26803 - Mathematics

Syllabus Information

Academic year: 2023/24
Subject: 26803 - Mathematics
Faculty / School: 100 - Facultad de Ciencias
Degree: 297 - Degree in Optics and Optometry
ECTS: 9.0
Year: 1
Semester: Annual
Subject type: Basic Education
Module:

1. General information

Mathematics provides the symbolic, formal and technical language of mathematical operations and provides the indispensable tools in those aspects of knowledge where quantitative, measurement and precision and control of results are essential (in particular, in all classical scientific disciplines such as Physics and Chemistry, but also and increasingly in the Health Sciences). The subject of Mathematics is the ideal place to test and train creativity in the formulation of models to address new problems in the other subjects that make up the degree and in the professional future. Mathematics is the foundation, the least visible but no less fundamental part of the building that constitutes the formation of the graduates.

2. Learning results

In order to pass this subject, the students shall demonstrate they has acquired the following results:

Acquires fundamental mathematical techniques to follow the other subjects.

Goes from mere imitation to autonomous discourse in the use of these techniques.

Handles at a basic level both analytically and graphically the fundamental curves and surfaces in optical design.

Analyses simple functions qualitatively and quantitatively.

Uses integration in the calculation of areas and volumes of simple figures.

Solves basic problems in geometry, mathematical analysis and linear algebra.

Becomes familiar, at the user level, with how to use the computer to solve such problems.

3. Syllabus

The contents of the subject are articulated around the following topics:

1. Trigonometry and complex numbers.

2. Differential calculus in 1 variable.

3. Integral calculus in 1 variable.

4. Differential calculus in several variables.

5. Vector space and applications.

4. Academic activities

Academic activities are divided into three types:

Theoretical classes: 6 ECTS

Types of problems: 1.5 ECTS

Laboratory practices: 1.5 ECTS

Theoretical and problem classes are taught in a classroom with the use of a blackboard and video projector, three hours per

week. Students have access to the contents and worksheets in the digital ring (ADD) (moodle2). The distribution in theoretical and practical classes is dynamic, depending on the distribution of contents.

The laboratory practices are carried out using the SAGE software, which is installed on a faculty server that students access via the web. Practical activities are carried out throughout the term, with a duration of two hours each.

5. Assessment system

Face-to-face students:

For newly enrolled students, computer-based practices are mandatory. The final grade in the subject will correspond 75% to the evaluation of the theoretical-practical exams (E) and 25% to the evaluation of computer practices (P).

In order to pass the subject, the theoretical-practical exams and the computer practices must be passed, i.e., E and P must both be greater than or equal to 5 (out of 10). In this case, the final grade for the subject will be 0.75*E + 0.25*P. Otherwise, that is, if any of the parts are not passed, the grade for the subject will be the minimum between E and P.

Students who have passed the practices in previous years are not required to repeat them.

Theoretical-practical examinations will be held at the end of each semester or at the end of the term, according to the examination calendar of the Faculty of Sciences.

Non-face-to-face students:
There will be a final theoretical-practical exam (on the dates assigned by the Faculty of Sciences) valued at 7.5 points and another practical exam with a computer (at the express request of the student) valued at 2.5 points.