Universidad Zaragoza

Year : 2019/20

28806 - Basic physics II

Syllabus Information

Academic Year: 2019/20
Subject: 28806 - Basic physics II
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 424 - Bachelor's Degree in Mechatronic Engineering
ECTS: 6.0
Year: 1
Semester: Second semester
Subject Type: Basic Education
Module: ---

1.General information

1.1.Aims of the course

The subject and its expected results respond to the following approaches and objectives:

Expose the universal nature of physical laws, their inexorable character and the enormous benefits that are obtained from their knowledge in the field of engineering.

1.2.Context and importance of this course in the degree

Basic Physics II is a basic training subject, with 6 ECTS credits that is taught during the first year of the degree in Industrial Organization Engineering.

It aims to provide the student with the basic knowledge of the most relevant phenomena and physical laws of application in the study of engineering; as well as the necessary tools to apply this theoretical knowledge to the resolution of engineering problems. More specifically, it focuses on the study of mechanics and thermodynamics.

1.3.Recommendations to take this course

It is a basic subject that must provide a first contact with the foundations, methods and scientific procedures of Physics. A close relationship is established with other analogous subjects such as physics II, Mathematics I, II, III inserted within the degree itself.

In order to face the subject with guarantees, it is recommended to have completed physics and mathematics in the second year of high school or equivalent.

2.Learning goals

2.1.Competences

Upon passing the subject, the student will be more competent to

- Generic competence:
  - **GI03:** Knowledge in basic and technological subjects, which enables them to learn new methods and theories, and give them the versatility to adapt to new situations.
  - **GI04:** Ability to solve problems with initiative, decision making, creativity, critical reasoning and to communicate and transmit knowledge, skills and abilities in the field of Mechatronic Engineering and in particular in the field of industrial electronics.
  - **GC02:** Interpret experimental data, contrast it with the theoretical and draw conclusions.
  - **GC03:** Capacity for abstraction and logical reasoning
  - **GC04:** Ability to learn in a continuous, self-directed and autonomous way.
  - **GC05:** Ability to evaluate alternatives.
  - **GC07:** Ability to lead a team as well as being a committed member of it.
  - **GC08:** Ability to locate technical information, as well as its understanding and assessment.
  - **GC10:** Ability to write technical documentation and to present it with the help of appropriate computer tools.
  - **GC11:** Ability to communicate their reasoning and designs clearly to specialized and non-specialized

audiences.

- Specific competence:
  - **EB02:** Understanding and mastery of basic concepts about the general laws of wave and electromagnetism and its application in the resolution of engineering problems

2.2.Learning goals

2.3.Importance of learning goals

The student, to pass this subject, must demonstrate the following results ...

- To solve practical exercises of waves using the notions studied in the theoretical classes.
- Recognize the physical magnitudes that characterize a wave, and describe it.
- Understand and explain the physical meaning of the Electric Field.
- Solve exercises of simple electrical circuits.
- Recognize the effects that an insulating material has on a condenser or other device.
- Calculate potentials and electric fields created by continuous distributions of electric charge.
- Use the laws of Biot-Savart and Ampère to calculate magnetic fields created by electric currents.
- Describe the effect that magnetic fields have on electric charges and their technological applications.
- Explain the laws of electromagnetic induction, apply them to specific cases and relate them to the mechanisms of production of electrical energy.
- Calculate the self-induction of different devices, and in particular of coils.
- Understand the effects of coils in electric circuits in direct and alternating current.
- Solve practical optical exercises with the knowledge acquired in class.
- Identify and know the main magnitudes and concepts that are defined in the optics

3.Assessment (1st and 2nd call)

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

There is the possibility of passing the subject through two different routes:

1.- Continuous evaluation.

2.- Global Test.

Continuous assessment:

Following the spirit of Bologna, regarding the degree of involvement and continued work of the

i.- Partial exams: Three partial exams will be carried out within the class schedule. You have

ii.- Laboratory practices: 4 laboratory practices will be carried out. For each of them, the s

iii.- Participation in class: It will be valued: the attendance to class, the participation ar

To qualify for the Continuous Assessment system, you must attend at least 80% of the face-to-f

Global Test:

The student must opt ??for this modality when, due to his / her personal situation, he / she c

As in the previous evaluation methodology, the final test of the final evaluation must have th

i.- Final written test: On the date indicated by the University, a global examination of the s

ii.- Laboratory practices: 4 laboratory practices will be carried out. For each of them, the s

iii.- Participation in class: It will be valued: the attendance to class, the participation ar

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. The course consists of 6 ECTS credits, which represents 150 hours of student work during the semester. 40% of this work (60 h.) will take place

in the classroom, and the rest will be autonomous work. One semester consists of 15 teaching weeks. To make the timing is used to measure the school week, in which the student must devote to the study of the subject 10 hours.

4.2.Learning tasks

The course includes the following learning tasks:

- Lectures: theoretical activities so fundamentally expository given by the teacher.
- Practice Sessions: practical discussion activities and conducting exercises conducted in the classroom and requiring high student participation.
- Laboratory Practice: Practical activities in laboratories.
- Group tutorials.
- individual tutoring.

4.3.Syllabus

The course will address the following topics:

Topic I. Electronics
Topic II. Magnetism
Topic III.mechanical waves
Topic IV. Optics

4.4.Course planning and calendar

Planning for weeks about the subject is as follows:

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Topic	I	I	I	I	II	II	II	II	III	III	III	IV	IV	IV	R
Exams				1º					2º					3º	

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=28806&year=2019