	2021/2022
Management and Innovation in the Mathematics Classroom	
Code: 102059	
ECTS Credits: 5	

Degree	Type	Year	Semester
2500798 Primary Education	OB	3	1

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)

Some groups entirely in English: Yes

Some groups entirely in Catalan: Yes

Some groups entirely in Spanish: No

Teachers

Josep Maria Fortuny Aymemí

Albert Vilalta Riera

Laura Morera Ubeda

Marc Guinjoan Francisco

Francisco Clemente Ciscar

Prerequisites

This course requires a basic level of math, equivalent to that achieved with the mathematics of Secondary Education. It is suggested that students who enroll in this course have taken and passed the subjects: "Mathematics for Teacher" (first course) and "Learning mathematics and curriculum" (second course). It is important that students who enroll in this course have an open and critical approach allows mathematics from different perspectives. Discriminatory attitudes or behaviors will not be accepted, and the inclusive use of language will be ensured.

Objectives and Contextualisation

It is a compulsory third year course that focuses on the development of skills of teaching and mathematical analysis, based on real situations of primary mathematics classroom, which allows students to design, manage and evaluate of innovative, interdisciplinary and diversified mathematical activities in their future teaching.

Taught when students have already completed the compulsory subjects: "Mathematics for teacher" and "Learning mathematics and curriculum". Since the subject *Management and innovation to the mathematics classroom* we want to influence the ability to relate and integrate the knowledge students have acquired from other subjects of mathematics and mathematics education that is needed for teaching mathematics at primary school.

This course develops practical knowledge and application of mathematics curriculum in the planning, the design and the assesment of activities and sequences teaching and learning of mathematical content in primary school, exemplifying the following curricular mathematical content:

1. Geometry: geometric transformations: symmetry. Similarity.

2. Rational numbers: decimals and operations, representations and concept of fractions

3. Measure: quantities and units of measurement, measurement procedures. Proportionality.

The following specific objectives are specified:

1. Knowing different theoretical elements to analyze educational situations of teaching and learning mathematics in primary school

2. Acquiring professional skills of didactical and mathematical analysis. In the design, planning, management and evaluation of teaching and learning sequences (involving topics such as numbers, measurement and geometry)

3. Understanding and analyzing teaching situations, interdisciplinary and innovative situations, identifying the mathematical content and other areas that work.

4. Encouraging innovative aspects of mathematics classroom management and use of educational resources.

5. Designing interventions for teaching mathematics in primary school, based on curriculum and their theoretical guidelines.

Competences

- Analyse, reason and communicate mathematical proposals.
- Critically analyse personal work and use resources for professional development.
- 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.
- Design, plan and evaluate education and learning processes, both individually and in collaboration with other teachers and professionals at the centre.
- 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.
- 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.
- 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. Analyse an educational situation for the teaching of mathematics, individually or in groups, to assess its relevance and make innovative alternative proposals.
2. Design and justify didactic situations from their curriculum and theoretical guidelines.
3. Design innovative didactic sequences for the teaching of mathematics, based on the use of contexts and analysis of phenomena that science provides.
4. Establish concrete relations by means of educational proposals in the different areas of the primary education curriculum.

5. Identify the social, economic and environmental implications of academic and professional activities within one?s own area of knowledge.
6. Identifying and creating good mathematical practices.
7. Identifying mathematical aspects in daily life and promoting their use in the design of mathematical activities.
8. Propose ways to evaluate projects and actions for improving sustainability.
9. Recognising the contributions of professional skills, mathematical skills and didactic analysis skills to the making of decisions about the design, management and evaluation of learning sequences of innovative mathematics in elementary classes.
10. Reflecting on classroom practices based on the use of new information and communication technology in order to innovate and improve the teaching task.
11. Understand and apply indicators for the evaluation and design of proposals for mathematics education from a perspective of gender equity and equality.
12. Understand and critically evaluate educational software and adequate websites for the teaching and learning of mathematics.
13. Understand interdisciplinary teaching situations for the teaching and learning of mathematics.
14. Using a variety of materials and methodologies for learning mathematics, especially in the contents of numbers, geometry and measurement.

