COURSE DATA

DATA SUBJECT

Code: 33654
Name: Teaching arithmetic and problem solving
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1305 - Degree in Primary School Education	Facultat de Formació del Professorat	3	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1305 - Degree in Primary School Education	Teaching maths in primary education	COMPULSORY

COORDINATION

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SUMMARY

The subject Teaching arithmetic and problem solving is a 6-credit semester subject taught in the third year of the Bachelor's Degree in Primary Education. It is part of a 12-credit subject called Didactics of mathematics in primary education.

The fundamental aim of the subject is linked to the specific competence number 2 of the subject, `didactically analyse the mathematics of the school curriculum¿, referring in this case to the curricular contents of arithmetic and problem solving of the primary curriculum.

On this basis, a series of activities related to various competences are deployed transversally, referring to curricular development, knowledge of cognitive processes, the most common difficulties and errors in pupils' actions and the use of ICT, with which contributes to the rest of the competences listed in the degree's verification report.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

COMPETENCES / LEARNING OUTCOMES

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Analyse critically the most relevant issues in today's society that affect family and school education: social and educational impact of audiovisual languages and of screens; changes in gender and inter-gender relations; multicultural and intercultural issues; discrimination and social inclusion, and sustainable development; Also, carry out educational actions aimed at preparing active and democratic citizens, committed to equality, especially between men and women.

Analyse didactically the mathematics of the school curriculum.

Analyse ICT as a teaching resource for mathematics.

Assume that teaching must be perfected and adapted to scientific, pedagogical and social changes throughout life.

Design, plan and evaluate teaching and learning classroom activities in multicultural and co-educational contexts.

Design, plan and evaluate the teaching and learning of mathematics in the classroom.

Develop and evaluate mathematical contents in the curriculum through appropriate teaching resources.

Evaluate mathematical contents in the curriculum through appropriate teaching resources.

Express oneself orally and in writing correctly and appropriately in the official languages of the autonomous region.

Identify and plan the resolution of educational situations that affect students with different abilities and different learning rates, and acquire resources to favour their integration.

Know and apply basic educational research methodologies and techniques and be able to design innovation projects identifying evaluation indicators.

Know and apply basic methodologies and techniques of educational research to teaching mathematics and be able to design innovation projects identifying evaluation indicators.

Know and implement innovative experiences for teaching mathematics in primary education.

Know how to work as a team with other professionals within and outside the school to attend to each student, to plan the learning sequences and to organise work in the classroom and in the play space.

Know teaching interventions that take into account the difficulties and errors in learning mathematics in primary education.

Know the difficulties and errors in the process of teaching and learning mathematics in primary education and the cognitive processes.

Know the processes of interaction and communication in the classroom.

Know the school math curriculum.

Promote cooperative work and individual work and effort.

Promote the basic mathematical competences proposed in the curriculum among students.

Raise and solve mathematical problems.

Recognise the identity of each educational stage and their cognitive, psychomotor, communicative, social and affective characteristics.

Understand that systematic observation is a basic tool that can be used to reflect on practice and reality, and to contribute to innovation and improvement in education.

Use information and communication technologies effectively as usual working tools.

DESCRIPTION OF CONTENTS

1.Didactic analysis of the concepts of number and numeration.

- Meanings and uses
- Conceptual aspects

2.Didactic analysis of number operations

- Conceptual aspects
- Algorithmic aspects

3.Didactic analysis of fractions, decimals, ratio, proportion and proportionality.

- Conceptual aspects
- Algorithmic aspects

4.Problem solving

- Additive
- Multiplicative
- Of several combined operations
- Heuristics

Didactic analysis may include the:

-Theories of teaching and learning of primary mathematics. The role of the teacher and the role of the textbook.

- Didactic analysis of primary mathematics.
- Analysis of teaching and learning processes in primary mathematics.
- Analysis of teaching units and sequences in primary mathematics.
- Programming, design, development and sequencing of educational projects, instructional units and activities that allow the curriculum to be adapted to the socio-cultural and classroom context.
- Difficulties and errors, cognitive processes related to teaching and learning situations, didactic interventions that take this into account.
- Evaluation of pupils, teachers and curricular materials as a regulatory element and promoter of the improvement of teaching and learning.
- ICT as a teaching resource.
- Dealing with diversity in the mathematics classroom.
- Educational innovation projects in mathematics teaching.
- Research in mathematics education.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theoretical and practical classes	60,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	90,00
Preparation of lessons	0,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

For the development of the subject, teaching and learning activities of different types and in different settings will be organised.

The types of activities may be:
- Explanations by teachers.
- Discussions between teachers and students and among students themselves.
- Appropriate practical work.

Work settings may include:
- The classroom.
- Individual tutoring.
- Collective tutoring.
- Individual and collective non-classroom work.

EVALUATION

The grading of students in this subject may be based on the consideration of various aspects of their activity during the course:

- The completion of as many written tests as deemed appropriate, independently of the officially scheduled final exams.
- The completion and passing of assignments.
- Linguistic and mathematical correctness in written tests and assignments.
- Monitoring of the student's participation and attitude in the classroom, tutorials and activities in group.

DETAILS ABOUT THE EVALUATION

- Continuous assessment
It will have a weight between 20% and 40%. The percentage will be related to the workload to be carried out by students. Continuous assessment may include activities such as quizzes after each topic, individual or group classroom activities, group work, etc. The grade of the continuous assessment can be saved for the second sitting.

- First exam session
There will be a final exam, the weight of which will be between 60% and 80% of the mark. A minimum score of 5 will be required in this exam in order to obtain a weighted average with the continuous assessment. If this minimum is not reached, the subject will be failed in the first sitting and the exam mark will be which will be recorded in the official grade report. If this minimum is reached, in order to pass the subject, the

weighted average of the exam with the continuous assessment must be 5 or higher, and this will be the grade that will be recorded in the official grade report. In case of passing the exam at the first sitting but obtaining a failing weighted average with the continuous assessment, at the second sitting the student will face an exam that will include questions on the continuous assessment.

- Second exam session
The activities corresponding to the continuous assessment are recoverable. In this sense, in the exam of the second call will always include (in addition to a part with a similar structure to exam of the first exam session) a part with additional questions in order to recover those activities corresponding to the continuous assessment. The percentages for these two parts are the same as those indicated in the previous sections. According to the lecturer's criteria, in the second exam session, the student may waive a continuous assessment mark and face the entire exam (including the questions on the continuous assessment part).

Plagiarism or the improper use of artificial intelligence tools may be penalised in accordance with article 15 of the evaluation and grading regulations of the Universitat de València.

The teaching staff may penalise spelling and/or grammatical errors in the assessment tests. In such a case, the instructions for the test will indicate the maximum penalty in this regard. In those groups in which teaching is given in Valencian, it will be compulsory for students to take the tests in Valencian. The teaching staff will indicate, where appropriate, the penalty for not following this rule (regulated by the University of Valencia's Regulations on Linguistic Uses).

In any case, the current assessment and grading regulations of the Universitat de València (2017/108) will be applied.

REFERENCES

- Carrillo, J., Contreras, L. C., Climent, N., Montes, M., Escudero, D., y Flores., E. (Coord.) (2016). Didáctica de las matemáticas para maestros de Educación Primaria. Madrid: Paraninfo.
- Castro, E., Rico, L., y Castro, E. (1987). Números y operaciones: Fundamentos para una aritmética escolar. Madrid: Síntesis.
- Chamorro, M. C. (coord) (2003). Didáctica de las matemáticas para primaria. Ed. Pearson Educación.
- Dickson, L; Brown, M & Gibson, O. (1991). El aprendizaje de las matemáticas. (Ministerio de Educación y Ciencia: Madrid).

- Godino et al. (2004). Didáctica de las matemáticas para maestros. Universidad de Granada. http: //www.ugr.es/local/jgodino/fprofesores.htm
- Gómez, B. (1989). Numeración y cálculo. Madrid: Síntesis.
- Llinares, C. et al. (1997). Fracciones. Madrid: Síntesis.
- Puig, L. y Cerdán, F. (1988). Problemas aritméticos escolares. Madrid: Síntesis.
- Sierra, M. et al. (1989). Divisibilidad. Madrid: Síntesis.
- Centeno, J. (1997). Números decimales. Madrid: Síntesis.
- Musser, G.L y Burger, W.F. (1988). Mathematics for Elementary Teachers, Publishing Company, New York.
- Sallán, J.M.G y Rocher, J.S. (2002). Números y algoritmos. Síntesis.
- DECRETO 106/2022, de 5 de agosto, del Consell, de ordenación y currículo de la etapa de Educación Primaria.