**Course guides**  
**820021 - BB - Biology**

Unit in charge: Barcelona East School of Engineering  
Teaching unit: 702 - CEM - Department of Materials Science and Engineering.  
Degree: BACHELOR’S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Compulsory subject).  
Academic year: 2021  
ECTS Credits: 6.0  
Languages: Catalan, Spanish

**LECTURER**

Coordinating lecturer: ELISABET ENGEL LOPEZ

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

**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**

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>10.00</td>
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<tr>
<td>Hours large group</td>
<td>45,0</td>
<td>30.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
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Total learning time: 150 h
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Full-or-part-time</th>
<th>Theory classes:</th>
<th>Laboratory classes:</th>
<th>Self study:</th>
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</thead>
<tbody>
<tr>
<td>1. - An evolutionary framework for Biology</td>
<td>Organisms have changed over hundreds of millions of years. Evolutionary mechanisms. Speciation that has led to diversity</td>
<td>5h 30m</td>
<td>1h 30m</td>
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<td>4h</td>
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<tr>
<td>2. - Introduction to molecular and cellular biology</td>
<td>Water properties, relation of life with water, acids, bases, pH, blocked cellular ion balance.</td>
<td>5h 30m</td>
<td>1h 30m</td>
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<td>4h</td>
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<tr>
<td>3. - Macromolecules: Their chemistry and biology</td>
<td>Condensation reactions: Proteins: polymers of amino acids, carbohydrates, polymers of sugars, nucleic acids: polymers, lipids, water-insoluble molecules</td>
<td>9h</td>
<td>3h</td>
<td>2h</td>
<td>4h</td>
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<tr>
<td>4. - Cell Organization</td>
<td>The Cell: basic unit of life, Prokaryotes, Eukaryotes. Information processing organelles that process energy, cytoskeleton, extracellular structures.</td>
<td>9h</td>
<td>3h</td>
<td>2h</td>
<td>4h</td>
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<td>5. - Cell membranes</td>
<td></td>
<td>7h 30m</td>
<td>1h 30m</td>
<td></td>
<td>6h</td>
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<td>Self study</td>
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<tr>
<td>6. Energy and metabolic enzymes</td>
<td>12h</td>
<td>3h</td>
<td>2h</td>
<td>7h</td>
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<tr>
<td>7. Cellular pathways that produce chemical energy</td>
<td>14h</td>
<td>3h</td>
<td>2h</td>
<td>9h</td>
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<tr>
<td>8. Chromosomes, cell cycle and cell division</td>
<td>11h</td>
<td>3h</td>
<td>2h</td>
<td>6h</td>
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<tr>
<td>9. Genetics: Mendel's Laws</td>
<td>9h 30m</td>
<td>1h 30m</td>
<td>2h</td>
<td>6h</td>
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<td>10. The DNA and its role in heredity</td>
<td>11h</td>
<td>3h</td>
<td>2h</td>
<td>6h</td>
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<tr>
<td>11. Of the DNA to Protein: Genotype to phenotype</td>
<td>11h</td>
<td>3h</td>
<td>2h</td>
<td>6h</td>
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<tr>
<td>12. The genome of eukaryotes and their expression</td>
<td>12h</td>
<td>4h</td>
<td>2h</td>
<td>6h</td>
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**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-to-face basis, 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:**