



Universitat de Lleida

DEGREE CURRICULUM
**BIOCHEMICAL PROCESSES
ENGINEERING**

Coordination: ESCRIBA GELONCH, MARC

Academic year 2023-24

Subject's general information

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|---|---|--------|-----------|------------------|
| Subject name | BIOCHEMICAL PROCESSES ENGINEERING | | | |
| Code | 102355 | | | |
| Semester | 1st Q(SEMESTER) CONTINUED EVALUATION | | | |
| Typology | Degree | Course | Character | Modality |
| | Not informed | 4 | OPTIONAL | Attendance-based |
| Course number of credits (ECTS) | 6 | | | |
| Type of activity, credits, and groups | Activity type | PRALAB | PRAULA | TEORIA |
| | Number of credits | 1 | 2 | 3 |
| | Number of groups | 1 | 1 | 1 |
| Coordination | ESCRIBA GELONCH, MARC | | | |
| Department | ENVIRONMENT AND SOIL SCIENCES AND CHEMISTRY | | | |
| Important information on data processing | Consult this link for more information. | | | |

| Teaching staff | E-mail addresses | Credits taught by teacher | Office and hour of attention |
|-----------------------|----------------------|---------------------------|------------------------------|
| ESCRIBA GELONCH, MARC | marc.escriba@udl.cat | 6 | |

Learning objectives

Identify the different bioelements and biocomposts and their industrial use.

Describe the different processes of biosynthesis at the industrial level.

To know the biochemical processes of synthesis, stabilization and degradation.

Define and know the main characteristics of hormones, antibiotics, vitamins and steroids, etc., within the concept of human biochemistry

Competences

Basic competences:

B02. That the students know how to apply their knowledge to their work or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study .

B03. That students have the ability to gather and interpret relevant data (usually within their area of study) to issue judgments that reflect on relevant issues of a social, scientific or ethical nature.

Transversal competences:

CT3. Implement new technologies and information and communication technologies.

CT5. Apply essential notions of scientific thought.

General competences:

CG3. Synthesize basic and technological subjects, which enable them to learn new methods and theories, and give them versatility to adapt to new situations.

Specific competences:

CE4. Apply the principles of fundamental knowledge of general chemistry, organic and inorganic chemistry and its applications in engineering.

CE22. Design, manage and operate processes of simulation, control and instrumentation of chemical processes.

Subject contents

The topics described herewith do not necessarily have to be given in this order, as the theoretical and practical lectures are combined in order to make the subject more understandable and to distribute the contents in the two parts in a proportionate way. T

he dynamics may imply the work and even the elaboration of scientific texts in English.

Topics

1) Introduction to bioelements and biomolecules. Terpenes, steroids and nucleic acids.

2) Biochemistry of biogenic elements: Vitamins, lipids, carbohydrates, amino acids and proteins. Degradation and

synthesis processes.

- 3) Bioenergetic compounds.
- 4) Balances of matter and energy in biochemical processes.
- 5) Kinetics of fermentative production: Antibiotics and hormones.
- 6) Enzymatic processes.
- 7) Matter transfer in multiphase systems.
- 8) Industrial synthesis processes.

Methodology

The methodology is divided into:

Theoretical classes 46h.

Problem resolution 14h.

External activities 3h.

Individual work 37h.

Self study 50h.

Development plan

Theme1. 25 h.

Large group 9h.

Guided activities 4h.

Autonomous learning 12h.

Theme2. 15 h.

Large group 6h.

Supervised activities 2h.

Autonomous learning 7h.

Theme3. 20 h.

Large group 6h.

Supervised activities 2h.

Autonomous learning 12h.

Topic 4. 20 h.

Large group 6h.

Supervised activities 3h.

Autonomous learning 11h.

Theme5. 15 h.

Large group 4h.

Supervised activities 1h.

Independent learning 10h.

Theme6. 15 h.

Big group 3h.

Supervised activities 3h.

Self-employed learning 9h.

Theme7. 15 h.

Large group 4 h.

Guided activities 2 h.
Autonomous learning 9 h.

Theme8. 15 h.
Large group 1 h.
Guided activities 2 h.
External activities 3 h.
Autonomous learning 9 h.

Theme9. 10 h.
Large group 2 h.
Supervised activities 1 h.
Autonomous learning 7 h.

Evaluation

Continued evaluation:

For this modality, all exercises presented within the established term will be valued, as well as the elaboration, oral presentation and defense of an original work related to the subject among the topics proposed by the professor.

The contributions of each aspect to the final grade will be:

Personal work: Proposed exercises (10%)

Other individual work (10%)

Final course work document (10%)

Oral presentation and defense of the course work (10%)

Written exams (50%)

Attendance, use and individual assessment by the teacher (10%)

The presentation of the exercises and works within the established term is mandatory. The calculation scale will be applied as long as the grade of the two partial exams is equal to or higher than 3/10. Those who have not passed the subject at the first opportunity, will be able to take a final resit exam which will include the failed exam (s).

Discontinued evaluation:

Those who prefer not to join the continuous evaluation will also have the right of two exams, which will coincide with the second partial exam (the first call), and the consequent retreat (second call). The qualification of the exam for this modality will be unique and will be worth 100% of the final mark. In any case, for this modality, the contents to evaluate will always be those of the total of the subject.

Conditions:

- 1) Any action not legitimized during any of the partial exams will imply the loss of the examination rights and the loss of the call.
- 2) Any plagiarized work will imply the loss of examination rights and the loss of the call.
- 3) Exams answered in pencil or with erasable pens will not be corrected.
- 4) It is the responsibility of the student that the letter is understandable by the teacher. In case the letter is not clear enough, it will not be corrected.

Bibliography

Scragg, Alan. Biotecnología para ingenieros: Sistemas biológicos en procesos tecnológicos. Limisa, 1996. ISBN 9681847083.

Macarulla, José M.; Goñi, Felix M. Bioquímica humana. Reverté 1985. ISBN 842915549X

Macarulla, José M.; Goñi, Felix M. Biomoléculas. Reverté 1978. ISBN 8429173285.

Najafpour, Ghasem D. Biochemical engineering and biotechnology. Elsevier, 2007. ISBN 9780444528452.