Experimental Sciences Didactics

Grado en Educación Primaria

TEACHING GUIDE

Assignment : Experimental Sciences Didactics

Degree: Degree in Primary Education

Character :Mandatory

Language: Spanish/ English

Modality : On-site/Distance

Credits: 6

Course: 4th

Semester: 7th

Professors/Teaching Staff: Dr. D. Francisco Javier Benítez Verguizas; Dra. Dña. Mª Victoria Hernández de Riquer; Dr. D. Jonathan Delgado Adámez; D. Fernando Evaristo Díaz Manzano; Dña. Laura Serna Cantero

1.   COMPETENCES AND LEARNING OUTCOMES

1.1. Competencies

Basic skills
CB1 Students are able to possess and understand the knowledge in an area of study that is based on general secondary education, and is usually found at a level that, while supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of their field of study.
CB2 Students know how to apply their knowledge to their work or vocation in a professional manner and possess the skills that are usually demonstrated through the development and defense of arguments and the resolution of problems within their area of study.
CB3 Students should have the ability to gather and interpret relevant data (normally within their area of study) to make judgments that include a reflection on relevant issues of a social, scientific or ethical nature.
CB4 Students can transmit information, ideas, problems and solutions to both specialized and non-specialized audiences.
CB5 Students have developed the learning skills necessary to undertake further studies with a high degree of autonomy.

General skills
CG1 Ability to use skills specific to intellectual work (understand, synthesize, outline, explain, present, organize).
CG2 Ability to use a basic methodology for source research: analysis, interpretation and synthesis.
CG3 Ability to manage information.
CG4 Ability to clearly present, orally and in writing, complex problems and projects within their field of study.
CG5 Ability for learning and independent work.
CG6 Ability to work in a team, integrate into multidisciplinary groups and collaborate with professionals from other fields.
CG7 Ability for self-initiative, self-motivation and perseverance.
CG8 Heuristic and speculative ability to solve problems in a creative and innovative way.
CG9 Ability to carry out new projects and action strategies in real situations and in various areas of application, from a humanistic perspective.
CG10 Ability for interpersonal communication, awareness of one's own capabilities and resources.
CG11 Ability to adapt to new situations.
CG12 Ability to recognize diversity and respect multiculturalism.
CG13 Sensitivity to environmental issues and to cultural and linguistic heritage.

CG14 Ability to document one's own culture and acquire the knowledge and skills to communicate with other cultures.

CG15 Ability to acquire and fulfill a professional ethical commitment.

CG17 Ability to use new information and knowledge technologies for the organization, planning and development of academic and professional activities.

Specific skills

CEC1 Know the curricular areas of Primary Education, the interdisciplinary relationship between them, the evaluation criteria and the body of didactic knowledge around the respective teaching and learning procedures.

CEC2 Design, plan and evaluate teaching and learning processes, both individually and in collaboration with other teachers and professionals at the center.

CEC4 Promote reading and critical commentary on texts from the various scientific and cultural domains contained in the school curriculum.

CEC14 Value individual and collective responsibility in achieving a sustainable future.

CEC16 Acquire habits and skills for autonomous and cooperative learning and promote it among students.

CEC17 Know and apply information and communication technologies in the classroom.

CEC18 Selectively discern audiovisual information that contributes to learning, civic education and cultural wealth.

CEM24 Understand the basic principles and fundamental laws of experimental sciences (Physics, Chemistry, Biology and Geology).

CEM25 Know the school curriculum for these sciences.

CEM26 Pose and solve problems associated with science in everyday life.

CEM27 Value science as a cultural fact.

CEM28 Recognize the mutual influence between science, society and technological development, as well as relevant citizen behavior, to ensure a sustainable future.

CEM66 Develop and evaluate curriculum content using appropriate teaching resources and promote corresponding competencies in students.

1.2. Learning outcomes

Upon completion of this subject, the student must:

- Understand the basic principles and fundamental laws of experimental sciences (Physics, Chemistry, Biology and Geology).
- Know the curriculum of experimental sciences.
- Appreciate science and be able to communicate its value to primary school students through problem-solving techniques applicable to everyday life.
- Consider science in its social and cultural context.
- Be able to identify learning difficulties in the area of Natural Sciences and know how to solve them.
- Know the learning processes specific to the referred school stage.
- Know the basic characteristics of students at this stage.
- Know the motivations and social contexts of students.
- Understand the evolution of students' personality and know how to identify dysfunctions.
- Be able to identify learning difficulties and know how to treat them.
- Be able to plan teaching at different learning rates of students.

2. CONTENTS

2.1. Prerequisites

None.

2.2. Description of contents

- Observation and Experimentation
- Experimental Sciences Teaching Techniques
- The laboratory in Experimental Sciences teaching
- ICT in the Sciences Classroom
- Development of didactic units in Primary Education
- Knowledge areas in Primary Education: Matter and energy, physical processes and chemical changes, the Earth and its living beings

2.3. Actividades formativas

On-site modality:

TRAINING ACTIVITY	HOURS	PERCENTAGE OF PRESENCE
AF1.Synchronous theoretical classes	22	100%
AF3. Practical classes. Seminars and workshops	17	100%
AF4. Tutorials	14	100%
AF5. Working in small groups	7	100%
AF6. Individual study and independent work	85	0%
AF7. Assessment activities	5	100%
TOTAL NUMBER OF HOURS	150	

Distance modality :

