UAB
Universitat Autònoma de Barcelona

Mathematics

Code: 103242
ECTS Credits: 6

2025/2026

Degree	Type	Year
Food Science and Technology	OB	1

Contact

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Teachers

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Teaching groups languages

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

Prerequisites

The subject has no established prerequisites. In spite of this, it is convenient for the student to have a good knowledge of the simplest algebraic calculations (operations with fractions and roots, powers of a binomial, simplification of algebraic expressions, rules of logical inference). It will also be convenient for the student to review polynomials (operations, roots, and factorial decomposition). It is also advisable that the student has had contact with the basic notions of differential calculus such as function, graphic and derivative.

Objectives and Contextualisation

The objective of this subject is that the student acquires the knowledge and the basic mathematical tools to be able to understand, use and develop the mathematical models associated with the chemical, physical or biological phenomena. The ability of the student to express himself in mathematical language must help him to approach scientific texts, work with computer software and raise and solve problems. A first transversal objective to be achieved is the development of scientific rigor, logical thinking and the critical spirit.

Competences

- Analyse, summarise, resolve problems and make professional decisions.
- Apply knowledge of the basic sciences to food science and technology.
- Apply the scientific method to resolving problems.

- Search for, manage and interpret information from different sources.
- Use IT resources for communication, the search for information within the field of study, data processing and calculations.

Learning Outcomes

1. Analyse, summarise, resolve problems and make professional decisions.
2. Apply the scientific method to resolving problems.
3. Compare analytical methods with numerical methods: the advantages and disadvantages of each.
4. Master the language and the basic tools of calculus (one or several variables).
5. Master the language and the basic tools of linear algebra.
6. Recognise the advantages and disadvantages of symbolic calculus tools.
7. Recognise the usefulness of mathematical methods in calculus, algebra and numbers, for modelling simple, real situations.
8. Search for, manage and interpret information from different sources.
9. Use IT resources for communication, the search for information within the field of study, data processing and calculations.
10. Use numerical methods to solve problems in algebra and calculus.
11. Use symbolic calculus by implementing processes to solve specific problems in algebra, calculus or numbers.

Content

1. Algebra

1.1 Sets of numbers. Sum and product operations, signs rule. Inequalities and absolute value. Real roots and power operations.

1.2 Polynomials. Roots and decomposition of polynomials.

2. Differential calculus of one variable

2.1 Concept of function. Examples of functions of real variable (polynomial, rational)

2.2 Limits of functions. Continuous functions

2.3 The derivative. Geometric interpretation and dynamic interpretation. Rule of the chain.

2.4 Inverse function. Exponential and logarithmic functions.

2.5 Growth and decrease of a function. Relative extremes. Graphical representation of functions

2.6 Optimization.

3. Integral calculus

3.1 Definite integral. The fundamental theorem of integral.

3.2 Calculation of some primitives.

4. Differential equations

4.1 Differential equations. Initial value problem.

4.2 Separable equations and linear equations. Applications to the balance of matter and the growth of populations

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Practices in the computer room	8	0.32	3, 6, 7, 11, 10
Problems classes	19	0.76	1, 2, 5, 4, 7
Theory	23	0.92	5, 4
Type: Supervised			
Tutorials	6	0.24	1, 8, 5
Type: Autonomous			
Problems resolution	43	1.72	1, 2, 5, 4, 7
Study	41	1.64	5, 4

The teaching is distributed in:

Theory:

These are classes in which the teacher introduces the basic concepts corresponding to subject matter, showing examples of their application, taking into account the attendees and adapting to their level. The student will complement the teacher's explanations with the autonomous personal study.

Problems:
The classes of problems are done in small groups and in them both the understanding of the concepts introduced and the techniques of problem solving are worked on.

Practices with a computer:
The student learns to use a symbolic and numerical mathematical software. The practical classes are carried out in small groups. Problem solving works with the help of computer support.

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

Evaluation of practices	10	2	0.08	1, 2, 8, 3, 5, 4, 6, 7, 11, 9, 10
Exercises test	10	0	0	4, 7, 11, 10
First partial exam	35	2	0.08	5, 4, 7, 11, 10
Recovery exam	90	4	0.16	5, 4, 7, 11, 10
Second partial exam	45	2	0.08	5, 4, 7, 11, 10

The subject will be evaluated according to the following criteria:

Practice exercises in the computer lab: 10%

An exercise class test: 10%

First partial exam: 35%

Second partial exam: 45%

Recovery test, only if necessary: 90%. The computer lab exercises grade will not be recoverable.

One or more assessment tests may be proposed during class time and with a maximum assessment of 10% additional to the previous one, always bearing in mind that the maximum overall mark cannot exceed 10 points.

This subject/module does not allow the single assessment system.

It will be considered that a student is not assessable if he has only participated in assessment activities that represent less than 15% of the final grade.

Bibliography

Primary:

Aguadé, J., ***Matemàtiques i modelització per a les ciències ambientals,*** UAB, 2018. http://ddd.uab.cat/record/158385

Secondary:

Salas, S. I Hille, E. *Calculus: una y varias variables*, Volum 1. Editorial Reverté, 2011 (llibre amb accés electrònic)

Batschelet, E., *Matemáticas básicas para biocientíficos*, Dossat, Madrid

Neuhauser, C., *Matemáticas para ciencias*, Prentice Hall, 2004

Software

In the practical classes a free software such as Maxima or an equivalent will be 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	1	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	2	Catalan	first semester	morning-mixed
(SEM) Seminars	1	Catalan	first semester	morning-mixed
(SEM) Seminars	2	Catalan	first semester	morning-mixed
(SEM) Seminars	3	Catalan	first semester	morning-mixed
(SEM) Seminars	4	Catalan	first semester	morning-mixed
(TE) Theory	1	Catalan	first semester	morning-mixed