



## Course guide

### 205273 - 205273 - R&D in Engineering

Last modified: 08/07/2024

**Unit in charge:** Terrassa School of Industrial, Aerospace and Audiovisual Engineering  
**Teaching unit:** 712 - EM - Department of Mechanical Engineering.

**Degree:** BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).  
BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Optional subject).  
BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Optional subject).  
BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).

**Academic year:** 2024    **ECTS Credits:** 3.0    **Languages:** English

#### LECTURER

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**Coordinating lecturer:** Balastegui Manso, Andreu  
Clot Razquin, Arnau

**Others:** Arcos Villamarín, Robert  
Pàmies Gómez, Teresa  
Romeu Garbi, Jordi

#### REQUIREMENTS

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None

#### TEACHING METHODOLOGY

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The teaching methodology is divided into three parts:

- In-person sessions to present the contents: Introduction of the theoretical bases of the course, illustrating them with examples to facilitate their understanding.
- In-person sessions in laboratories: Introduction to laboratory environments and to the experimental tests carried out to study the explained theoretical concepts.
- Independent work: Study and practical application of the course materials given by the lecturers with the aim of assimilating the basic concepts of the course. The teaching staff will provide a study plan for the proposed activities.

#### LEARNING OBJECTIVES OF THE SUBJECT

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At the end of the course the student must:

- 1) Understand what research and development is and what importance it has in engineering.
- 2) Understand the essential components of a scientific project, from the definition of the initial idea to its completion.
- 3) To know some of the research groups that exist in the ESEIAAT and have a general idea about the lines of research they work on.



## STUDY LOAD

Type	Hours	Percentage
Hours large group	20,0	26.67
Hours small group	10,0	13.33
Self study	45,0	60.00

**Total learning time:** 75 h

## CONTENTS

### Module 1: Introduction to R&D in engineering

**Description:**

Exposition of what R&D in engineering consists of. Description of the differences between R&D carried out by research groups and by companies. Description of the particularities in funding and executing R&D projects for each case.

**Related activities:**

Activity 1, Activity 2 and Activity 4.

**Full-or-part-time:** 33h

Theory classes: 8h

Self study : 25h

### Module 2: R&D seminars by research groups and engineering companies

**Description:**

Presentation by members of research groups and engineering companies of the research and development tasks they perform.

**Related activities:**

Activity 1.

**Full-or-part-time:** 12h

Theory classes: 12h

### Module 3: Visits to ESEIAAT research groups

**Description:**

Visits to specific ESEIAAT research groups to learn about their lines of research and, with the help of group members, development of a R&D project proposal.

**Related activities:**

Activity 1 and Activity 3.

**Full-or-part-time:** 30h

Laboratory classes: 10h

Self study : 20h



## ACTIVITIES

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### Activity 1: Theoretical lectures and visits to research groups

**Description:**

Attendance and participation in the theoretical lectures and seminars of the course. Visits to school research groups.

**Specific objectives:**

Assess the engagement of the students in the course activities.

**Full-or-part-time:** 26h

Theory classes: 16h

Laboratory classes: 10h

### Activity 2: Writing a review article on a research topic

**Description:**

Writing a review article on a research topic chosen by the student.

**Specific objectives:**

Assess the ability to search, understand and synthesize the information found on a specific scientific topic.

**Delivery:**

Review article on a research topic.

**Full-or-part-time:** 15h

Self study: 15h

### Activity 3: Writing a scientific project proposal

**Description:**

Writing the proposal for a scientific project linked to one of the school's research groups.

**Specific objectives:**

Assess the application of the course key concepts in the writing of a scientific proposal.

**Delivery:**

Project proposal document.

**Full-or-part-time:** 20h

Self study: 20h

### Activity 4: Oral presentation of the review article

**Description:**

Oral presentation of the review article on the chosen research topic.

**Specific objectives:**

Assess the ability to transmit the knowledge acquired on the chosen research topic.

**Full-or-part-time:** 14h

Self study: 10h

Theory classes: 4h



## GRADING SYSTEM

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The course will be evaluated by considering the following activities:

- Activity 1: Attendance at the scheduled theoretical and practical sessions of the course (30%).
- Activity 2: To write a review article on a research topic chosen by the student (20%).
- Activity 3: To write a proposal for a research and/or development project (30%).
- Activity 4: To give an oral presentation of the review article on the chosen research topic (20%).

## EXAMINATION RULES.

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It is mandatory to attend the theoretical and practical sessions planned in the course.  
Activities 2, 3 and 4 will be done in groups.

## RESOURCES

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### **Other resources:**

Material on the Atenea platform