

DIM-GITI-439 MANUFACTURING AND PRODUCTION TECHNOLOGIES

SEMESTER: Spring or fall

CREDITS: 6 ECTS

LANGUAGE: Spanish-English

DEGREES: GITI

Course overview

This course provides students ability to implement systems and manufacturing and production processes of industrial equipment and applied knowledge of business organization.

When completing the course, students will:

- Select and integrate tools and techniques of product manufacturing.
- Configure basic industrial products. Analyze the necessary information included in the documentation of a product to choose the manufacturing process of it.
- Design and analyze productive systems using the appropriate technologies.
- Design quality control of manufacturing processes.
- Knowledge about the different techniques for the study of methods and the measurement of work.

Prerequisites

There are no formal prerequisites to prevent this course. However is recommended concepts about mechanical drawing and tolerances.

Course contents

Theory:

1. Introduction to manufacturing and production systems. Organization of production areas and resources. Technical and functional considerations in the electromechanical field.
2. Design and selection of manufacturing processes. Production technologies in automated manufacturing environments.
3. Principles of transformation processes I. Conformation of parts through by casting processes.

4. Principles of transformation processes II. Conformation of parts by forming processes.
5. Principles of transformation processes III. Conformation of parts by welding processes.
6. Principles of transformation processes IV. Conformation of parts by metal cutting processes.
7. Advanced transformation processes. Electro-erosion: application and key concepts. Processing of plastics.
8. Quality control of processes. Tools for analysis and improvement of quality. Statistical processes control. Processing capacity.
9. Work organization. Methods and measurement Time Method (MTM). Health Safety Concepts . Lean Manufacturing

Laboratory:

- P1.** Casting: sand, lost wax.
- P2.** Forming: press, blender, etc.
- P3.** Welding: TIG, MIG, SMAW, etc.
- P4.** Conventional and advanced metal cutting: lathe, milling, grinding., CNC machines.
- P5.** Injection molding (plastics).

Textbook

- Mariano Jiménez Calzado. APUNTES ICAI DE INGENIERÍA DE FABRICACIÓN. Fichas técnicas de procesos industriales.
- Mikell Groover. FUNDAMENTOS DE MANUFACTURA MODERNA: MATERIALES, PROCESOS Y SISTEMAS (3ª edición). PRENTICE HALL HISPANOAMERICANA S.A. ISBN 9789688808467.
- Heizer, J., Render, B., DIRECCIÓN DE LA PRODUCCIÓN Y DE OPERACIONES. Vol. 1-2. Decisiones estratégicas. Ed. Prentice Hall. 2015

Grading

The following conditions must be accomplished to pass the course:

- A minimum overall grade of at least 5 over 10.

The overall grade is obtained as follows:

- Standard evaluation at the end of the term:

- 10% Midterms exams.
- 10% Homework.
- 30% Lab reports.
- 50% End of term exam (paper). A minimum grade in the final exam of 4 over 10.
- Attendance: minimum 85% to be allowed to take the exam.
- Additional evaluation during July (for those who do not pass at the end of the term):
 - 30% Lab reports.
 - 70% July exam (paper)