UAB

Universitat Autònoma
de Barcelona

Mathematics Learning and Curriculum

Code: 102061
ECTS Credits: 6

Degree	Type	Year	Semester
2500798 Primary Education	OB	2	2

Contact

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Teaching groups languages

You can check it through this link. To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

Teachers

Albert Vilalta Riera

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Prerequisites

This course requires a basic level of mathematics equivalent to that achieved in Secondary Education (12-16). Moreover, as we know that mathematics has often been seen as a set of formulas and techniques, it is important that students enrolling in this course have an open and critical attitude with this view, developing a new approach to mathematics from different perspectives. It is strongly recommended that students have passed the course "Mathematics for teachers".

Objectives and Contextualisation

The purpose of this course is to acquire a deep knowledge of the mathematical content in the Primary School Curriculum. Several curricular documents will be analyzed in order to show the students different resources that allow them to contextualize the mathematical knowledge in their future teaching. In addition to providing students with educational tools to develop basic mathematical content, this course also aims to provide them with methodological tools that allow them to create rich educational activities that could be applied for teaching other subjects. The specific objectives of this subject are:

1. Understanding different frames of reference for mathematics curricula and learn to interpret them.
2. Acquiring didactical and professional knowledge of the processes involved in the learning of mathematics, in particular, the connections that exist between mathematical ideas and also between mathematic and other areas. In this regard, it is also important to be aware of the connection between the patterns in our environment and mathematical structures.

3. Acquiring didactical knowledge of the appropriate teaching materials to carry out, asses and interpret mathematical tasks in geometry and numbers, encouraging imagination and visual thinking.

Competences

- Be familiar with the mathematics curriculum.
- 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 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.
- 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. Establish concrete relations by means of educational proposals in the different areas of the primary education curriculum.
2. Have solid knowledge of the teaching of arithmetic and geometry.
3. Identify the social, economic and environmental implications of academic and professional activities within one?s own area of knowledge.
4. Meet all the objectives, content, process and criteria for specific evaluation in the area of mathematics in primary education.
5. Possess indicators to evaluate and design proposals for mathematics education from the perspective of gender equity and equality.
6. Propose ways to evaluate projects and actions for improving sustainability.
7. Recognising the contributions of mathematical skill to the core skills as a whole.
8. Recognising the potential of new technologies for attending to the diversity of levels of learning mathematics.
9. Understand and critically evaluate educational software and adequate websites for the teaching and learning of mathematics.

Content

1. The mathematics curriculum

1.1 Structure of the current curricular documents in mathematics

1.2 Contrast between different curricular documents.

1.3 Analysis of the mathematical content in the curriculum.

1.4 The dimensions of the mathematics curriculum (Transversal axis)

1.4.1 Problem Solving

1.4.2 Representation and communication

1.4.3 Connections

1.4.4 Reasoning and proof

2. Curriculum's organization: Numbers and calculation

2.1 Numbers to count and calculate. Decimal numeral system.

2.2 Situations and problems of arithmetic: additive thinking. Calculation by counting. Calculation by structuring. Formal calculation.

2.3 Situations and problems of arithmetic: multiplicative thinking. Acquiring basic skills and properties.

2.4 Use of algorithm and reasoned calculation.

2.5 Estimation and approximation. Numerical sense.

2.6 Exact calculation, written calculation and calculator.

2.7 Analysis of class situations, textbooks and TAC (Technologies for learning and communication) applications.

3. Curriculum's organization: Space and shape

3.1 Knowledge of flat shapes: lines, polygons and puzzles. Classifications using basic elements of geometry.

3.2 Relationship 2D-3D. Orientation on the plane and space. Labyrinths, roads and coordinates.

3.3 Study of shape. Geometric solids. Construction of polyhedra and 3D puzzles. Curves and generation of solids of revolution.

3.4 Use of different materials for the teaching of geometry.

3.5 Analysis of class situations, textbooks and TAC (Technologies for learning and communication) applications.

Methodology

NOTICE: Our teaching approach and assessment procedures may be altered if public Health authorities impose new restrictions on public gatherings for COVID-19.

Regarding the gender perspective, and in line with the proposals of the UAB Observatory for Equality, this subject works explicitly with materials and knowledge produced by female scientists.

The protagonist in the learning process is the student, and under this premise methodology has been planned.

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.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Oral presentation in small groups	6	0.24	4, 8, 7

Whole group session	24	0.96	4, 5, 7
Workshop in small group	15	0.6	4, 9
Type: Supervised			
Individual or small group tutorials	30	1.2	5, 2
Type: Autonomous			
Individual work	75	3	4, 2, 7

Assessment

Attendance to a minimum of 80% of the face-to-face classes of the subject is mandatory for all students of the subject.

Continuous assessment

The continuous evaluation of the subject will be carried out throughout the semester through the activities shown in the table below.

