COURSE DATA

DATA SUBJECT

Code: 36582
Name: Basic Mathematics P-M
Cycle: Undergraduate Studies
ECTS Credits: 4.5
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
1928 - Double Degree Program Physics-Mathematics	Facultat de Ciències Matemàtiques	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1928 - Double Degree Program Physics-Mathematics	Primer Curso (Obligatorio)	COMPULSORY

COORDINATION

MARTINEZ MARIN JOSEP MIQUEL

SUMMARY

The course *"Basic Mathematics"* is conceived as an essential subject that serves as a foundation for later courses in the degree program, providing students with the necessary background to understand mathematical language and the most fundamental concepts.
Some of the content in this course may already be familiar to students from high school, although it has likely not been studied with the level of rigor required here. No prior knowledge is necessary for this course.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

COMPETENCES / LEARNING OUTCOMES

DESCRIPTION OF CONTENTS

1. Statements and Proofs in Mathematics
Mathematical notation. Methods of proof and examples.

2. Elementary Set Theory and Applications
Sets and their operations. Functions (injective, surjective, bijective). Basic structures: group, ring, and field. Homomorphisms between groups. Some properties and examples of these structures.

3. Equivalence and Order Relations
Definition of an equivalence relation, equivalence classes, and quotient set. Congruence modulo *n*. Compatibility of the congruence relation in Z (addition and multiplication). Example: equipotence relation. Definition of order relation. Introduction to the concept of finite and countable sets.

4. Integers and Divisibility. Algorithms
Division algorithm. Bézout's Theorem and Greatest Common Divisor. Euclidean algorithm. Least Common Multiple. Fundamental Theorem of Arithmetic. Modular arithmetic.

5. Complex Numbers
Definition. Addition, subtraction, and multiplication of complex numbers. Complex conjugate. Division. Polar and exponential form and basic algebraic operations (modulus and argument of a complex number, polar representation, multiplication and division in polar and exponential form). Roots and powers (De Moivre's Theorem).

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	**Hours**
Theory	22,00
Other activities	6,00
Classroom practices	17,00
Total hours	**45,00**

NON PRESENCIAL ACTIVITIES

Activity	**Hours**
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	0,00
Preparation of lessons	45,00
Preparation for assessment activities	22,50
Resolution of case studies	0,00
Total hours	**67,50**

TEACHING METHODOLOGY

In this course, several teaching and learning methodologies will be used with the aim of introducing students to mathematical reasoning.
The theoretical part will be covered in lectures, where the instructor will gradually introduce the content and mathematical methods.

In each topic, in addition to the corresponding theoretical concepts, numerous examples will be presented, along with the resolution of typical problems related to that topic. At the end of each topic, exercise lists will be provided for students to work on.

In both the practical sessions and the seminars, students will work in permanent groups.

EVALUATION

The assessment of the knowledge and competencies acquired by students will be carried out continuously throughout the course and will consist of the following components:

1. 10% for activities in seminars/tutorials.

2. 15% for continuous assessment tests.

3. 75% for the final exam, which will include both theoretical and practical content. A minimum grade of 4 out of 10 is required on the final exam in order to pass the course.

The criteria for determining the final grade will be the same in both the first and second exam calls. Seminar/tutorial activities and continuous assessment tests will not be recoverable in the second call.

REFERENCES

- P. J. Eccles, An introduction to mathematical reasoning, Cambridge Univ. Pess,1970.
- L. J. Gerstein, Mathematical structures and proofs, John and Barlett Publ. Springer, 1996.
- P. Halmos, Naive set theory, Princeton, Van Nostrand Company Inc, 1960.
- T. H. Hungerford, Algebra, Springer-Verlag, 1974.
- M. Liebeck, A Concise introduction to Pure Mathematics, Taylor&Francis Group, 2016.
- G. Navarro, Un curso de números, Publicacions Universitat de ValeÌncia, 2007.
- G. Navarro, Un curso de Álgebra, 2a ed., Publicacions Universitat de València, 2016.
- J. Stillwell, Numbers and Geometry, Springer, 1998