COMILLAS
UNIVERSIDAD PONTIFICIA
ICAI ICADE CIHS

**Syllabus**
**2025 - 2026**

## GENERAL INFORMATION

| Data of the subject | |
|---|---|
| **Subject name** | Manufacturing Engineering |
| **Subject code** | DIM-GITI-447 |
| **Mainprogram** | Bachelor's Degree in Engineering for Industrial Technologies |
| **Involved programs** | Grado en Ingeniería en Tecnologías Industriales [Fourth year] |
| **Credits** | 4,5 ECTS |
| **Type** | Optativa (Grado) |
| **Department** | Department of Mechanical Engineering |

| Teacher Information | |
|---|---|
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## DESCRIPTION OF THE SUBJECT

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## Contextualization of the subject

### Prerequisites

- Previous knowledge of Graphic Expression and use of CAD tools, as well as knowledge of Materials Science

## Course contents

### Contents

- Introduction. Manufacturing Cycle. Information to establish a manufacturing cycle. Organization of production areas and resources. Technical and functional considerations in the electrical and mechanical field.
- Dimensional verification techniques. Metrological vocabulary (VIM). Causes of measurement error. Dimensional measuring instruments and their metrological properties.
- Casting processes. Classification. Manufacture of models, cores and molds. molding materials. Design and defectology. Finishing and control of cast parts.
- Sheet metal processes. Cold deformation: punching, bending, drawing. Hot deformation: forging, rolling, drawing and extrusion.
- Welding processes. Types of welding: soft, strong, oxyacetylene, arc with covered electrode, TIG, MIG, resistance, friction, laser. Welding process. Defectology.
- Machining processes. Variables and precision. Chip formation. Conventional machine tools. Holding tools. Cutting tools. Post-machining processes.
- Advanced transformation processes: additive manufacturing, technologies and application.

## EVALUATION AND CRITERIA

The use of AI to produce full assignments or substantial parts thereof, without proper citation of the source or tool used, or without explicit permission in the assignment instructions, will be considered plagiarism and therefore subject to the University's General Regulations.

| Evaluation activities | Evaluation criteria | Weight |
|---|---|---|
| • Tests carried out at the end of class in the form of a test or short exercise | • Understanding of concepts.<br>• Theoretical justification of the practical results. | 10 |
| • Individual practical work.<br>• Group work | • Compression of concepts.<br>• Selection of manufacturing processes.<br>• Application of verification techniques. | 15 |
| • Laboratory reports. | • Understanding of concepts.<br>• Laboratory expertise.<br>• Justification of practical results. | 25 |
| • Final exam | • Differentiation and application of different manufacturing and verification processes. | 50 |

## BIBLIOGRAPHY AND RESOURCES

### Basic References


- Mariano Jiménez Calzado. APUNTES-PRESENTACIONES MOODLE - 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