

29825 - Manufacturing Technology

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura 326 - Escuela Universitaria Politécnica de Teruel
Degree	440 - Bachelor's Degree in Electronic and Automatic Engineering 444 - Bachelor's Degree in Electronic and Automatic Engineering
ECTS	6.0
Year	3
Semester	Second semester
Subject Type	Compulsory
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 student will have the opportunity to attend three different kinds of teaching activities which will require him a growing level of participation: lectures, problems sessions and laboratory sessions.

Theoretical concepts, problems and case studies will be explained to students in a large group format. Though laboratory

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sessions will be arranged in smaller groups to work with different software programs and laboratory equipment.

This teaching process should be complemented with the students' individual work encompassing activities such as readings or study theoretical and practical topics.

5.2.Learning tasks

In class work: 2.4 ECTS (60 hours)

1) Lectures (28 hours)

Oral presentations of theoretical concepts. The basis of the manufacturing technologies together with real examples will be shown. The topics to be covered can be seen in the "teaching program part".

2) Problems and technical cases sessions (14 hours)

Problems and cases, related with the theoretical contents, will be developed and explained together with the students participation though they will be encouraged to work previously on them.

3) Laboratory sessions (18 hours)

Six laboratory sessions that last three hours have been planned. Students will have access to the needed documentation in advance.

Out-of-class work: 3.6 ECTS (90hours)

4) Individual work (85 hours).

The student should study all the theoretical topics and practice in the solution of problems. The student will be encouraged to work in a continuous manner by means of a uniform work load along the semester. Here are also included tutorial meetings for students requiring individual attention to help them in their learning process.

5) Examination tasks (5 hours)

They have a twofold goal: to grade the student academic progress, and to inform him about the learning level he have reached in the course.

5.3.Syllabus

Teaching program for theoretical-practical lectures:

Contents block 1: Introduction.

- Definitions
- Classification of manufacturing processes (DIN 8580)

Contents block 2: Processes and manufacturing technologies.

2.1. Primary shaping processes.

- Casting with non-permanent moulds, die casting, injection moulding.
- Powder metallurgy.
- Additive manufacturing

2.2. Material removal processes.

- Metal cutting theory.
- Conventional machining: turning, milling, drilling.
- Abrasive processes
- Non-conventional machining processes: EDM, wire-EDM...

2.3. Forming processes.

- Volumetric forming processes: Rolling, forging, extrusion.
- Laminar forming processes: Cut, deep drawing, bending.

2.4. Welding and joining processes.

- Welding metallurgy
- Welding processes
- Other union processes

Contents block 3: Manufacturing systems.

- Characterization and analysis.
- CNC programming.
- Tooling and fixturing.
- Maintenance.

Contents block 4: Metrology and Quality.

4.1 Metrology.

- Inspection and industrial metrology.
- Measurement assessment.
- Systems and methods of measurement.
- Fits and tolerances

4.2 Quality.

- Basic concepts of quality.
- Quality planning.
- Quality in product design and process.
- Quality in manufacturing.

5.4.Course planning and calendar

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Lectures, problems, laboratory sessions and official exams schedule will be defined by the EINA (schedules are available in EINA web page). There will be in a general way:

- Three hours in class per week.
- One laboratory session every two weeks.

Mid-semester exam will be done in April, though students will be notified in advance.

All the information concerning optional works will be published in the ADD.

5.5. Bibliography and recommended resources

The following resources are recommended:

- Lectures notes and problems
- Laboratory sessions documentation

This information can be complemented with the following bibliography:

