Mathematics for Teachers

Code: 102055
ECTS Credits: 6

2024/2025

Degree	Type	Year
2500798 Primary Education	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

To follow the course it's required to have a good level in basic mathematics.

Objectives and Contextualisation

It is a basic subject of disciplinary content. Its purpose is to consolidate fundamental mathematical knowledge through various methodologies: problem solving, research and projects, among others. Consolidated progress in this subject should serve as a basis for the construction of of the teaching of mathematics throughout the degree. The fundamental mathematical knowledge built up in this subject is what will enable future teachers to guide Primary Education students towards the achievement of the mathematical competencies of the stage.

The following are specific objectives of the course:

- Manage the initial mathematical knowledge to bring it closer to the fundamental mathematical knowledge needed to be a teacher.
- Contextualize mathematical knowledge in the professional work of the mathematics teacher.
- To counter mechanistic learning of mathematics to construction of knowledge.
- Establish connections between different mathematical concepts and between mathematical concepts and concepts from other areas of knowledge.
- Understand math as a valuable problem-solving tool beyond the mathematics classroom.

Competences

- Acquire basic mathematics skills (numerical skills, calculation, geometry, spatial representations, estimation and measurement, organisation and interpretation of information, etc.).
- Design and regulate learning spaces in contexts of diversity that take into account gender equality, equity and respect for human rights and observe the values of public education.
- Incorporate information and communications technology to learn, communicate and share in educational contexts.
- Know and apply information and communication technologies to classrooms.
- Know the curricular areas of Primary Education, the interdisciplinary relation between them, the evaluation criteria and the body of didactic knowledge regarding the respective procedures of education and learning.
- Maintain a critical and autonomous relationship with respect to knowledge, values and public, social and private institutions.
- Posing and solving problems related to daily life.
- Reflect on classroom experiences in order to innovate and improve teaching work. Acquire skills and habits for autonomous and cooperative learning and promote it among pupils.
- Stimulate and value effort, constancy and personal discipline in pupils.
- Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
- Value the relationship between mathematics and sciences as one of the pillars of scientific thought.

Learning Outcomes

1. Being able to solve problems involving the connection between different blocks of content.
2. Critically analyse mathematical texts, activities and other proposals for education.
3. Demonstrate knowledge of the fundamental concepts and properties of number systems, plane and space geometry, measurement and data treatment.
4. Establish concrete relations by means of educational proposals in the different areas of the primary education curriculum.
5. Exploit situations from a particular scientific field to show the utility of mathematical content.
6. Find information using technologies for learning and knowledge resources in mathematics.
7. Identify the social, economic and environmental implications of academic and professional activities within one?s own area of knowledge.
8. Identifying problem situations drawn from other sciences that can be modelled mathematically.
9. Posing problems in order to introduce relevant mathematical concepts and results.
10. Propose ways to evaluate projects and actions for improving sustainability.
11. Resolving problems independently.
12. Resolving problems involving names, geometry and measurement in a variety of situations including those from everyday life.
13. Understand and apply indicators for the evaluation and design of proposals for mathematics education from a perspective of gender equity and equality.
14. Understand interdisciplinary teaching situations for the teaching and learning of mathematics.
15. Using software tools and specific maths programs for estimating, demonstrating and communicating mathematical results.

Content

1. Geometry to understand space.

Elementary geometric constructions. Plain representation of space.

2. Numbers to count and calculate.

Natural numbers. Decimal numbering system. Divisibility.

3. Measure to know the environment.

Concept of magnitude. Proportionality.

4. Data for interpreting reality.

Organization, interpretation and visualization of data.

The following are considered transversal contents relevant to all the content mentioned before:

5. Visualisation and representation of ideas and mathematical concepts.

6. Problem solving.

7. Patterns and relationships.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Classrom practice	30	1.2	2, 6, 8, 1, 15
Master class	45	1.8	2, 5, 8, 9
Projects development and problem solving	75	3	2, 5, 3, 8, 9, 11, 12, 1

The teaching proposal is based on a methodology of active, face-to-face classroom work. In parallel, the student must carry out the proposed tasks on time in order to properly follow the teaching of the subject. The student must work bearing in mind that learning mathematics requires daily practice and that mathematics is not learnt by watching or seeing how someone else does mathematics. Learning is based on DOING mathematics, showing a pro-active attitude.

