

<b>Academic subject: PARASITOLOGY, MYCOLOGY AND MANAGEMENT OF SINANTROPIC ANIMALS</b>			
<b>Degree Class: L38</b>		<b>Degree Course:</b> Animal Science	<b>Academic Year:</b> 2020/2021
		<b>Kind of class:</b>	<b>Year:</b> II <b>Period:</b> I
			<b>ECTS:</b> 9 divided into <b>ECTS lessons:</b> 8 <b>ECTS</b> <b>exe/lab/tutor:</b> 1
<b>Time management, hours, in-class study hours, out-of-class study hours</b> lesson: 80 Hours      exe/lab/tutor: 25 Hours      in-class study: 0      out-of-class study: 120			
<b>Language:</b> Italian	<b>Compulsory Attendance:</b> Yes		
<b>Subject Teacher:</b> Riccardo Paolo Lia Roberta Iatta Claudia Cafarchia	<b>Tel:</b> 080 5443802; <b>e-mail:</b> riccardopaolo.lia@uniba.it; <b>Tel:</b> 080 5443839; <b>e-mail:</b> roberta.iatta@uniba.it <b>Tel:</b> 080 5443837; <b>e-mail:</b> claudia.cafarchia@uniba.it	<b>Office:</b> Department of Veterinary Medicine, University of Bari "Aldo Moro", Italy	<b>Office days and hours:</b> Monday, Tuesday and Wednesday From 3:00 pm to 5:00 pm
<b>Prerequisites:</b> "Principles of physiology and endocrinology of domestic animals". In addition, the student must have basic notions of biology and immunology			
<b>Educational objectives:</b> The goal of this teaching activities provides  1) the acquisition of general concepts and theoretical bases relating to taxonomy, morphology, biological cycle of the main parasites and fungal microorganisms causing diseases in pets, livestock and wild animals as well as their epidemiology, clinical manifestations, diagnosis and prophylaxis.  2) the acquisition of technical and professional skills useful for assessing the impact of fungi and parasites on animal welfare trough a correct diagnosis, a prompt treatment as well as prophylaxis plans for the correct management of pets, livestock and synanthropic animals.			
<b>Expected learning outcomes (according to Dublin Descriptors)</b>	<p><b>Knowledge and understanding:</b> Students will be able to identify fungi and parasites, causing animal infections and those of zoonotic concern, at genus and species level. They will know the: a) biological aspects of interaction between microorganisms and host (commensalism, saprophyticism, commensalism and parasitism); b) pathogenetic mechanisms of parasites and fungi in the host and the main clinical aspects of the studied diseases; c) the methods and tests for performing a correct diagnosis and how to apply the good laboratory practices. Finally, they have to be able to recognize parasites and fungi causing zoonosis by using a "One Health" approach as well as studying the close relationship between human and animal health and the ecosystems.</p> <p><b>Applying knowledge and understanding:</b> The course promotes the acquisition of skills useful for the identification at genus and/or species level of parasites and fungi of medical-veterinary concern (i.e., pets, livestock and synanthropic animals) as well as the development and management of prophylaxis plans in the livestock with particular regards to the improvement of primary productions.</p> <p><b>Making judgements:</b> This teaching will help the student to achieve a growing degree of autonomy in judging the activities related to fungal and parasitic diseases by: (i) the identification the sources of a parasitic and fungal infection and its etiological agent; (ii) carrying out prophylaxis and control plans for reducing the risks of infection; (iii) by organizing knowledge independently for making simple interdisciplinary connections with related subjects.</p>		

**Communication:**

Students must be able to: (i) fully frame their work in wider contexts and motivate the choices made in an understandable and convincing way; (ii) transfer their knowledge adapting the communication method to the needs of the interlocutor; (iii) cooperate effectively in the activities of homogeneous and heterogeneous working groups; (iv) to easily start working and social relationships.

These objectives will be pursued and constantly verified during the teaching activity, favoring the active participation of students during theoretical and practical activities. Students divided in working groups will collaborate in presenting specific topic (i.e., case report, epidemiological studies) through power point presentations. Students will be encouraged to communicate and improve their skills during the lessons and lab activities provided by the course.

**Lifelong learning skills:**

At the end of the course, the student will know the specific terminology of the subject; will be independently able to recognize the main filamentous fungi, yeasts and parasites of medical and veterinary concern; will be able to monitor and control by preventative measures the fungal and parasitic diseases, in order to develop an integrated management of all available information in modern precision zootechnics. Finally, he/she will be able to make simple interdisciplinary connections with related subjects and to deal with "work-experience" and internship activities.

**Course program**

The teaching contents will be divided into three modules: Parasitology, Parasitic Diseases and Mycology.

