Information about the subject

Degree: Bachelor of Science Degree in Veterinary Medicine

Faculty: Faculty of Veterinary Medicine and Experimental Sciences

Code: 1260406 **Name:** Epidemiology

Credits: 6,00 **ECTS Year:** 3 **Semester:** 1

Module: Module of Clinical Sciences and Animal Health

Subject Matter: Clinical Sciences and Animal Health **Type:** Compulsory

Department: Animal Production and Public Health

Type of learning: Classroom-based learning

Languages in which it is taught: Spanish

Lecturer/-s:

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Module organization

Module of Clinical Sciences and Animal Health

Subject Matter	ECTS	Subject	ECTS	Year/semester
Alterations in Structure and Function, and Fundamentals of Diagnosis	36,00	Clinical diagnostic techniques I (Clinical Propedeutics)	6,00	3/1
		Clinical Diagnostic Techniques II (Imaging Diagnosis)	6,00	3/1
		Histopathology and General Pathological Anatomy	6,00	2/1
		Physiopathology and general integrated Pathology I	6,00	2/1
		Physiopathology and general integrated Pathology II	6,00	2/2
		Special pathological anatomy	6,00	2/2
Pharmacology and Therapeutics	12,00	Pharmacology and Toxicology	6,00	3/1
		Pharmacotherapy, preventive medicine and veterinary hygiene	6,00	5/1
Clinical Sciences and Animal Health	60,00	Clinic and health in equines	6,00	3/2
		Clinic and health in water animals	6,00	5/1
		Clinic and health in wild and exotic animals	6,00	3/2

Clinical Sciences and Animal Health	Clinic and health on the farm I	6,00	4/1
	Clinic and health on the farm II	6,00	4/2
	Epidemiology	6,00	3/1
	Pet Clinic	6,00	3/2
	Reproduction and Obstetrics	6,00	3/1
	Veterinary Surgery I	6,00	3/2
	Veterinary Surgery II	6,00	4/1

Recommended knowledge

Mathematics and Statistics Knowledge. Basic Informatics skills.

Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

R1 The student is able to solve problems related to the contents of the module.

R2 The student searches bibliographic information from different sources and knows how to analyse it with a critical and constructive spirit.

R3 The student has understood and assimilated the theoretical contents of the module.

R4 The student is able to write a comprehensible and organized text on various aspects of epidemiology and present it in public.

R5 Collaborates with the teacher and classmates throughout the learning process: Attends theoretical, practical or tutorial sessions; works in groups; is respectful in his/her treatment towards others; complies with the organizational rules of the module to the benefit of all.

Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

BASIC		Weighting			
		1	2	3	4
CB2	Capacity to apply knowledge to work or occupation in a professional way and have the competences that are proved by preparing and arguing topics and problem-solving in their specific field of study.				x
CB3	Capacity to gather and interpret relevant data usually within their specific field of study and capacity to make judgments that include reflection on relevant social, scientific or ethical issues.			x	
CB4	Capacity to communicate information, ideas, problems and solutions at specialist and non-specialist levels.				x
CB5	Capacity to develop those learning skills needed to undertake further studies with a high degree of autonomy.			x	

GENERAL		Weighting			
		1	2	3	4
CG0	Capacity to speak well in public.			x	
CG2	Understanding and applying prevention, diagnosis and individual or collective treatment , and control of animal diseases, individually or in groups, with special attention to zoonoses.		x		
CG3	Understanding and applying control of animal breeding, management, health, reproduction, protection, and feed as well as improving production.	x			
CG5	Understanding and applying laws, regulations and administrative provisions in all areas of the veterinary profession and public health, understanding the ethical implications of health in a changing global context.		x		

CG6	Developing professional practice, acquiring skills related to teamwork, with an efficient use of resources and quality management.			x	
CG7	Identifying emerging risks in all areas of the veterinary profession.	x			

SPECIFIC		Weighting			
		1	2	3	4
E24	Knowing and applying methods and procedures of clinical examination, additional diagnostic techniques and their interpretation.				x

