Universitat Autònoma de Barcelona

2023/2024

Microbiology

Code: 102660
ECTS Credits: 3

Degree	Type	Year	Semester
2502445 Veterinary Medicine	OB	2	1

Contact

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Teaching groups languages

You can check it through this link. To consult the language you will need to enter the CODE of the subject.
Please note that this information is provisional until 30 November 2023.

Teachers

Francesc Accensi Alemany

Prerequisites

Although there are no official prerequisites, it is advisable for the student to keep in mind the knowledge acquired in the Microbiology subject (taught in the 1st year) and in the Immunology part of the Physiology subject (taught in the 2nd year, just before the start of this subject)

Objectives and Contextualisation

This is a compulsory second course subject in which the student will have to acquire the theoretical and practical knowledge that will allow him to obtain knowledge of Virology (what are the basic techniques and methods for studying viruses, as well as the virus-host relationships; basic diagnostic techniques; prevention and control; viral taxonomy fundamentals; leading viruses of interest in Veterinary Medicine, focusing on emerging pathogens and zoonotic agents) and on the applications of Immunology in Veterinary Medicine (immunodiagnostic techniques, know how they work, understand their mechanism and their interpretation ...), especially in vaccines as a measure of prevention and control of diseases.
The specific training objectives of this subject are:
- Introduce the student to the basics of Virology.
- Provide knowledge about techniques and methods of work in Virology.
- To know the main virus of veterinary significance, as well as the existing control systems of the same.
- Know the applications of viruses at the biotechnologica levell, ecological level among others
- Know the prions and the problems that arise from them.
- Introduce to the student the applied aspects of the immune response, such as vaccines and immunodiagnostic tests.
- Provide some knowledge about the techniques and immunological methods

Competences

- Comunicar la informació obtinguda durant l'exercici professional de manera fluïda, oralment i per escrit, amb altres col·legues, autoritats i la societat en general.
- Demonstrate knowledge of English to communicate both orally and in writing in academic and professional contexts.
- Demonstrate knowledge of the rights and duties of the veterinarian, with a special focus on ethical principles
- Demonstrate knowledge, understanding and differentiation of the main biological agents of veterinary interest.
- Perform basic analytical techniques and interpret the clinical, biological and chemical results, and interpret the results of tests generated by other laboratories.
- Seek and manage information related with professional activity

Learning Outcomes

1. Apply suitable methodologies for the study of viruses.
2. Communicate information obtained during professional exercise in a fluid manner, orally and in writing, with other colleagues, authorities and society in general.
3. Demonstrate knowledge of English to communicate both orally and in writing in academic and professional contexts.
4. Describe and appreciate the applications of viruses.
5. Describe the basic diagnosis techniques of virology.
6. Describe the main types of vaccines.
7. Explain the nature, structure and genetics of viruses.
8. Identify basic taxonomy of viruses.
9. Identify the technical applications of immune response.
10. Interpret the results of the basic microbiological techniques in virology.
11. Recognise and characterise viruses as causal agents of disease in animals in order to diagnose and control them.
12. Recognise the bases of immunodiagnosis techniques.
13. Recognise the microorganism-host relationship, virulence and the pathogenicity mechanisms of viruses.
14. Seek and manage information related with professional activity

Content

The contents of the subject are divided into seven blocks:
Block I. Introduction to Virology: General characteristics of viruses. Viral genetics Types of viruses.
Block II. Virus-host relation: Resistance of the host. Environmental factors Pathogenicity and virulence. Stages of infection.
Block III. Viral taxonomy: Main viruses of veterinary interest. Single-stranded DNA viruses, double-stranded DNA viruses, single-stranded RNA viruses, double-stranded RNA viruses, retroviruses.
Block IV. Applications of viruses: Viruses and gene transfer.
Block V. Prions: subvíricos agents and prions. Differential characteristics. Importance to veterinarian and public health.
Block VI. Immunodiagnostic techniques: Valuation of the humoral base and cellular immune based immune response.
Block VII. Vaccines: Vaccines and serotherapy. Concepts Types of vaccines. New vaccine strategies.
The content of the laboratory practices of the subject is as follows:
- Techniques of study of viruses. Study of the action of bacteriophages. Effect of viruses on cell cultures.
- Immunodiagnostic techniques. Techniques to measure humoral and cellular immune response. Use of clinical samples
- Preparation of autovaccins

Methodology

The teaching methodology used during the learning process of this subject is mainly based on the student's work. The teacher's task will be to guide the students in this task, both by providing them with information (or advising on where it can be obtained), and by guiding and supervising the student's work. Thus, the following training activities will be carried out:

- Master classes: through this type of classes, the student acquires the basic scientific knowledge of the subject that will need to be supplemented later with personal and independent study. Once the master class has been given, the student will be able to download from the Virtual Campus platform the MS Power Point presentations that the teacher will use in each master class, to be able to use it as a guide/support for the study.

