Information about the subject

Degree: Master of Secondary Education Training, Professional Training and Teaching of Languages

Faculty: Faculty of Teaching and Education Sciences

Code: 1020017 **Name:** Resources for the teaching of Natural Sciences

Credits: 6 ECTS **Year: 1** **Semester: 2º**

Module: Specific

Subject Matter: Resources for the teaching of Natural Sciences **Type:** Compulsory

Department: Department of mathematics, natural sciences and social sciences applied to education

Type of learning: : Classroom-based learning

Language(s) in which it is taught: Spanish

Lecturer/-s

Dra. **Esther Moreno-Latorre** esther.moreno@ucv.es

Module organization

BASIC THEORETICAL TRAINING

Subject Matter	ECTS	Subject	ECTS	Year/semester
Complements for the formation to discipline	6	Natural Sciences curriculum for Secondary Education and hight School	6	1/2
Learning and teaching materials	12	Teaching of Natural Sciences	6	1/2
		Resources for the teaching of Natural Sciences for Secondary Education and High School	6	1/2
Teaching innovation and introduction to educational research	6	Innovation and research in Science Teaching of Nature	6	1/2

Recommended insights

Not applicable

Learning outcomes

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

Code	Learning outcomes
R1	Understand the fundamentals of the main didactic models in the teaching of Biology and Geology in Secondary Education.
R2	It recognises the importance of contextualisation in the analysis and design of didactic proposals, with express reference to everyday life.
R3	Develop didactic proposals consistent with significant learning of science and taking into account students with special educational needs.
R4	Identify the characteristics of the specific didactics of Biology and Geology.
R5	Use appropriate information from sources of relevance in science education.
R6	Appropriately uses different methodological strategies and evaluation instruments in the design of activities for the teaching of Biology and Geology.

Competences

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

Code	General	Weighting			
		1	2	3	4
G1	Competence in the application of acquired knowledge and problem solving abilities, encountered in new or unfamiliar environments; and, initiated within broader contexts or multidisciplinary scopes relative to one's field of study.				x
G2	Capability to integrate knowledge and determine complex judgment calls based on information which incorporates, but is not limited to, reflections on social and ethical responsibilities associated with pertinent knowledge and judgments			x	
G3	Knowing how to effectively communicate conclusions (sustaining relative rationale or arguments) to specialized and unspecialized audiences, in a clear and unambiguous manner.				x
G4	Having learning skills that enable them to continue studying in a self-directed or autonomous manner within the majority of circumstances				x
G5	To Know the curriculum related to the specialization and the didactics of teaching and learning, as well as a didactic knowledge of the teaching and learning processes, respectively. A knowledge of the different professions will be included for vocational training.		x		
G6	To plan, develop and evaluate the teaching and learning process enhancing educational activities to facilitate the acquisition of the different competences, taking into account the level and previous training of students to guide them, both individually and in collaboration with other teachers and school professionals				x
G7	To research, obtain, process and communicate information (oral, printed, audiovisual, digital, or multimedia), transforming it into knowledge that will be applied in the teaching and learning process				x
G10	To acquire strategies to encourage student effort and enhance their capacity to learn by themselves and with others, and develop thinking skills and decision-making abilities to facilitate autonomy, confidence and personal initiative.			x	
G11	To know the processes of interaction and communication in the classroom, mastering social skills necessary to promote learning and coexistence together in the classroom, dealing with problems of discipline and conflict resolution			x	
G15	To inform and advise families about the process of teaching and learning and personal counseling to know the academic and professional development of their children	x			

G9	To design and develop learning processes with special attention to equity, education and emotional values, equal rights and opportunities between men and women, civic education and respect for human rights that facilitate life in our society, making decisions and building a sustainable future.			x	
G8	To set the curriculum that will be established in a school. To develop and implement teaching methodologies, for both groups and individuals, taking into account the diversity of students				x
G12	To design and carry out formal and informal activities that make the centre a place of participation and culture in the environment where it is located. To perform the functions of mentoring and guiding students in a collaborative and coordinated way. To participate in the evaluation, research and innovation of teaching and learning				x
G13	To know the rules and institutional organization of the education system and models of improvement in quality in schools.		x		
G14	To know and analyze the historical characteristics of the teaching profession, its current status, perspectives and interaction with the social reality of the time.	x			

