

## 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

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### 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.