Mathematics for Understanding the World

Code: 102056
ECTS Credits: 6

Degree	Type	Year	Semester
2500798 Primary Education	OT	4	0

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.

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Use of Languages

Principal working language: catalan (cat)

Some groups entirely in English: No

Some groups entirely in Catalan: Yes

Some groups entirely in Spanish: No

Prerequisites

It is suggested that the students that enroll in this subject have studied and passed the first year subject "Mathematics for teachers", the second course subject: "Learning mathematics and curriculum" and the third course subject "Management and innovation In the classroom of mathematics ".
To pass this subject, the student must show, in the activities proposed, good general communicative competence, both orally and in writing, and a good command of the language or the vehicular languages that appear in the teaching guide.

Objectives and Contextualisation

This is an optional fourth year subject that is focused on the development of professional competencies around mathematics and its ability to understand the world around us. This subject should provide tools and strategies for teachers who want to study in depth the mathematics teaching and their relationship with the world, from the perspective of the application of mathematics to the physical or natural world and sociocultural as well as from The perspective of inspiration in both worlds to inspire / create mathematics and design, manage and evaluate interventions in the classroom of primary math according to these references.
It is taught when the students have already completed the compulsory subjects: Mathematics for teachers, Mathematics and curriculum development, and Management and innovation in the classroom of mathematics, and who wish to study or study as a free-choice subject, or Well to get the mention in didactics of mathematics. For this reason, from the subject Mathematics to understand the world, we want to focus on the knowledge of the world that surrounds us (both physical and natural and social) from the point of view of mathematics, to provide tools to offer Resources and strategies that allow future teachers to present a mathematics meaningful, useful and meaningful in primary.
This course develops the practical knowledge and application of the primary mathematical curriculum in the planning, design and evaluation of tasks and sequences of teaching and learning of mathematical contents. It works on numbering and calculations, relations and change, space and form, measurement, and statistics and chance to understand the world around us and have didactic tools to design interventions in the classroom of primary math. However, this does not mean that the mathematical processes and contents that work should be limited solely to those of the primary curriculum, but that the teacher should achieve the mathematical competences necessary to interpret Part of the world that surrounds itand to know how to limit itself and adapt to the level of primary when it comes to taking them to the classroom. The teacher must know more about what pupils need to learn.

The following specific objectives are specified:
1. To know different applications of mathematics from the point of view of the socio-cultural environment as well as physical / natural.
2. Design interventions for the teaching of mathematics in primary school based on these applications.
3. To design, plan, manage and evaluate teaching and learning activities of mathematics based on the criteria set by the primary curriculum.
4. Work on the mathematical contents of the environment using efficient didactic methodologies.
5. Understand the role of the world that surrounds us (natural and sociocultural) in order to create mathematics in a way that is opposite to that of the aforementioned application.
6. Knowing mathematical ideas from other cultural worlds present in primary classrooms.

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.
- Develop and evaluate contents of the curriculum by means of appropriate didactic resources and promote the corresponding skills in pupils.
- Develop autonomous learning strategies.
- Incorporate information and communications technology to learn, communicate and share in educational contexts.
- Know and apply information and communication technologies to classrooms.
- Know how primary schools are organised and about the diversity of actions involved in running them.
- 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.
- Value the relationship between mathematics and sciences as one of the pillars of scientific thought.

Learning Outcomes

1. Adapt teaching and learning programs and activities to pupil diversity.
2. Analyse social and historical facts and collect various interpretations of the relationship between mathematics and other sciences. Understand the positive or distorting role of the media in the use of these relationships.
3. Analyse the goals of mathematics education at different stages of primary education.
4. Assessing the value of, and applying professional cases relating to, the teaching of mathematics.
5. Design innovative teaching sequences from contexts that provide recreational mathematics.
6. Design teaching / learning strategies in which the assumptions of personal decisions are prioritized, and the identification of relevant information for individual projects.
7. Design teaching and learning sequences that connect different mathematical topics.
8. Develop mathematical content from the primary curriculum based on the use of mathematical games and recreations.
9. Gaining a deeper knowledge of school mathematics at a level of level connections, contexts and skills.
10. Identifying, designing and communicating concepts, facts and phenomena of different sciences capable of being modelled using mathematical concepts.
11. Understand and critically evaluate educational software and related web-based resources in the gaming world that are suitable for teaching and learning mathematics.

12. Understand recreational didactic situations involving mathematics, both inside and outside the classroom, to promote independent learning and cooperative work.

Content

The teacher's mathematical competence must not be reduced to what his students must achieve, but rather must

On the one hand, by the desire to understand some current phenomena in contemporary life and environment. C

From the point of view of the teaching methodologies for the Primary School, the course aims to integrate mather

The phenomena "of the world" that will be studied and will conform the contents of the subject will be:

Count to know

How are we?, how are they? How are I?
Identification and creation of numerical and geometric patterns
Unbeatable magnitudes

Live the measurement

What does it mean to measure?
Walk in space and in time
Pythagorean savings
Measure of uncertainty

How many ways can you do it?

Group yourself
Paint with millions of colors
QR codes
Go from one place to another

Mathematics to everyday contexts

Video games
Tiles the plan
Mosaics: a universal cultural phenomenon

Images

    Mathematical photography
    Images that are not understood without mathematics

Mathematics for ...

    Get Informed (media)
    Get to know the city (mathematical itineraries)
    Enjoy (games and sports)
    Bringing a healthy life (health and consumption)
    Work (workplace)

Methodology

The main character in the teaching-learning process is the student and under this premise, the methodology of the subject has been in 45 hours.

Exhibitions on basic themes of the syllabus (34 hours): it is done with the entire class group through an open and active participation by students.

When a return is needed, it will begin with an introduction where the lessons of the previous seminar will be shared. It ends with the presentation of the tasks that must be developed at the seminar and individually.

Work spaces in small groups within the classroom supervised by the teacher where through the analysis of documents or activities of research and use of manipulatives, it approaches the contents and topics worked in the large group and prepare the projects (14 hours).

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Big group	45	1.8	1, 9
Type: Supervised			
Supervised	30	1.2	1, 9
Type: Autonomous			
Autonomous	75	3	

Assessment

The evaluation of the subject will be carried out throughout the academic year through the activities that are shown in the previous grid. Deliveries of each of the works are scheduled for March 22 (indivual), May 31 (group) and June 21 (individual), 2021.

Class attendance is mandatory: the student must attend all classes to be evaluated. A maximum of 20% incidents are contemplated.

Otherwise, it will be considered not submitted. The student who has not submitted all the assessment activities within the established deadlines will also be considered considered unplanned.

The student must obtain a minimum grade of 5 for individual work and that the average of the two group work is greater than 5 for being able to be evaluated globally. If the grade of the individual work is less than 5, the students will have a period of 15 days to refer it and that it can be re-evaluated.

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

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Project 1: Individual work	30%	0	0	3, 9, 12, 7, 5
Project 2: Working in groups	35%	0	0	1, 3, 2, 11, 8, 6, 7, 10, 4
Project 3: Individual work	35%	0	0	1, 3, 2, 6, 7, 4

Bibliography

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