SHORT DESCRIPTION AND JUSTIFICATION (of the meaning of the course in relation to the studies. Between 100 and 200 words)

During this course the student will be exposed to the main concepts of molecular biology of the cell including replication, maintenance and reparation mechanisms of the DNA molecule. The concept of chromosomes (Histones and DNA) as well as epigenetics. Moreover, the student will have a detailed idea of the DNA expression processes such as transcription and transduction. Finally, the basic concepts of gene regulation and cell cycle will be essential to this level of study.

COMPETENCES (of the course placed in relation to the pre-assigned competences in the subject matter)

• That students know how to apply their knowledge to their work or vocation in a professional manner, and have acquired the competencies that allow them to elaborate and defence arguments as well as to solve problems within their area of study. (CB2)

• Be able to understand and apply advanced knowledge of Biosciences and Engineering to the field of Biotechnology. (E3)

• Be able to use tools, systems or processes to carry out the activities in the field of Biotechnology according to the established requirements. (E4)

PREVIOUS REQUIREMENTS * (modules, subject matters, courses or knowledge necessary for the follow-up of the subject. State previous courses required to be completed)

Students must have acquired knowledge of the basic module of the Degree in Biotechnology.

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COURSE: MOLECULAR BIOLOGY

SUBJECT MATTER: Molecular Biology
MODULE: Molecular and Cell Biology
PROGRAM: Degree in Biotechnology

CONTENTS (List the content of the course, with up to two level detail)

1. HISTORY OF THE DNA MOLECULE; FIRST PART (FROM 1869 TILL 1953)
2. HISTORY OF THE DNA MOLECULE; SECOND PART (FROM 1953 TILL 1970’S)
3. DNA and CHROMOSOMES
4. DNA REPLICATION
5. DNA REPARATION AND RECOMBINATION
6. BASIC EPIGENETICS
7. FROM ADN TO RNA: TRANSCRIPTION
8. FROM RNA TO PROTEINS: TRANSLATION
9. GENE EXPRESSION
10. CELL CYCLE

LEARNING ACTIVITIES * (Complete the table relating activities, workload in ECTS credits, and competences.)

<table>
<thead>
<tr>
<th>Learning Activities</th>
<th>ECTS Credits</th>
<th>Competences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>1,3</td>
<td>E3, E4</td>
</tr>
<tr>
<td>Case and Problem-Solving Sessions</td>
<td>0,2</td>
<td>CB2, E3, E4</td>
</tr>
<tr>
<td>Seminars</td>
<td>0,1</td>
<td>CB2, E3, E4</td>
</tr>
<tr>
<td>Practical and Lab Work</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Presentations</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Personal Study</td>
<td>3,3</td>
<td>CB2, E3, E4</td>
</tr>
<tr>
<td>Assessment Tasks (Exams, Continuous Assessment...)</td>
<td>0,1</td>
<td>CB2, E3, E4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5,0</td>
<td>CB2, E3, E4</td>
</tr>
</tbody>
</table>

TEACHING METHODOLOGY (justify the teaching methodology in relation to the competences and course contents. Between 100 and 200 words)

- **Lectures** - Presentation and explanation of contents by a teacher (possibly including demonstrations).
- **Case and Problem-Solving Sessions** - Resolution of exercises and problems, and exposition / discussion of cases by a teacher with the active participation of students.
- **Personal study activities** - Personal work of the student necessary to acquire the competences of each subject matter, and to assimilate the knowledge exposed in lectures and case and problem-solving sessions, using the recommended reference materials. They also include the preparation of tasks related to the other activities, and the preparation of exams.
- **Assessment Tasks** - Oral and / or written tests made during the academic period of a course, or once it has finished (final exams, follow-up controls).

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ASSESSMENT

ASSESSMENT METHODS * (Complete the table relating assessment methods, competences, and weight percentage in the course qualification)

<table>
<thead>
<tr>
<th>Assessment methods</th>
<th>Weight</th>
<th>Competences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Exam</td>
<td>40%</td>
<td>CB2, E3, E4</td>
</tr>
<tr>
<td>Midterm Exam/s</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Continuous Assessment Activities</td>
<td>35%</td>
<td>CB2, E3, E4</td>
</tr>
<tr>
<td>Reports and Presentations</td>
<td>20%</td>
<td>CB2, E3, E4</td>
</tr>
<tr>
<td>Lab or Field Work</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Projects</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Host Student Evaluation</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Participation</td>
<td>5%</td>
<td>CB2, E3, E4</td>
</tr>
</tbody>
</table>

LEARNING OUTCOMES (Explanation of the student's achievements that allow the assessment of competences, relating them to the competences and the assessment methods)

The student should be able to understand and apply advanced knowledge of Biosciences and Engineering to the field of MOLECULAR BIOLOGY. (CB2, E3, E4)

The student should be able to use tools, systems or processes to carry out the activities in the field of MOLECULAR BIOLOGY according to the established requirements.

QUALIFICATION (Explanation of the qualification system)

The FINAL EXAM and the AVERAGE OF THE CONTINUOUS ASSESSMENT ACTIVITIES should be equal or higher than 4 (MAXIMUM QUALIFICATION FOR EACH IS = 10).

FINAL QUALIFICATION: FINAL EXAM (FE, 40%) + Control Exams (CE, 35%) + Presentation works (PW, 20%) + Participation (P, 5%) = 100%

In order to approve the course, the FE grade should be equal or higher than 4. In case that this grade is lower than 4 the student should have to re-evaluate this exam and the average between the first grade and the second one should be equal or higher than 4.

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ASSESSMENT OF THE COMPETENCES (Describe the grading system for each competence in relation with the assessment tasks)

For the evaluation of CB2 competence the final exam (FE), control exams (CE), presentation works (PW) and participation (P) will be used as indicators. For the evaluation of the E3 and E4 competences FE, CE and PW will be used as indicators.

BIBLIOGRAPHY (Recommended and accessible to the student.)

- Molecular Cell Biology
  Lodish, Harvey; Berk, Arnold; Zipursky, S. Lawrence; Matsudaira, Paul; Baltimore, David; Darnell, James E.

- Molecular Biology of the Cell
  Alberts, Bruce; Johnson, Alexander; Lewis, Julian; Raff, Martin; Roberts, Keith; Walter, Peter

DOCUMENT HISTORY

PREVIOUS REVISIONS

CURRENT REVISION (Indicate date and author / s)
13 of May, 2019. Dr. Carlos Semino Margrett

* These features should not be modified without the approval of the academic board (subject matter, module and / or studies program).