COURSE DATA

DATA SUBJECT

Code: 34282
Name: External internships
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1105 - Degree in Physics	Facultat de Física	4	Indefinite (Individuals)

SUBJECT-MATTER

Degree	Subject-matter	Character
1105 - Degree in Physics	Complements of Physics	ELECTIVES

COORDINATION

CROS STOTTER ANA

SUMMARY

The purpose of External Internships is to strengthen the training and academic career of the university students in the Institutions and/or companies operating areas in order to get professionals with a real vision of problems and their interrelationships, preparing her/his future incorporation into productive work in a company or in an research Institution.

The University may establish agreements with institutions or companies, programs for the cooperation in which their participation can be arranged in specialized training and required internships practice for the training of students.

Internship programs will be established for the students in the final year of Degree in Physics. The programs must be developed in a way to allow a dedication to studies and activities within the established credit number.

The activity to be performed will be assigned from a list of institutions and companies with an agreement established with the Faculty of Physics, or others whom the student establish a contact with, after approval

by the commission of the External Internships.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

Relationship with other subjects of the same degree:

There are not specified restrictions with other subjects of the Physics Degree.

Other requirements:

To carry out the External internships I will be required to have passed all the subjects of the first two courses and a total of 170 credits of the Physics degree.

COMPETENCES / LEARNING OUTCOMES

-

Ability to collect and interpret relevant data in order to make judgements.

Basic & applied Research: acquire an understanding of the nature and ways of physics research and of how physics research is applicable to many fields other than physics, e.g. engineering; be able to design experimental and/or theoretical procedures for: (i) solving current problems in academic or industrial research; (ii) improving the existing results.

Communication Skills (written and oral): Being able to communicate information, ideas, problems and solutions through argumentation and reasoning which are characteristic of the scientific activity, using basic concepts and tools of physics.

Foreign Language skills: Have improved command of English (or other foreign languages of interest) through: use of the basic literature, written and oral communication (scientific and technical English), participation in courses, study abroad via exchange programmes, and recognition of credits at foreign universities or research centres.

Knowledge and understanding of the fundamentals of physics in theoretical and experimental aspects, and the mathematical background needed for its formulation.

Learning ability: be able to enter new fields through independent study, in physics and science and technology in general.

Literature Search: be able to search for and use physical and other technical literature, as well as any other sources of information relevant to research work and technical project development.

Modelling & Problem solving skills: be able to identify the essentials of a process / situation and to set up a

working model of the same; be able to perform the required approximations so as to reduce a problem to an approachable one. Critical thinking to construct physical models.

Physics general culture: Be familiar with the most important areas of physics and with those approaches which span many areas in physics, or connections of physics with other sciences.

Problem solving: be able to evaluate clearly the orders of magnitude in situations which are physically different, but show analogies, thus allowing the use of known solutions in new problems .

Students must be able to apply their knowledge to their work or vocation in a professional manner and have acquired the competences required for the preparation and defence of arguments and for problem solving in their field of study.

Students must be able to communicate information, ideas, problems and solutions to both expert and lay audiences.

Students must have acquired knowledge and understanding in a specific field of study, on the basis of general secondary education and at a level that includes mainly knowledge drawn from advanced textbooks, but also some cutting-edge knowledge in their field of study.

Students must have developed the learning skills needed to undertake further study with a high degree of autonomy.

Students must have the ability to gather and interpret relevant data (usually in their field of study) to make judgements that take relevant social, scientific or ethical issues into consideration.

To know how to apply the knowledge acquired to professional activity, to know how to
solve problems and develop and defend arguments, relying on this knowledge.

DESCRIPTION OF CONTENTS

1. External Internship

There are two different modalities for the development of the External Internship (EI):

1. Offer of External Practices of the degree.

The student will be able to choose an internship from the list corresponding to the External Internship offer proposed through ADEIT. For the development of this modality the guidelines indicated in the ADEIT web page will be followed: www.adeituv.es. If the company has requested student selection through an interview, the guidelines indicated in the Faculty of Physics¿ External Internship Regulations will be followed.
https://www.uv.es/uvweb/grau-fisica/en/studies/internships/external-internships-physics-degree-1285931405857.html

2. Autopracticum.

The student will propose an internship project in a company not included in the offer made by the Internship Committee, as long as it complies with the established requirements and regulations. The proposal will be sent to the Internship Coordinator of the Degree, for evaluation by the Internship Committee.

The Committee may make the modification proposals it deems appropriate, in order to ensure the training capacity of the activities to be developed by the student, as well as the common interests of all parties. Once the proposal is approved, it will be sent to ADEIT for the management of the Company-University agreement.

