Teaching and Learning Mathematics

Degree	Type	Year	Semester
4317414 Teacher Training for Secondary Schools, Vocational Training and Language Centres	OB	0	A

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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Teachers

Jordi Deulofeu Piquet

Iolanda Guevara Casanova

Laura Morera Ubeda

José Abraham de la Fuente Pérez

External teachers

Cecilia Calvo Pesce

Mireia López

Pere Grima

Use of Languages

Principal working language: catalan (cat)

Prerequisites

There are no prerequisites

Objectives and Contextualisation

At the end of the Master, students have to achieve the following objectives:

1. Acquire the didactic knowledge necessary to start teaching in seconda
2. Apply didactic and problem-solving knowledge to the exercise of teach
3. Integrate the didactic knowledge of mathematics learned in the course
4. Communicate their decisions and conclusions as a mathematics speci
5. Assess the importance of continuous training when teaching mathema

Competences

- Analyze and recognize their own socio-emotional skills to develop those needed in their performance and professional development.
- Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
- Communicate effectively both verbally and non-verbally.
- Continue the learning process, to a large extent autonomously.
- Design and conduct formal and informal activities that help make the center a place of participation and culture in the environment where it is located. Perform the functions of mentoring and guiding students in a collaborative and coordinated manner. Participate in the evaluation, research and innovation of teaching and learning.
- Design and develop learning spaces with special attention to equity, education and emotional values, equal rights and opportunities for men and women, civic education and respect for human rights that facilitate life in society, decision making and building a sustainable future.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Know the mathematics curriculum, and the body of didactic knowledge about the teaching and learning of mathematics.
- Make effective use of integrated information and communications technology.
- Plan, develop and evaluate the teaching and learning process enhancing educational processes that facilitate the acquisition of the competences of the teaching of mathematics, based on the level and previous training of students as well as the orientation of the same, both individually and in collaboration with other teachers and school professionals.
- Possess the necessary learning skills to carry out continuous training in both content and teaching of mathematics and general aspects of the teaching profession.
- Seek out, obtain, process and communicate information (oral, printed, audiovisual, digital or multimedia), transform it into knowledge and apply it in teaching and learning processes in the corresponding areas.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.

Learning Outcomes

1. Choose, use and develop materials for teaching mathematics.
2. Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
3. Continue the learning process, to a large extent autonomously.
4. Critically analyse one's own performance in the classroom in relation to one's emotional competences.
5. Demonstrate knowledge and use of resources and strategies for providing information and academic and professional guidance.
6. Demonstrate knowledge of contexts in which use is made of the different areas of mathematics in the secondary school curriculum, underlining the functional nature of mathematics.
7. Demonstrate knowledge of the different types of continuing education.
8. Demonstrate knowledge of the educational and cultural value of the mathematics content taught in secondary school and integrate it into the framework of science and culture.
9. Demonstrate knowledge of the secondary school mathematics curricula.
10. Demonstrate knowledge of the theoretical and practical developments in mathematics teaching and learning.
11. Design learning activities taking into account the diversity of the pupils.
12. Gain experience in planning, teaching and assessing the subject areas that correspond to the mathematics discipline.
13. Identify the problems in mathematics teaching and learning and put forward possible alternatives and solutions.
14. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
15. Know and use internet resources and software to teach mathematics in secondary school.

16. Obtain and select audiovisual, digital or multimedia information and use it to design learning activities.
17. Show mastery of oral and written expression in teaching.
18. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
19. Tie education to its context and understand the educational function of the family and the community, both in imparting knowledge and competences and in teaching respect for rights and freedoms, equality of rights and opportunities between men and women, and equal treatment and non-discrimination of persons with a disability.
20. Transform the mathematics curricula into sequenced learning activities and work programmes.
21. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.

