

Course guide

820021 - BB - Biology

Last modified: 02/10/2025

Unit in charge: Barcelona East School of Engineering
Teaching unit: 702 - CEM - Department of Materials Science and Engineering.
 751 - DECA - Department of Civil and Environmental Engineering.

Degree: BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Compulsory subject).

Academic year: 2025 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: ELISABET ENGEL LOPEZ

Others: Primer quadrimestre:
 DANIEL CABRERIZO AGUADO - Grup: M42, Grup: M44
 Jordi Guillem - Grup: M41, Grup: M43,
 Gonzalez Flo, Eva - Grup M45

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

2. Understand physiology and biology.
 CEBIO-200. Identify the functions of the human organism as a whole and by systems.

Transversal:

1. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.

TEACHING METHODOLOGY

The course uses expository methodology (theory) in 29%, individual or group classroom (lab) in 10%, individual distance in a 47% non-attendance and work in another group 14 %.

LEARNING OBJECTIVES OF THE SUBJECT

To provide students an overview of aspects of normal cell function to be able to understand the basics of integrating cells into tissues and their functional specialization, and also diseases at the molecular and cellular level.

STUDY LOAD

Type	Hours	Percentage
Hours large group	45,0	30.00
Self study	90,0	60.00
Hours small group	15,0	10.00

Total learning time: 150 h

CONTENTS

1.- An evolutionary framework for Biology

Description:

Organisms have changed over hundreds of millions of years. Evolutionary mechanisms. Speciation that has led to diversity

Full-or-part-time: 5h 30m

Theory classes: 1h 30m

Self study : 4h

2.- Introduction to molecular and cellular biology

Description:

Water properties, relation of life with water, acids, bases, pH, blocked cellular ion balance.

Full-or-part-time: 5h 30m

Theory classes: 1h 30m

Self study : 4h

3.- Macromolecules: Their chemistry and biology

Description:

Condensation reactions: Proteins: polymers of amino acids, carbohydrates, polymers of sugars, nucleic acids: polymers, lipids, water-insoluble molecules

Full-or-part-time: 9h

Theory classes: 3h

Laboratory classes: 2h

Self study : 4h

4.- Cell Organization

Description:

The Cell: basic unit of life, Prokaryotes, Eukaryotes. Information processing organelles that process energy, cytoskeleton, extracellular structures.

Full-or-part-time: 9h

Theory classes: 3h

Laboratory classes: 2h

Self study : 4h

5.- Cell membranes

Full-or-part-time: 7h 30m

Theory classes: 1h 30m

Self study : 6h

6 .- Energy and metabolic enzymes

Full-or-part-time: 12h

Theory classes: 3h

Laboratory classes: 2h

Self study : 7h

7 .- Cellular pathways that produce chemical energy

Full-or-part-time: 14h

Theory classes: 3h

Laboratory classes: 2h

Self study : 9h

8 .- Chromosomes, cell cycle and cell division

Full-or-part-time: 11h

Theory classes: 3h

Laboratory classes: 2h

Self study : 6h

9 .- Genetics: Mendel's Laws

Full-or-part-time: 9h 30m

Theory classes: 1h 30m

Practical classes: 2h

Self study : 6h

10 .- The DNA and its role in heredity

Full-or-part-time: 11h

Theory classes: 3h

Laboratory classes: 2h

Self study : 6h

11 .- Of the DNA to Protein: Genotype to phenotype

Full-or-part-time: 11h

Theory classes: 3h

Laboratory classes: 2h

Self study : 6h

12 .- The genome of eukaryotes and their expression

Full-or-part-time: 12h

Theory classes: 4h

Laboratory classes: 2h

Self study : 6h



13 .- Development: Differential expression of genes

Full-or-part-time: 11h

Theory classes: 3h

Laboratory classes: 2h

Self study : 6h

14 .- Recombinant DNA and biotechnology

Full-or-part-time: 11h

Theory classes: 3h

Self study : 8h

15 .- Molecular Biology and Medicine

Full-or-part-time: 11h

Theory classes: 3h

Self study : 8h

GRADING SYSTEM

The evaluation will be conducted through the assessment by teachers of student work, individual and / or group performed on a face and, appropriately weighting the following activities:

2 individual tests conducted face-off along the course.

guided laboratory exercises.

Weight in the final evaluation:

Two partial checks: 35% + 35%

Lab practices exam: 15%

Oral presentation: 15%

BIBLIOGRAPHY

Basic:

- Sadava, David [et al.]. Vida : la ciencia de la biología. 8ª ed. Buenos Aires [etc.]: Médica Panamericana, cop. 2009. ISBN 9789500682695.

- Solomon, Eldra Pearl; Berg, Linda R.; Martin, Diana W. Biología. 8a ed. México, D.F: McGraw-Hill/Interamericana, cop. 2008. ISBN 9789701063767.

- Devlin, Thomas M. Bioquímica : libro de texto con aplicaciones clínicas. 4ª ed. Barcelona: Reverté, 2004. ISBN 8429172084.