**Parasitology**

General aspects on parasites and vectors and their interactions with hosts. Parasites and parasitism. Elements of taxonomy, morphological characteristics and biological life cycles of:

Protista: (Sarcocystidophora; Apicomplexa). Animalia: Platyhelminthes, Digenea, Cestoda (Cyclophyllidea and Pseudophyllidea). Nematoda (Strongylida, Ascaridida, Rhabditida, Spirurida e Trichocephalida). Insecta: Diptera (Nematocera) e Siphonaptera (Fam. Pulicidae). Arachnida: Ixodida.

**Parasitic diseases**

Definition of parasitic disease. Damage caused by parasites to livestock. Role of parasitic populations on animal welfare and on quantitative-qualitative food production. Socio-economic aspects of parasitic diseases. Protozoan diseases: Babesiosis, Coccidiosis, Toxoplasmosis, Neosporosis, Giardiasis, Cryptosporidiosis and Trypanosomosis, Leishmaniasis. Flatworm diseases: Dicrocoeliosis, Fasciolosis and Paramphistomatosis. Infestation by larval stages (metacestodes) and adult cestodes. Nematode diseases: Ascariidosis, Ancylostomosis, broncho-pulmonary Strongilosis and gastrointestinal and intestinal strongilosis of ruminates and equines respectively. Thelaziosis. Arthropod-borne diseases: Flea Infestation, Tick infestation and tick-borne diseases (TBDs). *Phlebotomus* spp. and culicids. Main parasitic zoonoses. Laboratory diagnosis: detection of haemoprotozoa, coprological diagnosis, qualitative and quantitative methods (i.e., traditional and innovative techniques such as Flotac group. Morphological identification of ticks and insects of veterinary concern. Prophylaxis and control measures of fungal and parasitic diseases. Health education.

**Mycology**

Introduction of mycology: Fungi: yeasts and moulds: The fungal cell. Vegetative system. Type of Reproduction: sexual spores, conidia of asexual origin. Fungi Classification:

Zygomycetes, Ascomycetes and Basidiomycetes. The yeasts. Fungi and Lifestyle. Pathogenesis and host risk factors. The diagnosis of fungal infections. Cutaneous, subcutaneous and deep mycoses. Mycoses of veterinary interest: Malassezia infections, Dermatophytosis, Sporotrichosis, Mycetomas, Feifomycosis, Cryptococcosis and Aspergillosis.

**Teaching methods:**

Teaching activities: 8 CFU/ 80 Hours; Practical activities: 1CFU/ 25 hours (10 hours of Mycology and 15 hours of Parasitology)

The teaching includes theoretical and practical activities. The teaching activities will be held in classrooms equipped with multimedia tools through the projection for power point presentations. Innovative and interactive teachings will be held through online search in specific parasitology websites.

Practical activities will be held in didactic laboratories equipped with specific instruments such as optical

microscopies (laboratory n° 10 and n° 11). Students will be divided into groups of a maximum 10 people each. They will be followed by the teacher in charge assisted by the researchers and the technicians of the section. Each student will play individually the practical activities consisting in the identification of fungi and parasitic organisms by the macro- and microscopic examinations. Furthermore, the student will learn how to sample biological specimens and how to store them. The students will join field activities (i.e., bovine livestock farm).

**Auxiliary teaching:**

During the laboratory activities, the students will have to wear a personal laboratory coat indicating his name. The biosecurity material necessary for carrying out the practical activities (gloves and masks) will be provided by the staff.

**Assessment methods:**

The assessment of knowledge takes place through an oral exam on program topics.

The student will have to know the morphological and biological aspects of parasites and fungi and the diseases they caused and describe how to prevent and control them. The students have to use the appropriate terminology and able to critically discuss the contents of the subject. The final grade of the exam will be obtained by the average of the marks of the modules of Parasitology, Parasitic Diseases and Mycology.

**Bibliography:**

-Taylor M.A., Coop R., Wall R., "Parassitologia e Malattie Parassitarie degli Animali", Edizione italiana, EMSI, (2009).

-Petretti F. "Gestione della fauna" Edagricole (2003). A.V. "Gestione e protezione del patrimonio faunistico" Editore a cura dell'Istituto per la qualificazione e l'aggiornamento tecnico professionale in agricoltura- Brescia, Volume 32. Atti I e II Corso di Aggiornamento Brescia, 1989-1990.

-Ambrosi M. "Parassitologia zootecnica", Edagricole, (1995). -AA.VV. Parassitologia dei ruminanti. Summa. Anno XV, n° 9, 1998.

-Polonelli L., Ajello L., Morace G., (1994) Micologia medica Eusculapio Editore, Bologna.

-de Hoog G.S. and Guarro J., (1996), Atlas of clinical fungi, edit by de Hoog G.S. & Guarro J., Centraal bureau voor Schimmel cultures Baarn and Delft, The Netherlands.

Students will be provided with didactic and photographic material (<http://www.bariparasitology.it/pagina-Gallery.html>), lecture notes (<http://www.bariparasitology.it/materiale.html>), study readings in Italian (<https://www.vetjournal.it/riviste.html>) and English (<https://www.ncbi.nlm.nih.gov/pubmed>).