



TEACHING AND LEARNING EXPERIMENTAL SCIENCES I

17522 - TEACHING AND LEARNING EXPERIMENTAL SCIENCES I (2024-25)

General

Code: 17522

Lecturer responsible:

MENARGUES MARCILLA, MARIA ASUNCION

Credits ECTS:	6,00
Theoretical credits:	0,60
Practical credits:	1,80
Distance-base hours:	3,60

Departments involved

- **Dept:** GENERAL DIDACTICS AND SPECIFIC DIDACTICS

Area: TEACHING EXPERIMENTAL SCIENCES

Theoretical credits: 0,6

Practical credits: 1,8

This Dept. is responsible for the course.

This Dept. is responsible for the final mark record.

Study programmes where this course is taught

- [DEGREE IN PRIMARY SPECIALITY](#)

Course type: COMPULSORY (Year: 2)

Competencies and objectives

Course context for academic year 2024-25

The educational purpose of this subject has been designed taking into account: 1) The student's features; 2) Total available time to teaching and learning of science in the study plan, and 3) the legal requirements about this area of knowledge. These restraints are summed up in:

Almost 75% of students do not have studied physics, chemistry, biology, or geology since Secondary School.

- Most of them have negative attitudes toward teaching and learning science (especially toward physics and chemistry).
- From 240 credits of the study plan, all students will study only 12 credits related to teaching and learning science.
- There is a general interest in instructing future primary teachers in a way that enables them to be able to teach science in accordance, as well as point out legal requirements in the pedagogical content knowledge.

For all these reasons, we have designed a shared program for both subjects of teaching and learning science, and we have chosen:

- Depth against extent
- The quality and the selection of the contents instead of the superficial treatment of more scientific contents related to primary school.
- Methodological coherence between what is said and how classes are developed.

General Competences (CG)

- **CG1** : Identificar necessitats d'informació, buscar-la, analitzar-la, processar-la, valorar-la, usar-la i comunicar-la de manera eficaç, crítica i creativa.
- **CG2** : Planificar, organitzar i gestionar processos, informació, resolució de problemes i projectes. Tenir iniciativa, esperit emprenedor i capacitat de generar noves idees i accions.
- **CG3** : Mostrar habilitats lingüístiques orals i escrites per a ensenyar (llengües oficials de la Comunitat Valenciana i llengües estrangeres) i habilitats de comunicació en diferents nivells i registres.
- **CG4** : Fer ús de les noves tecnologies de la informació i la comunicació per a aprendre, comunicar-se i compartir coneixement.
- **CG5** : Treballar en equip, col·laborant i liderant quan siga necessari.
- **CG7** : Exercir la crítica i l'autocrítica emetent judicis raonats, i adquirir un compromís ètic, personal i professional. Estar motivat per a millorar la qualitat.
- **CG8** : Entendre l'aprenentatge com un fet global, complex i transcendent. Autoregular el propi aprenentatge i mobilitzar sabers de tot tipus per a adaptar-se a situacions noves i connectar coneixements com a mètode per a elaborar-ne altres de nous.
- **CG9** : Valorar l'impacte social i mediambiental d'actuacions en el seu àmbit.

Specific Competences (CE)

- **CE10** : Utilitzar l'avaluació en la seua funció pedagògica i no solament acreditativa, com a element regulador i promotor de la millora de l'ensenyament, de l'aprenentatge i de la pròpia formació, i assumir la necessitat de desenvolupament professional continu mitjançant la reflexió, l'autoavaluació i la investigació sobre la pròpia pràctica.
- **CE11** : Comprendre que el fet educatiu en general i els processos d'ensenyament i aprenentatge en particular són complexos. Assumir que l'exercici de la funció docent ha de millorar, actualitzar-se i adaptar-se als canvis científics, pedagògics, socials i culturals. Entendre la importància de participar en projectes d'innovació i d'investigació relacionats amb l'ensenyament i l'aprenentatge, i d'introduir propostes innovadores en l'aula.
- **CE12** : Expressar-se oralment i per escrit amb la fluïdesa i la correcció necessàries en llengua catalana i castellana per a desenvolupar l'ensenyament en l'etapa de primària, i també utilitzar la llengua estrangera com a llengua vehicular en algunes situacions de l'aula.
- **CE3** : Organitzar l'ensenyament en el marc dels paradigmes epistemològics de les matèries del títol, utilitzant de forma integrada els coneixements disciplinaris, transversals i multidisciplinaris adequats al respectiu nivell educatiu, mostrant la comprensió dels objectius d'aprenentatge de les àrees de coneixement que estableix el currículum d'educació primària.
- **CE6** : Potenciar en l'alumnat una actitud de ciutadania crítica responsable i poder dinamitzar la construcció participada de normes de convivència democràtica i enfrontar-se i resoldre de manera col·laborativa situacions problemàtiques i conflictives. Ser capaç d'analitzar les desigualtats socials en el marc de la complexa relació educació-escola i el paper del mestre per a reproduir-les o transformar-les.
- **CE7** : Dissenyar i desenvolupar projectes educatius, unitats de programació, entorns, activitats i materials, incloent-hi els digitals, que permeten adaptar el currículum a la diversitat de l'alumnat i promoure la qualitat dels contextos en què es desenvolupa el procés educatiu, de manera que es garantisca el seu benestar.
- **CE8** : Assumir la dimensió ètica de docent, actuant amb responsabilitat, prenent decisions i analitzant críticament les concepcions i propostes sobre educació procedents tant de la investigació i la innovació com de l'administració educativa.

