



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

**Master en Bilingual
Education 2021-2022**



UNIVERSIDAD
NEBRIJA

TEACHING GUIDE

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

Degree: Master in Bilingual Education

Type: Optional

Language: English

Modality: Blended and online

Credits: 6

Course: 1st

Semester: 2nd

Professor: Manuel Blázquez Merino

1. COMPETENCES AND LEARNING OUTCOMES

1.1. Competences

Basic competencies

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

CB7 That students know how to apply the knowledge acquired and their ability to solve problems in new or little-known environments within broader (or multidisciplinary) contexts related to their area of study.

CB8 That students are able to integrate their knowledge and cope with the complexity of making judgements from information that, being incomplete or limited, includes reflections on the social and ethical responsibilities associated with the application of their knowledge and judgements.

CB9 That students know how to communicate both their conclusions and the knowledge and ultimate reasons that sustain them to specialized and non-specialized audiences in a clear and unambiguous manner.

CB10 That students possess the learning skills that enable them to continue studying in a largely self-directed or autonomous way.

General competencies:

CG2 To know the specific problems of FL teaching, both linguistic and cultural, in a bilingual teaching environment.

CG3 To apply the knowledge acquired in terms of making appropriate decisions regarding the different factors involved in FL learning and teaching processes.

CG5. To be able to transmit social and cultural values according to the multilingual and multicultural current situation.

CG7 To acquire basic theoretical knowledge aimed at establishing an informed teaching practice in the field of bilingual education.

CG8 To know the legislation and regulations referring to the ordering and organization of bilingual centres.

Specific competencies:

CE1 To design integrated curricula within their area of knowledge altogether with linguistic contents in order to elaborate bilingual English/Spanish teaching programmes.

CE2 To create and adapt didactic materials for bilingual English/Spanish teaching, adjusting with sensitivity the linguistic level to the different learning rhythms, adapting the authentic material and turning it into didactic material.

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

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

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

CE8 To be able to use specialized terminology in both English and Spanish in the field of second language acquisition.

CE10 To be able to communicate fluently at CEFR level C1.

CE13 To know and apply the advantages of the communicative approach and task-based learning for linguistic interaction in English and Spanish.

CE27 To know the curricular elements, methodology and objectives of the area of Natural Sciences (Biology, Geology, Physics and Chemistry) in a bilingual environment.

CE28 To be able to adapt content to the diversity of Natural Science students (Biology, Geology, Physics and Chemistry).

CE29 To be able to use the most appropriate didactic techniques for the area of Natural Sciences (Biology, Geology, Physics and Chemistry).

1.2. Learning outcomes:

Upon successful completion of this subject, the following learning outcomes will have been achieved:

- That they know the linguistic and cultural problems of FL teaching/learning.
- That they know how to apply the acquired knowledge when making decisions regarding the factors involved in bilingual teaching/learning processes.
- That they are capable of transmitting social and cultural values meeting the multilingual and multicultural European reality.
- That they know how to base their teaching practice in an informed way according to the acquired knowledge.
- That they know the legislation and regulations regarding the organisation of bilingual centres.
- That they know how to design integrated curricula in the area of teaching/learning English/Spanish.
- That they are capable of creating and adapting didactic materials for bilingual teaching, taking into account the different levels of linguistic competence and the different rhythms of learning.
- That they know the evaluation tools necessary in the teaching/learning of the English language.
- That they know how to develop and apply methodologies adapted to students diversity in a bilingual environment.
- That they know how to evaluate linguistic and cultural contents in the English/Spanish bilingual education.
- That they are capable of incorporating new strategies, materials and technologies to the activities of the bilingual English/Spanish classroom.
- That they know how to design and develop specific learning spaces for the bilingual classroom regarding human rights and the values of a democratic culture.
- That they are able to use the specialized terminology of FL teaching/learning.
- That they know how to select and use appropriate texts in order to develop the linguistic and cultural competence of English/Spanish as FL.
- To practice and acquire the necessary skills to reach level C1 in the English language.
- That they know the cognitive and affective factors intervening in the process of FL acquisition; the learning strategies of the different communicative skills (interpretation and oral and written production) and the characteristics of the interlanguages of those learning a FL.
- To know and apply the advantages of the communicative approach and task-based learning for linguistic interaction in English and Spanish.
- That they know the teaching/learning methodology based on the integration of language and content (CLIL), and know how to design and develop didactic activities based on the above-mentioned methodology.

- That they know the curricular elements, the methodology and the objectives of the Social Sciences area; that they know how to adapt the contents to students diversity and use the most appropriate didactic techniques for the area.
- That they know the curricular elements, the methodology and the objectives of the area of Knowledge of the Natural, Social and Cultural Environment in a bilingual environment; that they are able to adapt the contents to students diversity and use the most appropriate didactic techniques for the area.
- That they know the curricular elements, methodology and objectives of the Arts Education area in a bilingual environment; that they know how to adapt the contents to students diversity; that they are capable of using the most appropriate didactic techniques for the area.
- That they know the curricular elements, the methodology and the objectives of the Technology area in a bilingual environment; that they know how to adapt the contents to students diversity; that they are capable of using the most appropriate didactic techniques for the area.
- That they know the curricular elements, methodology and objectives of the Natural Sciences area (Biology, Geology, Physics and Chemistry) in a bilingual environment; that they know how to adapt the contents to students diversity.
- That they know the curricular elements, the methodology and the objectives of the area of English Literature and Culture in a bilingual environment; that they know how to adapt the contents to students diversity; that they know how to use the most appropriate didactic techniques for the area.

2. CONTENTS

2.1. Previous requirements:

Demonstrate sufficient performance at level B2 in English.

2.2. Description of contents:

This course focuses on teaching the Natural Science area at Compulsory Secondary Education. The course offers effective and innovative teaching methodologies, strategies and tools that can be applied to the context of bilingual education.

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. Assignments:

Blended modality:

Assignments	Hours	Percentage of attendance
AF1. Teaching sessions	51,4	34,3%
AF2. Learning activities, individual and in groups, outside the lecture session	53,6	30%
AF3. Tutorials (face-to-face and/or at a distance, depending on the modality)	15	10%

AF4. Complementary training actions	15	10%
AF7. Evaluation Activities	15	0%

Online modality:

Assignments	Hours	Percentage of attendance
AF1. Teaching sessions	51,4	0%
AF2. Learning activities, individual and in groups, outside the lecture session	53,6	0%
AF3. Tutorials (face-to-face and/or at a distance, depending on the modality)	15	0%
AF4. Complementary training actions	15	0%
AF7. Evaluation Activities	15	0%

2.5 Methodology

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 is as follows:

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

3.2 Assessment

Ordinary or Extraordinary Calls

Blended and online Modalities

Assessment	Percentage
Participation in working and discussion groups	15%

Activities (critical reading of texts, book reviews)	25%
Educational unit design	60%

3.3 Plagiarism:

You are required to develop the proposed activities yourself. Plagiarism (illegal and unauthorized copying) will be penalized with a zero grade (0). Nebrija University will treat cases of plagiarism very seriously. Plagiarism includes, but is not limited to: using someone else's (Internet, books, classmates, etc.) ideas or words without appropriate acknowledgement. All suspected cases of academic dishonesty will follow the procedures outlined in the Reglamento del Alumno (Universidad Nebrija).

4. BIBLIOGRAPHY:

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COMPLEMENTARY REFERENCES

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WEB REFERENCES

- 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

All information on the teaching staff can be found in the official Web of the Master in Bilingual Education: <https://www.nebrija.com/programas-postgrado/master/ensenanza-bilingue-profesores/#masInfo#profesores>