

Academic Year: ( 2023 / 2024 )

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Department assigned to the subject: Mechanical Engineering Department

Coordinating teacher: DIAZ ALVAREZ, JOSE

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 1

## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

The students must have a good mechanical and mathematical foundation and have passed the following subjects:

Production and Manufacturing Systems.  
Mechanical Technology.

## OBJECTIVES

- Students will develop skills and acquire the necessary knowledge for the correct definition and selection of the production systems and processes necessary to obtain especially critical components.
- Students will develop their communication skills to communicate the results and conclusions.
- They will increase their ability to analyze advanced problems related with new processes and production systems (analytically and numerically).
- They will improve their ability to lead, plan and supervise multidisciplinary teams.
- The student will receive the necessary knowledge to make optimal designs according to the process and the production system used for its manufacture.

## DESCRIPTION OF CONTENTS: PROGRAMME

1. ADVANCED MANUFACTURING OF COMPOSITE MATERIALS.
  - 1.1. Processing of composite materials.
  - 1.2. Post-processing of composite materials.
    - 1.2.1. Machining of composite materials.
    - 1.2.2. Joining methods.
  - 1.3. Specific tools and equipment.
2. ADDITIVE MANUFACTURING.
3. HYBRID FORMING (ADDITIVE MANUFACTURING-MACHINING AND OTHER HYBRID PROCESSES).
4. NUMERICAL MODELING OF FORMING PROCESSES.

## LEARNING ACTIVITIES AND METHODOLOGY

### TRAINING ACTIVITIES

Theoretical classes

Practical classes

Computer assisted classes

Laboratory practices

Individual student work

Group work

### TEACHING METHODOLOGIES

Exposition in class of the teacher with support of computer and audiovisual means, in which the main concepts of the subject are developed and the bibliography is provided to complement the learning of the students.

Solving case studies, problems, etc. raised by the teacher individually or in a group  
Preparation of work and reports individually or in groups.

#### ASSESSMENT SYSTEM

<b>% end-of-term-examination/test:</b>	60
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	40

To pass the subject, the student must:

- 1) Obtain a minimum grade of 4.0/10 on the final exam
- 2) Obtain a minimum grade of 5.0/10 as the average of 60% on the final exam and 40% on the continuous assessment

#### BASIC BIBLIOGRAPHY

- Amateau, M.F. Engineering Composite Materials, Engineering Mechanics, 2003
- Jamal Y. Sheikh-Ahmad Machining of Polymer Composites, Springer, 2009
- Jones, R.M. Mechanics of Composite Materials, CRC Press, 1998
- Steinar Westhrin Killi Additive Manufacturing: Design, Methods, and Processes, CRC Press, 2017