Course number and name: Physics
Credits: 6 ECTS (3 US credits)
Credit categorization: Mathematics and basic science
Instructor: To be determined

Office:
Email:
Office hours:

Text book:

Required:

- Edward M. Purcell and David J. Morin; Electricity and Magnetism. Cambridge University Press. 2020.

Recommended supporting material:

- Paul A. Tipler; Physics for Scientists and Engineers. W. H. Freeman. 2020.
- Raymond A. Serway, John W. Jewett; Physics for Scientists and Engineers with Modern Physics. Brooks/Cole. 2018.

Specific Course information:

Brief description:

This course is an introduction to classical electricity and magnetism for its application to the resolution of engineering problems. Includes electricity charge and electric fields, Gauss's Law, electric potential, capacitance, current, resistance and circuits, magnetic fields and fields due to currents, induction and inductance, magnetism of matter, Maxwell's equations and electromagnetic oscillations.

Prerequisites or co-requisites:

Mathematics.

Required (Required, Elective or Selected Elective)

Course objectives and outcomes:

Course objectives:

1. Provide students with the basic principles required for understanding physics (electricity and magnetism) and its role in society and engineering practice.
2. Understand the principles of electricity and magnetism, and how to use them to solve engineering problems.
3. Apply the principles of electricity and magnetism to electrical systems.
4. Develop fundamental engineering problem solving skills applied to physics, electricity, and magnetism.

Course outcomes:

1. Formulate and solve problems in physics (electricity and magnetism) (ABET outcome 1).
2. Ability to communicate effectively in oral and written communications (ABET outcome 3).
3. Ability to function effectively on a team to complete laboratory experiments and class assignments related with electricity and magnetism (ABET outcome 5).
4. Ability to develop and conduct appropriate experimentation in laboratory with electricity and magnetism applications, analyze and interpret data, and

use engineering judgment to draw conclusions, write and present reports (ABET outcome 6).

List of topics to be covered:

1. Introduction to electricity and magnetism basic concepts
2. Electric Fields. Gauss's Law. Electric Potential
3. Capacitance and Dielectrics
4. Current and Resistance
5. Direct-Current Circuits
6. Magnetic Fields
7. Sources of the Magnetic Field
8. Faraday's Law
9. Inductance
10. Alternating-Current Circuits
11. Electromagnetic Waves

Assessment structure:

Methods of Evaluation	Weight	Date/freq.	Description
Final exam	40%	End of semester	Grading: 70% problems, 30% of theory
Following up activities	50%	Three/ course	Assessment controls of 1 hour lasting. Grading: ¿average of the 2 highest records?
Homework and presentations	5%	Every week	
Experimental work or fieldwork	5%	3 hours/ week	Assessment of experimental skills, report writing and oral communication presenting report