



General information	
Academic subject	VETERINARY MICROBIOLOGY AND IMMUNOLOGY
Degree course	VETERINARY MEDICINE
Academic Year	2021/2022
European Credit Transfer and Accumulation System (ECTS)	4
Language	ITALIAN
Academic calendar (starting and ending date)	III 8 WEEKS PERIOD
Attendance	MANDATORY

Professor/ Lecturer	
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Department and address	Veterinary Medicine Campus – Valenzano (BA)
Virtual headquarters	Teams platform “Microbiologia ed Immunologia Veterinaria 2021-2022 (access code ekfedrt)
Tutoring (time and day)	Tuesday-Thursday 14.30-16.30, Teams platform “Attività tutoria Microbiologia” (access code vavfapg) by appointment via email

Syllabus	
Learning Objectives	The course provides the essential and fundamental elements of knowledge of the microbial world, the interrelationships of microorganisms with the host and the tools and methods of response and defence of the immune system; it provides applications of immunology; it introduces the student to the microbiological terminology
Course prerequisites	The student must have acquired knowledge and skills relating to the anatomical districts, the biochemical and physiological mechanisms that regulate cellular functions and the blood compartment. Prerequisites: Physiology 1
Contents	<p>The course belongs to the Basic Science area</p> <p>Importance of microbiology and immunology in the acquisition of skills for the future veterinary profession and cultural background</p> <p>Bacteriology: Generalities on bacteria. Differences between eukaryotes and prokaryotes. Microscopy. Structure of the bacterial cell. Bacterial stainings. Bacterial multiplication. Bacterial growth factors. Bacterial growth curve. Cultivation and identification of bacteria. Pathogenic properties of bacteria. Bacterial genetics. Antibiotic resistance. Resistance of bacteria to physico-chemical agents. Sterilization. Disinfection.</p> <p>Systematic bacteriology: Classification of the main germs of medical-veterinary interest.</p> <p>Virology: General information on viruses. Structure of viruses. Composition and physico-chemical characteristics of viruses. Virus replication. Virus cultivation. Cytopathic effects. Types of Infection. Viral genetics. Bacteriophages: morphology, lytic cycle and lysogenic cycle. Resistance to physico-chemical agents. Prions. Virus titration: hemagglutination; plate method; end point method.</p> <p>Systematic virology: DNAvirus: Adenoviridae; Parvoviridae; Herpesviridae; Poxviridae. RNAvirus: Picornaviridae; Coronaviridae; Togaviridae; Flaviviridae; Caliciviridae; Paramyxoviridae; Orthomyxoviridae; Rhabdoviridae; Reoviridae;</p>

	Retroviridae. Immunology: Immunity and immune response. Lymphoid organs. Antigens and allergens. Aptens. Cells of the immune system. Antibodies. Components of the Innate immunity and mechanisms. Humoral immunity. Cell-mediated immunity. Mucosal immunity. Hypersensitivity (I, II, III, IV type). Passive immunity. Vaccines and vaccinations. Serological tests: Rapid serum agglutination. Agar Gel Immunodiffusion. Immunofluorescence test. Inhibition of hemagglutination. Seroneutralization test. Elisa test. Sampling. Molecular biology diagnostic techniques: PCR, Real-Time PCR.
Books and bibliography	Poli G, Dall'Ara P, Martino PA, Rosati S e coll. Microbiologia ed immunologia veterinaria, 3° ed. Edizioni EDRA S.p.A. Milano, 2017. Jawetz, Melnick, Adelberg's, Microbiologia medica, 25° Ed., Piccin Editore, 2011. Tizard IR, Veterinary Immunology, Elsevier 10th ed, 2017 Notes taken during lectures.
Additional materials	https://talk.ictvonline.org/ for more information on virus taxonomy

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
100	39	25	36
ECTS			
4	3	1	
Teaching strategy			
<p>The course consists of theoretical lectures and practical works in the laboratory. The theoretical part of the course takes place in classrooms equipped with multimedia tools such as pc, projector, internet connection, using power point slides and possibly video. The practical trainings focus on serological tests, bacteriology stains, cultivation and identification of bacteria and viruses, antibiogram and viral titration. The practical works are carried out in the various laboratories suitably equipped in the infectious disease section. To access it, students, aware of the biosecurity standards, must be equipped with their own disposable gown and gloves and possibly disposable masks and caps (these last disposable protective equipment is supplied by the Department). Students divided into small groups of a maximum of 10 units are followed by the subject owner and collaborators. After having learned the concepts and aims of the methods from the teacher, each student is asked to carry out the laboratory techniques individually or in groups and to discuss their interpretation in order to develop communication skills and the ability to work in a team. During the course, self-assessment questionnaires will be administered to verify learning. In the same way, innovative and interactive methods are used such as group quizzes (Kahoot!) to develop students' critical and deductive sense and specific and transversal competencies.</p> <p>The course is not delivered in e-learning mode.</p>			
Expected learning outcomes			
Knowledge and understanding on:	<p>At the end of the course the student must know:</p> <ul style="list-style-type: none"> ○ the basic principles of bacteriology, virology and immunology essential to the study and understanding of infectious diseases and prophylaxis plans; ○ diagnostic laboratory techniques and good laboratory practices and sampling methods 		
Applying knowledge and understanding on:	<p>At the end of the course the student must acquire:</p> <ul style="list-style-type: none"> ○ the ability to relate the characteristics of microorganisms with the 		



