



Didactics of Natural
Sciences (Biology and
Geology, and Physics and
Chemistry)

**Master en Bilingual
Education**



UNIVERSIDAD
NEBRIJA

TEACHING GUIDE

Subject: Didactics of Natural Sciences (Biology and Geology, and Physics and Chemistry)

Degree: Master in Bilingual Education

Type: Optional

Language: English

Modality: Blended and online

Credits: 6

Course: 1

Semester: 2

Professor: Dr. Manuel Blázquez Merino

1. COMPETENCES AND LEARNING OUTCOMES

1.1. Competences

Basic competences

CB6 To possess and understand knowledge that provides the basis and opportunity to be original in the development and application of ideas, often within a research context.

CB7 That students know how to apply the knowledge acquired and the capacity for problem solving in new and lesser-known environments within the broadest (or multi-disciplinary context) in relation to their area of study.

CB8 That students are capable of integrating knowledge and facing the complexity of opinion forming starting from information that, being incomplete or limited, includes reflections on the social and ethical responsibilities that are linked to the application of opinions and judgements.

CB9 That students know how to communicate their conclusions, and the knowledge and reasoning that supports them to a specialist and non-specialist public in a clear and unambiguous manner.

CB10 That students possess the learning ability that allows them to continue studying in a way that will be largely self-directed or autonomous.

General competences

CG2 To know about the specific problems of foreign language teaching in both linguistic and cultural terms in a bilingual environment.

CG3 To apply the knowledge acquired in decision making in relation to the different factors involved in the teaching and learning of foreign languages.

CG5 To be capable of transmitting social and cultural values in accordance with the current multilingual and multicultural reality.

CG7 To acquire basic theoretical knowledge designed as the foundation of an informed teaching practice in an environment of bilingual education.

CG8 To know the legislation and regulations with reference to the ordination and organisation of bilingual centres.

Specific competences

CE2 To create and adapt didactic materials for English/Spanish bilingual education, modifying the linguistic level with awareness of different rhythms of learning, and adapting authentic materials to transform them into didactic material.

CE3 To know about the instruments for planning and evaluation necessary in the teaching/learning of English/Spanish.

CE4 To develop and apply didactic methodologies adapted to the diversity of students in an English/Spanish bilingual environment.

CE6 To incorporate new strategies, teaching materials, and information technology to activities in the English/Spanish bilingual classroom.

CE8 To be capable of using specialist terminology in English and Spanish in the field of second language acquisition.

CE10 To be capable of communicating with fluency at C1 level of the European Common Framework.

CE13 To know and to know how to apply the advantages of the communicative approach and learning by tasks method for linguistic interaction in English and Spanish.

CE27 To know the elements of the syllabuses, methodology, and objectives of Natural Sciences (Biology, Geology, Physics, and Chemistry).

CE28 To be able to adapt the contents to the diversity of students in Natural Sciences (Biology, Geology, Physics, and Chemistry)

CE29 Ser capaz de utilizar las técnicas didácticas más apropiadas para el área de Ciencias Naturales (Biología, Geología, Física y Química).

1.2. Learning outcomes:

At the end of the subject, the student must:

- Know how to apply the knowledge acquired and the capacity to resolve problems in new environments within their area of study, the teaching/learning of foreign languages
- Be capable of integrating their knowledge, facing the complexity of forming opinions starting from incomplete information on social and ethical responsibilities linked to their area of study.
- Be capable of communicating reasonably on themes related to their area of study. Be capable of acquiring new knowledge in an autonomous manner in their field, the teaching and learning of foreign languages.
- Be capable of transmitting social and cultural values that attend to the multilingual and multicultural European reality
- Know how to base their teaching practice in an informed manner according to the knowledge acquired
- Be capable of creating and adapting didactic materials to bilingual teaching taking into account the different levels of linguistic competence and different rhythms of learning
- Know the instruments of evaluation necessary in the teaching/learning of English language
- Know how to develop and apply methodologies to the diversity of the students in a bilingual environment
- Be capable of incorporating new strategies, materials, and technologies to activities in the bilingual classroom
- Practice and acquire the skills necessary to reach C1 level in English language
- Know the curricular elements, methodology and objectives of the area of Natural Sciences (Biology, Geology, Physics and Chemistry) in a bilingual environment; that they know how to adapt the content to the diversity of their students

2. CONTENTS

2.1. Previous requirements:

None

2.2. Description of contents:

This course deals with the didactics of CLIL Science teaching, Biology and Geology in the 1st cycle of Compulsory Secondary Education, Physics and Chemistry in the 1st cycle of Compulsory Secondary Education, Science Subjects in the 2nd Cycle of Compulsory Secondary Education, design and development of didactic units in science, ICT tools to enhance Science teaching and learning processes, and assessment of Science subjects: functions, criteria and procedures.