TRANSVERSAL		Weighting			
		1	2	3	4
T1	Capacity of analysis, synthesis, implementation of knowledge for problem-solving and decision-making.				x
T2	Understanding and applying the scientific method to professional practice including evidence-based medicine.		x		
T3	Basic knowledge of the veterinary profession: legal, economic, administrative, planning and time management issues and the veterinarians' society together with the importance of monitoring quality, standardization and protocols of veterinary practice.		x		
T4	Mastering fluency in oral and written mother tongue communication, listening and responding effectively using a language appropriate to audience and context.			x	
T6	Using information technology to communicate, share, search for, collect, analyze and manage information, especially related to the veterinarian practice.				x
T7	Ability to adapt to new situations, self-critical ability, being aware of personal limitations and understanding when and where seeking and obtaining advice and professional help.			x	
T8	Efficient and effective work, both independently and as a member of a multidisciplinary team or unit, showing respect, appreciation and sensitivity to the work of others.			x	

T9	Keeping an ethical behaviour in the exercise of given responsibilities toward the profession and society.	x		
T10	Ability to learn, to research, and to be aware of the need to keep knowledge updated, and attending training programs.		x	

Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3, R4, R5	40,00%	Written assessment of acquired knowledge and skills. The test may consist of a series of open-ended questions or multiple-choice questions about the theoretical contents of the module and/or practical exercises (problem-solving).
R1, R2, R3, R4, R5	15,00%	Evaluation of the use of the practical lessons in the classroom, of problems or computer science, seminars and tutorials, by means of participation, computer-supported problem solving and the elaboration of the corresponding reports.
R1, R2, R3, R4, R5	15,00%	Evaluation of the practical laboratory work, which must demonstrate the competences acquired by the student and his or her ability to use them to solve the different situations and problems that arise in a laboratory; this assessment may consist of one of the following methods, or a combination of several of them: an individual written test, the individual or group performance of a laboratory experience, the delivery of an individual or group report on the work carried out in the laboratory.
R1, R2, R3, R4, R5	20,00%	Evaluation of group work through a system of continuous assessment throughout the course based on the delivery of assignments the objectives and content of which will be proposed by the teacher.
R1, R2, R3, R4, R5	10,00%	Evaluation of activities in which the student must do some research individually and structure information related to each of the topics through a system of continuous assessment throughout the course based on the delivery of papers, the objectives and contents of which will be proposed by the teacher.

Observations

The student must pass the 50% of all the supervised tasks, to obtain the mean of subject. The total score mean must be 5 points over 10, to pass the subject.

Attendance at practices is mandatory, so unjustified absence to every one of the practices of the subject will be a discount of 10% of the final practice score.

Those students who, for various reasons (see Article 10 of current regulations https://www.ucv.es/documentos/normativa/documento11.html), do not attend the assessment of the subject on the official examination date, may be submit to the final assessment of the subject through an oral or written examination according to the criteria of the teacher.

This course is not eligible for single evaluation. According to the general evaluation and qualification regulations, the preferred evaluation system will be continuous evaluation.

The use of artificial intelligence (AI)-based tools is subject to the discretion of the teacher, who may establish specific limits or conditions depending on the training or assessment activity.

MENTION OF DISTINCTION:
In accordance with the regulations governing the assessment and grading of subjects in force at UCV, the distinction of "Matrícula de Honor" (Honours with Distinction) may be awarded to students who have achieved a grade of 9.0 or higher. The number of "Matrículas de Honor" (Honours with Distinction) may not exceed five percent of the students enrolled in the group for the corresponding academic year, unless the number of enrolled students is fewer than 20, in which case a single "Matrícula de Honor" (Honours with 9 Distinction) may be awarded. Exceptionally, these distinctions may be assigned globally across different groups of the same subject. Nevertheless, the total number of distinctions awarded will be the same as if they were assigned by group, but they may be distributed among all students based on a common criterion, regardless of the group to which they belong. The criteria for awarding "Matrícula de Honor" (Honours with Distinction) will be determined according to the guidelines stipulated by the professor responsible for the course, as detailed in the "Observations" section of the evaluation system in the course guide.

Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

M1 On-site training activity aimed primarily at acquiring knowledge acquisition skills. It is characterised by the fact that students are spoken to. Also called master class or exposition, it refers to the oral presentation made by the teacher, (with the support of blackboard, a computer and a projector for the display of texts, graphs, etc.), in front of a group of students. They are expository, explanatory or demonstrative sessions of contents. The size of the group is determined by the limit or physical capacity of the classroom; therefore, it is a single group.

