UAB
Universitat Autònoma de Barcelona

Complementary Disciplinary Training in Mathematics

Code: 45453
ECTS Credits: 10

2025/2026

Degree	Type	Year
Teacher Training for Secondary Schools, Vocational Training and Language Centres (Spec. Mathematics)	OB	1

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Teachers

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Teaching groups languages

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

Prerequisites

There are no prerequisites

Objectives and Contextualisation

This module aims to provide the most relevant mathematical complements to teach secondary mathematics. It is divided into three blocks :

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1 . Key Concepts and Problem Solving (3 ECTS). The objective of this block is the use of problems to encourage and motivate the learning of mathematics. For which it is convenient: To use mathematical notation correctly . Clarify and study, if necessary, the mathematical concepts involved in solving a problem and work until students understand them. Apply problem solving techniques and strategies. Write in a mathematical style and in an appropriate language, and not only symbolic, the materials worked on. Reflect on the ideas and processes of solving each problem.

2 . Key topics in mathematics from a historical perspective (4 ECTS). The teaching of mathematics requires a solid knowledge of the subject that goes beyond the strict contents that are transmitted to the ESO and high school. Teachers need to have a training background that gives them a broad and integrated perspective of the mathematical concepts and procedures that they have to transmit and to know the origin and evolution of mathematics over time. This perspective is important for a global understanding of the subject and also to bring students closer to the human aspects of science.

3 . Modeling (3 ECTS). Mathematical modeling is an important part of the Secondary School Curriculum. The preamble of the ESO Mathematics Curriculum states: Mathematics is an instrument of knowledge and analysis of reality [...] Likewise, mathematics makes possible the creation of simplified models of the real world that allow a limited interpretation of it and at the same time generate problems appropriate to the educational moment of the student, facilitating his critical spirit and awakening his creativity. This gives us an idea of the importance that the Curriculum gives to mathematical modeling and to aspects of everyday mathematics.

Learning Outcomes

1. CA03 (Competence) To behave in a committed, respectful and ethical manner with society, students, the teaching profession, the educational community and the educational institution, within the framework of the teaching profession's code of conduct.
2. CA09 (Competence) To build a mathematical identity supported by professional development and a commitment to education that contributes to the development of a sustainable, equal, diverse and fair society that respects human rights.
3. CA10 (Competence) To apply disciplinary and curricular content from the perspective of literacy and education for all.
4. CA11 (Competence) To work as a team in a cooperative manner to co-create joint proposals, designs and activities, within the field of teaching in mathematics.
5. KA06 (Knowledge) To recognise the basic aspects of the mathematics curriculum and the personal and didactic knowledge of mathematics required to plan learning situations and classroom management and assessment strategies in the field of mathematics.
6. SA05 (Skill) To use evidence to analyse teaching actions in the mathematics classroom with a view to enhancing the processes and outcomes of learning mathematics.
7. SA06 (Skill) To demonstrate digital competence as a teacher and support students as they use digital tools to learn mathematics.
8. SA07 (Skill) To integrate a humanist vision that incorporates mathematical modelling and scientific, social and artistic elements to interpret reality and its relationship with mathematics.

Content

Key concepts and problem solving (3 credits)

Key math topics from a historical perspective (4 credits)

Mathematical Modeling (3 credits)

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Oral presentations	30	1.2	CA03, CA09, CA10, CA11, KA06, SA05, SA06, SA07, CA03
Practical cases	30	1.2	CA03, CA09, CA10, CA11, KA06, SA05, SA06, SA07, CA03
Type: Supervised			
Analysis of modeling situations	30	1.2	CA03, CA09, CA10, CA11, KA06, SA05, SA06, SA07, CA03
Type: Autonomous			
Personal study	50	2	CA03, CA10, KA06, SA05, SA07, CA03
Proposed activities	60	2.4	CA03, CA09, CA10, CA11, KA06, SA05, SA06, SA07, CA03

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 th
The proposed teaching methodology and assessment may undergo som

"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

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
Mathematics history group work	40%	20	0.8	CA03, CA09, CA10, CA11, KA06, SA05, SA06, SA07
Practical modeling work	30%	15	0.6	CA03, CA09, CA10, CA11, KA06, SA05, SA06, SA07
Practical problem solving work	30%	15	0.6	CA03, CA09, CA10, CA11, KA06, SA05, SA06, SA07

Students may choose between continuous evaluation and single evaluation.

Specific validations can be made to ensure authorship and competence acquisition in case of suspected academic fraud.

In order to be entitled to the evaluation in any of the modalities, the following are requirements:
- Compulsory attendance to a minimum of 80% of the class sessions.
- The delivery of all practices and evaluation exercises within the indicated deadlines.
- No single evaluation activity may represent more than 50% of the final grade of the module. In case the student does not pass an evaluable part, it will be guaranteed the possibility of recovering, at least, 50% of the score corresponding to this part. The recovery will have to be made during Phase V, before the beginning of the writing of the Master's Final Project (TFM), and will be adjusted to the conditions -data and format- established by the teacher responsible for the failed activity.
- The comments and/or grades of the activities released by the student will be provided within a maximum period of 20 working days.
Continuous evaluation mode:
The set of evaluation activities will be as follows:
Key concepts and problem solving (30% of the module).

50% of the evaluation in a final work in groups of maximum 3, 40% of the work or activities throughout the course in groups and the other 10% attendance and participation.
The deadline for submitting the work will be the last day of classes of this part.

Mathematical Modeling (30% of the module)

The evaluation will be based on the works and activities proposed by the teacher responsible for this part of the module. It is expected that the students will make a presentation in the classroom about the developed works, which will take place during the last two days of the sessions corresponding to this part. A 10% of the final grade will be given for attendance and active participation in class.

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

The evaluation is distributed with a weight of 50% for the final work and 40% for thegroup work of the activities proposed. 10% attendance and participation in class. The deadline for handing in the work will be the last day of the classes of this part.

The work, for any of the groups, must be delivered within the deadlines indicated by the respective teachers of each group.

Modality by single evaluation:
The students who opt for the single evaluation will have to release the work previously set by the teacher of each block on the last day of the module (or the day designated by the single evaluation). On the same day, the student must take a written exam of the module consisting of three parts, one for each block. The final score of the block will be made up of 20% of the grade of the work and/or activities done, 10% of the class attendance and 70% of the grade of the exam corresponding to the block.

The final grade for the module will be, as indicated in the teaching guide, 40% for the history part, 30% for the problem solving part and 30% for the modeling part.

Summary of both modalities:

The final grade becomes from the result of the operation:

0.3 x key concepts and problem solving grade + 0.3 x modeling grade + 0.4 x historical perspective grade.
It will be mandatory to have a grade equal or higher than 4 points in each part to make the average.

Recuperation
Phase V, before writing the TFM, will be the period destined to recover the part of the module failed that can be recovered, as indicated by the teacher in charge.

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Software

A specific program is not contemplated. Each teacher will indicate, when necessary, the free software that 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
(TEmRD) Teoria (màster RD)	1	Catalan	annual	morning-mixed
(TEmRD) Teoria (màster RD)	2	Catalan	annual	afternoon
(TEmRD) Teoria (màster RD)	3	Catalan	annual	afternoon
(TEmRD) Teoria (màster RD)	4	Catalan	annual	afternoon