



DEGREE CURRICULUM
**INFECTIOUS AND PARASITIC DISEASES
DIAGNOSTICS**

Coordination: RAMIREZ RIVERO, GUSTAVO ADOLFO

Academic year 2023-24

Subject's general information

Subject name	INFECTIOUS AND PARASITIC DISEASES DIAGNOSTICS			
Code	100361			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Double bachelor's degree: Bachelor's Degree in Veterinary Medicine and Bachelor's Degree in Science and Production	5	COMPULSORY	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRACLIN	PRALAB	TEORIA
	Number of credits	0.5	2.5	3
	Number of groups	6	4	1
Coordination	RAMIREZ RIVERO, GUSTAVO ADOLFO			
Department	ANIMAL SCIENCE			
Teaching load distribution between lectures and independent student work	Attendance hours: 60 Non-attendance (self-work) hours: 90			
Important information on data processing	Consult this link for more information.			
Language	Spanish (3.6 credits), Catalan (2.4 credits).			
Distribution of credits	3 theoretical credits 3 practical credits - Sampling and pathologic diagnosis: 0.9 - Parasitologic diagnosis: 0.3 - Serologicl / microbiologic diagnosis: 0.4 - Molecular diagnosis: 0.4 - Small animal clinical cases: 0.4 - Clinical cases of large animals / production animals: 0.6			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
BASSOLS WOLF, MARTA	marta.bassols@udl.cat	2	
GASSO GARCIA, DIANA	diana.gasso@udl.cat	1,6	
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Subject's extra information

Multidisciplinary subject oriented to the connection of the basic foundations of the different techniques and methodologies used in Veterinary Medicine for the diagnosis of infectious diseases. The subject is intended to have a practical profile; however it will be necessary learning about basic theoretical concepts, protocols and applications of the different techniques in each case (microbiologic, immunologic, molecular, parasitologic and anatomopathologic diagnosis in different animal species).

This subject complements the practical part of several of the subjects related to Animal Health, including Pathology and Clinical disciplines.

For the correct follow-up of the subject and achievement of knowledge, constant work by the student is recommended.

Learning objectives

OBJECTIVES OF KNOWLEDGE

The student who passes the subject must:

1. Learn the diagnostic method.
2. Apply the diagnostic techniques on diseases with a infectious origin.
3. Use the appropriate nomenclature for each technique.
4. Know the diagnostic techniques in bacteriology, mycology, virology and parasitology.

OBJECTIVES OF CAPACITY

The student who passes the subject must be able of:

1. Make a correct choice among the diagnostic methods available.
2. Perform diagnostic techniques properly on diseases with infectious origin.
3. Interpretation of the results arisen from the different diagnostic techniques.
4. Obtain and conserve properly samples obtained for anatomopathological studies, or bacteriological, virological, parasitic, toxicological or serological tests, based on the findings and presumptive diagnosis.
5. Identification of parasites and other infectious agents, with special interest to the most important pathogens.

Competences

BASIC COMPETENCES:

- CB1 Get knowledge in an area of study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of their field of study
- CB2 Apply their knowledge to their job or vocation in a professional way and possess the competencies that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.
- CB3 Ability to collect and interpret relevant data (usually within their area of study) to make judgments that include reflection on relevant issues of a social, scientific or ethical nature
- CB4 Being able to transmit information, ideas, problems and solutions to a specialized and non-specialized audience
- CB5 Know how to develop those learning skills necessary to undertake further studies with a high degree of autonomy

GENERAL COMPETENCES

- CG2 Prevention, diagnosis and individual or collective treatment, as well as fighting against animal diseases, with special emphasis in zoonoses.
- CG5 Knowledge and application of legal, regulatory and administrative provisions in all areas of the veterinary profession and public health, understanding the ethical implications of health in a changing and global context.
- CG6 Development of professional practice with respect to other health professionals, acquiring skills related to teamwork, with the efficient use of resources and in quality management.
- CG7 Identification of emerging risks in all areas of the veterinary profession

