

Course	Mechanical and Industrial Informatics			Academic year	2021/2022		
Subject	Technologies and Manufacturing Processes			ECTS	5,5		
Type of course	Compulsory						
Year	2nd	Semester	1st	Student Workload:			
Professor(s)	Jorge Manuel Pereira Gregório			Total	148,5	Contact	60
Area Coordinator	José Reinas dos Santos André						

Planned SD

1. LEARNING OBJECTIVES

Provide students with basic knowledge on workshop environment, metrology, Technologies and Manufacturing Processes.

Acquire the necessary knowledge to allow a theoretical and practical approach to manufacturing processes, in particular technological processes related to plastic forming technologies, machining technologies, cutting technologies and bonding technologies.

Apply acquired skills to product development and design in mechanical construction.

Know how to be in a workshop environment and identify the resources of a metalworking workshop and units of measurement.

Identify the most commonly used measuring instruments in metalworking.

Know the main mechanical conformation processes.

Identify the raw materials, equipment, tools and accessories involved in each process, as well as the main by-products/ products obtained.

2. PROGRAMME

Workshop environment. Hygiene and Safety fundamentals in workshops. Organization and workshop equipment. Tooling. Industrial Metrology. Notions of Metrology. Quantities and Units. Unit systems. Measuring instruments most commonly used in metalworking. Measurement and reading of quantities. Measurement procedures.

Product development technologies.

Introduction to subtractive and additive manufacturing technologies. Mechanical Forming Processes for plastic forming (stamping, drawing, extrusion) and chip removal manufacturing processes. EDM.

Metallurgical Conformation Processes.

Foundry. Foundry Processes and Types.

Cutting processes. Mechanical cutting, thermal cutting and special cutting processes.

Binding Processes. Bolted connections Riveted connections Welded connections - Identification and characterization of welding processes. Adhesive Joints and Joint bending connections.

Introduction to Surface Treatments.

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

The programme contents aim to provide students with knowledge in the area of Technologies and Manufacturing Processes, in order to integrate them in the world of work in the workshop and industrial area. In particular, the programme aims to prepare students to be aware of the need to know how to do in the instrumental and operational areas. The outlined programme will also allow students to be able to develop their activity autonomously and productively and apply the concepts learned about technologies and manufacturing processes in companies/organizations.

4. MAIN BIBLIOGRAPHY

Chiaverini, Vicente (1986). Tecnologia Mecânica. Vol. I, II e III (2nd Ed). São Paulo: McGraw-Hill.

Rocha, Acácio Teixeira (1989). Tecnologia Mecânica. Vol. I, II e III. Coimbra: Coimbra Editora, Lda.

Santos F. Oliveira e Quintino Luísa (1998). Processos de Soldadura. Vol. I, II e III. Edições Técnicas ISQ.

A. Barata da Rocha, J. Ferreira Duarte. Tecnologia do corte em prensa. ed. por Associação Portuguesa das Tecnologias de Conformação.

SAF (1981). Guia do Utilizador de Soldadura Manual. Lisbon: Ar Líquido.

Gerling, Henrich (1967). À volta da máquina-ferramenta. São Paulo: Reverte.

Davim J.P. (2008). Princípios da Maquinagem. Coimbra: Almedina.

Completo A., Festas A., Davim, J.P. (2009). Tecnologia de Fabrico. Porto: Publindustria.

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

The programme contents privilege the interconnection between the theoretical and practical components. The theoretical aspects presented by the expository, demonstrative and interrogative methods supported by the board or the use of projection will be, whenever possible, explored in a workshop environment.

During the semester students should carry out project group work and laboratory work. The aim is to encourage practical aspects so that learning develops towards future professional activities with group work and demonstrations. These practical works will always be presented in reports that will be evaluated.

Evaluation: Final exam (50%), practical work evaluation (50%).

Final grade equal to or higher than 10 values to obtain approval, with 20 being the highest grade possible.

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

To achieve the proposed objectives the methodology in this curricular unit is based on principles of theoretical - practical training. The teaching methods and techniques during classes are applied with interconnection between the expository, interrogative and demonstrative techniques; group interaction method, being the professor responsible for reinforcing learning and coordinating the various actions.

7. ATTENDANCE

N.A.

8. CONTACTS AND OFFICE HOURS

Professor: Jorge Manuel Pereira Gregório (Ph.D); jgregorio@ipg.pt; office n.º 5

Area Coordinator: José Reinas dos Santos André (Ph.D); jandre@ipg.pt; office n.º 13

Date: 30/06/2021