

## Course guide

### 330508 - F2 - Physics 2

**Last modified:** 04/05/2023

**Unit in charge:** Manresa School of Engineering  
**Teaching unit:** 750 - EMIT - Department of Mining, Industrial and ICT Engineering.

**Degree:** BACHELOR'S DEGREE IN AUTOMOTIVE ENGINEERING (Syllabus 2017). (Compulsory subject).

**Academic year:** 2023    **ECTS Credits:** 4.5    **Languages:** Catalan

#### LECTURER

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**Coordinating lecturer:** Ciriano Nogales, Yolanda

**Others:** Conangla Triviño, Laura  
Lladó Valero, Jordi  
Vallbe Mumbrau, Marc  
Vilanova Arnau, David  
Rota Font, Francesc

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Specific:**

CE2. Understanding and mastering the basic concepts of the general laws of mechanics, thermodynamics, fields and waves and electromagnetism and their application for solving engineering problems.

**Generical:**

CG3. Knowledge of basic and technological subjects that will enable students to learn new methods and theories and that will endow them with the versatility needed to adapt to new situations.

**Transversal:**

1. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
2. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.

**Basic:**

CB1. Students will be able to demonstrate their knowledge of a field of study that builds on secondary education and is usually found at a level that, while supported by advanced textbooks, also includes aspects that involve knowledge of the latest developments in the field of study.

CB2. Students will be able to apply their knowledge to their work or vocation in a professional manner and demonstrate that they possess the competencies that are typically demonstrated by elaborating and defending arguments and solving problems in the field of study.

#### TEACHING METHODOLOGY

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MD1 Master class or lecture (EXP)  
MD2 Problem solving and case study (RP)  
MD3 Practical work in laboratory or workshop (TP)  
MD7 Assessment activities (EV)



## LEARNING OBJECTIVES OF THE SUBJECT

At the end of the course the student should be able to do the following:

- Understand and use the basic principles of electric fields.
- Understand and use the basic principles of magnetic fields.
- Manipulate laboratory instruments, properly collect data, process data and prepare a report.

## STUDY LOAD

Type	Hours	Percentage
Hours small group	22,5	20.00
Self study	67,5	60.00
Hours large group	22,5	20.00

**Total learning time:** 112.5 h

## CONTENTS

### Topic 1: ELECTRIC FIELDS

**Description:**

Coulomb's law, electric fields, electric potential. Applications of electrostatics. Capacitors, dielectrics. Electric current. DC circuits.

**Specific objectives:**

To understand and use the basic principles of electric fields.

**Related activities:**

- Activity 1: Laboratory practical
- Activity 1: Laboratory practical
- Activity 2: Assessment test
- Activity 3: Delivery
- Activity 4: Final assessment test

**Full-or-part-time:** 52h 30m

- Theory classes: 10h 30m
- Laboratory classes: 10h 30m
- Self study : 31h 30m

### Topic 2: MAGNETIC FIELDS

**Description:**

Magnetic fields, magnetic field sources, magnetic materials, Faraday's law of induction.

**Specific objectives:**

To understand and use the basic principles of magnetic fields.

**Related activities:**

- Activity 1: Laboratory practical
- Activity 2: Assessment test
- Activity 3: Delivery
- Activity 4: Final assessment test

**Full-or-part-time:** 60h

- Theory classes: 12h
- Laboratory classes: 12h
- Self study : 36h



## ACTIVITIES

### Activity 1: LABORATORY PRACTICE

**Description:**

- Laboratory teamwork.
- The students read the instructions and produce a sheet to record the experimental data.

**Specific objectives:**

At the end of the activity, students should be able to do the following:

- Effectively handle the devices used in the activity.
- Understand the physical concepts involved in the activity.

**Material:**

- Web page: <http://www.epsem.upc.edu/practiquesfisica>
- All necessary equipment for carrying out the practical.

**Delivery:**

The team prepare and deliver a report to the professor, following the instructions.

**Full-or-part-time:** 4h 30m

Laboratory classes: 1h 30m

Self study: 3h

### Activity 2: ASSESSMENT TEST

**Description:**

Individual classroom on the theoretical concepts of the topics with exercises related to the learning objectives.

**Specific objectives:**

After the activity, students should be able to understand and use the basic principles of the topics.

**Material:**

Test paper and calculator.

**Delivery:**

Completed test.

**Full-or-part-time:** 7h 30m

Theory classes: 1h 30m

Self study: 6h

### Activity 3: DELIVERY

**Description:**

Individual multiple choice test about theoretical concepts and/or problem solving related to the topics.

**Specific objectives:**

After the activity, students should be able to understand and use the basic principles of the topics.

**Material:**

Test paper and calculator.

**Delivery:**

Delivery of the completed test on time.

**Full-or-part-time:** 3h

Self study: 3h



#### Title of activity of class 4: FINAL ASSESSMENT TEST

**Description:**

Individual classroom test on the theoretical concepts of the subject with exercises related to the learning objectives.

**Specific objectives:**

After the activity, students should be able to understand and use the basic principles of the subject.

**Material:**

Test paper and calculator.

**Delivery:**

Completed test.

**Full-or-part-time:** 13h

Theory classes: 3h

Self study: 10h

## GRADING SYSTEM

- Activity 1 (Laboratory practical) is repeated for each topic, twice for the first and once for the second, and is assessed within the denomination EV5 "Performance and quality of the work group (TG)". The set of two topics represent 25% of the final mark. It is an essential condition to pass the subject to have done the practices and present the reports associated with them.
- Activity 2 (Assessment test) is repeated for each topic and is assessed within the denomination EV1 "Written test of knowledge (PE)", with 30% of the final mark for each topic.
- The activity 3 (Delivery) is repeated for each topic and is assessed as EV3 "Work done throughout the course (TR)", with 15% of the final mark for the set of two topics.
- Students who have not passed one or more of the topics in Activity 2 it is recommended to recover the pending part in the final exam (Activity 4).

## EXAMINATION RULES.

Each activity will be carried out according to the course schedule. An alternative day will be scheduled for students who are unable to perform one or more of the topics in Activity 1 on the day scheduled. Students who are unable to attend the tests in Activity 2 must sit the test in Activity 4. Activity 3 must be carried out on the day set.

## BIBLIOGRAPHY

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### Basic:

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### Complementary:

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