SPECIFIC COMPETENCES

- CE14 Identify and apply the methods and procedures of the diagnostic techniques and their interpretation as well as identify and apply the roles of the Necropsy
- CE16. Identify and apply the bases of the diagnosis, of the different types of lesions and their association with pathological processes
- CE22. Know the infectious and parasitic diseases with a veterinary interest, including its diagnosis and fighting; applying the bases of Zoonoses and Public Health
- CE40 Perform basic analytical techniques and interpret their clinical, biological and chemical results, interpret the results of tests generated by other laboratories as well as collect, preserve and send all types of samples with their corresponding report

TRANSVERSAL COMPETENCES

- CT1 Acquire adequate oral and written comprehension and expression of Catalan and Spanish
- CT2 Acquire significant knowledge of a foreign language, especially English
- CT3 Acquire training in the use of new technologies, including information and communication technologies
- CT4 Acquire basic knowledge of entrepreneurship and professional environments
- CT5 Acquire essential knowledge of scientific thinking

Subject contents

THEORY

Sampling for diagnostic procedures in infectious diseases. Sampling: how and when. Conservation of samples.

Molecular diagnosis. Nucleic acids (isolation methods according to origin, DNA / RNA, sample shipping conditions). Experimental design (databases of nucleic acids, databases of hereditary diseases). Diagnosis type (presence / absence, viral load, identification of strains). Amplification techniques (PCR, RT-PCR, qPCR). Diagnosis based on DNA probes or deep sequencing (metagenomics). Examples of practical cases.

Parasitologic diagnosis. General concepts, parasite-host interactions, zoonosis. Direct methods of detecting parasites. Indirect detection methods. Clinical cases.

Anatomopathologic Diagnosis: Introduction to the anatomopathologic diagnosis process; fundamentals. Sampling during necropsy and microscopic diagnosis applied to infectious diseases. Recognition of macro- and microscopic morphological patterns of injury; types of inflammation and adaptive responses to infectious injury. Approach oriented to the problem. Conservation and processing of samples. Histochemical stains for the detection of infectious forms. Immunohistochemistry applied to the detection of infectious forms. Other techniques (in situ hybridization, tissue microarrays)

Immunologic-serological and microbiologic diagnosis. Preparation of samples for serology and serology techniques. Obtention, preparation and sending of samples, basic immunological memory, more important serological techniques (Agglutination, Elisa, Immunodiffusion ...). Types and uses of microbiological media, techniques.

Clinical diagnosis. Main techniques for the diagnosis of Infectious diseases in small and large animals. Sampling: how and when. Conservation of samples. Techniques in the clinics and techniques in the laboratory of reference. Biochemical tests.

PRACTICAL BLOCK

P1. Practice of pathological diagnosis. Necropsy, correct procedures and sampling target to infectious diseases.

P2: Practice of parasitologic diagnosis. Coprology: direct examination and concentration techniques (flotation, sedimentation and migration; Baerman); McMaster to quantify and stool culture. Cytological techniques (tricrogram, printing, adhesive tape, cotton swabs, brushing and scraping). Interpretation of proteinograms and serologies.

P3. Practice of pathological diagnosis. Cutting and processing of the samples

P4: Molecular diagnostic practices. Molecular diagnosis. DNA / RNA extraction. Diagnosis of presence / absence by qPCR and PCR at the end time.

P5: Microbiological and immunological diagnostic practices. Performing serology techniques (ELISA, agglutination ...); preparation and sowing of microbiological cultures.

P6, P7: Pathological diagnostic practices. Histopathology: lesions characteristic of the most common infectious processes.

P8, P9: Theoretical-practical seminars on clinical diagnosis in small animals. Main infectious diseases in the daily clinic: Clinical cases. Interpretation of results in different clinical situations.

P10, P11, P12, P13: Theoretical-practical seminars on clinical diagnosis in large animals. Main infectious diseases in the daily clinic: Clinical cases. Interpretation of results in different clinical situations.

Methodology

Theory

AIM: to acquire full knowledge in different laboratory procedures available for the diagnosis of different infectious diseases in different domestic species. They will be taught every week during the first semester, through audiovisual media (presentations, videos ...), requesting the participation of the student. In addition, the teacher can expose in the class one or several didactic problems or cases with images.

