



## COURSE DATA

### DATA SUBJECT

**Code:** 33678  
**Name:** Teaching proposals for sciences and mathematics  
**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	4	Second quarter
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	Specialist in science and mathematics	ELECTIVES
1305 - Degree in Primary School Education	Specialist in science and mathematics	ELECTIVES

### COORDINATION

CALERO LLINARES MARIA

GUTIERREZ SOTO JUAN

## SUMMARY

"Didactic proposals with science and mathematics" is oriented to the analysis of the contents in science and mathematics. mathematics of the Primary Education stage, with a curricular approach. It is intended to study, substantiate, select, design or elaborate and evaluate proposals and didactic activities that support and favour the teaching and learning of scientific-technical disciplines.

This subject is predominantly practical and together with other subjects make up the itinerary of Specialist in Science and Mathematics. It links to the subject of "Didactics of Natural Sciences", "Didactics of Mathematics" and the Practicum allowing future teachers to apply the knowledge and experience acquired in them.

## 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

-

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.

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.

Develop and evaluate teaching proposals for sciences curriculum contents.

Develop and evaluate teaching proposals for the curriculum in areas other than science and mathematics in which concepts and tools specific to science and mathematics are used.

Develop and evaluate teaching proposals mathematics curriculum contents.

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 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 the historical evolution of some mathematical ideas and their reflection in the contents of school mathematics.

Know the historical evolution of some scientific ideas and their reflection in the contents of school sciences.

Know the joint historical evolution of some scientific and mathematical ideas and their reflection in school contents.



Know the processes of interaction and communication in the classroom.

Promote cooperative work and individual work and effort.

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 as a teaching resource for science and mathematics in the primary school classroom.

Use information and communication technologies effectively as usual working tools.

## DESCRIPTION OF CONTENTS

### 1. INTRODUCTION

#### 1.1. STRUCTURE AND COMPONENTS OF A TEACHING PROPOSAL

Design: How to develop teaching proposals? Description and justification. Elements that comprise the teaching proposal. Planning, methodology, and development of activities. Theoretical frameworks and epistemological foundations.

### 2. DESIGN AND CONSTRUCTION OF TEACHING PROPOSALS FOR SCIENCE TEACHING

#### 2.1. DESIGN, DEVELOPMENT, AND FOUNDATION OF TEACHING PROPOSALS IN SCIENCE

Selection of content: the primary curriculum. Teaching resources and tools specific to science. Information sources. Theoretical frameworks. Design and analysis of teaching proposals in science. Examples of teaching proposals in science.

#### 2.2. EVALUATION OF SCIENCE TEACHING PROPOSALS

Improving the teaching-learning process through the evaluation of teaching proposals. Assessment planning. Assessment tools and strategies applied to science teaching proposals. Collection, interpretation, and evaluation of information. Success indicators and correction of science teaching proposals.

#### 2.3. INVOLVEMENT OF SCIENCE IN THE DEVELOPMENT OF MULTIDISCIPLINARY AND TRANSVERSAL TEACHING PROPOSALS

Multidisciplinary teaching proposals involving science: examples in language, history, and mathematics. Design of transversal teaching proposals involving science in environmental education, health education, values education, and socialization.



### 3. DESIGN AND CONSTRUCTION OF TEACHING PROPOSALS FOR TEACHING MATHEMATICS

#### 3.1. DESIGN, PREPARATION, AND FOUNDATION OF TEACHING PROPOSALS IN MATHEMATICS

Content selection: the primary school curriculum. Specific mathematics teaching resources. Information sources. Specific theoretical frameworks and epistemological foundations. Design and analysis of teaching proposals in mathematics. Exemplification of teaching proposals in mathematics.

#### 3.2. EVALUATION OF TEACHING PROPOSALS IN MATHEMATICS

Improving the teaching-learning process through the evaluation of teaching proposals. Evaluation planning. Assessment tools and strategies applied to teaching proposals. Collection, interpretation, and assessment of information. Success indicators and correction of teaching proposals in mathematics.

#### 3.3. INVOLVING MATHEMATICS IN THE DEVELOPMENT OF MULTIDISCIPLINARY AND TRANSVERSAL TEACHING PROPOSALS

Multidisciplinary teaching proposals involving mathematics: examples.

## WORKLOAD

### PRESENCIAL ACTIVITIES

Activity	Hours
Theoretical and practical classes	60,00
<b>Total hours</b>	<b>60,00</b>

### 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
<b>Total hours</b>	<b>90,00</b>

## TEACHING METHODOLOGY

The course is predominantly practical in nature, and therefore, different methodologies are combined depending on the learning outcomes to be achieved.



Academic practice can be structured at various levels:

**In-person activities:**

1. Theoretical and practical classes

1.1. Project work: allows for coherent articulation of content and achieves meaningful learning. It fosters the creation of collaborative learning contexts.

1.2. Lecture: necessary to present, develop, and discuss theoretical knowledge.

1.3. Didactic questioning: complements the lecture and promotes constructivist learning. The results can be used in learning assessment and promote reflection on theoretical knowledge.