To pass this subject, it is compulsory to show an attitude compatible with the educational profession. This attitude includes competencies such as active listening, respect, participation, cooperation, empathy, kindness, punctuality, responsability, don't judge, use arguments and make a proper use of electronic devices (mobile phine, laptop, etc.).

It is necessary to show a good general communicative competence, both orally and in writing, and a good command of the working language that appears in this guide. Therefore, in all the activities (both individual and in groups), linguistic correctness, writing, and formal aspects of presentation will be taken into account. Students should be able to express themselves fluently and correctly, and to show a high level of comprehension of academic texts. Any activity can be returned (not assessed) or failed if the teacher considers it does not meet these requirements.

All evaluation activities carried out throughout the course must be submitted within the deadline in the syllabus. If not delivered within the deadline, the evaluation of this activity will be automatically a zero.

Plagiarism of all or part of an assessment activity and / or the copy of any of the assessment activities is adirect cause to fail the course.

The mark in a group activity doesn't have to be the same for all the members of the group. The evaluation process in a singleworking group is determined by the evidence of learning of each member of the group.

In order to pass the subject, it is necessary to obtain at least a 5 in the individual written exam, and to have an average mark equal to or greater than 5 in the rest of the tasks.

Exam resit: Students who have a grade of more than 3.5 but do not achieve a grade of 5 in the final exam may retake the exam. This exam will be held one week after the ordinary exam. The maximum grade in a resit exam is 5.

Tasks repetition (summaries and task in pairs): Students who having passed the exam do not achieve a grade of 5 can submit again, individually, all the failed tasks. The maximum grade in a resit task is 5.

To participate in the resit activities, students must have been previously evaluated in a set of activities whose weight is equivalent to a minimum of 50% of the total grade of the subject.

Students who have to submit again any task besides resitting the exam should notice that repeated tasks would be only corrected in case of passing the exam resit.

The overall grade of the course is the weighted average of all the assessment activities and the grade obtained in the final exam or in the exam resit.

Passing the exam is a condition for having a weighted average mark.

Students who have failed the exam can have a maximum final mark of 4.

If, having passed the exam, the result of the weighted average does not reach 5, the overall grade is the weighted average mark.

Oral presentations cannot be repeated.

Assessment dates

Analysis of a problem: end of the fifth week

Workshop submissions:

- Curriculum: end of bloc 1

- Numbers and operations: end of bloc 2

- Geometry: the day before the exam

Exam: The week of June 17th to 21st.

Resit examinations and activities: The week of July 1st to 5th.

Single assessment

The single assessment will consist of the following activities:

1. Individual written test (50%). It will take place on the week of June 17th to 21st.
2. Learning folder with all the solved practices of the seminars (10%)
3. Individual oral defense on the tasks of the seminars, which must be delivered developed and in writing in the learning folder (20%). It will take place the same day as the individual written test, after finishing the written test at a time informed by the teaching staff. Depending on the number of students who opt for this modality, the oral test may have an alternative format.
4. Individual oral defense of the work on problem solving that must be delivered in writing with evidence of the resolution process (videos, photos of the implementation with Primary Education students, written student productions, etc.) (20%). The written work will have to be handed in before the individual written test. The oral defense will take place the same day as the individual written test, after finishing the written test at a time informed by the teaching staff. Depending on the number of students who opt for this modality, the oral test may have an alternative format.

Resit

To participate in the resit activities, students must have been previously evaluated in a set of activities whose weight is equivalent to a minimum of 50% of the total grade of the subject.

Resit examinations and activities will be on the week of July 1st to 5th.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes

Activity in pairs: competential analysis of children's resolutions.	15%	0	0	4, 1, 8
Group activity: Workshops about Curriculum, Numbers and Geometry.	20%	0	0	9, 5, 1, 3, 6, 7
Individual final exam.	50%	0	0	4, 9, 5, 2, 1
Oral presentation in group.	15%	0	0	9, 3, 6, 7

Bibliography

Books of reference

Burgués, C. (2013). *Competències bàsiques de l'àmbit matemàtic. Identificació i desplegament a l'educació primària*. Generalitat de Catalunya. Departament d'Ensenyament.

NCTM. (2003). *Principios y estándares para la educación matemática*. Granada: Sociedad Andaluza de Profesores de Matemáticas.

TAL Team (2001). *Children learn mathematics*. Utrecht: Freudenthal Institute and National Institute for Curriculum Development.

TAL Team (2005). *Young children learn measurement and geometry*. Utrecht: Freudenthal Institute and National Institute for Curriculum Development.

Software

In this subject it is necessari to have access to a basic text processor, a presentation tool, spreadsheets and a pdf reader. Some free software (e.g. Geogebra) can be used under teacher's judegement. It is no necessary to buy or get any particular license.