Practical contents

Aimed to acquisition of necessary knowledge to choose between the different diagnostic techniques in each specific case, knowing what is the basis of this choice, adequacy, the best available procedure and how make the interpretation of the results obtained. This block will be carried out through practices with small groups in the laboratory with specific instruments, or in the classroom where will be dedicated to the discussion of problems cases with audiovisual or computer media, requesting and allowing the participation of the student at all times. The specific contents of each practice are detailed in the section contents of this Teaching Guide.

Other classroom activities (tutorials, evaluation ...).

Development plan

FIRST SEMESTER COURSE 2018-2019

- **Theory:** sessions of 2 hours / week.
- **Molecular diagnostic laboratory practices:** sessions of 2 hours / group.
- **Laboratory practices Parasitologic diagnosis:** session of 3 hours / group
- **Laboratory practices Serological / microbiological diagnosis:** sessions of 2 hours / group
- **Laboratory practices Anatomopathologic diagnosis: macroscopic pathology and sampling:** session of 3 hours / group.

- **Laboratory practices Anatomopathologic diagnosis: sample processing** : virtual.
- **Seminars Anatomopathologic diagnosis: histopathological injury patterns of infectious diseases**: session of 2 hours / group
- **Practical seminars Clinical diagnosis small animals**: sessions of 2 hours / group
- **Practical seminars Clinical diagnosis large animals**: sessions of 2 hours / group

The schedules of theoretical and practical sessions, groups of practices and seminars, dates of exams and general calendar of the semester will be delivered to each student by the direction of studies / coordination of the degree.

RULES OF THE SUBJECT

1. Several of the practices have been designed with a specific number of participants due to space or material restrictions for the development of the same. **No changes of groups or practices are allowed except those that are justified by certificate or participants are exchanged.**
2. **It is required to wear surgical pajamas or overalls/ boilersuit + waterproof boots to access the practices that are performed in the necropsy room. A lab coat is required. If this requirement is not met, students will not be able to access the practice.**
3. In order to be able to comply with the teaching program, punctuality will be appreciated at each of the practical sessions. **A practical session can not be accessed if more than 15 minutes pass from the start time.**
4. **If an attempted copy is detected in any of the exams of the subject, it will proceed to the immediate expulsion.**

Evaluation

The contents of the subject are divided into SIX evaluative BLOCKS:

THEORY AND CLINICAL CASES BLOCK I: SMALL ANIMALS. It represents 30% of the total grade for the subject. It will be evaluated through attendance and participation in the proposed seminars, as well as through a single written test at the end of the semester, on the date and time established for this purpose in the official academic calendar of the Double Degree. It will consist of clinical cases, real or fictitious, about diseases of small animals that will be scored between 0-10 points. The test will evaluate if the theoretical and practical knowledge has been acquired in an integral way and if the student is able to use it in solving problems. The exercises will include the concepts explained and addressed both in the theoretical classes and in the practical seminars. **A 4 is required as a minimum score** to be able to average with the rest of the evaluation activities. If this minimum is not reached, the student must appear to **resit** the block.

THEORY AND CLINICAL CASES BLOCK II: LARGE ANIMALS. It represents 30% of the total grade for the subject. It will be evaluated through attendance and participation in the proposed seminars, as well as through a single written test at the end of the semester, on the date and time established for this purpose in the official academic calendar of the Double Degree. It will consist of clinical cases, real or fictitious, about diseases of small animals that will be scored between 0-10 points. The test will evaluate if the theoretical and practical knowledge has been acquired in an integral way and if the student is able to use it in solving problems. The exercises will include the concepts explained and addressed both in the theoretical classes and in the practical seminars. **A 4 is required as a minimum score** to be able to average with the rest of the evaluation activities. If this minimum is not reached, the student must appear to **resit** the block.

