

ACADEMIC YEAR 2022/2023

General information	
Academic subject	PARASSITOLOGY
Integrated Teaching Modules	Parasitology, Parasitic Diseases, Mycology
Degree course	Veterinary Medicine
Academic Year	III
European Credit Transfer and Accumulation System (ECTS)	10
Language	Italian/English
Academic calendar (starting and ending date)	Ist and IInd Two months period
Attendance	Compulsory

Professor/ Lecturer	E mail	Phone
Domenico Otranto	domenico.otranto@uniba.it	080 4679839
Claudia Cafarchia	claudia.cafarchia@uniba.it	080 4679834
Jairo Mendoza Roldan	jairo.mendozaroldan@uniba.it	080 4679839
Department and address	Department of Veterinary Medicine, University of Bari	
Virtual headquarters	Microsoft Teams	
Tutoring (time and day)	Monday and Wednesday, From 2:30 pm to 4:30 pm	

Syllabus	
Learning Objectives	<p>The Parasitology, Parasitic Diseases and Mycology courses aim to transfer to the student the knowledge on taxonomy, morphology and biological life cycles of the main groups of parasites (protozoa and metazoa) and pathogenic fungi that cause animal and human infections.</p> <p>In addition, the student will acquire knowledge on epidemiology, pathogenesis, clinical manifestations, diagnosis, prophylaxis and treatment of parasitic and fungal diseases of Veterinary and Public Health concern.</p> <p>The student will acquire skills to manage parasitic and fungal diseases starting from a correct approach to the diagnostic procedure, a rational recourse to laboratory methods. He/she/they must be able to set up appropriate control measures for parasitic and fungal diseases by assessing the host/parasite/environment interactions. In particular, the student will acquire the knowledge of parasitic/fungal diseases transmitted from animal to humans (zoonoses).</p>
Course prerequisites	Propedeutics: General pathology. The student must have basic knowledge of biology, physiology, immunology .

<p>Contents Parasitology Course Professor/ Lecturer Domenico OTRANTO</p> <p>Lectures CFU: 2 Hours: 26</p> <p>Practical activities CFU: 1 Hours: 15</p>	<p>The course refers to Basic Sciences. Protista: (Apicomplexa and Sarcomastigophora) <i>Babesia</i> spp., <i>Theileria</i> spp., <i>Eimeria</i> spp., <i>Cystoisospora</i> spp., <i>Cyclospora</i>, <i>Toxoplasma gondii</i>, <i>Neospora</i> spp., <i>Sarcocystis</i> spp., <i>Cryptosporidium</i> spp., <i>Besnoitia besnoiti</i>, <i>Giardia</i> spp., <i>Plasmodium</i> spp., <i>Trypanosoma</i> spp. e <i>Leishmania</i> spp.</p> <p>Animalia: Platyhelminthes, Digenea, <i>Dicrocoelium dendriticum</i>, <i>Fasciola hepatica</i>, <i>Paramphistomum</i> spp., <i>Cotilophoron</i> spp., <i>Opistorchis felinus</i> e <i>Schistosoma</i> spp. Cestoda (Cyclophyllidea, Pseudophyllidea) Taeniidae; Anoplocephalidae; Dilepididae; Mesocestoididae; Davaineidae; Hymenolepididae e Diphyllobotriidae. Nematoda: Trichostrongylidae; Strongylidae: Strongylinae e Cyathostominae; Protostrongylidae, Dictyocaulidae, Metastrongylidae, Ascaridiidae; Ancylostomatidae; Strongyloididae; Spirurida: Onchocercidae, Thelaziidae. Trichocephalida e Dioctophymatidae. Insecta: Diptera: Nematocera (Ceratopogonidae, Simuliidae, Psychodidae e Culicidae). Brachycera (Tabanidae, Muscidae, Fannidae, Glossinidae, Calliphoridae, Sarcophagidae, Oestridae e Steganinae). Siphonaptera; Phiraptera ed Hemiptera. Arachnida, Parasitiformes, Ixodoida Metastigmata. Acari, Sarcotiformes: Astigmata: Sarcotidae, Psoroptidae, Knemidocoptes, Dermoglyphidae. Gamasida: Mesostigmata. Trombidiformes: Prostigmata. Other zoological groups of medical and health interest: Pentastomida Acanthocephala, Anellida, Mollusca, Crustacea (Copepoda) e Decapoda</p> <p>The practical lessons of Parasitology course will focus on the identification of parasitic agents by using their micro and macroscopic features. Students will process biological samples and will recognise parasites by macro or microscopic observation. Slides from the Parasitology Collection previously prepared and Reading Keys will be available to the students.</p>
<p>Contents Parasitic Diseases Course Professor/ Lecturer Domenico OTRANTO</p> <p>Lectures CFU: 2 Hours: 26</p> <p>Practical activities CFU: 1 Hours: 15</p>	<p>The module concerns to the Clinical Science of companion animals and food-producing animals Protozoan diseases: Babesiosis, Theileriosis, Coccidiosis, Toxoplasmosis, Neosporosis, Cryptosporidiosis, Besnoitiosis, Giardiosis, Malaria, Trypanosomosis, Leishmaniasis. Flatworm diseases: Dicroceliosis, Fasciolosis, Paramphistomosis, Opistorchiosis and Schistosomosis. Infestation by larval stages (metacestodes) and adult cestodes. Nematode diseases: Gastrointestinal and intestinal strongylosis of ruminants and equines, Broncho-pulmonary strongylosis of ruminants, dogs and cats. Ascariidiosis, Ancylostomosis, Uncinariosis, Oxyuriasis, Strongyloidosis, Trichuriasis and Trichinellosis. Cardiopulmonary and subcutaneous dirofilariosis in dogs. Others filarids in ruminants and horses. Habronemiosis and Thelaziosis Onchocercosis in the animal and humans. Arthropod-borne diseases. Myasis. Flea, Louse and Bed Bug Infestation, Tick infestation and tick-borne diseases (TBDs). Mange.</p> <p>Practical activities for Parasitic Diseases will cover laboratory diagnostic procedures applied to parasitic diseases. Students will have to carry out and interpret the results of coprological, morphological, cytological, molecular and</p>