Content

- Introducción a la didáctica de las matemáticas: currículum, competencies, aprendizaje y enseñanza

- Recursos, propuestas de enseñanza y conocimiento didáctico en relación a los bloques temáticos del currículum de matemáticas, así como a la conexión entre ellos y a su inclusión en el mundo que nos rodea:

Números e iniciación al álgebra

Geometría y medida

Estadística i probabilidad

Análisis

Methodology

The methodology combines presentations by the teacher, solving didactic problems and practical proposals.
Readings of articles and texts that are discussed in class are commission
In relation to the autonomous activity, the student must carry out the prop

The proposed teaching methodology and assessment may undergo some modification depending on the attenda

"The proposed methodology involves a face-to-face development of the subject. If it were necessary to move to a

the theoretical part it would be done by videoconference (through teams) and the practical part would be done in

If it were necessary to return to a confinement everything would be done through teams and the virtual campus.In

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Case studies	12	0.48	4, 15, 6, 8, 10, 7, 5, 11, 13, 21, 14, 18, 2, 20
Oral presentations	24	0.96	17, 4, 15, 6, 9, 10, 5, 13, 16, 14, 18, 2, 1
Problem Solving	36	1.44	17, 4, 15, 6, 8, 11, 16, 21, 14, 18, 2, 3, 1, 20
Type: Supervised			
Analysis of didactic situations	30	1.2	17, 12, 4, 15, 6, 9, 10, 5, 11, 13, 21, 14, 18, 2, 19, 1, 20
Type: Autonomous			
Readings	36	1.44	17, 4, 15, 6, 8, 9, 10, 5, 16, 21, 14
Realization of proposals of didactic activities	42	1.68	17, 12, 15, 6, 8, 9, 5, 11, 16, 14, 18, 2, 3, 1, 20
personal study	60	2.4	12, 6, 8, 9, 10, 7, 5, 11, 13, 21, 14, 18, 2, 3, 19, 1, 20

Assessment

The following will be required to be entitled to the final assessment:

Attendance at a minimum of 80% of class sessions. The delivery of all practices and exercises within the indicat

The mastery of mathematics that make up the curriculum of Compulsory Secondary Education and Baccalaureat

The delivery of all assessment activities and a minimum grade of 5 points out of 10 in each of them.

The return of the works and controls will be made no later than 30 working days after the date of delivery and / o

Plagiarism is considered a major infraction, if a plagiarism is detected in a job it will be invalidated, it must be rep

For a definition of plagiarism you can consult: http://wuster.uab.es/web_argumenta_obert/unit_20/sot_2_01.html

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Design of mathematical activities	23,75%	15	0.6	17, 12, 4, 15, 6, 8, 9, 10, 5, 11, 13, 16, 21, 14, 18, 2, 19, 1, 20
Didactic sequence of calculus	17,5%	10	0.4	17, 12, 15, 6, 8, 9, 11, 16, 21, 14, 18, 2, 1, 20
Interpretation of student productions	17,5%	10	0.4	12, 15, 8, 9, 10, 7, 5, 13, 21, 14, 18, 2, 3, 19
Practice on the teaching of numbers	17,5%	10	0.4	17, 12, 15, 6, 8, 9, 10, 7, 11, 13, 16, 21, 14, 18, 2, 1, 20
Use of materials and resources to teach geometry	23,75%	15	0.6	17, 12, 15, 6, 8, 9, 10, 5, 11, 13, 16, 21, 14, 18, 2, 3, 1, 20

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Varis autors (2011).Col.lecció de RBA "el mundo es matemático".Qualsevol llibre pot ser útil

Webs d' interès:

http://phobos.xtec.cat/creamat/joomla/ (CREAMAT. Centre de Recursos per ensenyar i aprendre matemàtiques. Generalitat de Catalunya. Departament d'Educació)

http://www.divulgamat.net/ (Divulgamat: Centro Virtual de Divulgación de las matemáticas).

http://nrich.maths.org/frontpage

Cada professor indicará bibliografía complementaria para la parte correspondiente a su docencia