In both cases, if the proposed External Internship project is coordinated with the FDP subject, the program of activities of the FDP will have to be attached to the External Internship.

The committee will publish an offer of companies specifically interested in students of the degree in Physics, which will be updated throughout the course. Preference will be given to those applications related to companies that are not linked to universities, institutions and public companies.

2. Internship Models. Training Paths and Areas of Action.

The contents of the External Internships align with the following training paths, included in the internship models listed below. These contents are based on the functions of the regulated profession of Physicist, according to a report by the Official College of Physicists, which defines the areas of action for a physics graduate.

TELEC
Telecommunications. Space Technology and Optoelectronics.
Acquisition, processing, and analysis of all types of data related to the transmission, detection, and emission of electromagnetic signals in telecommunications and space technology. Study of materials for telecommunications and space using physical techniques. Image analysis. Use and development of computer programs for data analysis and manipulation. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

HOSP
Hospital Radiophysics. Electromedicine. Medical Imaging.
Study of the characteristics of radiation used in treatment and diagnosis. Control and design of electronic, photonic, and acoustic systems for medical diagnostics. Calibration of equipment and sources (dosimetry). Use and development of computer programs for data analysis and manipulation. Image analysis. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

METEO
Meteorology. Environmental Studies and Management. Remote Sensing.
Development of meteorological models and predictive analysis. Analysis of meteorological and atmospheric pollutant data. Study of climate models. Use and development of computer programs for data analysis and manipulation. Image analysis. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

ENE
Design and management of renewable and non-renewable energy exploitation systems.
Use of physical methods for the study of energy-related materials. Calibration of energy collection and emission equipment in a broad sense (photovoltaic, piezoelectric, electric, wind¿). Use and development of computer programs for data analysis and manipulation. Image analysis. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

DIV
Physics Education and Outreach.
Development of classroom demonstrations. Design of experimental and simulation-based educational practices. Development of technical and conceptual tools for the teaching and dissemination of physical concepts. Use and development of computer programs for data analysis and manipulation. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

MAT
Materials Science. Micro and Nanotechnology. Semiconductors.
Use of physical methods for the development and study of materials and nanomaterials. Analysis of semiconductor devices. Development of applications based on the physical properties of materials. Use and development of computer programs for data analysis and manipulation. Image analysis. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

INF
Computer Science. Database Management. Algorithm Development and Programming.
Use of computer programs for data management and analysis and control systems, including sensors. Modeling and simulation of problems using algorithms. Programming. Image analysis. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

PART
Particle Physics and Astrophysics.
Analysis of high-energy physics and astrophysics data. Development and analysis of physical models. Calibration of sensors and control systems. Use and development of computer programs for data analysis and manipulation. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

FOT
Optical, Optoelectronic, Photonic, and Microwave Technologies.
Acquisition, processing, and analysis of all types of data related to photonic and microwave technologies. Use of physical methods for the development and study of materials with photonic applications (optical fibers, sensors, waveguides¿). Development and analysis of physical models. Calibration of sensors and control systems. Use and development of computer programs for data analysis and manipulation. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

CON

Scientific and Technological Consulting.
Feasibility analysis of scientific and technological systems and projects. Search for technological solutions and experts. Design of information systems and data processing services for science and technology. Use and development of computer programs for data analysis and manipulation. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

RAD
Radiological Protection, Monitoring, and Control of Ionizing and Electromagnetic Radiation.
Calibration of equipment and sources. Dosimetry. Radiometry. Use and development of computer programs for data analysis and manipulation. Image analysis. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

OCEA
Physical Oceanography and Oceanographic Instrumentation.
Calibration of equipment and sources for the study of physical conditions and processes in the oceans (temperature, salinity, density, flow, waves¿). Use and development of computer programs for data analysis and manipulation. Image analysis. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

METRO
Design and Production of Scientific and Technical Instrumentation. Metrological Studies and Calibration.
Development of sensors based on physical methods. Sensor calibration. Development of standards and measurement tests. Use and development of computer programs for data analysis and manipulation. Image analysis. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

BIO
Application of Physical Technologies to the Study of Living Beings. Biophysics.
Biomechanics. Bioelectromagnetism. Bioacoustics. Biostatistics. Application of thermodynamics to biological systems. Photonic applications to biological systems. Use and development of computer programs for data analysis and manipulation. Image analysis. Preparation of technical reports and outreach material. Bibliographic search and analysis. Presentation and discussion of results.

