27122 - Introduction to Systems Biology

Información del Plan Docente

Academic Year	2018/19
Subject	27122 - Introduction to Systems Biology
Faculty / School	100 - Facultad de Ciencias
Degree	446 - Degree in Biotechnology
ECTS	6.0
Year	
Semester	Second semester
Subject Type	Compulsory
Module	---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, practice sessions, autonomous work, study and assessment tasks.

This course is scheduled to address an intensification of theoretical knowledge with student participation. This strategy will allow the student to revise a topic closely with an outstanding professional. This approach of a research aspect will provide them tools for a subsequent professional development.

Further information regarding the course will be provided on the first day of class.

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4.2.Learning tasks

The course includes the following learning tasks:

- Lectures. 4 ECTS. The contents of the lectures are given in the program of the subject in section 5.3.
- Assessment task and oral presentation: 2 ECTS. This activity is that students collect information on a particular topic, aided by the teacher. Professor monitor at all times the autonomous work of students by scheduling tutorials. Finally, the assessment task are presented and debated in class.
- Complementary activities: Seminars and lectures by experts will be announced during the development of the course.

4.3.Syllabus

The course will address the following topics:

1. Introduction to Systems Biology and Synthetic Biology.
2. Basics and applications of genomics.
3. Epigenomics and metagenomics.
4. Transcriptomics.
5. Technical principles of proteomics.
6. Identification of peptides and proteins.
7. Characterization of posttranslational modifications of proteins.
8. Differential analysis and comparison of proteomes.
9. Proteomics interactions.
10. Combinatorial expression libraries of peptides and proteins.
11. Large-scale trials by immobilization of peptides, proteins, antibodies and ligands.
12. Proteomics systems. Protein interaction networks. functional networks.
13. Fundamentals of metabolomics.
14. Lipidomics.
15. Software tools and computer in genomics, proteomics and metabolomics.
16. Integration of metabolic pathways and cellular communication and its usefulness to know pathology mechanisms

4.4.Course planning and calendar

Schedules of lectures and problems will coincide with the officially established and will be available at: https://ciencias.unizar.es/grado-en-biotecnologia.

The places, calendar and groups for training and practical sessions will be established in coordination with the rest of the subjects at the beginning of course. The Coordinator will produce the groups of students for these activities at beginning of course to avoid overlaps with other subjects.

For students enrolled in the subject, places, times and dates of lectures and practical sessions will be public via Bulletin Board advertisements of the grade on the platform Moodle at the University of Zaragoza, https://moodle2.unizar.es/add/, and in the moodle page for the course. These routes will be also used to communicate enrolled students their distribution by groups of practical sessions, which will be organized by the coordination of degree. Provisional dates will be available on the website of the Faculty of Sciences in the corresponding section of the Degree in Biotechnology: https://ciencias.unizar.es/grado-en-biotecnologia.

In this web there will be also available the dates of exams.

4.5.Bibliography and recommended resources