

## 66433 - Advanced Materials in Mechanical Engineering

### Syllabus Information

**Academic Year:** 2019/20

**Subject:** 66433 - Advanced Materials in Mechanical Engineering

**Faculty / School:** 110 -

**Degree:** 536 - Master's in Mechanical Engineering

**ECTS:** 4.5

**Year:** 1

**Semester:** Second semester

**Subject Type:** Optional

**Module:** ---

### 1.General information

#### 1.1.Aims of the course

#### 1.2.Context and importance of this course in the degree

#### 1.3.Recommendations to take this course

### 2.Learning goals

#### 2.1.Competences

#### 2.2.Learning goals

#### 2.3.Importance of learning goals

### 3.Assessment (1st and 2nd call)

#### 3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

### 4.Methodology, learning tasks, syllabus and resources

#### 4.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, problem sets and case studies, laboratory work, tutorials, autonomous work, and assessment activities.

#### 4.2.Learning tasks

The course includes the following learning tasks:

- **Lectures** A01 (15 hours). The teacher explains the main contents of the course. It will take place in the classroom.
- **Practice sessions** (15 hours). It takes place in the lecture classroom. They consist of problem sets and case studies.
- **Laboratory sessions** A03 (10 hours).
- **Special practice sessions** A04 (5 hours).
- **Assignment** A05 (30 hours). The student will study several research articles given by the teacher. It can be done individually or in pairs, depending on the number of students. If needed, students should analyze and seek additional information for full understanding of the articles. The student will prepare a report for each assignment

and submit them to the teacher. This work will be defended orally in front of the teachers and the rest of the class.

- **Tutorials** A06 (5 hours). Students can attend office hours to review and discuss the materials and topics presented in both theoretical and practical classes.
- **Study of theory** A07 (30 hours).
- **Assessment** A08 (2.5 hours). Reports, assignments, and written tests.

### 4.3.Syllabus

The course will address the following topics:

1. Materials used in mechanical engineering and its application in various industrial sectors.
2. Selection of materials for various applications in mechanical engineering.
3. Inspection techniques for damage monitoring during service, as well as the basics of failure, and necessary concepts to identify the failure mechanism and determine its root cause.
4. The latest trends in materials in mechanical engineering and its forming processes, manufacturing and mechanical properties.

### 4.4.Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website.

### 4.5.Bibliography and recommended resources