M2 On-site training activity aimed primarily at obtaining knowledge application and research skills. Knowledge is built through interaction and activities. The activity consists of supervised monographic sessions with shared participation (teachers, students, experts). The size of the group is variable, from one large group to various small groups, with a minimum of 6 students to ensure interaction. The evaluation will be based on follow-up records kept by the teacher. Participation and the development of the capacity to problematize should be taken into account.

M3 On-site group-work training activity oriented toward problem solving under the supervision of a teacher. It would correspond to "Animal-free supervised practical work", type e1, from the European evaluation of EAEVE. The size of the group is variable, in a range of 10 to 20 students, to differentiate it from a master class.

M4 On-site training activity in groups that takes place in the classroom. It includes working with documents and formulating ideas without handling animals, organs, objects, products, or corpses (e.g., work with articles or documents, clinical case studies, diagnostic analyses, etc.). It would correspond to "Animal-free supervised practical work", type e1, from the European evaluation of EAEVE. The size of the group is variable, in a range of 10 to 20 students.

M5 On-site training activity in groups that takes place in the Computer Lab where the computer is used as support for learning. It includes work with computer models, specific software, Web queries, etc. It would correspond to "Animal-free supervised practical work", type e1, from the European evaluation of EAEVE. The size of the group is variable, in a range of 10 to 20 students.

M6 On-site training activity in groups carried out in the laboratory. It includes the sessions where the students develop laboratory experiments, make dissections or use the microscopes for the study of histological or histopathological samples actively and autonomously, under the supervision of the professor. It also includes work with healthy animals, objects, products, corpses (e.g., animal handling, bacteriological practices, physiology or biochemistry, meat inspection, etc.). It would correspond to the "Supervised practical non-clinical animal work" type e2 of the European evaluation of EAEVE. The size of the group is variable, in a range of 10 to 20 students.

M7 On-site training activity that is defined as the clinical practical work developed in the Veterinary Clinical Hospital or clinical centres ascribed to the University, as well as itinerant clinical practices, mainly with ruminants, equids, pigs, birds and aquatic animals. Also included are necropsies, surgical workshops and training in clinical examination techniques or diagnosis with healthy patients. In these practical sessions the student will always work with animals, which can be healthy (e.g. propaedeutic or obstetrics) or clinical cases (individual or collective), including a protocol or work scheme, being supervised by a teacher and assuming the provision of a service. This type of training corresponds to type e3 of the EAEVE European evaluation called "Clinical Training" (strickly hands-on)". The size of the group will be 5 students or fewer.

M8 A set of on-site training activities carried out by the teacher to provide personalised attention to the student or in small groups with the aim of reviewing and discussing the materials and topics presented in classes, seminars, readings, carrying out projects, etc. The aim is to ensure a truly comprehensive education of the student rather than a mere transfer of information. It is, therefore, a personalized assistance relationship in which the tutor assists, facilitates and guides one or more students in the learning process.

M9 Set of processes that attempt to evaluate the learning outcomes of students expressed in terms of acquired knowledge, capacities, skills or abilities developed and manifested attitudes. It covers a wide range of activities that can be developed for students to demonstrate their training (e.g. written, oral and practical tests, projects or assignments). It also includes the Official Calls.

M10 Autonomous training activity, including activities and coursework, bibliographic searches. The results obtained from unsupervised group and teamwork will be evaluated, with particular attention paid at the time of evaluation to the acquisition of specific knowledge development skills through group work.

M11 Autonomous training activities related to personal study, or the preparation of individual course assignments. The individual preparation of readings, essays, problem solving, papers, reports, etc. will be evaluated through presentations or submissions during theoretical classes, practical classes, seminars and/or tutorials. The evaluation of the submitted papers will consider the structure of the paper, the quality of the documentation, originality, spelling and presentation.

IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Theoretical lessons (TL) M1	R1, R2, R3, R4, R5	60,00	2,40
Seminars (S) M2	R1, R2, R3, R4, R5	4,00	0,16
Problem-solving Practice (PSP) M3	R1, R3, R5	10,00	0,40
Computer Practice (CoP) M5	R1, R2, R3, R5	10,00	0,40
Tutorial M8	R1, R2, R3, R4, R5	3,00	0,12
Evaluation (Ev) M9	R1, R2, R3, R4, R5	3,00	0,12
TOTAL		**90,00**	**3,60**

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Group work M10	R1, R2, R3, R4, R5	30,00	1,20
Individual work M11	R1, R2, R3, R4, R5	30,00	1,20
TOTAL		**60,00**	**2,40**

Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
UNIT 1: INTRODUCTION TO EPIDEMIOLOGY	ITEM 1. Concepts of epidemiology: definitions and objectives. Classes epidemiology. Applications.