2.3. Detailed content:

1. Didactics of CLIL Science teaching
2. Biology and Geology in the 1st cycle of Compulsory Secondary Education
3. Physics and Chemistry in the 1st cycle of Compulsory Secondary Education
4. Science Subjects in the 2nd Cycle of Compulsory Secondary Education
5. Design and development of didactic units in Science
6. ICT tools to enhance Science teaching and learning processes
7. Assessment of Science subjects: functions, criteria and procedures.

2.4. Training activities

Blended modality

Training activities	Hours	Percentage of attendance
AF1. Teaching sessions	51,4	34,3%
AF2. Individual and group learning activities outside the teaching sessions	53,6	30%
AF3. Tutorials	15	10%
AF4. Complementary training activities	15	10%
AF7. Evaluation Activities	15	0%

Online modality:

Training activities	Hours	Percentage of attendance
AF1. Teaching sessions	51,4	0%
AF2. Individual and group learning activities outside the teaching sessions	53,6	0%
AF3. Tutorials	15	0%
AF4. Complementary training activities	15	0%
AF7. Evaluation Activities	15	0%

2.5 Teaching methodologies

An active didactic methodology in which the student is the protagonist of their own learning process, and the teacher an expert in the field. The teacher will possess the knowledge of the materials and resources necessary to help the student in the learning process and to optimise their learning strategies. Through interaction and mutual co-operation, the student will achieve the competencies that they can then incorporate within their professional profile.

The teaching methodology will combine real-life and online teaching in the semi-present mode and online teaching in the online mode. This is therefore a mixed methodology that will be supported by the use of ICT as well as collaborative work (forums, chats, video-conferences) in accordance with the teacher's tools (agenda, announcements, files of materials, and links). For this purpose, the Virtual Campus will be used with the Blackboard Ultra platform. This interactive methodology requires the systematic and continuous active participation of the students and teachers.

3. EVALUATION SYSTEM:

3.1 Grading

The grading system (R.D. 1125/2003, of 5th September) will be as follows:

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

The mention of "honors" may be obtained at the proposal of the professor of the subject after completing a tutored work. The teacher must write a report evaluating the contributions of the work.

3.2 Assessment

Ordinary or Extraordinary Calls

Blended and online Modalities

Assessment	Percentage
Participation in work groups and discussion	15%
Guided activities	25%
Final exam	60%

3.3 Restrictions

Minimum grade

In order to average the above weightings, it is necessary to obtain at least a grade of 5 in the final exam.

Attendance

Students who, without justification, fail to attend more than 75% of the face-to-face classes may be deprived of the right to take the exam in the regular exam.

Writing standards

Special attention will be paid in the papers, practices and written projects, as well as in the exams, to both the presentation and the content, taking care of the grammatical and spelling aspects. Failure to meet the minimum acceptable standards may result in points being deducted in such work.

3.4 Warning about plagiarism

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. BIBLIOGRAPHY

Basic Bibliography

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- Coyle, D. (1999). "Theory and planning for effective classrooms: supporting students in content and language integrated learning contexts". Editor Masih, J. Learning Through a Foreign Language London: CILT
- Current Royal Decrees from Spanish ministry of Education, especially, Royal Decree 1105/2014 of Decemeber 26th
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- "Teacher page. A resource for teachers". New York City Education Department. Available at: <http://schools.nyc.gov/Teachers> .
- "Eurydice. Information on Education Systems and Policies in Europe" Available at: <http://eacea.ec.europa.eu/education/eurydice/> .

Recommended Bibliography

- Castillo Arredondo, Santiago. (1999). "Sentido educativo de la Evaluación en la Educación Secundaria". Educación XXI (2), p. 65-96. ISSN: 1139-613X. UNED. Madrid
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- Zydatið, Wolfgang. 2007. "Bilingualer Fachunterricht in Deutschland:eine Bilanz". Fremdsprachen Lehren und Lernen 36, 8-25.
- Recommendation 2006/962/EC of the European Parliament and of the Council of 8 December 2006 on key competences for lifelong Learning. Official Journal L 394 of 30.12.2006

Other resources

- Physics and Chemistry Resources for ESO students - http://recursostic.educacion.es/apls/informacion_didactica/1419
- Natural Sciences and Biology & Geology Resources - <http://www.sciencehelpdesk.com/>. Ministerio de Educación, Cultura y Deporte de España and British Council.
- Scientific web for kids and teachers. <http://tryscience.org>
- Scientific Teaching topics available at: <http://www.hyperstaffs.info/#> Last visited: February 1st, 2016.

5. PROFESSOR

You can consult the e-mail addresses of the professors and the academic and professional profile of the teaching staff at <https://www.nebrija.com/programas-postgrado/master/ensenanza-bilingue-profesores/#masInfo#profesores>