3. Profile of the company tutor

The company tutor will have recognized experience in STEM areas (science, technology, engineering, or mathematics), with the ability to propose interdisciplinary integration of these science areas in a business context.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at the internship centre	150,00
Attendance at supplementary activities	0,00

Monitoring and tutoring of internships	0,00
Total hours	**150,00**

NON PRESENCIAL ACTIVITIES

Activity	**Hours**
Independent study and work	15,00
Preparation of supplementary reports	0,00
Preparation of the internship report and evaluation of the internship	15,00
Total hours	**30,00**

TEACHING METHODOLOGY

The subject has volume of learning based on the achievement of learning outcomes and their associated workload of 6 ECTS credits that, extraordinarily and due to its special characteristics, correspond to a minimum of 180 effective hours of student work, distributed as follows:

In-company hours (150h):

To begin the internship, the student will contact the academic tutor, who will provide the tutoring schedule for monitoring the internship and any other relevant information.

Generally, the following activities will be carried out:

a) Orientation interview and follow-up activities.

b) Initial training.

c) Attendance and work at the internship center.

d) Contact and meetings with the tutor of the institution or company.

e) Attendance to seminars or work meetings.

Autonomous work and other activities 30h:

a) Study and preparation of aspects related to the work to be performed (instrumentation, methodology, organization, etc.).

b) Preparation and attendance to activities and seminars.

c) Preparation of the final internship report and, if applicable, of the oral presentation.

The report should be approximately 10 to 15 pages long (in exceptional cases where a longer than 15 pages is necessary, authorization must be requested from the person in charge of external internship, justifying the circumstances), it may be written in an official language of the UV or in English, and with the following contents as a minimum:

1. Cover page, with the student's, academic tutor's and company's data.

2. Introduction, which must include a description of the company where the internship has been carried out.

3. Objectives of the proposed activities.

4. Development of the internship. Description of the activities carried out, indicating the contributions to the student's training.

5. Evaluation of the internship. Personal evaluation of the tasks performed and the skills acquired.

6. Bibliography, if applicable.

In the case of internships coordinated with the Degree Final Project (DFP) subject, an appendix must be included specifying the characteristics of the external internships and their differences with the tasks developed in the DFP.

The total number of credit hours may never exceed 180 hours (6 ECTS credits), but there is the possibility (if agreed by both parties: student and company) of extending the internship up to a maximum of 450 hours, considering the excess (from 180 hours to a maximum of 450 hours) as extracurricular internships.

EVALUATION

1.— The tutors of the company or institution in which the student performs the work will issue a report evaluating different aspects of his/her development: organization, initiative, responsibility, interest, interpretation and evaluation of data, punctuality, integration in the work group, order, assimilation of new technologies, etc.

2.— The academic tutor will evaluate the student taking into account the report presented by the tutor of the institution or company, the final report presented by the student and a brief interview. The agreement with the institution or company will establish the objectives of the internship and the competencies to be developed.

3.— The evaluation will take into account the adequacy of the work to these objectives. Even in the case that the DFP is coordinated with the external internship, the evaluation of both subjects will be carried out separately.

4.— The Internship Committee will resolve possible conflicts between the DFP and the EI.

5.— The Internship Committee will determine the final grade based on the following evaluation percentages:

a) Company or institution tutor's report: 40%.

b) Report of the academic tutor, based on the report and the interview: 30%.

c) Attendance and certified participation in the employment forum, or similar activity established by the Commission: 10% (Compulsory activity to pass the course).

d) Report of a tribunal, whose composition will be determined by the Internship Commission of the Center for this purpose, based on an oral presentation of 10–15 minutes of the student: 20%.

After the presentation, the student will have to answer questions, clarifications and suggestions that may be raised by the members of the examining board. The language of presentation of the work can be in one of the official languages of the UV or in English.

The evaluation of this tribunal will not be compulsory, but in the case of not doing it, the maximum score of the subject that the student can obtain is 8 points out of 10.The oral presentation mentioned in the previous point will also be used to decide on the assignment of honors (in case of ties) for those students with an overall grade higher than 7.2 points, from the sum of sections a), b), and c) aforementioned above.

In any case, the assignment of these assignments of honors will be carried out following the criteria of the corresponding regulations of the Universitat de València.The language of presentation of the work can be one of the official languages of the UV or English.

REFERENCES

- www.adeituv.es
- Normativa de Prácticas Externas de la Universitat de València https://www.uv.es/fsicadoc/REGLAMENT%20PPEE%20UVEG.pdf
- Normativa de Prácticas Externas de la Facultad de Física https://www.uv.es/fsicadoc/normativa/normativa_ppee_gf_2023.pdf