Exclusive skill taught in this course

No data

Learning outcomes (Training objectives)

No data

Specific objectives stated by the academic staff for academic year 2024-25

- To know which factors influence how a primary teacher teaches science.
- To be aware of the necessity of compromise in the improvement of science teaching.
- To update the way to teach science during their professional development.
- To acquire the inquire based learning model and use it to analyze and to develop teaching sequences in primary school.
- To identify essential factors of the scientific methodology and use them to assess scientific dissemination texts, textbooks, media, and pseudoscientific beliefs.
- To communicate the results of brief research.
- To understand the scientific contents of the Primary Education's curriculum, deepening in some of them and achieving, in others (*), enough knowledge to carry out with sense the Science Education in Primary School. In particular, it can be promoted that a good apprenticeship can motivate and change negative attitudes to positive ones.

(*) It begins in this subject, but its acquirement will be completed in the science subject of the 3rd course.

Content and bibliography

Content for academic year 2024-25

- Attitudes toward learning (and teaching) of science. The learning of scientific knowledge: how scientific thinking is built; the importance of "spontaneous thinking" and educational implications. Which models of teaching can we use to achieve conceptual and epistemological development? We will pay special attention to guided research (inquired based learning).
- Approach to the nature of scientific work. Features of the research process. Assessment of fragments of scientific texts (simplified) and implementation of simple research as an example. The distorted image of science and scientific work transmitted by education and media.
- We will review the objectives, methodological orientations, and official curriculum contents. We will choose big questions or problems that are in the origin of scientific knowledge and which is in the official curriculum.
- Development of some of the big problems chosen throughout guided research, coherently with didactic orientations addressed in this subject.
 1. Do exist regularities and symmetries in the movement of the stars, which allow us to orientate temporally and spatially? (Seasons).
 2. What can be due to those cycles and symmetries? (Sun/Earth model. Solar System).
- What and how to teach science to children in Primary School? Features of children's thinking related to scientific development and consequences. General criteria to elaborate and evaluate teaching sequences. Assessment of textbooks of Primary School (*).
- Elaboration of teaching sequences for Primary Education to develop the contents related to problems addressed during this subject (*)

(*) Linked with the beginning of the subject Teaching and Learning Science II, in the 3rd course.

Related links

No data

Bibliography

Enseñanza y aprendizaje de las ciencias

Author(s): Harlen, Wynne

Issue: Madrid : Ministerio de Educación y Cultura, 1998;

ISBN: 978-84-7112-331-2

Category: Básico

Astronomía E.S.O.

Author(s): Osuna García, Luis...[et al.]

Issue: Alicante : Aguaclara, 1998;

ISBN: 978-84-8018-141-9

Category: Básico

La estructura problematizada de los temas y cursos de física y química como instrumento de mejora de su enseñanza y aprendizaje

Author(s): Verdú Carbonell, Rafaela; Martínez-Torregrosa, Joaquín

Issue: Valencia : Universitat de València, 2004;