The student is expected to autonomously take responsibility for extending his or her basic mathematical knowledge. The inclusion of different learning paces will be facilitated with voluntary, non-assessable activities. The specific assessment activities and the criteria for marking them will be the same for all those enrolled on the course.

The inclusion of different learning paces will be facilitated with proposals for non-assessable voluntary activities. The specific assessment activities and the criteria for marking them will be the same for all those enrolled on the course. In mathematics, the result of each activity or problem can be reached by different routes. This premise is what allows us to promote an inclusive vision of mathematics learning.

Activity analysis and Problem solving

Working sessions in small or large groups where problems are solved and situations are analysed in relation to the mathematical contents involved in the subject. The students responsible for the assignment will present their work orally and the teacher will validate the mathematical knowledge that is involved with the active participation of the rest of the students.

Master classes

Presentation by the teacher of the main contents of the course in which students are expected to actively participate.

Practices or investigations

Group work sessions where research activities are proposed that students solve under the guidance of their teacher.

NOTE: The proposed teaching methodology and assessment may be modified if health authorities impose restrictions on public gatherings.

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
Individual written tests	50	0	0	3, 11, 12, 1
Plannning, solving and reporting of problems and/or activities	20	0	0	6, 3, 9, 11, 12, 1, 15
Projects or investigations	30	0	0	2, 5, 6, 13, 14, 4, 7, 8, 10

The student must work bearing in mind that learning mathematics requires daily practice and that mathematics is not learned by watching or listening to how someone does mathematics. Learning is based on DOING mathematics, showing a proactive attitude. Students are expected to autonomously take responsibility for extending and consolidating their basic mathematical knowledge.

The specification of some of the assessment activities will depend on whether the student chooses continuous assessment or single assessment. The assessment criteria will be the same for all those enrolled on the course.

TEST OF BASIC MATHEMATICAL KNOWLEDGE AS A REQUIREMENT FOR ASSESSMENT

During the course the student must obtain a minimum mark of 7 out of 10 in a Basic Mathematical Knowledge (BMK) test in which he/she must demonstrate that he/she has mastered the mathematical knowledge proper to compulsory education.

- On the first day of the course (11/02/2025 or 13/02/2025 as appropriate) ALL students may sit this test on the first day of the course: BMK 1. Those students who obtain a mark equal to or higher than 7/10 will be considered to have passed the BMK.
- In the middle of the semester, there will be a new opportunity to take this test: BMK 2. Students who have not obtained a 7/10 in the BMK 1 test will be able to take this test, whether they are in continuous or single assessment. It will take place in the middle of the semester - dates to be specified by the teacher depending on the organisation of the content blocks. Each teacher will publish the date of BMK 2 when they publish the course syllabus.

- On the day of the final assessment (17/06/2025 or 19/06/2025 as appropriate) students, both continuous assessment and single assessment students, who have not obtained a 7 in the previous BMK will have an extraordinary opportunity to pass the test: BMK 3.

The BMK test aims to verify that the studenthas reached a good level of basic mathematics, in particular the mathematics of compulsory education, which is a prerequisite for the evaluation of the subject. In the event that the student does not pass the minimum grade in any of the three examinations, the final grade for the subject will be a 3.

TYPOLOGY AND WEIGHTING OF EVALUATION ACTIVITIES

For each of the different blocks into which the subject is organised (organisation of data; numbers and proportionality; geometry and measurement) there will be a follow-up assessment activity for the block, which will take one form or another depending on whether the student chooses continuous assessment or single assessment.

The follow-up assessment activities for each block have different typologies:

- - Planning, solving and reporting of activities: For the geometry and measurement block, a series of linked mathematical activities will be proposed to be developed in small groups to be presented and discussed in seminars (15% of the course grade).
- - Planning, development and project report. For the data organisation block, students, organised in small groups, will be asked to plan and develop a statistical research project that they will have to present to the rest of their classmates (15% of the course grade).
- - Individual problem-solving test: For the numbers and proportionality block, students will have to take an individual follow-up test (20% of the course grade).