	<p>capabilities of interrelation with the external and host environment and knowing how to apply them in the diagnostic and prophylactic approach to infectious diseases.</p> <ul style="list-style-type: none"> ○ the ability to collect, store and process biological samples and send them appropriately to the laboratory ○ the ability to perform the common serological and microbiological diagnostic techniques, know how to apply them in an appropriate way, know how to interpret and discuss the results with interlocutors, even non-specialists. ○ The ability to apply biosecurity principles correctly, including sterilization of equipment and disinfection of clothing.
Soft skills	<ul style="list-style-type: none"> • Making informed judgments and choices At the end of the course, the student must be able to: <ul style="list-style-type: none"> ○ acquire the fundamental and essential bases of microbiology that can allow him/her to face and solve problems of an infectious nature both from an epidemiological, diagnostic and prophylactic point of view ○ know and apply the research methods and contribution of basic and applied research to veterinary science ○ know the principles of disease prevention and the promotion of health and welfare. ○ reason and argue ○ work both independently and as part of a team. ○ solve problems by applying knowledge ○ search and manage information related to veterinary practice. ○ use information in a foreign language ○ obtain adequate, diverse and updated information by various means such as literature and Internet information, and critically analyze it. • Communicating knowledge and understanding At the end of the course, the student must be able to: <ul style="list-style-type: none"> ○ communicate with exact terminology, with mastery of language and matter, on topics related to the host-pathogen relationship and the immune response in the epidemiological and prophylactic field. ○ make a clear, concise, and consistent public presentation • Capacities to continue learning • At the end of the course, the student must be able to: <ul style="list-style-type: none"> ○ know and apply a scientific methodological rigor to approach subsequent studies and in the veterinary profession. ○ be aware of the need to keep professional skills and knowledge up-to-date through a process of lifelong learning ○ participate actively to research activities.

Assessment and feedback	
Methods of assessment	<p>Exam takes place through a preparatory (propedeutic) practical laboratory test on topics covered in the practical works and an oral test on program topics. The practical part assessment is passed with a score grade ranging from 18 to 30L and can be taken separately from the oral part; the exam must be completed within 12 months under penalty of forfeiture of the validity of the outcome of the practical laboratory part.</p> <p>During the oral exam the student will be asked questions (usually 6) of special and general bacteriology and virology and questions of immunology (at least 2).</p>



<p>Evaluation criteria</p>	<ul style="list-style-type: none"> • Knowledge and understanding <ul style="list-style-type: none"> ○ The student must demonstrate knowledge of the mechanisms that regulate the microbial world and the immune response. ○ The student must be familiar with the concepts and methodologies used in diagnostic techniques • Applying knowledge and understanding <ul style="list-style-type: none"> ○ The student must demonstrate the skills acquired during the practical exercises and the knowledge of the principles of microbiology; ○ The student must demonstrate that he/she is able to choose and apply the best laboratory techniques for the isolation and cultivation of microorganisms of veterinary interest; ○ The student must be able to explore the different topics on the program by relating the characteristics of the different microorganisms with the different infections and types of immune response ○ The student must be able to apply the basic concepts of vaccinology • Autonomy of judgment <ul style="list-style-type: none"> ○ An important criterion is the evaluation of the student's ability to reason transversally by correlating notions acquired in previous and preparatory courses. • Communication skills <ul style="list-style-type: none"> ○ Particular attention will be paid to the quality of the presentation of the topics, the use of scientific terminology and the mastery of language • Capacities to continue learning <ul style="list-style-type: none"> ○ The student must demonstrate that he has assimilated and understood the fundamental concepts of microbiology in order to use them for subsequent studies.
<p>Criteria for assessment and attribution of the final mark</p>	<p>The final grade is awarded out of thirty. The exam is considered passed when the grade is greater than or equal to 18. The grade assigned to the practical laboratory test, which is preparatory to the oral exam, contributes for 20% to the determination of the final grade. In the oral exam, more attention will be given to the answers given to the immunology questions. Failure to answer questions, even those of taxonomy affects negatively, even significantly, the final grade and the outcome of the exam. The ability to relate the different topics of the program with a critical sense and language ability significantly affects the attribution of the final grade and the outcome of the exam.</p>
<p>Additional information</p>	<p>To access the attribution of the attendance signature and to be able to access the exam, students must attend 75% of the theoretical lessons and 75% of the practical trainings. This condition will not apply in the event of the persistence of the COVID state of emergency and consequent delivery of the course remotely.</p>