ISBN: 84-689-2380-X

Category: Básico

Assessment

Assessment procedures and criteria 2024-25

No data

Description	Criteria	Type	Weighting system
Written test and practical works	<p>Participation in class is essential to learn with comprehension and to develop attitudes to teach science in Primary School. To overcome the subject (without doing the final exam) it is needed, at least, to attend to 80% of classes. If any exceptional situation occurs (supported by a report) will be analyzed individually.</p> <p>During the course, it will develop a formative assessment system with marks. It will consist of written tests and works (notebook, a memory of practices, analysis of scientific texts or children's ideas about specific concepts, etc.) Marks will be outweighed, provided student has achieved, at least, 4 points from 10 of each test and works. The evaluation system will include, at least, two individual tests (in November and December).</p> <p>Who overcome this subject in this way can decide to do or not the final exam.</p>	ACTIVITIES OF EVALUATION DURING THE SEMESTER	50

Written test	It will be about contents addressed during the course (theoretical and practical contents, problem-solving, empirical works and texts...).	FINAL TEST	50
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Official exam dates for academic year 2024-25

Exam session	Date	Time	Group - Classroom(s) allocated	Comments
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(C2) Periodo ordinario
para asignaturas de
primer semestre

20/01/2025

GROUP 1
(THEORY
CLASS)

GROUP 2
(THEORY
CLASS)

GROUP 3
(THEORY
CLASS)

GROUP 4
(THEORY
CLASS)

GROUP 5
(THEORY
CLASS)

17/01/2025

GROUP 6
(THEORY
CLASS)

GROUP 7
(THEORY
CLASS)

GROUP 8
(THEORY
CLASS)

GROUP 9
(THEORY
CLASS)

(C4) Pruebas
extraordinarias para
asignaturas de grado y
máster

03/07/2025

Academic staff



MENARGUES MARCILLA, MARIA ASUNCION

Lecturer responsible

THEORY CLASS: Groups: 4

FIELD WORK PRACTICALS: Groups: 4

PROBLEM PRACTICALS / WORKSHOP: Groups: 4



ALCARAZ ARGUESO, BELEN

THEORY CLASS: Groups: 6 , 7
FIELD WORK PRACTICALS: Groups: 6 , 7
PROBLEM PRACTICALS / WORKSHOP: Groups: 6 , 7



DIONIS RIVERA, SARA

THEORY CLASS: Groups: 8 , 9
FIELD WORK PRACTICALS: Groups: 8 , 9
PROBLEM PRACTICALS / WORKSHOP: Groups: 8 , 9



LIMIÑANA MORCILLO, RUBEN

THEORY CLASS: Groups: 2
FIELD WORK PRACTICALS: Groups: 2
PROBLEM PRACTICALS / WORKSHOP: Groups: 2



NICOLAS CASTELLANO, CAROLINA

THEORY CLASS: Groups: 10
FIELD WORK PRACTICALS: Groups: 10
PROBLEM PRACTICALS / WORKSHOP: Groups: 10



REY CUBERO, ALEXANDRA

THEORY CLASS: Groups: 1 , 5
FIELD WORK PRACTICALS: Groups: 1 , 5
PROBLEM PRACTICALS / WORKSHOP: Groups: 1 , 5



ROSA CINTAS, SERGIO

THEORY CLASS: Groups: 3
FIELD WORK PRACTICALS: Groups: 3
PROBLEM PRACTICALS / WORKSHOP: Groups: 3