At the beginning of each block, the follow-up assessment activities for the block will be presented and specified.

- Continuous assessment students will take the problem-solving test and hand in the follow-up activities for the content blocks one week after the block has been completed. Teachers will publish the dates of the test and the follow-up activities of the blocks when publishing the programme, as the dates depend on the temporal organisation of the blocks.
- In the case of students who take the single assessment, for the geometry and measurement and data organisation blocks, they will have to hand in the written report of the activity and/or project and they will have to take a written test to validate the report they have handed in. The delivery of the reports and the validation tests will be on the day of the final assessment (17/06/2025 or 19/06/2025 as appropriate).

FINAL TEST

Two weeks after finishing the subject there will be an individual final test of the entire course content (50% of the course grade). The date of the final exam is 18/06/2024 or 20/06/2024 depending on the day of the week that the group teaches this subject.

MAKE-UP TEST

Those students who in the final exam have a grade higher than 3.5 but do not get a 5 can take a make-up exam (weight 50% - in substitution of the final exam grade). The make-up exam will take place two weeks after the final exam, on 01/07/2025 or 03/07/2025 depending on the day of the week that the group is teaching this subject.

CALCULATION OF THE COURSE GRADE

The final grade of the course is the weighted average of the marks of the three evaluation activities of the monitoring of the blocks (geometry and measurement = 15%; number and proportionality = 20%; organisation of data = 15%) and the mark obtained in the final test or the make-up test (with a weight of 50%), with the following conditions:

- In order to be eligible for the weighted average of the course marks, the student must have obtained a minimum of 7 out of 10 in the Fundamental Mathematical Knowledge test. If the student has not reached this minimum in any of the opportunities given, the final grade for the course will be a 3.
- In order to be eligible for the weighted average with the rest of the marks of the course, the student must have obtained a minimum of 5 in the final exam or in the make-up exam. If the student does not obtain a minimum of 5 in thefinal exam or in the make-up exam, he/she does not pass the course and the final grade for the subject will be a 3.
- Late submission of the block assessment activities will result in a 0 in the block assessment. Likewise, failure to attend the problem-solving test will result in a 0 in the evaluation of that block.
- The block assessment activities are not recoverable in any case.
- Despite having passed the final exam or, where appropriate, the recovery, if the weighted average of the marks does not reach 5, the student does not pass the subject and the final grade on their transcript will be a 3.

OTHER ASSESSMENT CONSIDERATIONS

The student should take into account the following normative considerations on assessment:

- The use of a calculator is not allowed in individual written tests, unless indicated by the teacher.
- The use of Artificial Intelligence tools in assessment activities is not allowed.
- All assessment activities are compulsory for all students.
- The mark for a group assignment is not necessarily the individual mark for each student in that group.
- Those students who are not in the seminar sessions during the development of the assessment activities of a block will have a maximum mark of 5 for that block. This consideration applies to both continuous assessment students and single assessment students.
- Copying or plagiarism of material in any evaluation activity implies a 0 in the subject.

ATTENDANCE AND ASSESSMENT

The course is face-to-face. Students who are not in the seminar sessions during the development of the evaluation activities of the monitoring of a block will have a maximum mark of 5 for that block. This consideration applies to both continuous assessment students and single assessment students.

CONTINUOUS ASSESSMENT

Specific dates for the specific assessment activities for students takingpart in continuous assessment:

- The student can take advantage of the three opportunities to pass the CMF, until the required mark of 7/10 is achieved. The dates have been defined above (see test of fundamental mathematical knowledge as a requirement for assessment).
- The deliveries and the test corresponding to the follow-up evaluations of the blocks will be done one week after the end of the block, as established above (typology and weight of the evaluation activities).
- The dates set for the final exam and the make-up exam are those established for all students enrolled in the subject.

