

## 29720 - Manufacturing Technology I

### Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	330 - Complementos de formación Máster/Doctorado 434 - Bachelor's Degree in Mechanical Engineering
ECTS	6.0
Year	XX
Semester	Half-yearly
Subject Type	Compulsory, ENG/Complementos de Formación
Module	---

### **1.General information**

#### **1.1.Introduction**

#### **1.2.Recommendations to take this course**

#### **1.3.Context and importance of this course in the degree**

#### **1.4.Activities and key dates**

### **2.Learning goals**

#### **2.1.Learning goals**

#### **2.2.Importance of learning goals**

### **3.Aims of the course and competences**

#### **3.1.Aims of the course**

#### **3.2.Competences**

### **4.Assessment (1st and 2nd call)**

#### **4.1.Assessment tasks (description of tasks, marking system and assessment criteria)**

### **5.Methodology, learning tasks, syllabus and resources**

#### **5.1.Methodological overview**

The methodology followed in this course is oriented towards achievement of the learning objectives. It is based on participation and the active role of the student favors the development of communication and decision-making skills. A wide range of teaching and learning tasks are implemented, such as lectures, guided assignments, laboratory sessions, autonomous work, and tutorials.

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Students are expected to participate actively in the class throughout the semester.

Further information regarding the course will be provided on the first day of class.

### 5.2.Learning tasks

The course includes 6 ECTS organized according to:

- Lectures (1.68 ECTS): 42 hours.
- Laboratory sessions (0.72 ECTS): 18 hours.
- Autonomous work (3.4 ECTS): 85 hours.
- Evaluation (0.2 ECTS): 5 hours
- Tutorials.

**Lectures:** the professor will explain the theoretical contents of the course and solve illustrative applied problems. These problems and exercises can be found in the problem set provided at the beginning of the semester. Lectures run for 3 weekly hours. Although it is not a mandatory activity, regular attendance is highly recommended.

**Laboratory sessions:** sessions will take place every 2 weeks (6 sessions in total) and last 3.0 hours each. Students will work together in groups actively doing tasks such as practical demonstrations, measurements, calculations, and the use of graphical and analytical methods.

**Guided assignments:** students will complete assignments, problems and exercises related to concepts seen in laboratory sessions and lectures. They will be submitted at the beginning of every laboratory sessions to be discussed and analyzed. If assignments are submitted later, students will not be able to take the assessment test.

**Autonomous work:** students are expected to spend about 85 hours to study theory, solve problems, prepare lab sessions, and take exams.

**Tutorials:** the professor's office hours will be posted on the degree website to assist students with questions and doubts. It is beneficial for the student to come with clear and specific questions.

### 5.3.Syllabus

- 1) Classification of manufacturing processes.
- 2) Metrology
  1. Inspection and industrial metrology.
  2. Systems and methods of measurement.
  3. Measurement assurance.

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### 3) Quality

1. Fundamental concepts of quality.
2. Quality management
3. Quality planning.
4. Quality in product design and process.
5. Manufacturing quality.

### 4) Fundamentals of machining processes.

1. Technological aspects of common machining processes: turning, drilling, milling.
2. Tools: materials, geometry and selection criteria.
3. Abrasive machining processes.
4. Unconventional machining processes: EDM

### 5) Fundamentals of metal-cutting

1. Mechanics of metal-cutting.
2. Temperatures in metal-cutting.
3. Tool life.
4. Cutting fluids.
5. High speed machining.
6. Economics of metal-cutting operations.

### 6) Machining systems.

1. Manufacturing systems and automation.
2. Jig & Fixtures.
3. Programming tool machines.

### 7) Manufacturing process planning.

## 5.4.Course planning and calendar

For further details concerning the timetable, classroom and further information regarding this course please refer to the "Escuela de Ingeniería y Arquitectura " website ( <https://eina.unizar.es/> )

## 5.5.Bibliography and recommended resources

[BB: Basic Bibliography / BC: Additional Bibliography]

- [BB] 1. López de Lacalle, Luis Norberto. Mecanizado de alto rendimiento : procesos de arranque / L. N. López de Lacalle Marcaide, J. A. Sánchez Galíndez, A. Lamikiz Menchaca . 1ª ed. Bilbao : Ediciones Técnicas Izaro, 2004
- [BB] 2. Arnone, Miles. Mecanizado alta velocidad y gran precisión / Miles Arnone Bilbao : El Mercado Técnico, D.L. 2000
- [BB] 3. Boothroyd, Geoffrey. Fundamentos del corte de metales y de las máquinas- herramienta / Geoffrey Boothroyd Bogotá [etc.] : McGraw-Hill Latinoamericana, cop. 1978
- [BB] 6. Pfeifer, Tilo. Manual de gestión e ingeniería de la calidad / Tilo Pfeifer, Fernando Torres . - 1ª. ed. española act. y amp., 1ª reimp. Zaragoza : Mira, 2002