<p>Professor Jairo MENDOZA ROLDAN</p>	<p>serological examinations in order to perform a correct diagnosis of parasitic infection. Videos highlighting the clinical features of parasitic diseases and sampling procedures will be available for the students, in order to help them in accurately performing diagnostic procedures.</p>
<p>Contents Mycology Course</p> <p>Professor/ Lecturer Claudia CAFARCHIA</p> <p>Lectures CFU: 2 Hours: 26</p> <p>Practical activities CFU: 1 Hours: 15</p>	<p>The course refers to Basic Sciences.</p> <p>Fungi Kingdom: The fungal cell wall. Vegetative system. Reproduction: spores of sexual origin, spores of asexual origin. Classification of fungi of medical and veterinary concern: Zygomycetes, Ascomycetes and Basidiomycetes. The yeasts. Black Yeast and black moulds. The life of fungi, Pathogenesis of infections: host risk factors, Virulence factors of fungi. Diagnosis of fungal infections: clinical diagnosis, sampling and laboratory diagnosis. Therapy and antifungal <i>in vitro</i> tests. The cutaneous mycoses: <i>Malassezia</i> spp and <i>Candida</i> spp infection; Dermatophytoses. Subcutaneous mycoses: Sporotrichosis, Mycetoma, Hyalophomycosis, Phaeohyphomycosis. Deep mycoses: Cryptococcosis and Aspergillosis</p> <p>The practical activities will be focused on the identification of fungal strains by using their micro and macroscopic features. An atlas will be suitably prepared in power point presentations. Students will have to process biological samples and perform direct microscopic and culture examinations in order to diagnose/confirm a fungal infection. Video will be prepared with the aim to show the techniques useful to prepare culture media, to isolate fungal strains in pure culture and to prepare the slides for microscopic identification of fungi. Videos will also be prepared aimed in highlighting the techniques useful for carrying out the microscopic and cultural examination of biological samples.</p>
<p>Biosafety rules for the attendance of practical activities.</p>	<p>Access to laboratories, stables and isolation unit of the veterinary teaching hospital will be allowed only to students wearing protective clothing (disposable coats and gloves and, when required, also footwear) and that have read the biosafety manual. The exercises and the practical test will be carried out in the Parasitology/ Mycology laboratories and "Aula Vinci"; therefore, the student will have to wear a laboratory coat. The laboratory staff will provide the biosecurity materials (gloves) required for carrying out the practical test.</p>
<p>Books and bibliography</p>	<p>Parasitology and Parasitic diseases Otranto D. Parassitologia e malattie parassitarie degli animali (Ed. italiana Veterinary Parasitology; MA Taylor, R Coop, R. Wall), Roma, Edra Editore, 2022. Appunti di lezione e dispense sulla diagnosi di laboratorio delle malattie parassitarie (http://www.bariparasitology.it/materiale.html)</p> <p>Mycology Cafarchia C. e Mancianti F. Micologia Veterinaria e Comparata. Aracne Editore, Roma 2022. Claudia Cafarchia Lecture notes</p>
<p>Additional materials</p>	<p>Teaching materials (http://www.bariparasitology.it/materiale.html).</p>