Code	Specific	Weighting			
		1	2	3	4
CE1	Knowing the cultural and educational value of the relevant areas of specialization and contents that are taught in the respective teachings	x			
CE2	Knowing the history and recent developments and prospects materials to convey a dynamic view.		x		
CE3	Knowing contexts and situations in which use or apply the various curricular contens.			x	
CE4	Knowing the theoretical and practical aspects of teaching and learning materials				x
CE5	Transforming educational curriculum in specific programs				x
CE6	Acquire criteria for selection and development of educational materials.				x
CE7	Encourage a climate that facilitates learning and put in value the contributions of students			x	
CE8	Integrating training with media studies in the teaching-learning process				x
CE9	Learn strategies and techniques for assessing and understanding the evaluation as a tool to regulate and encourage the efforts				x
CE10	Know and apply innovative teaching proposals in the field of specialization Studied.				x
CE11	Analyze critically the process of teaching, of good practice and orientation using quality indicators				x
CE12	Identify issues related to teaching and learning matters and to propose alternatives and solutions				x

CE13	Understand and apply methods and techniques of research and evaluation and to be able to design and develop research, innovation and evaluation.				x

Assessment system for the acquisition of competencies and grading system

Resultados de aprendizaje evaluados	Porcentaje otoígado	Instrumento de evaluación
R1,R2, R3, R4	30%	Written and oral tests
R1, R2, R3, R3, R4	40%	presentation of group work
R1, R2, R3, R4	20%	presentation of individual reports
R1, R2R3, R4	10%	Active participation in the development of the different activities of the course/subject/module. modul

Mention of Distinction: *In accordance with the regulations governing the assessment and grading of subjects in force at UCV, the distinction of "Matrícula de Honor" (Honours with Distinction) may be awarded to students who have achieved a grade of 9.0 or higher. The number of "Matrículas de Honor" (Honours with Distinction) may not exceed five percent of the students enrolled in the group for the corresponding academic year, unless the number of enrolled students is fewer than 20, in which case a single "Matrícula de Honor" (Honours with 9 Distinction) may be awarded.*
Exceptionally, these distinctions may be assigned globally across different groups of the same subject. Nevertheless, the total number of distinctions awarded will be the same as if they were assigned by group, but they may be distributed among all students based on a common criterion, regardless of the group to which they belong.
The criteria for awarding "Matrícula de Honor" (Honours with Distinction) will be determined according to the guidelines stipulated by the professor responsible for the course, as detailed in the "Observations" section of the evaluation system in the course guide.

Single evaluation: *Exceptionally, those students who, for unforeseen, justified and accredited reasons, cannot undergo the continuous evaluation system and request it from the Coordination of the specialty, within the first month of teaching, may opt for this evaluation system.*
In this case, it will be evaluated as follows: the student will submit, through UCVnet, all the work carried out during the course, within the established deadlines. Likewise, you will take the evaluation test on the date assigned for this purpose.

Learning activities

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

M1	Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge.
M2	Group work sessions supervised by the professor. Case studies, diagnostic tests, problems, field work, computer room, visits, data search, libraries, on-line, Internet, etc. Meaningful construction of knowledge through interaction and student activity.
M3	Application of multidisciplinary knowledge.
M4	Personalized and small group attention. Period of instruction and/or orientation carried out by a tutor to review and discuss materials and topics presented in classes, readings, papers, etc.
M5	Set of oral and/or written tests used in initial, formative or additive assessment of the student
M6	Group preparation of readings, essays, problem solving, seminars, papers, reports, etc. to be presented or submitted in theoretical lectures, practical and/or small-group tutoring sessions.
M7	Student study: Group Individual preparation of readings, essays, problem solving, seminars, papers, reports, etc. to be presented or submitted in theoretical lectures, practical and/or small-group tutoring sessions.

IN-CLASS LEARNING ACTIVITIES		
Activity	**Learning Outcomes**	**ECTS**
ON-CAMPUS CLASS	R1,R4,R5	1
PRACTICAL CLASSES	R1,R2,R3,R4,R6	1,2
GROUP PRESENTATION OF PAPERS	R1,R2,R3,R5,R6	0,06
OFFICE ASSISTANCE	R1,R2,R3,R4,R5,R6	0,04
ASSESSMENT	R1,R2,R3,R4,R5,R6	0,10
	Total	2,4

LEARNING ACTIVITIES OF AUTONOMOUS WORK		
Activity	**Learning Outcomes**	**ECTS**
GROUP WORK	R2,R3,R4,R5	**1,44**
INDEPENDENT WORK	R1,R2,R3,R4,R5,R6	**2,16**
	Total	3,6

