

**Complementary Disciplinary Training in  
Mathematics**

Code: 44296  
ECTS Credits: 10

Degree	Type	Year	Semester
4317414 Teacher Training for Secondary Schools, Vocational Training and Language Centres	OB	0	A

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

## Contact

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## Use of Languages

Principal working language: catalan (cat)

## Teachers

Josep Gascón Pérez

## External teachers

Carles Dorce (UB)  
Joan Carles Naranjo (UB)  
Joan Vicenç Gómez Urgelles (UPC)  
Josep Fortiana (UB)  
Maria Rosa Massa (UPC)

## Prerequisites

There are no prerequisites

## Objectives and Contextualisation

This module aims to provide the most relevant mathematical complements to teach mathematics in secondary schools. The module is divided into three main areas:

1. Key Concepts and Problem Solving (3 ECTS). The aim of this block is to provide the most relevant mathematical complements to teach mathematics in secondary schools.
2. Key Mathematics Topics from a Historical Perspective (4 ECTS). Teaching mathematics from a historical perspective is an important part of the curriculum.
3. Modeling (3 ECTS). Mathematical modeling is an important part of the curriculum.

## Competences

- Acquire strategies to encourage student effort and enhance their capacity to learn by himself and others, and develop thinking skills and decision-making to facilitate autonomy, confidence and personal initiative.
- Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
- Communicate effectively both verbally and non-verbally.
- Continue the learning process, to a large extent autonomously.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Know the mathematics curriculum, and the body of didactic knowledge about the teaching and learning of mathematics.
- Make effective use of integrated information and communications technology.
- Possess the necessary learning skills to carry out continuous training in both content and teaching of mathematics and general aspects of the teaching profession.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
- Work in teams and teams (the same field or interdisciplinary) and develop attitudes of participation and collaboration as an active member of the community.

## Learning Outcomes

1. Collaborate in implementing didactic initiatives in a group.
2. Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
3. Continue the learning process, to a large extent autonomously.
4. Create an atmosphere conducive to interaction and acknowledge the contributions that pupils make to foster mathematics learning in the classroom.
5. Demonstrate knowledge of contexts in which use is made of the different areas of mathematics in the secondary school curriculum, underlining the functional nature of mathematics.
6. Demonstrate knowledge of the different types of continuing education.
7. Demonstrate knowledge of the educational and cultural value of the mathematics content taught in secondary school and integrate it into the framework of science and culture.
8. Demonstrate knowledge of the history of the different areas of mathematics and recent and future developments in them, to show their dynamism and lend meaning to school mathematics, highlighting the historical origins of mathematical knowledge.
9. Identify and plan how to resolve situations in education that affect pupils with different capacities and learning paces.
10. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
11. Know and use internet resources and software to teach mathematics in secondary school.
12. Show mastery of oral and written expression in teaching.
13. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
14. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.

## Content

Key concepts and problem solving (3 credits)

Key math topics from a historical perspective (4 credits)

## Methodology

All face-to-face sessions will be with the whole class group. However, as indicated in the methodology, there will

The methodology will include the following types of activities:

- Teacher exhibition.
  - Use of the virtual campus. Discussion forums.
  - Cooperative work.
  - Student exhibitions.
  - Personal work of students.
  - Case study and practical work in the classroom.
  - Mechanisms of linking the theory and work done with the sessions of the
- The proposed teaching methodology and assessment may undergo some

"The proposed methodology involves a face-to-face development of the subject. If it were necessary to move to a

it would be done by videoconference (through teams) and the practical part would be done in person, but dividing

If it were necessary to return to a confinement everything would be done through teams and the virtual campus.

In any case it would always be synchronously according to the timeline of the subject

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Oral presentations	30	1.2	11, 4, 5, 7, 6, 8, 14, 3
Practical cases	30	1.2	12, 1, 11, 4, 5, 7, 6, 9, 14, 10, 13, 2
Type: Supervised			
Analysis of modeling situations	30	1.2	12, 11, 4, 5, 7, 8, 9, 14, 10, 13, 2, 3
Type: Autonomous			
Personal study	50	2	11, 5, 7, 8, 9, 14, 10, 13, 3
Proposed activities	60	2.4	12, 1, 11, 5, 7, 8, 14, 10, 13, 2, 3

## Assessment

The following will be required to be entitled to the final assessment:

Compulsory attendance at a minimum of 80% of class sessions.

The delivery of all the practices and exercises of evaluation within the inc

The set of assessment activities will be as follows:

Key concepts and problem solving (30% of the module)

The evaluation will consist of a final work (which will have a weight of 50%

Mathematical Modeling (30% of the module)

50% of the evaluation will consist of a final work that will be done prefera

Key mathematics topics from a historical perspective (40% of the module

The evaluation of this part will consist of individual work with a weight of .

The works, for any of the groups, must be delivered within the deadlines

The final grade is the result of the operation:  $0.3 \times \text{Note of key concepts} +$

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Mathematics history group work	40%	20	0.8	12, 1, 11, 5, 7, 6, 8, 14, 10, 13, 2, 3
Practical modeling work	30%	15	0.6	12, 1, 11, 4, 5, 7, 6, 9, 14, 10, 13, 2, 3
Practical problem solving work	30%	15	0.6	12, 11, 5, 7, 14, 10, 13, 2, 3

## Bibliography

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