- Practical sessions in the laboratory: through this type of classes, carried out in small groups, the aim is to contrast, while completing and reinforcing, the knowledge acquired in the theoretical classes. The student will be able to download the internship script from the Campus Virtual platform. This script will be written in English. At the end of the internship there will be a self-assessment activity that will consist of a short test exam (in English) that will help the student to assess how well they have taken advantage of the sessions.

- Scheduled tutorials: tutorials are sessions arranged to inform about the content and development of the teaching activities of the subject: as well as to resolve doubts, clarify concepts, correct errors and discuss specific aspects of the subject.

- Group work / seminars: The group work activity aims to improve the ability to write, communicate and synthesize a scientific topic and at the same time encourage teamwork. Thus, the knowledge obtained in the theoretical and practical sessions of the subject will be worked on, with the aim of deepening certain aspects, while promoting a critical discussion. In addition, this activity will promote the ability to analyze and synthesize: after reading a scientific article provided by the teacher (in English), the students, in groups of 4-5 students, will have to make a presentation in MS Power Point or Prezi (or similar) with the text of the slides in English, which will be presented briefly in front of the teacher and other students on a pre-agreed date. A seminar will be held in order to clarify any doubts, especially of a methodological nature, that may arise during the completion of this work. A seminar will be held on the subject of prions and another one (to be confirmed yet) about vaccinology

Other teaching material provided to the student during the course will be available to the student through the Campus Virtual platform. In addition, the mentioned platform will be used as a mechanism for the exchange of opinions and information between the students and the professor of the subject.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Magister class	8.5	0.34	2
Seminars	3	0.12	14, 2, 3
laboratory practices	15	0.6	

Type: Supervised			
Tutorial class	2	0.08	
Type: Autonomous			
Autonomous study	32	1.28	14, 3
selflearning	11	0.44	14, 2, 3

Assessment

The assessment will be individual and will be carried out continuously during the development of the different scheduled activities of the subject. The minimum overall score to successfully pass the subject is 5 points out of 10.

The overall weight of each of them will be as follows:

Exam (80% weight in the overall grade): it is a written test on the knowledge acquired throughout the course (during lectures, seminars or practicals), which the student must complete on the set date in the general schedule. The exam will consist of short or development questions. If the student so requests, the exam may be oral. Maximum overall exam score (out of 10): 8 points. In case of not passing the exam or not having appeared for it, there will be the possibility of retaking it on the dates indicated in the general schedule of the course. The exam will be written in Catalan (if you want a Spanish version, you must request it at least 15 days in advance).

Group Work Activity (20% weight in the overall grade): In groups of 4-6 students, students will have to make a short oral presentation on a scientific article proposed by the teaching staff. Maximum score in the overall grade (out of 10): 2 points.

Completion of the work and attendance at the practical sessions in the laboratory are mandatory. Without completing it, the student will not be able to take the exam, suspending the subject.

This subject does not provide for the single assessment system.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Examen	80%	2.5	0.1	1, 2, 6, 4, 5, 7, 8, 9, 10, 11, 13, 12
Oral presentation (group)	20%	1	0.04	1, 14, 2, 3, 6, 4, 5, 7, 8, 9, 10, 11, 13, 12

Bibliography

Bamford, D. & Zuckerman, M. A. (eds). 2021. Encyclopedia of Virology, 4th edition. Academic Press.

Shors, T. 2017. Understanding viruses, 3rd edition. Jones & Bartlett Learning

Murphy, K.; Weaver, C. & Berg, L. 2022. Janeway's Immunobiology. 10th edition. W. W. Norton & Company.

Tizard, I. 2017. Veterinary Immunology. 10th edition. Saunders.

Gómez-Lucía, E. *et al*. 2007. Manual de Inmunología Veterinaria. Pearson.

Software

No special software is required. In any case, it will be necessary to use a text editor (MS Word or similar) or a presentation tool (MS Power Point or similar)