

## Course guides

### 820021 - BB - Biology

Last modified: 04/09/2019

**Unit in charge:** Barcelona East School of Engineering  
**Teaching unit:** 745 - DEAB - Department of Agri-Food Engineering and Biotechnology.

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

**Academic year:** 2019    **ECTS Credits:** 6.0    **Languages:** Catalan

#### LECTURER

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**Coordinating lecturer:** ELISABET ENGEL LOPEZ

**Others:** Primer quadrimestre:  
SOLEDAD GRACIELA PEREZ AMODIO - M21, M22, M23, M24

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**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

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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

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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

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

**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:** 5 h

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:** 5 h

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:** 9 h

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:** 9 h

Theory classes: 3h

Laboratory classes: 2h

Self study : 4h

### 5 .- Cell membranes

**Full-or-part-time:** 7 h

Theory classes: 1h 30m

Self study : 6h



#### 6.- Energy and metabolic enzymes

**Full-or-part-time:** 12 h

Theory classes: 3h

Laboratory classes: 2h

Self study : 7h

#### 7.- Cellular pathways that produce chemical energy

**Full-or-part-time:** 14 h

Theory classes: 3h

Laboratory classes: 2h

Self study : 9h

#### 8.- Chromosomes, cell cycle and cell division

**Full-or-part-time:** 11 h

Theory classes: 3h

Laboratory classes: 2h

Self study : 6h

#### 9.- Genetics: Mendel's Laws

**Full-or-part-time:** 9 h

Theory classes: 1h 30m

Practical classes: 2h

Self study : 6h

#### 10.- The DNA and its role in heredity

**Full-or-part-time:** 11 h

Theory classes: 3h

Laboratory classes: 2h

Self study : 6h

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

**Full-or-part-time:** 11 h

Theory classes: 3h

Laboratory classes: 2h

Self study : 6h

#### 12.- The genome of eukaryotes and their expression

**Full-or-part-time:** 12 h

Theory classes: 4h

Laboratory classes: 2h

Self study : 6h



### 13 .- Development: Differential expression of genes

**Full-or-part-time:** 11 h

Theory classes: 3h

Laboratory classes: 2h

Self study : 6h

### 14 .- Recombinant DNA and biotechnology

**Full-or-part-time:** 11 h

Theory classes: 3h

Self study : 8h

### 15 .- Molecular Biology and Medicine

**Full-or-part-time:** 11 h

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%

Working range: 25%

Generic skills: Effective oral and written communication: 5%

## 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.