Groups

THEORY CLASS

Group	Semester	Morning or afternoon session	Language	No. of enrolled students		On registration, distribution
Gr. 1 (THEORY CLASS) : 1 PRIMARY (SPANISH-MORNING)	1S	Morning	Spanish	50	<ul style="list-style-type: none"> ▪ Allowed INTERNATIONAL MOBILITY PROGRAMME ▪ Allowed DEGREE IN PRIMARY SPECIALITY 	From ID document number A - To ID document number Z
Gr. 10 (THEORY CLASS) : 10 PRIMARY (SPANISH-MORNING)	1S	Morning	Spanish	27	<ul style="list-style-type: none"> ▪ Allowed DEGREE IN PRIMARY SPECIALITY ▪ Allowed INTERNATIONAL MOBILITY PROGRAMME 	From ID document number A - To ID document number Z
Gr. 2 (THEORY CLASS) : 2 PRIMARY (SPANISH-MORNING)	1S	Morning	Spanish	49	<ul style="list-style-type: none"> ▪ Allowed DEGREE IN PRIMARY SPECIALITY ▪ Allowed INTERNATIONAL MOBILITY PROGRAMME 	From ID document number A - To ID document number Z
Gr. 3 (THEORY CLASS) : 3 PRIMARY (VALENCIAN-MORNING)	1S	Morning	Valencian	54	<ul style="list-style-type: none"> ▪ Allowed DEGREE IN PRIMARY SPECIALITY 	From ID document number A - To ID document number Z
Gr. 4 (THEORY CLASS) : 4 HIGH ACADEMIC PERFORMANCE GROUP (ARA)	1S	Morning	English	33	<ul style="list-style-type: none"> ▪ Allowed INTERNATIONAL MOBILITY PROGRAMME ▪ Allowed DEGREE IN PRIMARY SPECIALITY 	From ID document number A - To ID document number Z
Gr. 5 (THEORY CLASS) : 5 PRIMARY (SPANISH-MORNING)	1S	Morning	Spanish	52	<ul style="list-style-type: none"> ▪ Allowed DEGREE IN PRIMARY SPECIALITY ▪ Allowed INTERNATIONAL MOBILITY PROGRAMME 	From ID document number A - To ID document number Z
Gr. 6 (THEORY CLASS) : 6 PRIMARY (SPANISH-AFTERNOON)	1S	Afternoon	Spanish	50	<ul style="list-style-type: none"> ▪ Allowed DEGREE IN PRIMARY SPECIALITY ▪ Allowed INTERNATIONAL MOBILITY PROGRAMME 	From ID document number A - To ID document number Z
Gr. 7 (THEORY CLASS) : 7 PRIMARY (SPANISH-AFTERNOON)	1S	Afternoon	Spanish	37	<ul style="list-style-type: none"> ▪ Allowed INTERNATIONAL MOBILITY PROGRAMME ▪ Allowed DEGREE IN PRIMARY SPECIALITY 	From ID document number A - To ID document number Z
Gr. 8 (THEORY CLASS) : 8 PRIMARY (SPANISH-AFTERNOON)	1S	Afternoon	Spanish	32	<ul style="list-style-type: none"> ▪ Allowed INTERNATIONAL MOBILITY PROGRAMME ▪ Allowed DEGREE IN PRIMARY SPECIALITY 	From ID document number A - To ID document number Z
Gr. 9 (THEORY CLASS) : 9 PRIMARY (VALENCIAN-AFTERNOON)	1S	Afternoon	Valencian	32	<ul style="list-style-type: none"> ▪ Allowed DEGREE IN PRIMARY SPECIALITY 	From ID document number A - To ID document number Z

FIELD WORK PRACTICALS

Group	Semester	Morning or afternoon session	Language	No. of enrolled students
Gr. 1 (FIELD WORK PRACTICALS) : 1 PRIMARY (SPANISH-MORNING)	1S	Morning	Spanish	50
Gr. 10 (FIELD WORK PRACTICALS) : 10 PRIMARY (SPANISH-MORNING)	1S	Morning	Spanish	27
Gr. 2 (FIELD WORK PRACTICALS) : 2 PRIMARY (SPANISH-MORNING)	1S	Morning	Spanish	49
Gr. 3 (FIELD WORK PRACTICALS) : 3 PRIMARY (VALENCIAN-MORNING)	1S	Morning	Valencian	54
Gr. 4 (FIELD WORK PRACTICALS) : 4 HIGH ACADEMIC PERFORMANCE GROUP (ARA)	1S	Morning	English	33
Gr. 5 (FIELD WORK PRACTICALS) : 5 PRIMARY (SPANISH-MORNING)	1S	Morning	Spanish	52
Gr. 6 (FIELD WORK PRACTICALS) : 6 PRIMARY (SPANISH-AFTERNOON)	1S	Afternoon	Spanish	50
Gr. 7 (FIELD WORK PRACTICALS) : 7 PRIMARY (SPANISH-AFTERNOON)	1S	Afternoon	Spanish	37
Gr. 8 (FIELD WORK PRACTICALS) : 8 PRIMARY (SPANISH-AFTERNOON)	1S	Afternoon	Spanish	32
Gr. 9 (FIELD WORK PRACTICALS) : 9 PRIMARY (VALENCIAN-AFTERNOON)	1S	Afternoon	Valencian	32