Description of the contents

Description of the necessary contents to acquire the learning outcomes:

CONTENT BLOCK	Contents
Introduction to educational methodology in the field of natural sciences. Didactic strategies and resarces/ module	Introduction to educational methodology in natural sciences. Strategies and teaching resources.
Methodological strategies in the classroom. Application to the contents of natural sciences in secondary education.	Methodological strategies in the classroom. Application to the contents of the natural sciences in secondary education
Didactic materials and educational resources in the didactics of natural sciences: fundamentals, analysis and selection applied to different training situations.	Analysis, development and evaluation of educational proposals from innovative methodologies developed. The teaching materials and educational resources in the teaching of natural sciences: foundations, analysis and selection applied to different training Situations
The evaluation	The evaluation in the knowledge of Natural Sciences Analysis, elaboration and evaluation of didactic proposals developed from active methodologies.

Temporary organization of learning

BLOCK OF CONTENT/DICACTIC UNIT	Number of sessions	Hours
Introduction to educational methodology in natural sciences. Strategies and teaching resources.	2	5
Methodological strategies in the classroom. Application to the contents of the natural sciences in secondary education.	4	10
Analysis, development and evaluation of educational proposals from innovative methodologies developed	2	5
The textbook as an educational resource	2	5
Field trips	2	5
metodologías activas	2	5

References

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CAÑAL P. (coord.) (2011) *Biología y Geología*. Complementos de formación disciplinar Barcelona: Graó
CAÑAL P. (coord.) (2011) *Biología y Geología Investigación, innovación y buenas prácticas* Barcelona: Graó
CAÑAS, A., MARTÍN-DIAZ, M.J. y NIEDA, J. (2007) Competencia en el conocimiento y la interacción con el medio físico. Madrid: Alianza Editorial
CATALÁ, M. y otros (2002) *Las ciencias en la escuela: teoría y prácticas*. Barcelona: Graó
DRIVER, R., GUESNE, E. y TIBERGHIEN, A. (1992) *Ideas científicas en la infancia y la adolescencia*. Madrid: Morata
HARLEN, W. (2007) *Enseñanza y aprendizaje de las ciencias*. Madrid: Morata
JIMÉNEZ, M. P. (Coord.) (2003) *Enseñar ciencias*. Barcelona: Graó
PEDRINACI (Coord.) (2012) El desarrollo de la competencia científica. 11 ideas clave. Barcelona: Graó
PUJOL, R. M. (2007) *Didáctica de las ciencias en la educación primaria*. Madrid: Síntesis.
SANMARTÍ, N. (2002) *Didáctica de las ciencias en la educación secundaria*. Madrid: Síntesis
SANMARTÍ, N. (2007) *Evaluar para aprender.10 ideas clave.* Barcelona: Graó
VVAA (2008) *Hacemos ciencia en la escuela: experiencias y descubrimientos*. Barcelona: Graó
VVAA (2002) *Las ciencias en la escuela. Teoría y prácticas*. Barcelona: Graó

National Journals

Enseñanza de las ciencias (www.ensciencias.uab.es/)
Alambique (www.alambique.grao.com)
Eureka (www.apac-eureka.org.revista/Consejo_revista.htm)
Enseñanza de las Ciencias de la Tierra (www.aepect.org/nuestra_revista)
REEC (saum.uvigo.es/reec/)
Investigación en la Escuela (www.diadaeditora.com)

Complementary bibliography

GARRIDO, J.M., PERALES, F.J. y GALDÓN, M. (2009) *Ciencia para educadores* Madrid: Pearson
GIL,D., VILCHES, A. (2006) "Educación ciudadana y alfabetización científica: Mitos y realidades" *Revista Iberoamericana de educación* 42, 31-53.
GONZÁLEZ, M.P. (Coord.) (2003) *Prácticas de laboratorio y de aula. Biología, Ecología, Genética y Geología*. Madrid: Narcea-MEC
LÓPEZ, J., LOPEZ, R., CARDENETE, S. y CARMONA, J. (1999) *Técnicas experimentales de laboratorio*. Madrid: McGraw Hill
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Website addresses

http://recursostic.educacion.es/ciencias/biosfera/web/
Proyecto Biosfera. Página elaborada por el Ministerio de Educación sobre el área de Ciencias de la Naturaleza (Biología y Geología)
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