PRACTICAL BLOCK Molecular Diagnosis: will account for 10% of the final grade for the course. The practice will be evaluated through the activities scheduled during and at the end of the practice. **This evaluation is not retaken.**

PRACTICAL BLOCK Immunological and Microbiological Diagnosis: will account for 10% of the final grade for the course. The practice will be evaluated through the activities scheduled during and at the end of the practice. **This evaluation is not retaken.**

PRACTICAL BLOCK Parasitological Diagnosis: will account for 10% of the final grade for the course. The practice of taking samples will be evaluated at the end of the practice through a brief written questionnaire. **This evaluation is not retaken.**

PRACTICAL BLOCK Anatomopathological Diagnosis: it will account for 10% of the final grade for the course. **This evaluation is not retaken.** In turn, it is divided into:

- **Sampling:** it will be evaluated during the practice. Students must meet certain objectives set in the practice dossier (virtual campus). It represents 50% of the total mark of this block.
- **Processing of samples, making histological sections and histological staining for infectious agents:** The practice will be evaluated with the virtual campus test tool. It represents 20% of the total mark of this block
- **Histopathological lesion patterns of infectious diseases:** it will be evaluated during the practice. Students must meet certain objectives set in the practice dossier (virtual campus). It represents 30% of the total mark of this block

The assistance is necessary for the evaluation of the practices, since the exercises and evaluative tests are carried out during the execution of these practical activities. The unjustified absence to the practical sessions will imply, therefore, the absence of evaluation and is considered as failed (qualification = 0), in each case. Late or partial attendance at the practical sessions is penalized by 1 point, in each case, over the total practical note. The participatory attitude in the practices and the realization of the additional activities proposed at the end of the course may represent, at the discretion of the teacher, an extra 1 point in the total grade, provided that the subject is approved.

Final score

To pass the subject it will be essential to obtain a minimum grade of 5 in the total count of activities. If the minimum is not reached, the course will be suspended.

The amount of each exam in the final grade will be: 30% Theory and clinical cases I + 30% theory and clinical cases II + 10% Práct. Mol + 10% Practice Microbiol/Immunol + 10% Práct. Parasitol + 10% Práct. pathology

The results obtained will be qualified according to the numerical scale: 0-4.9: Suspense; 5.0-6.9: Approved; 7.0-8.9: Notable; 9.0-10: Excellent

In case of not reaching the minimum required mark established in some of the evaluation blocks, but the average of the subject is approved, the subject will be graded in the minutes with a 4.9 (see *NORMATIVA DE L'AVUACIÓ I LA QUALIFICACIÓ DELS APRENTATGES IN ELS GRAUS I MASTERS* of the UdL, 2023).

As of 9 in the final grade for the subject, the grade may be weighted to grant honors if deemed appropriate by the teaching staff based on the student's evolution during the semester.

The condition of not presented (NP) is reserved for those students who carry out evaluable activities that weigh less than 50% of the overall grade for the subject (*NORMATIVA DE L'AVUACIÓ I LA QUALIFICACIÓ DELS APRENTATGES EN ELS GRAUS I MASTERS* de the UdL, 2023).

ALTERNATIVE EVALUATION

According with NORMATIVA DE L'AVUACIÓ I LA QUALIFICACIÓ DELS APRENTATGES IN ELS GRAUS I MASTERS of the UdL (2023), there is the possibility of carrying out an alternative evaluation for those students due to necessity and duly justified cause.

- THEORY BLOCK AND CLINICAL CASES + THEORETICAL-PRACTICAL SEMINARS P8-P13: This evaluation will consist of a single exam at the end of the semester, which will include the contents of the course, the theory blocks and clinical cases I and II with the same characteristics as the conventional evaluation path exam. The date and time of the same will be agreed with the teaching staff of the subject. Only exam at the end of the semester. The material from the seminars taught will be made available to the student.
- PRACTICAL BLOCKS (activities P1-P7): Attendance at these contents is essential to cover and assume the necessary competencies on the part of the student, and to be evaluated, for which they must be carried out. The student will coordinate with the teaching staff in order to find the fit within the designated times for the different groups.

***All the theoretical and practical evaluation tests are planned in face-to-face format (except for P3).**

Bibliography

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