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
136	91	45	114
CFU/ETCS			
10	7	3	/
Teaching strategy		<p>Teaching activity will include oral and practical lessons to which active learning methods, such as problem solving and case studies, will be added in order to integrate information and to foster learning. The oral lessons process will be implemented through iconic, verbal and graphic communication models using available teaching resources and technologies. To implement self-learning activities, students should present particular fungal and parasitic diseases after a careful review of the literature. There will also be self-assessment tests provided by the lecturers. During practical lessons, more emphasis will be placed on “problem solving” and “learning by doing” to encourage the acquisition of skills and competences. Students, divided into groups of a maximum of 10 person, will process and/or observe biological samples and parasite specimens individually in order to perform a correct diagnosis of infection and/or identification of the aetiological agent. The results will be discussed with the lecturer or collaborators. Collection Slides of parasites and fungi from the Parasitology and Mycology section will be available for students</p>	
Expected learning outcomes		<p>At the end of the course, the student will acquire knowledge on</p> <ul style="list-style-type: none"> • The aetiology, pathogenesis, clinical signs, diagnosis and treatment of the common parasitic and fungal diseases and disorders that occur in the common animal species.(DOC 2.5) • The principles of disease prevention and the promotion of health and welfare. (DOC 2.9). • Veterinary public health issues, with particular interest on zoonotic diseases, emerging and re-emerging diseases (DOC 2.10) 	

<p>Knowledge and understanding on:</p>	<p>At the end of the course, the student should be able to:</p> <ul style="list-style-type: none"> • Apply principles of bio-security correctly (DOC 1.28) • Use her/his professional capabilities to contribute to the advancement of veterinary knowledge and One Health concept in order to improve animal health and welfare, the quality of animal care and veterinary public health (DOC 1.10). • Obtain an accurate and relevant history of the individual animal or animal group, and its/their environment (DOC 1.15). • Collect, preserve and transport samples, select appropriate diagnostic tests, interpret and understand the limitations of the test results (DOC 1.21). • Diagnose Parasitic and fungal diseases mainly zoonotic diseases and take appropriate action, including notifying the relevant authorities (DOC 1.24). • Understand the contribution that imaging and other diagnostic techniques can make in achieving a diagnosis. Use basic imaging equipment and carry out an examination effectively as appropriate to the case, in accordance with good health and safety practice and current regulations (DOC 1.24). • Prescribe and dispense medicines correctly and responsibly in accordance with legislation and latest guidance (1.26) • Advise on, and implement, preventive and eradication programmes appropriate to the species and in line with accepted animal health, welfare and public health standards (DOC 1.36) • Communicate clearly and collaborate with referral and diagnostic services, including providing an appropriate medical history (DOC 1.22)
<p>Applying knowledge and understanding on:</p>	<p>Judgment autonomy</p> <ul style="list-style-type: none"> • Be able to review and evaluate literature and presentations critically (DOC 1.8). • Understanding of, and competence in, the logical approaches to both scientific and clinical reasoning, the distinction between the two, and the strengths and limitations of each (DOC 2.1) • Critically analysing the operational procedures of a process (diagnostic, preventive, therapeutic...) • Propose solutions in problematic situations. <p>Communication skills</p> <ul style="list-style-type: none"> • Work effectively as a member of a multi-disciplinary team in the delivery of services (DOC 1.6.) • Communicate effectively with clients, the public, professional colleagues and responsible authorities, using language appropriate to the audience concerned and in full respect of confidentiality and privacy (DOC 1.4) <p>Ability to learn autonomously</p> <ul style="list-style-type: none"> • Demonstrate an ability of lifelong learning and a commitment to learning and professional development. This includes recording and reflecting on professional experience and taking measures to improve performance and competence (DOC 1.13)