UNIT 2: DESCRIPTIVE EPIDEMIOLOGY	ITEM 2. Etiology and causality. Causes necessary, sufficient and components. Causality postulates. Causal models. ITEM 3 Ways disease presentation: endemic, epidemic, pandemic and sporadic disease. ITEM 4. Determinants of disease. Types of determinants. ITEM 5. Methods of transmission and maintenance of the disease. Temporal and spatial evolution of the disease. ITEM 6. Measures of Disease Frequency. Prevalence rate, incidence rate and cumulative incidence. Relationships between incidence and prevalence. Troubleshooting. ITEM 7. Ratios and crude and specific rates. Attack Rate. Mortality and case fatality rates. Adjusting rates. ITEM 8. Sources and nature of epidemiological data. ITEM 9. Data collection. Questionnaires. Structure. Development. Utilization. Variables most common in veterinary epidemiology. ITEM 10. Sampling. Population and sample. Sampling rates. Sampling errors associated. ITEM 11. Sample size. Sampling to detect disease. Sampling and detecting a mean percentage. Troubleshooting.
UNIT 3: DIAGNOSTIC EPIDEMIOLOGY	ITEM 12. Epidemiology diagnostic concept. Measures for evaluating screening tests (screening): sensitivity and specificity. Troubleshooting. ITEM 13. Predictive values. Measures the correlation between two tests: Kappa statistic. Troubleshooting.

UNIT 4: ANALYTICAL EPIDEMIOLOGY

ITEM 14. Epidemiological studies: experimental and observational studies. Objectives and types of studies. Cohort studies. Case-control studies. Design studies.

ITEM 15. Measures of association: relative risk, prevalence ratio, incidence rate ratio, odds ratio. Troubleshooting.

ITEM 16. Measures of Impact: etiologic fraction, attributable risk, attributable fraction. Troubleshooting.

ITEM 17. Multiple data analysis in observational studies. Confusion and interaction. Techniques for control of confounding and interaction. Troubleshooting.

ITEM 18. Economy of the disease. Methods of economic analysis.

Organization of the practical activities:

	Content	Place	Hours
PR1.	Networking applications available for the study of the descriptive epidemiology.	Computer	2,00
PR2.	WinEpiscope ® Program I.	Computer	2,00
PR3.	WinEpiscope ® Program II.	Computer	2,00
PR4.	WinEpiscope ® Program III.	Computer	2,00
PR5.	WinEpiscope ® Program IV	Computer	2,00
PR6.	Problems calculating prevalence and incidence.	Lecture room	2,00
PR7.	Problems calculating sample size.	Lecture room	2,00
PR8.	Problems calculating diagnostic epidemiology.	Lecture room	2,00
PR9.	Problems calculating measures of association.	Lecture room	2,00
PR10.	Problems calculating multiple data analysis.	Lecture room	2,00

Temporary organization of learning:

Block of content	Number of sessions	Hours
UNIT 1: INTRODUCTION TO EPIDEMIOLOGY	2,00	4,00
UNIT 2: DESCRIPTIVE EPIDEMIOLOGY	15,00	30,00
UNIT 3: DIAGNOSTIC EPIDEMIOLOGY	10,00	20,00
UNIT 4: ANALYTICAL EPIDEMIOLOGY	18,00	36,00

References

CONTRERAS DE VERA, A., SANCHEZ LÓPEZ, A., CORRALES ROMERO, J.C. Epidemiología Veterinaria. ICE Universidad de Murcia. 2004.
FLETCHER,R H., FLETCHER, S W., FLETCHER, G. Epidemiología clínica. Wolters Kluwer, 2016.
HERNÁNDEZ-AGUADO I., LUMBRERAS LACARRA, B., A. PARKER L., ÁLVAREZ-DARDET DÍAZ, C. Manual de epidemiología y salud pública: para grados en ciencias de la salud. Médica Panamericana. 2018.
RUIZ MORALES, A J., GÓMEZ-RESTREPO,C. Epidemiología clínica: investigación clínica aplicada. Médica Panamericana, 2015.
THRUSFIELD, M. Veterinary Epidemiology. University of Edinburgh. 4th Edition. Blackwell Publishing. 2018.