

60025 - Research methodology in physics

Syllabus Information

Academic year: 2024/25

Subject: 60025 - Research methodology in physics

Faculty / School: 100 - Facultad de Ciencias

Degree: 538 - Master's in Physics and Physical Technologies
589 - Master's in Physics and Physical Technologies

ECTS: 6.0

Year: 1

Semester: First semester

Subject type: Compulsory

Module:

1. General information

This subject is designed in a way that will allow the students to:

- Have the necessary knowledge about the functioning of research teams, work methodology, ethical aspects and the socio-political context, all of which will facilitate the development of their own research activity.
- Be able to present and defend their work rigorously both orally and in writing, in specialized and informative environments.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>):

- SDG 4 Quality education.
- SDG 5 Gender equality.

2. Learning results

- The student is able to describe the process of scientific research in the field of Physics.
- The student knows how to value the ethical aspects of scientific work.
- The student is able to locate calls for grants of interest to them and to adequately write proposals.
- The student knows how to properly write a paper in scientific publication format.
- The student is able to present and orally defend a paper in the field of Physics research.

3. Syllabus

1.- Scientific research processes.

The scientific method applied to physics and the structure of research teams.

2.- Ethical aspects of scientific work.

Axiology of science, ethical standards of publication, malpractice and scientific fraud.

Introduction to science policy.

Typology of action programs, research career.

Communication techniques.

Scientific-technical documents, the use of English in academic contexts, the structure of scientific articles, text writing, techniques for the presentation and defence of research papers, techniques for academic discourse, web communication, assessment procedures.

4. Academic activities

Formative Activity 1: Acquisition of knowledge about the contents of the subject. ECTS: 2.5. Methodology: Participative lectures; case-based learning; tutorials. Attendance: 40%.

Learning Activity 2: Case analysis, sharing and debate on the contents of the subject. ECTS: 1.5. Methodology: Case-based learning; small group work; class presentation and discussion. Attendance: 40%.

Learning Activity 3: Writing and public oral presentation of scientific papers. ECTS: 2. Methodology: Tutorials; elaboration of scientific papers; public presentation of the work. Attendance 40%.

5. Assessment system

There will be a continuous assessment of each of the blocks in which the subject is divided. The grade will be weighted as follows:

Block 1: Scientific research processes (20%)

Students will summarize and answer questions related to epistemological theories in physics. The ability to summarise and debate in class will be valued.

Block 2: Ethical aspects of scientific work (15%)

Students will analyse a case of scientific malpractice. The ability to analyse and debate in class will be valued.

Block 3: Introduction to science policy (15%)

Students should locate mobility funding grants. The adequacy of the calls to the proposed cases will be assessed.

Block 4: Communication techniques (50%)

Students will be required to write a scientific article in the format of a journal, which will be defended in public. The following will be valued:

- The layout of the text; the clarity of the exposition; the adequacy of the initial summary, conclusions and references; the relevance of figures and/or tables.
- The order and clarity of the presentation, the summarising of ideas.
- The use of audiovisual elements.
- The ability to debate.

Both activities will be conducted preferably in English.

Students will also have the possibility of being assessed by means of a single global test on the contents of the subject

The grade of "Matrícula de Honor" "Outstanding" may be awarded in accordance with current regulations.

6. Sustainable Development Goals

4 - Quality Education

5 - Gender Equality