



COURSE DATA

DATA SUBJECT

Code: 34870
Name: Mathematics I
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1403 - Degree in Telematics Engineering	Escola Tècnica Superior d'Enginyeria	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1403 - Degree in Telematics Engineering	Mathematics	BASIC

COORDINATION

ARNALTE MUR PABLO

SUMMARY

The course Mathematics I is part of the scientific background to be acquired by all students of engineering before entering fully into the specifics of the degree. The course must, in the first instance, fill gaps in the mathematical knowledge of many students who enter University without studying mathematics in the last year of high school (2º Bachillerato). On the other hand, the course serves as a foundation for more advanced mathematical concepts studied in Mathematics II and III.

Given the extent of the material and the very limited number of hours, the course will be mainly practical: the aim is that the students will be able to apply the methods discussed to solve problems.

The course contents are: **Linear Algebra, Geometry, Differential and integral calculus of one real variable and Statistics**, which are divided into thematic units as listed in Section 6.

The general objectives of the course are:

- To manage with ease the elementary techniques of matrix algebra. In particular, to solve systems of linear equations and to know how to reduce a problem to a system of linear



equations.

- To use geometric intuition to enrich mathematical knowledge, and vice versa, to take advantage of the vocabulary of mathematics to raise geometric vision.
- To acquire a basic understanding of the concepts and terminology of functions of one real variable (relating properties of a function and the shape of its graph, understanding what is the derivative and how it is used and similar questions regarding the integration) and the corresponding calculation skills.
- To understand the basic statistical definitions and apply them in simple situations.
- To perform some simple applications of interest in engineering, building on the basic content of the 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

We assume that the student has mastered a mathematical content equivalent to the Mathematics in First year of the Spanish Bachillerato.

While successful completion of the Mathematics in second year would be desirable, it is not strictly necessary. All technical units start with the indicated level and cover the skills of the second year before proceeding any further.

Nevertheless, we arrive to a much higher level so the pace is strong and the student who has not completed high school mathematics in se

COMPETENCES / LEARNING OUTCOMES

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B1 - Ability to solve any mathematical problems that may arise in engineering. Ability to apply knowledge of: linear algebra, geometry, differential geometry, differential and integral calculus, differential equations and partial derivatives, numerical methods, numerical algorithms, statistics and optimization.

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.

DESCRIPTION OF CONTENTS



1. Differential Calculus

Elementary functions, continuity. Derivatives of the elementary functions. The Chain Rule. Successive derivatives. Taylor formula. Study of the graph of a function.

2. Integral Calculus

Primitives. Integration by parts. Change of variable. Definite integral. Computation of areas and averages.

3. Linear equations and Matrices

Systems of linear equations. Matrices and the Gauss-Jordan diagonalisation process. Determinants of matrices.

4. Basic Geometry

Vectors. Linear dependence and independence. Bases, linear applications. Straight lines and planes. Diagonalization. Scalar product. Angle between vectors. Orthogonal projection. Complex numbers.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Classroom practices	30,00
Total hours	60,00

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	20,00
Preparation of lessons	55,00
Preparation for assessment activities	15,00
Resolution of case studies	0,00
Total hours	90,00

TEACHING METHODOLOGY

In the theoretical classes, the lecturer will gradually introduce mathematical concepts and their use mainly



through examples. They will also explain the standard procedures for solving problems related to the topic. **(G3, G4, B1)**

Practical classes will be aimed at the student, through his work, internalize explained in lectures. The way to achieve the active participation of students may vary according to the size of groups, ranging from exercises in small groups, when the number permitted, the execution of periodic inspections, when the number is excessive. **(G3, G4, B1)**

EVALUATION

The exam will be of a problem-solving kind and will carry up to 70% of the final grade. It will be split into two partial exams. The first partial exam will take place upon completion of the first part of the subject (Calculus), while the second part (Algebra) will take place after the end of the lectures. In the second call, there will be a single exam covering the full content of the subject.

In any case, it will be necessary to get a minimum mark of 4 over 10 in the exam in order to pass the subject.

The rest of the grade will be calculated using the continuous evaluation. The students' work will be graded using the Virtual Classroom.

In case the student could not participate in the continuous evaluation (for a justifiable reason), its weight will proportionally decrease and the grade will be calculated using a final exam. Its weight will not exceed the maximum of 70%, as set by the School.

The obvious copying or plagiarism of any activity that is part of the evaluation will mean the impossibility of passing the subject, subsequently subjecting yourself to the appropriate disciplinary procedures indicated in the PROTOCOL FOR ACTION AGAINST FRAUDULENT PRACTICES AT THE UNIVERSITAT DE VALÈNCIA (ACGUV 123/2020).

In any case the evaluation system is guided by the rules of the University regarding found on this address: <https://webges.uv.es/uvTaeWeb/MuestralInformacionEdictoPublicoFrontAction.do?idEdictoSeleccionado=5639>

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REFERENCES

- Anthony Croft, Robert Davison, Mathematics for engineers: a modern interactive approach, Addison-Wesley, 1999



- C. Neuhauser, Matemáticas para ciencias, Prentice-Hall, Madrid, 2004
- Alan Jeffrey, Mathematics for Engineers and Scientists, Chapman Hall, 2005.
- A.D. Polyanin, A.V. Manzhirov, Handbook of Mathematics for Engineers and Scientists, Chapman Hall, 2007.