COURSE: LABORATORY 3
(BIOCHEMISTRY)

SUBJECT MATTER: Biochemistry and Molecular Biology Lab
MODULE: Laboratories
PROGRAM: Degree in Biotechnology

GENERAL FEATURES *
Type: ☐ Basic training, ☑ Compulsory, ☐ Elective
☐ Final Degree Project, ☐ Practicum
Duration: Semestral Semester / s: 3
Number of ECTS credits: 4
Language / s: Spanish, Catalan

DESCRIPTION

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

The activity in the Laboratory is a fundamental part of the professional biotechnologist's work and one of the essential ways of obtaining data in the profession. The subject pursues that the students acquire the basic knowledge of practical type that are applicable in a laboratory of biochemistry, that will be essential both for the further development of other activities in the degree, as for their future professional life. They will also acquire the language of that laboratory.

The subject includes as essential contents the following: Manipulation of biomolecules and instrumental analysis techniques. Extraction, separation and purification techniques. Enzyme activity measurement techniques.

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

• That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical issues (CB3)
• Be able to work in a team (T1)
• Be able to work in a multidisciplinary environment (T2)
• Be able to design processes and experiments to achieve the requirements established in the activity to be carried out in the practice of the different fields of Biotechnology (E5)
• Be able to analyze, integrate and interpret data and information from the field of Biosciences (E7)
• Be able to assess the risks in the use of chemical and biological substances (E8)

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

The core competencies of the fundamental module.

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

1. Methods of work and safety in the biochemistry laboratory
2. Basic techniques: use of micropipettes and weighing techniques
3. Preparation of buffers
4. Spectrophotometry
5. Cell rupture and protein quantification
6. Protein analysis by electrophoresis (SDS-PAGE and PAGE)
7. Chromatographic techniques
8. Enzymatic kinetics

METHODOLOGY

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>-</td>
<td>-</td>
</tr>
<tr>
<td>Case and Problem-Solving Sessions</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Seminars</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Practical and Lab Work</td>
<td>3.5</td>
<td>T1, T2, E5, E8</td>
</tr>
<tr>
<td>Presentations</td>
<td>0.1</td>
<td>B3, T1, E5, E7</td>
</tr>
<tr>
<td>Personal Study</td>
<td>0.3</td>
<td>B3, E7</td>
</tr>
<tr>
<td>Assessment Tasks (Exams, Continuous Assessment...)</td>
<td>0.1</td>
<td>B3, E7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4</td>
<td>B3, T1, T2, E5, E7, E8</td>
</tr>
</tbody>
</table>

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

Assignment of laboratory practices supervised by a teacher that students perform individually or in groups. Follow-up of the works during the practical realization and supervision of the records associated to the activity that has been carried out, through laboratory journals that will be individually provided to the students at the beginning of the course and the formulation of questionnaires associated to each practice.

Each practice will consist of an explanation about the foundation of the practice, an experimental realization of the same and a discussion of the results obtained.
Each student or group must make the pertinent reports of the practices carried out, for their subsequent evaluation.

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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>30%</td>
<td>B3, E7</td>
</tr>
<tr>
<td>Midterm Exam/s</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Continuous Assessment Activities</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Reports and Presentations</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Lab or Field Work</td>
<td>70%</td>
<td>T1, T2, E5, E8</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>-</td>
<td>-</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)

• To know how to manipulate biomolecules (T1, T2, E5, E8)
• To be able to use instrumentation for analysis, extraction, separation and purification of biomolecules (T1, T2, E5, E8)
• To be able to plan and execute experiments for the detection and quantification of biomolecules (B3, T1, T2, E5, E7, E8)

QUALIFICATION (Explanation of the qualification system)

The qualification of the Biochemistry laboratory (CLB) will be obtained from the note of the experimental work of the Biochemistry laboratory (TEB) and the final examination of the Biochemistry laboratory (EFB). Both notes (TEB, EFB) will be over 10 and will have a maximum value of 10.

The note of the experimental work of the Biochemistry laboratory (TEB) will be calculated as the weighted average of the different activities carried out in the experimental work in said laboratory. This note (TEB) must be greater than or equal to 5 in order to pass.

The final exam note of the Biochemistry laboratory (EFB) will be the grade obtained in the final exam made by the student. The grade of that exam must be greater than or equal to 5 in order to pass.

The final grade of the Biochemistry laboratory (CLB) will be obtained by calculating the weighted average of the note of the experimental work of the Biochemistry laboratory (TEB, EFB)
70%) and the final exam note of the Biochemistry laboratory (EFB, 30%). If any of the two notes (TEB, EFB) is lower than 5, the Biochemistry laboratory (CLB) qualification will be the lowest grade of both. If both grades are equal to or greater than 5, the rating of the Biochemistry laboratory (CLB) is calculated: \( CLB = 0.7 \times TEB + 0.3 \times EFB \).

In the case that the note of the experimental work of the Biochemistry laboratory (TEB) is less than 5, it can be recovered through another exam, or another type of activity, at the teacher's discretion. In the event that the final exam grade of the Biochemistry laboratory (EFB) is less than 5, it can be recovered through another exam, or another type of activity, at the teacher's discretion.

In order to pass the subject, the final grade of the Biochemistry laboratory (CLB) must be greater than or equal to 5. In the case that the final grade is less than 5, it can be recovered through another exam, or another type of activity, at the discretion of the teacher.

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

For the evaluation of the competences T1, T2, E5 and E8 the note of experimental work will be used as indicator. For the evaluation of the rest of the competences, the indicator used will be the grade of the final exam of the subject.

BIBLIOGRAPHY (Recommended and accessible to the student.)

- BIOQUÍMICA. CURSO BÁSICO. J. Tymoczko / J. Berg / L. Stryer.
- BIOQUÍMICA 7ED. L. Stryer / J. Berg / J. Tymoczko

DOCUMENT HISTORY

PREVIOUS REVISIONS (Indicate date and author / s, first the most recent one)

CURRENT REVISION (Indicate date and author / s)
Mars 23th, 2019 Dra Maria Auset Vallejo, Patricia Torruella

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