



Information about the subject

Degree: Bachelor of Arts Degree in Primary School Education

Faculty: Faculty of Teacher Training and Education Sciences

Code: 1160203 **Name:** Fundamentals of Natural Sciences

Credits: 6,00 **ECTS** **Year:** 2 **Semester:** 2

Module: Teaching and learning Experimental Science

Subject Matter: Experimental Sciences and their Didactics **Type:** Compulsory

Field of knowledge: Social and Legal Science

Department: -

Type of learning: Classroom-based learning / Online

Languages in which it is taught: Spanish

Lecturer/-s:

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Module organization

Teaching and learning Experimental Science

Subject Matter	ECTS	Subject	ECTS	Year/semester
Experimental Sciences and their Didactics	12,00	Fundamentals of Natural Sciences	6,00	2/2
		Teaching of Natural Sciences	6,00	3/1

Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

- R1 Interprets and applies the processes through which scientific knowledge is constructed.
- R2 Explains the basic principles and fundamental laws of Natural Sciences (Physics, Chemistry, Biology, and Geology) studied in the subject, necessary for the exercise of a Primary Education teacher, applying them in everyday life situations.
- R3 Recognizes the different aspects that characterize the interdisciplinary nature of the contents of this subject and interprets, from a systemic perspective, the relationships between science, technology, society, and the environment, in a way that develops a critical spirit and attitudes of respect, appreciation, and commitment towards life and the environment, as well as the desire to transmit it to primary school students.



Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

GENERAL	Weighting			
	1	2	3	4
CG1 Understand 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.	x			
CG4 Design and regulate learning spaces in diverse contexts that address gender equality, equity, and respect for human rights, which form the values of citizenship education.	x			
CG8 Maintain a critical and autonomous relationship with knowledge, values, and public and private social institutions.		x		
CG9 Value individual and collective responsibility in the attainment of a sustainable future.		x		
CG10 Reflect on classroom practices to innovate and improve teaching work. Acquire habits and skills for autonomous and cooperative learning and promote it among students.	x			

SPECIFIC	Weighting			
	1	2	3	4
CE23 Comprehend the basic principles and fundamental laws of experimental sciences (Physics, Chemistry, Biology, and Geology).			x	
CE24 Know the school curriculum of these sciences.	x			
CE25 Pose and solve problems associated with sciences in daily life.			x	
CE26 Value sciences as a cultural fact.			x	
CE27 Recognize the mutual influence between science, society, and technological development, as well as relevant civic behaviors to promote a sustainable future.			x	





Assessment system for the acquisition of competencies and grading system

In-class teaching

Assessed learning outcomes	Granted percentage	Assessment method
	0,00%	Oral presentation of group and individual works: Self-assessment systems (oral, written, individual, in groups). Oral tests (individual, in groups, presentation of topics or works).
R1, R2, R3	10,00%	Active participation in theoretical-practical sessions, seminars, and tutorials: Attitude scale (to gather opinions, values, social and managerial skills, interaction behaviors).
R1, R2, R3	60,00%	Written tests: Objective tests with short and extended responses.
R1, R2, R3	20,00%	Projects. Development and/or design works.
R1, R2, R3	10,00%	Reports/Practice reports.

Observations

Exam composed of the following parts:

- Objective test of multiple choice or true/false questions, with a penalty for incorrect answers, related to theoretical content and questions of scientific reasoning.
- Development questions, related to theoretical content and questions of scientific reasoning.
- Questions related to the practical knowledge acquired in the laboratory.

Online teaching

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3	60,00%	Written tests: short-answer objective tests, developmental tests. Projects. Reports/Practical reports. Design work, development
	0,00%	Exposición oral de trabajos grupales e individuales: sistemas de autoevaluación (oral, escrita, individual, en grupo). Pruebas orales (individual, en grupo, presentación de temas-trabajos)



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R1, R2, R3	10,00%	Active participation in theoretical-practical sessions, seminars, and tutorials: Attitude scale (to gather opinions, values, social and managerial skills, interaction behaviors).
R1, R2, R3	30,00%	Projects. Development and/or design works.

Observations

Exam composed of objective test of multiple choice or true/false questions, with a penalty for incorrect answers, related to theoretical content and questions of scientific rea.

CRITERIA FOR THE AWARDING OF HONOURS:

As a sign of academic exceptionality, the Honour's Degree will be awarded to the student who, in addition to obtaining a maximum mark in the above criteria, is considered by the teacher to be worthy of such a distinction. And, in accordance with the general regulations which indicate that only one matriculation of honour can be awarded for every 20 students, not per fraction of 20, with the exception of the case of groups of less than 20 students in total, in which one matriculation can be awarded.

Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

- M1 Participatory Master Class
- M3 Project-based Learning
- M4 Learning Contracts
- M5 Seminar Work
- M7 Cooperative/Collaborative Work
- M9 Group and Individual Tutoring
- M10 Individual Tutoring



- M11 Participatory Master Class
- M13 Seminar Work
- M15 Project-based Learning
- M16 Learning Contracts
- M18 Cooperative/Collaborative Work
- M19 Individual Tutoring
- M20 Group and Individual Tutoring





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IN-CLASS LEARNING

IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Group Work Presentation M7	R1, R2, R3	7,00	0,28
Theoretical Class M1, M5	R1, R2, R3	34,00	1,36
Practical Class M5, M7	R1, R2, R3	10,00	0,40
Tutoring M9, M10	R1, R2, R3	6,00	0,24
Evaluation M1, M5, M7, M9, M10	R1, R2, R3	3,00	0,12
TOTAL		60,00	2,40

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Group work M7	R1, R2, R3	20,00	0,80
Individual work M10	R1, R2, R3	70,00	2,80
TOTAL		90,00	3,60



ON-LINE LEARNING

SYNCHRONOUS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Theoretical class (e-learning mode) M11	R1, R2, R3	41,00	1,64
Practical class (e-learning mode) M18	R1, R2, R3	5,00	0,20
Individual tutoring (e-learning mode) M19	R1, R2, R3	1,50	0,06
Evaluation (e-learning mode) M11, M18, M19	R1, R2, R3	2,50	0,10
TOTAL		50,00	2,00

ASYNCHRONOUS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Individual work Activities (e-learning mode) M11, M18	R1, R2, R3	71,25	2,85
Group Work (e-learning mode) M18	R1, R2, R3	17,50	0,70
Asynchronous Tutoring (e-learning mode) M19	R1, R2, R3	1,25	0,05
Theoretical-Practical Class (distance mode) M11, M18	R1, R2, R3	10,00	0,40
TOTAL		100,00	4,00



Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
Concept and processes of Science	<ul style="list-style-type: none">- Natural Sciences in the global framework of sciences.- System concept.- Science, technology, society and environment interaction.- Characteristics of scientific knowledge.- Research and scientific methodology.
Matter and energy	<ul style="list-style-type: none">- Concept of matter.- Properties of matter.- Pure substances and mixtures.- Atom and atomic structure.- Chemical reactions.- States of aggregation of matter.- Energy concept.- Forms of energy.
Planet Earth	<ul style="list-style-type: none">- General structure of the Earth.- Atmosphere.- Hydrosphere.- Geosphere. Structure and dynamics. Volcanoes. Earthquakes. Mineral matter: rocks.
Living beings	<ul style="list-style-type: none">- Characteristics of living beings. The cell.- Vital functions.- Diversity of living beings.



Temporary organization of learning:

Block of content	Number of sessions	Hours
Concept and processes of Science	12,00	24,00
Matter and energy	9,00	18,00
Planet Earth	4,00	8,00
Living beings	5,00	10,00



References

Basic references

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- Ciudad Ciencia, un lugar de encuentro entre ciencia y sociedad, CSIC (Consejo Superior de Investigaciones Científicas). <http://www.ciudadciencia.es/>
- CSIC en la escuela. Recursos y experiencias de ciencias en Infantil, Primaria y Secundaria (Consejo Superior de Investigaciones Científicas). <http://www.csicenlaescuela.csic.es/>
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Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

Situation 1: Teaching without limited capacity (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).

In this case, no changes are made in the guide of the subject.

Situation 2: Teaching with limited capacity (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:

Microsoft Teams

Kaltura



Situation 3: Confinement due to a new State of Alarm.

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

- Microsoft Teams
- Kaltura

Explanation about the practical sessions:

The practical activities will be carried out using an adapted and guided practice booklet with tutorials.



2. System for Assessing the Acquisition of the competences and Assessment System

ONSITE WORK

Regarding the Assessment Tools:



The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.



The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

Comments to the Assessment System:

Adaptation to the change from a face-to-face format to an online format, according to the specifications given by the Faculty and the University, without affecting the evaluation of the Learning Results of the subject. In no case do they represent an increase in the student's work demands.



ONLINE WORK

Regarding the Assessment Tools:

- | | |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus. |
| <input type="checkbox"/> | The following changes will be made to adapt the subject's assessment to the online teaching. |

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

Comments to the Assessment System: