



COURSE GUIDE
Universidad Católica de Valencia

Teaching Innovation and Introduction to
Educational Research in Natural Sciences

2023-24



COURSE GUIDE

| | | ECTS |
|---|---|------|
| MODULE: Biology and Geology | | 24 |
| FIELD: Teaching Innovation and Introduction to Educational Research in Biology and Geology | | 6 |
| Subject: Teaching Innovation and Introduction to Educational Research in Biology and Geology | | 6 |
| Type of learning: Compulsory | YEAR: 1 Semester: 2 | |
| Lecturer: Dra. Clara Gomis | Department: Basic and Transversal Sciences | |
| | E-mail: clara.gomis@ucv.es | |

SUBJECT ORGANIZATION

| BIOLOGY AND GEOLOGY | | | | Nº ECTS: 24 |
|---|------|---|------|-----------------|
| Duration and temporal location within the curriculum: 2 ND Semester. | | | | |
| Subjects and Courses | | | | |
| Subject | ECTS | Courses | ECTS | Course/semester |
| Complements for the formation to B and G | 6 | Curriculum of Natural Sciences in ESO and Bachillerato | 6 | 1/2 |
| Learning and education on B and G | 6 | Didactics of Natural Sciences | 6 | 1/2 |
| | | Didactic resources for the education of Natural Sciences | 6 | 1/2 |
| Teaching Innovation and Introduction to Educational Research in Biology and Geology | 6 | Teaching Innovation and Introduction to Educational Research in Biology and Geology | 6 | 1/2 |

**COURSE GUIDE TO THE SUBJECT****Prerequisites:** none**GENERAL GOALS**

- a. Learn to critically analyze the performance of teaching, good practice and guidance from quality indicators
- b. Learn to identify situations regarding teaching and learning in school, to be able to propose research involving alternatives and solutions.
- c. Learn to transform the educational proposals in programmes of activities and work, purchasing criteria of selection and preparation of educational materials.
- d. Know and implement and apply to the proposed classroom teachers innovative, dynamic improvement and search for quality in education.
- e. Know and apply methodologies and techniques of educational research and evaluation, and be able to design and develop projects of research, innovation and evaluation.
- f. Learn to find, obtain and process information and transform it into knowledge in processes of teaching self-education.
- g. Know linking theory with practice to improve while the latter is involved in the construction of the knowledge of teaching.
- h. Know how to communicate research and proposals to specialized audiences.

CROSS-SECTIONAL COMPETENCES**Competence
measuring scale**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| G 1 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 | |
| G 2 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 |
| G 3 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 | | |
| G 6 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 | | | X | |



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| teachers and school professionals. | | | | |
| 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 | |

| | 1 | 2 | 3 | 4 |
|--|---|---|---|---|
| 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 | |
| G 11 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 | |
| G 15. 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 | | | |

| | 1 | 2 | 3 | 4 |
|--|---|---|---|---|
| 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 | |
| G 8 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 | | | |



| SPECIFIC COMPETENCES | | | | |
|--|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| E1 To know the cultural and educational value of the specific subjects and the content that is taught | X | | | |
| E2 To know the history and recent developments of the classroom subjects and their perspectives in order to transmit a dynamic vision. | | X | | |
| E3 To know different environments to practice curricular contents. | X | | | |
| E4 To know the theoretical and practical processes in teaching and learning different classroom subjects | | X | | |
| E5 To transform curricula in activity and work programs | | | X | |
| E6 To acquire criteria to select and develop educational resources | | | X | |
| E7 To foster a climate that facilitates learning and values the contributions of the students | | X | | |
| E8 To integrate training for the use of media studies in the teaching-learning process | | | | X |
| E9 To learn evaluation strategies and techniques and to understand evaluation as a tool to regulate and encourage the effort. | | | X | |
| E10 To know and apply innovative teaching proposals in the field of specialization | | | | X |
| E11 To analyze critically the process of teaching, the practicum and the direction using quality indicators | | | | X |
| E12 To identify the problems of teaching and learning certain materials and to propose alternatives and solutions. | | | | X |
| E13 To understand and apply methods and basic techniques of research and evaluation and to be able to design and develop research, innovation and evaluation projects. | | | | X |

| LEARNING OUTCOMES | COMPETENCES |
|--|--|
| RA Understand the concept of quality to critically analyze the teaching practices. | G2, G10, G9, G12, G13, G14, E7, E8, E9, E10, E11, E12, E13 |



