Universidad Antonio de Nebrija en asignaturas de materiales y procesos. Profesor colaborador con la Universidad Carlos III.

## COORDINATOR OF THE INDUSTRIAL PROCESSES AREA

Name and surname	Rafael Barea del Cerro
Departament	Departamento de Ingeniería Industrial
Académic Degree	Doctor
E-mail:	rbarea@nebrija.es
Teacher's place	Campus de Dehesa.- D411
Tutoring	Contactar con el profesor previa petición de hora por e-mail
Brief curriculum	Doctor por la UAM, Ingeniero de Materiales por la UPM, Licenciado en CC Físicas y Diplomado en Magisterio por la UCM. Especialista universitario en elementos finitos en problemas térmicos por la UNED. Experiencia investigadora durante años en diferentes centros del CSIC (Cerámica y Vidrio, CENIM). Especialidades: procesamiento y caracterización de materiales cerámico y metálicos, experto en modelos matemáticos y simulación (redes neuronales, lógica difusa, elementos finitos, modelización de propiedades no lineales de materiales...).