Content

1. Analysis of mathematical and didactic curricular mathematical content of primary education

    1.1. Geometry: geometric transformations: symmetry. Similarity.

    1.2. Rational numbers: decimal numbers and operations, representations and conceptof fractions .

    1.3. Measure: quantities and units of measurement, measurement procedures. Proportionality.

2. Design, planning and analysis work to primary mathematics classroom

    2.1. Design activities to the mathematics classroom.

    2.2. Didactic and mathematical analysis of primary classroom situations.

    2.3. Design of didactic sequences promoting mathematics competences in the primary school classroom

3. Management and innovation in the mathematics classroom primary

    3.1. Methodologies for the work in the classroom: projects, problem solving, collaborative work environments.

    3.2. Resources for the work in mathematics classroom: technology, manipulatives materials, games.

4. Evaluation of mathematical activity in the primary classroom

    4.1. Mathematics assessment: concepts, processes, skills.

    4.2. Methodes to evaluate mathematical practices: assessment, correction, rating.

    4.3. Moments of assessment in learning mathematics: initial, continuing, summative, final.

Methodology

The student will attend weekly sessions (of two hours) in a large group and one hour in small group. The large sessions group, led by teachers, will be dedicated on the one hand, to the analysis and discussion of real situations of learning and teaching mathematics classroom in primary school. Besides, to the realization of mathematical concepts and ideas that emerge from these teaching situations.

To help students develop professional skills of teaching and mathematical analysis, seminars in small group will be based on the analysis of real situations of primary mathematics classroom linked to the specified mathematical content. Seminars facilitates future teachers to design, manage and evaluate innovative, interdisciplinary and diversified mathematical activities. Also, seminars enhance small group within the oral processes involved in the design and analysis of the sequences teaching programs in mathematics at the primary stage preapred by the students.

The protagonist in the learning process is the student and is under this premise that has been planned methodology of this subject as shown in the following table.

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

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			
Classroom course. Major group.	25	1	2, 6
Exposure Seminars. Small group.	4	0.16	2, 6
Seminars. Small group.	5	0.2	2, 6
Technology seminars. Small group.	4	0.16	
Type: Supervised			
Assessment final test activities.	5	0.2	
Tutoring sessions.	20	0.8	
Type: Autonomous			
Students work on written reports and oral exposures.	62	2.48	

Assessment

The evaluation of the course will be held throughout the first semester by the activities shown in that follows.

Attendance at classes of the subject is compulsory. It is necessary to attend 80% of the hours, to be evaluated in the subject.

All work done throughout the course (Designing a teaching sequence analysis, individual cases and in groups, articles and other activities of the seminars) shall be submitted within established timings without retrieval possibility. If not delivered within the prescribed period, the evaluation of this activity will automatically with a rating of zero. The delivery of different jobs and returns of corrections by teachers will be agreed between students and teachers during the course.

The deliveries of the analysis of individual and group cases, articles and other seminar activities will be closed weekly on the day of the session of each subgroup. The delivery of the design of a didactic sequence will be closed on the day of the session of each subgroup of the final week of November.

It is essential a correct and proper use of language to all deliveries, linguistic correctness is considered the evaluation of all tasks.

The total or partial plagiarism of one of the evaluation activities or copy in an assessment test is a direct reason for suspending the subject, following the criteria and guidelines for evaluation of the Faculty (COA 28 May 2015).

The marking of a working group is not necessarily the individual grade of students in this group. The process of individual assessment in a working group is determined by the evidence of learning of each individual in the group.

As for the final test,it is necessary to obtain at least a score of five (5.0).

As for the formative evaluation activities must be obtained at least 5 in all of them.

The final evaluations will be the last school week of December according to the day assigned to each subgroup. Similarly, re-evaluations will be thefirst school week in
January

A student receives rating not evaluable if you have not presented any of the task or has not presented any of the individual tests.

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Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Individual work: evaluation tests.	50%	0	0	11, 12, 2, 4, 6, 10
Working in groups: Didactic and mathematical analysis of mathematical situations and resources in primary classroom	30%	0	0	1, 11, 12, 13, 2, 3, 4, 7, 6, 5, 8, 9, 10, 14
Working in pairs: design of a didactic sequence of mathematics, which involves blocks of primary education content	20%	0	0	11, 12, 13, 2, 3, 4, 7, 6, 9, 10, 14

Bibliography

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

Castelnuvo, E. (1981). *La matemática/La geometria*. Ketres Editora, Barcelona.

Chamorro, M. C. (2003). *Didáctica de las Matemáticas para Primaria*. Pearson Educación, Madrid.

NCTM. (2003). *Principios y estándares para la educación matemàtica*. Sociedad Andaluza de profesores de matemáticas, Granada.

Segovia, I., L. Rico. (2011). *Matemáticas para maestros de Educación Primaria*. Ediciones Pirámide, Madrid.

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

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

Webgrafía

http://www.urg.es/local/jgodino/edumat-maestros/

http://www.geogebra.org/cms/

http://www.fi.uu.nl/rekenweb/en/

http://www.fi.uu.nl/

http://www.nctm.org/standards/content.aspx?id=26885

http://issuu.com/creamat/docs/3_comunicacion

http://recursostic.educacion.es/gauss/web/materiales_didacticos/primaria/actividades/novedades.htm

http://www.edu365.cat/aulanet/intermates

http://puntmat.blogspot.com.es/

Software

https://www.geogebra.org/?lang=ca