Soft skills	<p>Conoscenze:</p> <p>2.5 2.9 2.10</p> <p>Competenze:</p> <p>1.4 1.6 1.8 1.10 1.13 1.15 1.18 1.21 1.22 1.23 1.24 1.28 1.29 1.36</p>
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Assessment and feedback	<p>The Parasitology exam allows the acquisition of 10 CFU of the study plan. The exam comprises a partial exam of the 'Mycology' module, consisting of an oral test on topics of the program and a partial exam of the 'Parasitology' and 'Parasitic Diseases' modules. The exam of the two parts can be performed in the same session or in different sessions; in this case, the partial exam of Micology is propedeutic.</p> <p>The assessment of the student's learning for both the partial parts will be done through a practical and oral exam. During the practical test (that is propedeutic for the oral exam) , the candidate will demonstrate knowledge of laboratory instrumentation, the use of microscopes and the ability to perform laboratory techniques for the correct morphological identification of parasites and fungi. Throughout the oral exam, the student will be able to demonstrate that he/she has acquired adequate knowledge relating to parasitic and fungal diseases of domestic and farm animals and humans with particular regard to the aetiology, epidemiology, clinical, laboratory diagnosis, therapy and prophylaxis of a specific parasitic and fungal disease.</p> <p>The CFU will be acquired after the two parts of the exam have been passed and registered on the ESSE3 portal.</p>
Methods of assessment	
Evaluation criteria	<p>Knowledge and comprehension skills</p> <ul style="list-style-type: none"> The assessment of the student's learning will be conducted at the end of the course, through the practical test and the oral test that will ascertain the acquisition of the knowledge expected as detailed in the course objectives. The student must demonstrate that she /he has acquired an autonomy of judgment in recognizing individual parasitic/fungal diseases. In addition, during the interview, the examiner will verify that the student has acquired an appropriate scientific language.

	<p>Applying knowledge and understanding</p> <ul style="list-style-type: none"> • Ability to make connections between different disciplines and provide appropriate examples • Ability to evaluate a clinical picture and prepare a diagnostic algorithm • Ability to critically evaluate different health control strategies and prophylaxis plans. <p>Autonomy of judgment</p> <ul style="list-style-type: none"> • Ability to analyse and be critical about the topics studied • Ability to make a global and unitary evaluation of the most common clinical and epidemiological situations of livestock and pets <p>Communication skills</p> <ul style="list-style-type: none"> • Ability to fully frame their work in wider contexts and motivate the choices made in an understandable and convincing way; • Ability to transfer their knowledge adapting the communication method to the needs of the interlocutor; • Ability to cooperate effectively in the activities of homogeneous and heterogeneous working groups; • Ability to easily start working and social relationships. <p>Capacities to continue learning</p> <ul style="list-style-type: none"> • Ability to rework knowledge and transfer it to new and differentiated situations
<p>Criteria for assessment and attribution of the final mark</p>	<p>The results of the Parasitology, Parasitic Diseases and Mycology tests will be used to determine the final grade for the Parasitology exam.</p> <p>The final grade is the result of the collegiate judgement relating to the two part-tests (Mycology and Parasitology/Parasitic Diseases) in which the student must demonstrate that he/she has acquired a critical sense of the topics studied. The final grade, expressed in thirtieths, will be considered passed with a grade equal or higher than 18 taken in consideration not only the accuracy of the answer, but also the ability to communicate, the clarity of exposition, the disciplinary competence and the level of the details. The maximum score (30/30) will be assigned in cases all the evaluation parameters outlined according to the so-called Dublin Descriptors will be fully satisfactory</p>
<p>Additional information</p>	<p>During the course, some topics will be presented in English both by the teacher and by collaborators (PhD) of the Parasitology and Mycology section and by the experts of the sector (Visiting Professor).</p>