



Universitat de Lleida

DEGREE CURRICULUM  
**MANUFACTURING  
TECHNOLOGIES**

Academic year 2014-15

## Subject's general information

<b>Subject name</b>	Manufacturing Technologies
<b>Code</b>	102309
<b>Semester</b>	2nd
<b>Typology</b>	Mandatory
<b>ECTS credits</b>	6
<b>Groups</b>	1 GG, 2 GM and 5 GP
<b>Theoretical credits</b>	3
<b>Practical credits</b>	3
<b>Office and hour of attention</b>	Miquel Nogués, Tuesday from 19:00 to 20:30 and Thursday from 10 to 11:30 Juan José González, Thursday from 18:00 to 20:00
<b>Department</b>	Informàtica i Enginyeria Industrial
<b>Teaching load distribution between lectures and independent student work</b>	40% lectures in class 60% independent student work
<b>Modality</b>	Presencial
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.
<b>Language</b>	Catalan
<b>Degree</b>	Degree in Engineering Mechanics
<b>Distribution of credits</b>	Miquel Nogués Aymamí 3 Juan Jose Gonzalez Fabra 7,2
<b>Office and hour of attention</b>	Miquel Nogués, Tuesday from 19:00 to 20:30 and Thursday from 10 to 11:30 Juan José González, Thursday from 18:00 to 20:00
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Miquel Nogués Aymamí  
Juan Jose Gonzalez Fabra

## Subject's extra information

It is essential to have studied previously, and it is advisable to have passed the following subjects:

- GRAPHICS EXPRESSION I.
- MATERIALS SCIENCE.
- THEORY OF MECHANISMS.
- ELASTICITY AND STRENGTH OF MATERIALS I.
- MATERIALS FOR MECHANICAL MANUFACTURING.

## Learning objectives

To show different systems and manufacturing processes of parts, especially metal parts, due to its great importance in the industrial world.

## Competences

### Degree-specific competences

- Applied knowledge of manufacturing, metrology and quality control systems and processes.
- Knowledge and ability to apply mechanical engineering.

### Degree-transversal competences

- Ability to resolve problems and elaborate and defend arguments inside their field of study.
- Ability to analyse and synthesize

## Subject contents

Topic 1 - METROLOGY

Topic 2 - METAL FORMING PROCESSES.

Topic 3 - METAL CUTTING AND MACHINING PROCESSES.

Topic 4 - NUMERICAL CONTROL.

Topic 5 - WELDING TECHNOLOGIES

Topic 6 - RAPID PROTOTYPING

Topic 7 - UNCONVENTIONAL MACHINING PROCESSES.

## Methodology

Theory class: Presentations are available in SAKAI before class starts.

Problems class: Solving problems, questions and exercises. Solved exercises are available in SAKAI

Lab Practices: Assistance and adequate attendance in all the lab exercises is mandatory to pass the course

## Development plan

Week 1 and 2 - METROLOGY

Week 3 and 4 - METAL FORMING PROCESSES

Week 5, 6, 7 and 8 - METAL CUTTING AND MACHINING PROCESSES.

Week 9, 10 and 11 - NUMERICAL CONTROL

Week 12 and 13 - WELDING TECNOLOGIES

Week 14 - RAPID PROTOTYPING

Week 15 - UNCONVENCIONAL MACHINING PROCESSES.

### WORKSHOP EXCERCISES

- METROLOGY (calipers, micrometres, dial indicators, protactors, ...)
- SHEETMETAL FORMING (punching and bending machines)
- LATHE AND MILLING MACHINES
- NUMERICAL CONTROL (CIMCO software)
- CAD/CAM (MASTERCAM software)
- WELDING TECNOLOGIES (shielded arc, TIG, MIG/MAG, soldering, brazing and resistance spot welding)

## Evaluation

The evaluation will consist of one theoretical part and one practical part.

The theoretical part will be divided in two exams which are indicated in the academic calendar, and each exam will have two parts: a multiple test and exercises. The theory grade (NT) obtained will be calculated by:

$$NT = + 0,5x E1 + 0,5x E2$$

In the practical part (NP) must be remarked that assistance and adequate attendance in all the lab exercises is mandatory to pass the course

The mark of the practical part will be obtained by:

$$NP = + 0,4x PR + 0,6x TR$$

where:

PR: Reports delivered in lab and practical problems in class

TR: Exercises done in a teamwork

Final course grade (NF)

$$NF = + 0,7x NT + 0,3x NP$$

If the final score is not greater than or equal to 5, students can do the extraordinary exam which will contain all the extraordinary syllabus of the course to rise his mark. The practice mark is not recoverable.

## Bibliography

GROOVER, M.P. "Fundamentos de manufacturamoderna". Ed. Mc GrawHill 2007

KALPAKJIAN, S. "Manufactura: Ingeniería y Tecnología". Ed. PearsonEducación 2002

SCHEY, J."Introduction to manufacturing processes".Ed. Mc GrawHill 2000

Singh, R."Applied Welding Engineering". Ed. Elsevier Inc. 2012

SALUEÑA X. i NÁPOLES A. " Tecnología Mecánica". Ed.CPDA-ETSEIB. 2000

VIVANCOS, J."Procesos mecanizado". Tomo I. Ed.CPDA-ETSEIB. 1999.

VIVANCOS, J."Control Numèric". Ed. UPCBarcelona 1996.

## **COMPLEMENTARY BIBLIOGRAPHY**

COCA, P. i ROSIQUE, J. "Tecnología Mecánica i Metrotècnia". Ed. Pirámide1984.

LASHERAS ESTEBAN,J.M. "Tecnologia mecánica i Metrotècnia". Ed.Donostiarra. 1987.

Falk, D. i Gockel, H."Metrotècnia Fundamental". Ed. Reverté, 1986.