Mathematics

Code: 106040
ECTS Credits: 9

2025/2026

Degree	Type	Year
Chemical Engineering	FB	1

Contact

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

None.

A good knowledge of mathematics (secondary school level) is assumed.

Objectives and Contextualisation

1. Be able to fluently use the language of Infinitesimal Calculus and basic Algebra, mainly linear.
2. Achieve theoretical knowledge of Calculus and Algebra, and the most
3. Know how to apply Calculus methods to Science and Technology prob

Competences

- Apply relevant knowledge of the basic sciences, such as mathematics, chemistry, physics and biology, and the principles of economics, biochemistry, statistics and material science, to comprehend, describe and resolve typical chemical engineering problems.
- Demonstrate basic knowledge of the use and programming of computers, and apply the applicable IT resources to chemical engineering.
- Develop personal work habits.
- Develop thinking habits.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
- Work in a team.

Learning Outcomes

1. Apply the basic concepts of algebra to problem solving.
2. Apply the methods and basic concepts of differential and integral calculus of a variable to the description and calculation of magnitudes.
3. Apply the methods for solving differential equations to the analysis of deterministic phenomena.
4. Develop critical thinking and reasoning
5. Develop scientific thinking.
6. Identify, describe and apply basic mathematical and statistical concepts.
7. Make one's own decisions.
8. Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
9. Use specific software to resolve mathematical or statistical problems in engineering.
10. Work cooperatively.

Content

1- Real numbers.

2- Functions of one real variable. Graphs. Limits and continuity.

3- Polinomic equations. The complex numbers.

4- Derivatives and their properties. Optimitzation. Taylor's formula. Applications.

5- Integration. Primitives. Basic differential relations (Equations). Parametric integrals. Applications.

6- The R^n space. Linear transformations and simetries. Matrices. Determinants. Matrius. Determinants. Systems of linear equations. Applications.

7- Vector spaces.

8- Matrix diagonalization. Applications.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Problems session	23	0.92	5, 4, 7, 8
Theoretical sessions	45	1.8	5, 4, 6, 8
Type: Supervised			
Seminars	8	0.32	1, 6, 7, 10
Type: Autonomous			
Preparation of the evaluations	27	1.08	5, 4, 7, 10
Solving the proposed problems	45	1.8	1, 5, 4, 6
Study of theoretical concepts	68	2.72	1, 5, 4, 6

Theory classes. The scientific and technical knowledge of the subject will be presented in these classes.

Practical classes (of problems). The scientific and technical knowledge presented in the theory classes will be wo

Seminars. Students must work independently in the classroom, in groups and assisted by the teacher when nece
The course will have a space in the Moodle Classroom, within the platfor

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
First Parcial Exam P1	40%	3	0.12	2, 3, 4, 6, 7, 8
Second Partial Exam P2	40%	3	0.12	1, 5, 6, 7, 8
Seminar exams S	20%	3	0.12	4, 6, 8, 10, 9

You get your current qualification from fórmula: $Q=0,2\cdot S+ 0,40\cdot(P1+P2)$.

If Q is bigger or equal than 5, you succeeded. Otherwise, you have the possibility of a second try consisting in a global exam where you will obtain a qualification R. The final qualification is given by the formula $Q'=0,2\cdot S+ \max\{0,40\cdot(P1+P2), 0,8\ R\}$.

Bibliography

See the CATALAN version

Software

No software used.

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this link. To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	211	Catalan	annual	morning-mixed
(PAUL) Classroom practices	212	Catalan	annual	morning-mixed
(SEM) Seminars	211	Catalan	annual	morning-mixed
(SEM) Seminars	212	Catalan	annual	morning-mixed
(TE) Theory	21	Catalan	annual	morning-mixed