Physics II

Academic Year: (2022 / 2023) **Review date: 20-06-2022**

Department assigned to the subject: Department of Physics

Coordinating teacher: GARCIA GONZALO, LUIS

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 2

Branch of knowledge: Engineering and Architecture

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction to Thermodynamics. Thermodynamic systems. Thermodynamic variables. Work. Temperature. The ideal gas.
2. First Law of Thermodynamics. Introduction to heat transfer processes: conduction, convection and radiation.
3. Second Law of Thermodynamics. Introduction to thermodynamic cycles: engines, refrigerating and heating cycles. Entropy and reversibility.
4. Electrostatics of vacuum: Coulomb's law. Electric field. Superposition principle. Electric potential. Sources of the electric field. Gauss theorem. Electrostatic energy.
5. Conductors and Capacitors. Conductors in equilibrium. Electrostatic shielding. Capacity. Systems of conductors. Planar, cylindrical and spherical capacitors. Capacitor.
associations: serial and parallel. Dielectrics.
6. Electric current. Ohm¿s law. Electric conductivity and resistance. Joule¿s law. Resistance associations: serial and parallel. Kirchoff's laws. Electromotive force.
7. Magnetostatics of vacuum. Force between currents. Magnetic field. Biot-Savart's law. Magnetic flux. Sources of the magnetic field. Ampere's law. Magnetic energy.
8. Magnetic induction: Faraday's law. Lenz's law. Dynamos and Transformers. Magnetic circuits.
9. Displacement current. Maxwell's equations

LEARNING ACTIVITIES AND METHODOLOGY

AF1. THEORETICAL-PRACTICAL CLASSES. Knowledge and concepts students mustacquire. Receive course notes and will have basic reference texts.Students partake in exercises to resolve practical problems
AF2. TUTORING SESSIONS. Individualized attendance (individual tutoring) or in-group (group tutoring) for students with a teacher.Subjects with 6 credits have 4 hours of tutoring/ 100% on- site attendance.
AF3. STUDENT INDIVIDUAL WORK OR GROUP WORK.Subjects with 6 credits have 98 hours/0% on-site.
AF8. WORKSHOPS AND LABORATORY SESSIONS. Subjects with 3 credits have 4 hours with 100% on-site instruction. Subjects with 6 credits have 8 hours/100% on-site instruction.
AF9. FINAL EXAM. Global assessment of knowledge, skills and capacities acquired throughout the course. It entails 4 hours/100% on-site
AF8. WORKSHOPS AND LABORATORY SESSIONS. Subjects with 3 credits have 4 hours with 100% on-site instruction. Subjects with 6 credits have 8 hours/100% on-site instruction.
MD1. THEORY CLASS. Classroom presentations by the teacher with IT and audiovisual support in which the subject`s main concepts are developed, while providing material and bibliography to complement student learning
MD2. PRACTICAL CLASS. Resolution of practical cases and problem, posed by the teacher, and carried out individually or in a group
MD3. TUTORING SESSIONS. Individualized attendance (individual tutoring sessions) or in-group (group tutoring sessions) for students with teacher as tutor. Subjects with 6 credits have 4 hours of tutoring/100% on-site.
MD6. LABORATORY PRACTICAL SESSIONS. Applied/experimental learning/teaching in workshops and laboratories under the tutor's supervision.

ASSESSMENT SYSTEM

1) Laboratory sessions (15% of final mark). Evaluation based on:

- Attendance to the laboratory sessions, participation and attitude. Activities in groups of two students.

- Laboratory reports quality. Mark is shared by the members of the group.

2) Assessment during the course (25% of final mark). Evaluation based on:

- Midterm exams.

3) Final exam (60% of final mark).

The exam is made at the end of the semester and it is the same for all the students
Contents:
- Problems to be solved covering the topics of the program.

Despite the final mark is obtained with the indicated percentages, attendance to the laboratory sessions is COMPULSORY to pass the course. Additionally, it is OBLIGATORY to obtain at least a score of 3 out of 10 in the final exam to pass the course.

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

BASIC BIBLIOGRAPHY

- Paul A. Tipler, Gene Mosca Physics For Scientists and Engineers, W.H. Freeman and Company, 2008
- Raymond A. Serway, John W. Jewett, Jr. Physics For Scientists and Engineers, Brooks/Cole, 2014

ADDITIONAL BIBLIOGRAPHY

- John R Reitz, Frederick J Milford, Robert W Christy Foundations of Electromagnetic Theory, Addison-Wesley, 2008
- Mark W. Zemansky, Richard H. Dittman Heat and Thermodynamics, McGraw-Hill, 1981
- Roald K. Wangsness Electromagnetic Fields, Wiley, 1986