

26915 - Electromagnetism

Syllabus Information

Academic Year: 2022/23

Subject: 26915 - Electromagnetism

Faculty / School: 100 - Facultad de Ciencias

Degree: 447 - Degree in Physics

ECTS: 8.0

Year: 2

Semester: First semester

Subject Type: Compulsory

Module:

1. General information

1.1. Aims of the course

The aims of the course are aligned with the following Sustainable Development Goals (SDGs):

- Goal 4: Quality Education

2. Learning goals

3. Assessment (1st and 2nd call)

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: Development and progressive discussion of the course contents in the classroom, based on the material prepared by the teacher and the bibliography provided.
- Practice sessions: Solving practical cases in the classroom, with active participation of students. Students are provided with a collection of exercises, some of which are solved in the classroom.
- Laboratory sessions: Explanation in the classroom of the use of equipment and measurement methods. Students prepare and elaborate in pairs, five laboratory activities, which will focus on the course contents. Students will have an explanatory script. The teacher will supervise the implementation of the experiments, data collection and analysis. Students will prepare after the session a written report on the work done that they may occasionally have to defend.
- Theoretical-practical work proposed based on specific seminars to be developed during the course (Optional). The student (individually or in pairs) has the option to write and present in the classroom a report of their work (equivalent to 20 hours). For this, it will have specific follow-up tutorials. Their assessment will be included in the continuous assessment or internship section depending on the nature of the work.
- Tutorials: The solving of doubts and explanation of concepts will take place in the teacher's office at a specified time.

4.2. Learning tasks

The course includes the following learning tasks:

- Lectures (5.5 ETCS).
- Practice sessions (1.5 ETCS).
- Laboratory sessions (1.0 ETCS).

4.3. Syllabus

The course will address the following topics:

- Static electric field and potential in free space. Dielectrics and conductor systems. The problem of potential. Electrostatic energy and forces.
- Steady electric currents. Static magnetic field in free space. Static magnetic field in matter. Magnetostatics potentials.
- Electromagnetic induction. Maxwell's equations. Energy and forces.
- Electromagnetic radiation and propagation. Antennas.
- Introduction to electrodynamics. Relativistic invariance of Maxwell's equations.

4.4. Course planning and calendar

Laboratory sessions dates will be set at the beginning of the semester according to the number of students enrolled and the availability of laboratories.

Exam: The written exam will last 4 hours. It will be held on the date indicated by the Faculty of Sciences. For the practice laboratory test, it will be convened in due time with the students who must do it.

Further information concerning the timetable, classroom, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the Faculty of Sciences

4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=26915>