COURSE DATA

DATA SUBJECT

Code: 33686
Name: ICT as a teaching resources in 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	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1305 - Degree in Primary School Education	Specialist in information and communication technologies	ELECTIVES

COORDINATION

HURTADO SOLER DESAMPARADOS

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SUMMARY

The subject "ICT as a Didactic Resource in Science and Mathematics"addresses the analysis of science and mathematics content in Primary Education through the design and evaluation of teaching proposals and activities, using programs and virtual environments that promote the teaching and learning of these disciplines.

The predominantly practical nature of the subject facilitates the acquisition of digital skills and abilities that allow students to interact fluently with the main tools for designing educational materials. Digital literacy helps to minimize the so-called digital divide that exists in Early Childhood and Primary classrooms, which distances teachers and students when working with new technologies.

This subject links "Teaching Proposals in Science and Mathematics", "Teaching Proposals in Mathematics", "Teaching Proposals in Science", and the Practicum, allowing future teachers to apply the knowledge and experiences acquired in them.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

1305 - Degree in Primary School Education

Obligation to have previously passed the subject(s)	33682 - Education and ICT 33683 - Software and hardware in educational contexts 33684 - Designing educational material

OTHER REQUIREMENTS

It is recommended to have basic knowledge of using internet browsers, office programs, and calculators.

COMPETENCES / LEARNING OUTCOMES

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Advise the members of the educational community as users of information and communication technologies.

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.

Be able to use the devices that support information and communication technologies, at the user level, in the educational environment.

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

Develop a critical spirit towards information and communication technologies and towards the discourses that are generated from them.

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 anthropological principles of the information and communication society, based on the

interaction with screens.

Know the processes of interaction and communication in the classroom.

Programme pedagogical interventions taking advantage of the possibilities offered by information and communication technologies.

Promote autonomy in the processes of teaching and learning among students and encourage collaboration in educational actions among both teachers and students.

Promote cooperative work and individual work and effort.

Promote positive, yet critical attitudes towards the use of information and communication technologies.

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.

Understand the influence of information and communication technologies and television on early childhood.

Use information and communication technologies effectively as usual working tools.

Use technologies as creativity enhancers to generate educational resources.

DESCRIPTION OF CONTENTS

1. Teaching mathematics in computer environments. Software for teaching mathematics.

1.1. ICT tools for teaching problem-solving and logical thinking
1.2. ICT tools for teaching geometry

2. Teaching science in computer environments. Software for teaching science.

2.1. ICT tools for teaching science

3. Teaching units in mathematics and science with computer support.

3.1. Programming in the primary classroom

3.2. Educational robotics
3.3. Creation of educational content

4. Teaching mathematics and science in virtual environments.

4.1. ICT-based analysis applications for mathematics education
4.2. Virtual learning environments

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

Academic practice in this subject is structured at different levels:

A) Face-to-face activities (40% of the total workload)

1. Theoretical-practical classes.

The subject is practical in nature and therefore it is necessary to combine different methodologies depending on the learning outcomes that must be achieved.

- Project work. We will use it to create collaborative learning contexts and achieve meaningful learning and an adequate articulation of the contents that will be of great use for teaching planning.

- Lecture or theoretical exposition class. It is an essential methodology for presenting and discussing theoretical knowledge.
- Didactic interrogation. As a complement to the lecture, it promotes constructivist learning and its results can be used to properly evaluate learning.
- Cooperative work and evaluation techniques. We will use them to promote meaningful and autonomous learning by students.
- Case studies. It is useful for students to place the Primary Education curriculum in reality in terms of ICT skills and their application in the scientific and mathematical field.
- Problem solving. It is a way of learning to design, implement and evaluate projects and activities in the primary classroom. It will be used to work on the curriculum by cycles.
- Learning portfolio. It is used to bring together the students' learning journey throughout the subject and as an assessment instrument.

2. Attendance at seminars and complementary activities

3. Tutorials
Individual and group tutorials will serve to coordinate students in individual and group tasks, as well as to evaluate individual progress, activities and teaching methodology.

B) Non-face-to-face activities (60% of the total volume of work)

4. Study and independent work.

Preparation of assigned tasks and completion of proposed work projects applying the research model.

EVALUATION

The assessment of student learning will be carried out in two different stages for the two calls for the subject:

1. Formative assessment, where there will be a continuous assessment of the progress and work that the student has developed throughout the course. This assessment will comprise between 60% and 40% of the final grade for the subject and may be controlled by the following instruments:
    - Attendance and participation in class.
    - Completion and passing of assigned work.
    - Completion of any number of written tests deemed appropriate, regardless of the officially scheduled final exams.
2. Final assessment of the course, which will comprise between 60% and 40% of the final grade for the subject.

The assessment may take into account, in general terms:

- The student's linguistic and communicative competence, both oral and written in science and mathematics.
- The acquisition of specific knowledge and skills of the subject.
- The mastery of methods, techniques and other capacities and skills typical of mathematics and science for a teacher student.
- The attitude towards the subject and respect for classmates, attendance and participation in class, interest and perseverance in achieving positive progression and the ability to work in a group.

In order to pass the subject, it will be essential to obtain a minimum grade of 5 points (out of 10) in each of the two previous sections, in addition to achieving the linguistic adequacy and correctness that are expected for future teaching work. In any case, the current evaluation and qualification regulations of the University of Valencia (108/2017) will apply.

Plagiarism or improper use of artificial intelligence tools may be sanctioned in accordance with article 15 of the evaluation and qualification regulations of the University of Valencia.

REFERENCES

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- Cabero, J. (2006) Nuevas tecnologías aplicadas a la educación, Madrid: Mc Graw Hill.

- Roig Vila, R. (2006) Objetos de aprendizaje en Internet como recursos didácticos en la enseñanza de las ciencias, Descubrir, investigar, experimentar: iniciación a las Ciencias, Madrid: Ministerio de Educación y Cultura.

- Cacheiro González, M. L. (2014), Educación y tecnologîa: estrategias didácticas para la integración de las TIC, UNED.

- Gros B. (2011), Educación y retos de la educación virtual: construyendo el e-learning del siglo XXI, UOC.

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