PROBLEM PRACTICALS / WORKSHOP

Group	Semester	Morning or afternoon session	Language	No. of enrolled students
Gr. 1 (PROBLEM PRACTICALS / WORKSHOP) : 1 PRIMARY (SPANISH-MORNING)	1S	Morning	Spanish	50
Gr. 10 (PROBLEM PRACTICALS / WORKSHOP) : 10 PRIMARY (SPANISH-MORNING)	1S	Morning	Spanish	27
Gr. 2 (PROBLEM PRACTICALS / WORKSHOP) : 2 PRIMARY (SPANISH-MORNING)	1S	Morning	Spanish	49
Gr. 3 (PROBLEM PRACTICALS / WORKSHOP) : 3 PRIMARY (VALENCIAN-MORNING)	1S	Morning	Valencian	54
Gr. 4 (PROBLEM PRACTICALS / WORKSHOP) : 4 HIGH ACADEMIC PERFORMANCE GROUP (ARA)	1S	Morning	English	33
Gr. 5 (PROBLEM PRACTICALS / WORKSHOP) : 5 PRIMARY (SPANISH-MORNING)	1S	Morning	Spanish	52
Gr. 6 (PROBLEM PRACTICALS / WORKSHOP) : 6 PRIMARY (SPANISH-AFTERNOON)	1S	Afternoon	Spanish	50
Gr. 7 (PROBLEM PRACTICALS / WORKSHOP) : 7 PRIMARY (SPANISH-AFTERNOON)	1S	Afternoon	Spanish	37








Group	Semester	Morning or afternoon session	Language	No. of enrolled students
Gr. 8 (PROBLEM PRACTICALS / WORKSHOP) : 8 PRIMARY (SPANISH-AFTERNOON)	1S	Afternoon	Spanish	32
Gr. 9 (PROBLEM PRACTICALS / WORKSHOP) : 9 PRIMARY (VALENCIAN-AFTERNOON)	1S	Afternoon	Valencian	32




Timetables

THEORY CLASS










Group	Start date	End date	Day	Start time	End time	Lecture room
1	09/09/2024	20/12/2024	MAR	08:00	09:00	0702P2055 
10	09/09/2024	20/12/2024	MAR	12:00	13:00	0702P2064 
2	09/09/2024	20/12/2024	MAR	10:00	11:00	0702P2055 
3	09/09/2024	20/12/2024	MAR	10:00	11:00	0702P2064 
4	09/09/2024	20/12/2024	MAR	12:00	13:00	0702P2055 
5	09/09/2024	20/12/2024	MAR	12:00	13:00	ED/1-15 
6	09/09/2024	20/12/2024	MAR	15:00	16:00	0702P2055 
7	09/09/2024	20/12/2024	MAR	17:00	18:00	0702P2055 
8	09/09/2024	20/12/2024	MAR	17:00	18:00	0702P2064 
9	09/09/2024	20/12/2024	MAR	19:00	20:00	0702P2055 

FIELD WORK PRACTICALS

Group	Start date	End date	Day	Start time	End time	Lecture room
1	09/09/2024	20/12/2024	MAR	09:00	10:00	0702P2055 
10	09/09/2024	20/12/2024	MAR	13:00	14:00	0702P2064 
2	09/09/2024	20/12/2024	MAR	11:00	12:00	0702P2055 
3	09/09/2024	20/12/2024	MAR	11:00	12:00	0702P2064 
4	09/09/2024	20/12/2024	MAR	13:00	14:00	0702P2055 
5	09/09/2024	20/12/2024	MAR	13:00	14:00	ED/1-15 
6	09/09/2024	20/12/2024	MAR	16:00	17:00	0702P2055 

Group	Start date	End date	Day	Start time	End time	Lecture room
7	09/09/2024	20/12/2024	MAR	18:00	19:00	0702P2055. 
8	09/09/2024	20/12/2024	MAR	18:00	19:00	0702P2064. 
9	09/09/2024	20/12/2024	MAR	20:00	21:00	0702P2055. 

PROBLEM PRACTICALS / WORKSHOP

Group	Start date	End date	Day	Start time	End time	Lecture room
1	09/09/2024	20/12/2024	JUE	08:00	10:00	0702P2055. 
10	09/09/2024	20/12/2024	JUE	12:00	14:00	0702P2064. 
2	09/09/2024	20/12/2024	JUE	10:00	12:00	0702P2055. 
3	09/09/2024	20/12/2024	JUE	10:00	12:00	0702P2064. 
4	09/09/2024	20/12/2024	JUE	12:00	14:00	0702P2055. 
5	09/09/2024	20/12/2024	JUE	12:00	14:00	ED/1-15 
6	09/09/2024	20/12/2024	JUE	15:00	17:00	0702P2055. 
7	09/09/2024	20/12/2024	JUE	17:00	19:00	0702P2055. 
8	09/09/2024	20/12/2024	JUE	17:00	19:00	0702P2064. 
9	09/09/2024	20/12/2024	JUE	19:00	21:00	0702P2055. 