1.4. Cooperative work and assessment techniques: promotes meaningful and autonomous student learning.

1.5. Case studies and problem-solving: allows students to learn how to design, implement, and evaluate projects and activities in the primary classroom.

1.6. Learning Portfolio: This allows students to consolidate their learning sequences throughout the course. It will be used as an assessment tool.

2. Group Work: Attendance at seminars and complementary activities.

3. Individual and Group Tutorials: These will be used to coordinate students in individual and group assignments, as well as to assess individual progress, activities, and teaching methodology.

**Off-campus Activities:** Independent Study and Work: These will focus on preparing assignments and completing proposed projects and activities. The research model will be applied so that the student's activity focuses on searching, locating, analyzing, manipulating, processing, and reporting information.

## EVALUATION

The objectives and competencies common to the degree subjects, as well as those specific to each subject or course, will be assessed.

Assessment will be continuous and comprehensive, will have a guiding and formative nature, and must analyze individual and collective learning processes.

The grade, the ultimate representation of the assessment process, must reflect individual learning, understood not only as the acquisition of knowledge, but as a process fundamentally related to students' intellectual and personal changes when they encounter new situations that require them to develop new comprehension and reasoning skills.

The student assessment process may include the preparation of a report on the degree of individual learning acquisition.

Information to demonstrate learning will be collected primarily through:

1) Continuous assessment (50%-70%). This may include:

- Regular monitoring of student progress, both in the classroom and in individual and group tutoring.

- Assessment of assigned work, including analysis and evaluation of observations on work prepared by third parties.



- Assessment of individual and group participation, both in class and in assignments completed outside of class.

2) Oral and/or written tests (30%-50%). These may include:

- Exams, presentations of work, etc.

Written tests and assignments will take into account appropriate presentation for a future teacher, as well as spelling, vocabulary, and grammar accuracy, as well as aspects related to the appropriateness, coherence, and cohesion of the text, both in paper and digital formats.

To pass the course, a weighted average of 5 and a minimum of 4 in each section will be required. Failure to meet both requirements will result in a second exam, in which the entire subject will be assessed and will count for 100% of the grade.

Plagiarism or misuse of artificial intelligence will be punished in accordance with Article 15 of the University of Valencia's assessment and grading regulations.

In any case, the current assessment and grading regulations approved by the University of Valencia's Governing Council (ACGUV 108/2017) will apply.

## REFERENCES

- COUSO, D., Jimenez-Liso, M.R., Refojo, C. & Sacristán, J.A. (Coords) (2020) Enseñando Ciencia con Ciencia. FECYT & Fundación Lilly. Madrid: Penguin Random House
- FRIED, A. (2000). Enseñar ciencia a los niños. Ed. Gedisa.
- HARLEN, W. & QUALTER, A. (2009) The teaching of Science in Primary Schools. 5 th edition. David Fulton Ed.
- HARLEN, W. (2007). Enseñanza y aprendizaje de las ciencias. Ediciones Morata Ministerio de Educación y Ciencia.
- JIMÉNEZ ALEIXANDRE, M.P.; A. CAAMAÑO; A. OÑORBE; E. PEDRINACI y A. DE PRO. (2007). Enseñar Ciencias. 2º Edición. Editorial GRAÓ.
- MEMBIELA, P. (2001). Enseñanza de las ciencias desde la perspectiva ciencia-tecnología-sociedad. Formación científica para la ciudadanía. Editorial Narcea.
- PERALES, F. J. y CAÑAL, P. (2000). Didáctica de las ciencias experimentales. Teoría y práctica de la enseñanza de las ciencias. Alcoi: Marfil.
- DE PRO BUENO, A. (2010). Competencia en el conocimiento e interacción con el mundo físico: la comprensión del entorno próximo. Madrid: Ministerio de Educación, Subdirección General de Documentación y Publicaciones.
- OECD (2000). Measuring student knowledge and skills: The PISA assessment of reading, mathematical and scientific literacy. París: OECD. Traducción de G. Gil Escudero, J. Fernández García, F. Rubio Miguelsanz, C. López Ramos y S. Sánchez Robles (2001), La medida de los conocimientos y las destrezas de los alumnos: La evaluación de la lectura, las matemáticas y las ciencias en el proyecto PISA 2000. Madrid: INCE/MECD.



- RAMIRO, Enric. (2010). La maleta de la ciencia. Ed. GRAÓ: Barcelona.
- RAMIRO, Enric. (2010). La maleta de la ciencia. Ed. GRAÓ: Barcelona.
- Real Decreto 157/2022, de 1 de marzo, por el que se establecen la ordenación y las enseñanzas mínimas de la Educación Primaria y el Decreto 106/2022, de 5 de agosto, del Consell, de ordenación y currículo de la etapa de Educación Primaria
- SEP (2003). Taller de diseño de propuestas didácticas y análisis del trabajo docente I y II. Secretaría de Educación Pública, México.
- Throughout the course, textbooks will be studied, and internet addresses and additional bibliographies will be suggested.