SINGLE ASSESSMENT

Students who take the single assessment must follow the development of the subject, attending class regularly. However, they WILL NOT SUBMIT THE FOLLOW-UP ASSESSMENT ACTIVITIES OF THE BLOCK UNTIL THE SAME DAY OF THE FINAL ASSESSMENT. For this reason, they WILL NOT HAVE A RETURN of the individualised follow-up assessment activities of the blocks during the course of the subject. In any case, they will be able to access the general feedback, either that which is done during the feedback sessions for the whole class group or that which may be published on the virtual campus for the whole group.

The date of collection of the assessment evidence and the requirement for a validation test of the evidence collected is specific to students who take the single assessment. The teaching team of the subject considers it necessary to carry out a validation test of the collected evidences because the students will have had access to the process of returning the activities and the project and the corrected evidences of their classmates.

The date for the delivery for the evaluation of the blocks and for the tests for their validation and the test of the block of numbers and proportionality is the same established for the final exam, 17/06/2025 or 19/06/2025 depending on the day of the week that the group has teaching of this subject.

Therefore, on 17/06/2025 or 19/06/2025, as appropriate, students taking the single assessment must:

- Take the CMF test if necessary, if they have not passed any of the previous tests with a 7/10.

- Take the same final test at the same time as the rest of the students in the course; the same conditions will apply to the make-up test if necessary.

- Take an individual written test to evaluate the follow-up of the block of numbers and proportionality.

- Hand in the evaluation activities of the geometry and measurement block and take their validation tests.

Students with a mark of 3.5 or more but less than 5 can take a recovery test, which will be the same for all students of the subject and will be held on the same day (on 02/07/2024 or 04/07/2024 as appropriate).

The grade for the geometry and measurement and data organisation blocks will be that of the corresponding validation test.

The weighting of the assessment of the different blocks and of the final exam (or, if applicable, the recovery) and the calculation of the final mark for the course are the same for all students on the course, even if they have taken a single assessment. The other specific assessment considerations also apply to both continuous assessment and single assessment students.

It is essential that students taking a single assessment reserve the FULL DAY of the final assessment, 17/06/2025 or 19/06/2025 as appropriate, in order to have time to carry out all the tests that will constitute the evidence of their assessment.

ATTENTION NOTE FOR STUDENTS WHO DID NOT PASS THE COURSE IN PREVIOUS ACADEMIC YEARS

From the academic year 2023-24, there is NO SYNTHESIS ASSESSMENT for this subject.

Therefore, those enrolling for thesecond time will be able to choose between continuous assessment or single assessment. In both cases, the conditions regarding attendance will be the same as for the rest of the students enrolled in the subject. Therefore, we recommend that students repeating the subject ensure that they are available in time to follow it regularly, if necessary, avoiding enrolling in other subjects of other courses that are taught on the same day in the same time slot.

NOTE: In order to pass this subject, it is necessary to show a good general communicative competence, both orally and in writing, and a good command of the vehicular language or languages listed in the teaching guide. In all activities (individual and group), linguistic correctness, writing and formal aspects of presentation will therefore be taken into account. It is necessary to be able to express oneself fluently and correctly and to show a high degree of understanding of academic texts. An activity may be returned (not assessed) or failed if it is deemed not to meet these requirements.

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Software

We plan to use the usual programmes for editing texts or oral presentations, a spreadsheet, or GeoGebra, a free interactive programme that combines geometry, algebra and calculus.

Language list

Name	Group	Language	Semester	Turn
(SEM) Seminars	211	Catalan	second semester	morning-mixed

(SEM) Seminars	212	Catalan	second semester	morning-mixed
(SEM) Seminars	311	Catalan	second semester	morning-mixed
(SEM) Seminars	312	Catalan	second semester	morning-mixed
(SEM) Seminars	411	Catalan	second semester	afternoon
(SEM) Seminars	412	Catalan	second semester	afternoon
(SEM) Seminars	711	English	second semester	afternoon
(SEM) Seminars	712	English	second semester	afternoon
(TE) Theory	21	Catalan	second semester	morning-mixed
(TE) Theory	31	Catalan	second semester	morning-mixed
(TE) Theory	41	Catalan	second semester	afternoon
(TE) Theory	71	English	second semester	afternoon