Universidad Zaragoza

Academic Year/course: 2024/25

30804 - Microbiology

Syllabus Information

Academic year: 2024/25
Subject: 30804 - Microbiology
Faculty / School: 105 - Facultad de Veterinaria
Degree: 568 - Degree in Food Science and Technology
ECTS: 6.0
Year: 1
Semester: Second semester
Subject type: Basic Education
Module:

1. General information

Objective: to acquire the basic training in Microbiology necessary to understand the rest of the specific subjects of the Degree. This training includes i) differentiating the types of microorganisms (bacteria, viruses, fungi, etc.); ii) knowing their basic characteristics (structure, composition, pathogenic power, antibiotic resistance, biofilm formation, etc.); iii) identifying those microorganisms of relevance in FST, learning the basic techniques for their manipulation and study.

Subject aligned at least with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 : 3-Health and well-being, 4-Quality education, 6-Clean water and sanitation, 8-Decent work and economic growth, and 12-Responsible production and consumption.

2. Learning results

The student, in order to pass this subject, must demonstrate that:

1. Knows, from a basic point of view, the microorganisms object of study in Microbiology and Parasitology.

2. Is able to define and properly use the scientific terminology used in Microbiology and Parasitology.

3. Is able to reinforce basic knowledge about eukaryotic and prokaryotic microorganisms.

4. Is able to differentiate the different types of microorganisms that are the object of study in Microbiology and Parasitology, with special attention to

those related to food.

5. Is able to differentiate microbial and parasitic diversity from systematic, physiological and ecological points of view.

6. Is able to define the mechanisms they use in their metabolism to carry out their activities.

7. It is able to interpret by what mechanisms they exchange genetic information with each other and what this exchange of information brings them.

8. Is able to know the characteristics of microbial growth and the alternatives for its control.

9. Is able to know the importance of the pathogenicity mechanisms of different microorganisms and parasites, since food acts as a vehicle for them and can cause diseases to consumers.

10. Is able to differentiate and evaluate the most common sterilization and sanitization techniques.

11. Is able to work in a team, synthesize the available information on a topic, present and substantiate their opinion and present it publicly and orally

3. Syllabus

Theoretical Program

Block I. GENERAL BACTERIOLOGY

Block II. PATHOGEN-SPECIFIC AND APPLIED BACTERIOLOGY

Block III. GENERAL, PATHOGENIC AND APPLIED MYCOLOGY

Block IV. GENERAL VIROLOGY AND VIROLOGY OF VIRAL PATHOGENS

Block V. GENERAL AND FOOD-BORNE PARASITOLOGY

Block VI. INTRODUCTION TO INDUSTRIAL MICROBIOLOGY

Practical Program

It will be carried out in 5 sessions that will be developed along approximately 4 hours of duration each one, throughout the semester. The content of the practical sessions is as follows:

Practice 1: Microbiology laboratory standards. Culture media. Optical microscopy. Basic stains.

Practice 2: Sampling, seeding techniques, interpretation of bacterial growths. Specific stains.

Practice 3: Quantitative study of bacterial populations and identification of bacteria.

Practice 4: Serological diagnostic techniques.

Practice 5: Characterization and identification of fungi and parasites.

Seminars (resolution of problems and cases): introduction to the bibliographic search and approach and beginning of group work in Microbiology and Immunology Works presentation

Seminar 1. Case studies and group work.

Seminar 2. Presentation of cases

4. Academic activities

The learning activities are divided into:

- Participative master classes (35 hours);
- Laboratory sessions (20 hours), where students will put into practice the theoretical knowledge acquired; Tutored group work. Students will be assigned work related to the subject that must be developed and defended before the faculty (5 face-to-face hours).

The documentation of each theoretical topic and the practice scripts will be posted in the Digital Teaching Ring of the University of Zaragoza (ADD)

Students will have tutoring hours (face-to-face or online) to solve doubts about the subject . Tutorials will be arranged in advance with the teachers.

5. Assessment system

A. Theoretical knowledge assessment test

Consisting of multiple-choice or similar questions through the Moodle platform of the University of Zaragoza. The understanding and reasoning of the concepts developed during the term will be assessed. A mid-term exam will be held at the middle of the term It accounts for 60% of the final grade. It is necessary to achieve a minimum grade of 5 in each partial to pass the test A.

B. Evaluation test of laboratory practices

An exam with short questions and/or multiple-choice or similar questions about the practical sessions. It accounts for 20% of the final grade . In case of not attending the practical sessions, the students will have to take an exam in the laboratory, or a presentation of the practice that demonstrates that they have the same skills and abilities as those who performed the practices.

C. Evaluation test of group work

A public presentation of the work will be made and the design, content, expository clarity and defence of the presentation will be evaluated. It represents 20% of the final grade.

In all tests (A, B and C) it will be necessary to obtain a minimum grade of 5 out of 10. Correction factors that help reduce the risk of randomly answering questions may be considered in the multiple-choice questions. In this sense, failed answers will be penalized with 20% of the total value of the question.

Students taking a single comprehensive test may only take the evaluation test individually (after assignment of the topic by the teacher in charge), and must present it orally immediately after the written tests. Those students who have failed the practices can make an oral presentation of the same immediately after the written tests or a demonstration in the laboratory (depending on the availability of the laboratory).

The grade obtained in these tests will be maintained in successive calls for exams of the same academic year.

However, the grade of tests B and C can be kept in consecutive calls within the following 2 years after the first enrolment

6. Sustainable Development Goals

3 - Good Health & Well-Being
4 - Quality Education
6 - Clean Water and Sanitation