Metabolism

Academic Year: (2023 / 2024) **Review date: 23-05-2023**

Department assigned to the subject: Bioengineering Department

Coordinating teacher:

Type: Electives ECTS Credits : 6.0

Year : Semester :

SKILLS AND LEARNING OUTCOMES

At the end of this course, the student should be able to:

¿ Analyze complex biological processes at the molecular and cellular level in a general and integrated manner.

¿ Use conceptual and technical tools necessary to understand the relationship between molecular and cellular mechanisms of biological functions, being able to apply this knowledge to relevant issues in different fields of Biosciences.

¿ Recognize and interpret the fundamental knowledge about the organization and function of the biological systems of organisms from a molecular and cellular perspective.

¿ Distinguish the physical and chemical bases of cellular processes, as well as apply the main physical, chemical and mathematical tools used to investigate them.

¿ Identify the main current problems and future challenges of the Biosciences.

DESCRIPTION OF CONTENTS: PROGRAMME

Enzymology and enzyme regulation.
Mitochondrial electron transport.
Oxidative phosphorylation.
Phosphorylation.
Krebs cycle.
Carbohydrate degradation.
Glycogenesis.
Glycogen metabolism.
Photosynthetic carbon fixation.
Metabolism of fatty acids and other lipids.
Metabolism of amino acids.
Metabolism of nucleic acids.
Regulation and integration of metabolism.

LEARNING ACTIVITIES AND METHODOLOGY

TRAINING ACTIVITIES

Lectures: these are systematic and orderly expository sessions of the subject's syllabus and selected problems are solved in detail to exemplify the implementation of the theoretical contents. The objective is for students to acquire the specific competences of each subject. 210 hours, 100% attendance.

Practical classes in the classroom: in these sessions, students work on the applications of the contents of the subjects, including numerical examples, case analysis, data search, directed work, gamification sessions, etc. The objective is to show students how to act. 50 hours, 100% attendance.

Practical laboratory classes and practices with computer media: students will carry out supervised experimental or computational work in specialized laboratories in which they will put into practice the theoretical knowledge acquired in the different subjects and learn to work safely in the laboratory. 150 hours, 100% attendance.

Individual and/or small group tutorials: this is a personalized attention to students, in person and where a professor attends, facilitates and guides one or more students in the training process. They allow the teacher a more individualized follow-up of each student's learning. 20 hours, 100% attendance.

Evaluation tests. 20 hours, 100% attendance.

Group study and work: consists of the preparation of seminars, problems, exercises, readings, data collection and analysis, etc. to be presented or delivered in class by students working in groups, so that they acquire the ability to work as a team and learn through interaction with their peers. 190 hours.

Study and individual autonomous work to develop self-learning skills. It includes the same activities of the group work, but carried out individually. It also includes personal study (preparing exams, complementary readings, doing problems and exercises), which is fundamental for autonomous learning. 240 hours: online tasks using information and communication technologies, in order for students to acquire skills in these technologies, in addition to those of the subject. 50 hours.

Preparation of reports, writing of practical reports (laboratory, field, computer), writing of papers on current issues related to the development and applications of science and technology, etc. 120 hours.

TEACHING METHODOLOGIES

Expository method: oral presentations by the teacher supported, if necessary, with computer material (PowerPoint, videos, etc.). They provide the transmission of knowledge and activation of cognitive processes in the student.

Problem-based learning: development of active learning through problem solving, which confronts students with new situations in which they have to search for information and apply new knowledge to solve problems.

Cooperative learning: fosters the development of autonomous learning through collaboration among peers.

ASSESSMENT SYSTEM

EVALUATION SYSTEM

Continuous evaluation by means of different types of controls, individual or in group, carried out at different stages of the course. Maximum weighting 50%.

Final written exam. Maximum weighting 80%.

Resolution of problems and practical cases. Maximum weighting 50%.

Completion of written work and reports, delivery of practice reports, delivery of complementary work, exercises, cases, readings. Maximum weighting 50%.

Oral presentation of work done individually or in groups, as well as its debate and discussion. Maximum weighting 50%.

Attendance and/or participation in the theoretical classes, classroom practices and in individual and group face-to-face activities. Maximum weighting 50%.

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40