TRAINING ACTIVITY	HOURS	PERCENTAGE OF PRESENCE
AF2.Asynchronous theoretical classes.	14	0%
AF3. Practical classes. Seminars and workshops	10	0%
AF 4 Tutorials	12	0%
AF6. Individual study and independent work	112	0%
AF7 Assessment Activities	2	100
TOTAL NUMBER OF HOURS	150	

2.4. Teaching methodologies

The teaching staff may choose between one or more of the following methodologies detailed in the verified degree report:

Code	Teaching methodologies	Description
MD1	Expository method. Master class	Structured presentation of the topic by the teacher in order to provide information to students, transmit knowledge and activate cognitive processes. Active student participation is encouraged through debate activities, case discussions, questions and presentations.
MD2	Individual study	Independent and reflective work by the student, in order to deepen the acquisition of associated skills (preparation of classes and exams; use of information sources; completion of assignments, presentations; use of ICT; participation in discussion forums, etc.)
MD3	Collaborative learning	Develop active and meaningful learning in a cooperative manner.
MD4	Troubleshooting	Active methodology that allows you to exercise, rehearse and put into practice previous knowledge.
MD5	Case study	Analysis of a real or simulated case with the aim of understanding it, interpreting it, solving it, generating hypotheses, contrasting data, reflecting, completing knowledge, etc.
MD6	Project-oriented learning	Carry out a project to solve a problem and apply acquired skills and knowledge.
MD7	Tutoring (individual and/or group)	Methodology based on the teacher as a guide for student learning. In person or through the use of technological tools such as forums, email or video conferences .
MD8	Apprenticeship contract	Develop autonomous learning.
MD9	Self-assessment	Assessment of one's own knowledge, skills and acquisition of competencies.
MD10	Heteroassessment	Student evaluation by the teacher

3. EVALUATION SYSTEM

3.1. Grading system

The final grading system will be expressed numerically, in accordance with the provisions of art. 5 of Royal Decree 1125/2003, of 5 September (BOE, 18 September), which establishes the European Credit System and the Grading System for official university degrees and their validity throughout the national territory.

> 0 - 4.9 Fail (SS)
> 5.0 - 6.9 Pass (AP)
> 7.0 - 8.9 Excellent (NT)
> 9.0 - 10 Outstanding (SB)

The mention of "matricula de honor" may be awarded to students who have obtained a grade equal to or greater than 9.0.

The number of honorary matriculation awards may not exceed 5% of the students enrolled in a subject in the corresponding academic year, unless the number of students enrolled is less than 20, in which case only one honorary matriculation award may be granted.

3.2. Evaluation criteria

<u>Ordinary call</u>

Modality: On-site

Evaluation systems	Percentage
Partial evaluation	20%
Activities	20%
Participation	10%
Final exam	50%

Modality: Distance

Evaluation systems	Percentage
Activities	30%
Participation	10%
Final exam	60%

<u>Extraordinary call</u>

Modality: On-site

Evaluation systems	Percentage
Activities	40%
Final exam	60%

Modality: Distance

Evaluation systems	Percentage
Activities	40%
Final exam	60%

3.3. Restrictions

<u>Minimum rating</u>
In order to average t h e above weightings, it is necessary to obtain at least a grade of
5 in the final test.

<u>Attendance</u>
The student who, without justification, fails to attend more than 25 % of the classes may be deprived of the right to take the exam in the ordinary call.

<u>Writing rules</u>
Special attention will be paid to the presentation and content of written assignments, practical exercises and projects, as well as to exams, taking into account grammar and spelling. Failure to comply with the minimum acceptable standards may result in points being deducted from the assignment.

3.4. Plagiarism warning

The Universidad Antonio de Nebrija will not tolerate plagiarism or copying under any circumstances. It will be considered plagiarism the reproduction of paragraphs from texts other than the student's audit (Internet, books, articles, papers of colleagues...), when the original source is not cited. *The use of quotations cannot be indiscriminate. Plagiarism is a crime.*

If this type of practice is detected, it will be considered a Serious Misconduct and the sanction foreseen in the Student Regulations may be applied.

4. LITERATURE

Basic bibliography

Garrido, J.M., Perales, F.J. and Galdón, M. (2008). *Science for educators* . Pearson Prentice Hall
Jiménez, MP (2014). *Teach science.* Graó Editorial.
Pozo, JI (2009). Learning and teaching science: from everyday knowledge to scientific knowledge. Ediciones Morata
Rudi, JM, Reyes, MS, & De Greef , M. (2023). Development of teaching materials with a STEAM approach for teaching experimental sciences in primary school. *Cenas Educacionais* , *6* , e15275-e15275.

Recommended bibliography

Berretti , M. (2017). *Genetics in 100 questions.* Nowtilus Editions .
Blackmore , S. *et al* . (2002). *Science and Society* . Nobel Press.
Del Rosario, V., and Rossis , R. (2018). *Geology in 100 questions.* Nowtilus Editions .
Fernández, M., and Ruiz, D. (2018). *Biochemistry in 100 questions.* Nowtilus Editions.
Pozuelo, J. (2016). *Biology in 100 questions.* Nowtilus Editions .
Sanz, JM *et al* . (2004). *Science, technology and education: educational solutions for the acquisition of a scientific and technological culture* . Iberdrola Foundation.

5. TEACHING STAFF DATA

The e-mail addresses of the professors and the academic and professional profiles of the teaching staff can be consulted at https://www.nebrija.com/carreras-universitarias/grado-educacion-primaria/#masInfo#profesores