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| BB | 1.1 Valero Ruiz, Carlos. Introducción a los procesos de fabricación / autores Carlos Valero Ruiz, Juan Carlos De Francisco Moreno ; con la colaboración de Fernando Torres, Luis Berges, María José Oliveros . - 2ª ed. Zaragoza : Kronos, 2001 |
| BB | 1.2 Groover, Mikell P.. Fundamentos de manufactura moderna : Materiales, procesos y sistemas / Mikell P. Groover . - 1a ed. México : Prentice-Hall Hispanoamericana, cop. 1997 |
| BB | 1.3 Kalpakjian, Serope. Manufactura, ingeniería y tecnología. Vol. 1, Tecnología de materiales / Serope Kalpakjian, Steven R. Schmid ; traducción Jesús Elmer Murrieta Murrieta ; revisión técnica Ulises Figueroa López, Francisco Sandoval Palafo. 7ª ed. Naucalpan de Juárez (México) : Pearson Educación, 2014 |
| BB | 1.3 Kalpakjian, Serope. Manufactura, ingeniería y tecnología. Vol. 2, Procesos de manufactura / Serope Kalpakjian, Steven R. Schmid ; traducción Javier Enríquez Brito ; revisión técnica Ulises Figueroa López, Francisco Sandoval Palafox, Jorge Eduardo Aguirre Aguilar . - 7ª ed. Naucalpan de Juárez (México) : Pearson Educación, 2014 |
| BB | 1.4 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 |

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- BC** 2.1 Hernández Riesco, Germán. Manual del soldador / Germán Hernández Riesco ; Asociación Española de Soldadura y Tecnologías de Unión . - 18ª ed. Madrid : CESOL, D.L. 2007
- BC** 2.2 DeGarmo, E. Paul. Materiales y procesos de fabricación / E. Paul DeGarmo, J. Temple Black, Ronald A. Kohser ; [versión española por J. Vilardell] . - 2ª ed., reimp. Barcelona : Reverté, imp. 2002
- BC** 2.3 Boothroyd, Geoffrey. Fundamentals of Machining and Machine Tools / Boothroyd, G., Knight, W.A New York: Marcel Dekker, 1989
- BC** 2.4 DIN 8580. Manufacturing processes - Terms and definitions, division. Deutsches Institut Fur Normung E.V. (German National Standard), 2003.
- BC** 2.5 Manrique, E.. Metrología básica / E. Manrique, A. Casanova Barcelona : Edebe, 1994
- BC** 2.6 Planificación y gestión de la producción / Jesús A. Royo Sánchez, Alejandro Hernández Paricio, Luis Berges Muro, José Manuel Franco Gimeno . - 1ª ed. [Zaragoza : s. n.], 2002f(Kronos)

At the EUPT (TERUEL):

- BB** Groover, Mikell P.. Fundamentos de manufactura moderna : Materiales, procesos y sistemas / Mikell P. Groover . - 1a ed. México : Prentice-Hall Hispanoamericana, cop. 1997
- BB** Kalpakjian, Serope. Manufactura, ingeniería y tecnología / Serope Kalpakjian, Steven R. Schmid ; traducción Jaime Espinosa Limón ; revisión técnica Francisco Sandoval Palafox, Ulises Figueroa López, Roberto Hernández Cárdenas . - 5ª ed. Naucalpan de Juárez (México) : Pearson Educación, 2008
- BB** 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
- BB** Valero Ruiz, Carlos. Introducción a los procesos de fabricación / autores Carlos Valero Ruiz, Juan Carlos De Francisco Moreno ; con la colaboración de Fernando Torres, Luis Berges, María José Oliveros . - 2ª ed. Zaragoza : Kronos, 2001
- BC** Boothroyd, Geoffrey . Fundamentals of

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- machining and machine tools / Geoffrey Boothroyd, Winston A. Knight. - 3rd ed
Boca Raton : Taylor & Francis, cop. 2006
- BC** DeGarmo, E. Paul. Materiales y procesos de fabricación / E. Paul DeGarmo, J. Temple Black, Ronald A. Kohser ; [versión española por J. Vilardell] . - 2ª ed., reimp. Barcelona : Reverté, imp. 2002
- BC** Deutsches Institut Fur Normung E.V. (German National Standard). DIN 8580 Manufacturing processes - Terms and definitions, division Editorial: 2003-09
- BC** Hernández Riesco, Germán. Manual del soldador / Germán Hernández Riesco ; Asociación Española de Soldadura y Tecnologías de Unión . - 18ª ed. Madrid : CESOL, D.L. 2007
- BC** Manrique, E.. Metrología básica / E. Manrique, A. Casanova Barcelona : Edebe, 1994
- BC** Planificación y gestión de la producción / Jesús A. Royo Sánchez, Alejandro Hernández Paricio, Luis Berges Muro, José Manuel Franco Gimeno . - 1ª ed. [Zaragoza : s. n.], 2002f(Kronos)