| | |
|---|--|
| RB Identify the most frequent situations related to the process of teaching and learning | G1, G2, G4, G5, G6, G10, G11, G15, G8, G12, E2, E3, E4, E6, E7, E8, E9, E11, E12 |
| RC Learn to transform a simple educational proposal in a sequence of activities by selecting the most suitable educational material | G1, G4, G5, G6, G11, G9, G8, E1, E3, E4, E5, E6, E8, E9 |
| RD Understand the concept of innovation and evaluation in relation to the classroom | G5, G12, G13, E2, E7, E8, E9, E10, E11, E12, E13 |
| RE Be able to design a short research project and evaluate the result | G2, G7, G12, E9, E10, E11, E12, E13 |
| RF Know relevant information on specific training issues | G1, G4, G5, G7, G9, G12, E1, E2, E12, E13 |
| RG Know relate theory and practice to build teacher knowledge. | G2, G4, G5, G6, G7, G10, G14, E2, E3, E4, E5, E6, E8, E9, E11, E13 |
| RH Know how to communicate a brief didactic proposal or research in a formal situation | G1, G3, G6, G7, G11, G12, E7, E13 |

| ON-CAMPUS EDUCATIONAL ACTIVITIES | | | |
|----------------------------------|--|---|------|
| ACTIVITY | Teaching-Learning Methodology | Relationship With Learning Outcomes for the subject | ECTS |
| CLASS | Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge. | RA, RB, RC, RD, RE | 1,15 |
| PRACTICAL CLASSES | 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. | RA, RB, RC, RD, RE, RF, RG, RH | 0,67 |

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| LABORATORY | Activities carried out in spaces with specialized equipment. | RA, RB, RD, RE, RF, RG | 0,3 |
| SEMINAR | Supervised monographic sessions with shared participation | RA, RB, RD, RG, RH | 0,06 |
| GROUP PRESENTATION OF PAPERS | Application of multidisciplinary knowledge | RA, RB, RC, RE, RF, RG, RH | 0,06 |
| OFFICE ASSISTANCE | 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, seminars, readings, papers, etc. | RA, RB, RE, RF | 0,04 |
| ASSESSMENT | Set of oral and/or written tests used in initial, formative or additive assessment of the student | RA, RC, RD, RE, RF, RG, RH | 0,12 |
| Total | | | 2,4 |

INDEPENDENT WORK ACTIVITIES

| ACTIVITY | Teaching-Learning Methodology | Relationship of Course with Learning Outcomes | ECTS |
|------------------|---|---|------|
| GROUP WORK | 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. Work done on the university e-learning platform (www.plataforma.ucv.es) | RC, RD, RE, RF, RG, RH | 1,44 |
| INDEPENDENT WORK | Student study: Group Individual preparation of | RC, RD, RE, RF, RG, RH | 2,16 |



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|-------|--|--|-----|
| | readings, essays, problem solving, seminars, papers, reports, etc. to be presented or submitted in theoretical lectures, practical and/or small-group tutoring sessions. Work done on the university e-learning platform (www.plataforma.ucv.es) | | |
| Total | | | 3,6 |

| SYSTEM FOR ASSESSING THE ACQUISITION OF THE COMPETENCES AND ASSESSMENT SYSTEM | | |
|---|--------------------------------|----------------------|
| Assessment Tool | LEARNING OUTCOMES ASSESSED | Allocated Percentage |
| Written exams | RA, RB, RC, RD, RE, RF, RG, RH | 40 % |
| Seminars and directed Works | RB, RC, RD, RE, RG, RH | 30 % |
| Directed Questions | RA, RC, RD, RE, RF, RG, RH | 30 % |

MENTION OF DISTINCTION:

The mention of Distinction will be awarded to students who have achieved a score equal to or greater than 9.0. The number of Distinctions granted will not exceed 5% of students enrolled in a subject in the corresponding academic year unless enrollment is under 20, in which case only one Distinction may be granted. (RD 1125/2003).



| DESCRIPTION OF CONTENTS | COMPETENCES |
|--|--------------------------|
| Educational Research in Biology and Geology. Visions of the science and the scientific activity. Methodologies to research. Design and development of research projects. Final project. | E2, E3, E5, E11, E12 |
| Quality and Education. Quality in the educational activity and high schools. | E6, E7, E11 |
| Teacher: The attitudes of the student body towards the sciences and his learning. Difficulties in the learning of the sciences and strategies to overcome them. Areas of professional investigation: knowledge to discipline, you design of the pupils, educational contents, methodologies of education, process of evaluation, didactic models, offers of innovation, etc. | E1, E4, |
| Educational innovation. Know and apply innovative teaching approaches in the field of natural sciences. | E5, E6, E8, E9, E10, E13 |

REFERENCES

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Addendum to the Course Guide of the Subject Teaching Innovation and Introduction to Educational Research in Natural Sciences

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



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 onsite activities described in this section of the Course Guide, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

Microsoft Teams



Explanation about the practical sessions:



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 |
|--------------|------------|
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Comments to the Assessment System: