

**COURSE DATA****Data Subject**

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|----------------------|-------------|
| Code | 34790 |
| Name | Physics II |
| Cycle | Grade |
| ECTS Credits | 6.0 |
| Academic year | 2021 - 2022 |

Study (s)

| Degree | Center | Acad. year | Period |
|---|-----------------------|-------------------|---------------|
| 1402 - Degree in Telecommunications Electronic Engineering | School of Engineering | 1 | Second term |

Subject-matter

| Degree | Subject-matter | Character |
|---|-----------------------|------------------|
| 1402 - Degree in Telecommunications Electronic Engineering | 2 - Physics | Basic Training |

Coordination

| Name | Department |
|------------------------|--|
| CANTARERO SAEZ, ANDRES | 175 - Applied Physics and Electromagnetism |

SUMMARY

The course provides the basis of wave mechanics and electromagnetic phenomena from a phenomenological point of view. It begins with the study of wave mechanics with special attention to sound. Here are the basic principles of electromagnetism studying electro and magnetostatic fields in vacuum and material means, after studying the behavior of time-varying fields, and, finally, the course finished studying the basic characteristics of electromagnetic waves.

PREVIOUS KNOWLEDGE



Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

Knowledge of Physics, Chemistry and Mathematics Bachelor level or similar.

OUTCOMES

1402 - Degree in Telecommunications Electronic Engineering

- G3 - Acquisition of the knowledge of the basic and technological subjects that allows students to learn new methods and theories and endows them with the versatility to adapt to new situations.
- G4 - Ability to solve problems with initiative, decision-making and creativity, and to communicate and transmit knowledge, abilities and skills, understanding the ethical and professional responsibility of the activity of a telecommunications technical engineer.
- B3 - Understand and master the basic concepts of the general laws of mechanics, thermodynamics, fields and waves and electromagnetism their application to solve engineering problems.

LEARNING OUTCOMES

Understanding and mastery of concepts and basic electromagnetic wave and its application to solving problems of engineering.

Knowledge of the principles and technologies that enable them to learning new methods and to adapt to new situations.

Ability to solve problems, apply knowledge creatively and communicate knowledge in the field of engineering.

DESCRIPTION OF CONTENTS

1. Oscillation movement.

Wave phenomena. Wave Equation. Velocity of propagation. Harmonic solution. Energy and intensity of a wave.

2. Acoustic.

Pressure waves. Response of the human ear. Doppler effect.



3.

Electrostatic field in vacuum.

Coulomb's law. Electric field. Gauss theorem. Potential. Work.

4. Electrostatic field in material media.

Electric dipoles. Media Bias Materials. Relative dielectric permittivity. Driver charged in equilibrium. Electricity, resistivity.

5.

Static magnetic field in vacuum.

Ampere's Law. Magnetic Field. Biot and Savart. Ampère theorem.

6. Static magnetic field in material media.

Magnetic dipoles. Bias material means. Relative magnetic permeability. Magnetic properties of matter.

7. Campos variables over time.

Faraday's law of induction. Inductive devices. Displacement current.

8. Electromagnetic waves.

Maxwell equations. Electromagnetic waves. Electromagnetic spectrum.

9. Laboratory

Velocity and attenuation of electromagnetic waves. Interferences of electromagnetic waves. Magnetic fields. Electromagnetic induction.



WORKLOAD

| ACTIVITY | Hours | % To be attended |
|--|---------------|------------------|
| Classroom practices | 25,00 | 100 |
| Theory classes | 25,00 | 100 |
| Laboratory practices | 10,00 | 100 |
| Study and independent work | 11,00 | 0 |
| Preparation of evaluation activities | 12,00 | 0 |
| Preparing lectures | 16,00 | 0 |
| Preparation of practical classes and problem | 17,00 | 0 |
| Resolution of case studies | 34,00 | 0 |
| TOTAL | 150,00 | |

TEACHING METHODOLOGY

Class work: theory classes, practical classes and laboratory classes.

Student class work: Preparation of classes, problem solving, job preparation and presentation of results.

Individual or group tutoring.

EVALUATION

The evaluation of the theoretical and practical concepts studied during the course will correspond to the 80% of the total mark. It will be performed by means of a continuous evaluation, which will consist at least of a 50% of the theoretical-practical mark and a written exam, which will complete the qualification until the 100% of the mentioned contents. It will be compulsory to obtain a 40% of the total mark of the subject from these concepts.

The attendance to the laboratory classes and the realization of the experiments is compulsory and non recoverable. The evaluation will be carried by means of a report summarizing the results obtained in the laboratory throughout the different sessions and it will represent the 20% of the total mark, being necessary to obtain at least 8 points out of 20 (40%). The mark obtained in the laboratory will have a validity of two academic years.

In any case, the evaluation system will be governed by the provisions of the Evaluation and Qualification Regulations of the Universitat de València for Degrees and Masters:

<https://webges.uv.es/uvTaeWeb/MuestraInformacionEdictoPublicoFrontAction.do?idEdictoSeleccionado=5639>



REFERENCES

Basic

- Referencia b1: Física, P.A. Tipler, Edt.Reverte.
- Referencia b2: Physics for scientists and engineers, R.A. Serway, Edt Sunders Golden Burst Series.

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

Contents

The contents initially included in the teaching guide are maintained.

Workload and temporary teaching planning

The different activities described in the teaching guide are maintained with the planned dedication.

The material for the follow-up of the classes of theory/practices allows to continue with the professor of temporary planning so much in days as in schedule, so much if the teaching is face-to-face in the classroom or if it is not.

Teaching methodology

In classroom theory and practices, students will tend to have the maximum physical attendance possible, always respecting the sanitary restrictions that limit the capacity of the classrooms as indicated by the competent public health authorities to the estimated percentage of their usual occupation.

Depending on the capacity of the classroom and the number of students enrolled, it may be necessary to distribute the students into two groups. If this situation arises, each group will attend classroom theory and practical sessions with physical presence in the classroom by rotating shifts, thus ensuring compliance with the criteria for occupying spaces.



The rotation system will be established once the actual enrollment data is known, guaranteeing, in any case, that the attendance percentage of all the students enrolled in the subject is the same.

With respect to laboratory practices, attendance at sessions scheduled in the schedule will be totally face-to-face.

Once the actual enrollment data is available and the availability of spaces is known, the Academic Committee of the Degree will approve the Teaching Model of the Degree and its adaptation to each subject, establishing in said model the specific conditions in which it will be developed teaching the subject.

If there is a closure of the facilities for sanitary reasons that totally or partially affects the classes of the subject, these will be replaced by non-contact sessions following the established schedules.

Evaluation

The evaluation system described in the teaching guide of the subject in which the different evaluable activities have been specified as well as their contribution to the final grade of the subject is maintained.

If there is a closure of the facilities for health reasons that affect the development of any face-to-face evaluable activity of the subject, it will be replaced by a test of a similar nature that will be carried out in virtual mode using the computer tools licensed by the Universitat de València.

The contribution of each evaluable activity to the final grade for the course will remain unchanged, as established in this guide.

Bibliography

The bibliography recommended in the teaching guide.