

IDENTIFICATION DETAILS

| Degree: | Pharmacy | | | |
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| Scope | Pharmacy | | | |
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| Faculty/School: | Experimental Sciences | | | |
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| Course: | PARASITOLOGY | | | |
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| Туре: | Compulsory | | ECTS credits: | 6 |
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| Year: | 3 | | Code: | 2528 |
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| Teaching period: | Fifth semester | | | |
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| Subject: | Biologics | | | |
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| Module: | Biologics | | | |
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| Teaching type: | Classroom-based | | | |
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| Language: | Spanish | | | |
| | | | | |
| Total number of student study hours: | 150 | | | |

SUBJECT DESCRIPTION

Parasitology addresses the basic training necessary on the morphology and bionomy of parasites and the parasite-host relationship in order to apply these concepts to the epidemiology, pathology, diagnosis, treatment, prevention and control of the main human parasitic diseases. The biological cycles of parasites, their forms of transmission and routes of human infestation are analyzed in detail, as well as their geographical distribution and the basic study of the symptomatology and diagnosis of the diseases they cause. All this knowledge is related in each topic to measures for the prevention and control of parasitic diseases and to the knowledge of the most appropriate medications for their treatment.

GOAL

Recognize and identify the main parasitic species responsible for disease in humans.

The specific aims of the subject are:

OBJ1. Morphologically identify the parasites of greatest importance to humans.

OBJ2. Be able to perform the most common parasitological laboratory tests.

OBJ3. Be able to issue a diagnostic report.

OBJ4. Be able to give advice for the prevention and control of parasitic diseases.

OBJ 5. Be able to establish preventive and control measures against major human parasitic diseases.

OBJ6. Develop capacities to pose and solve practical parasitological problems.

OBJ 7. Learn the main techniques for the isolation, concentration and identification of parasitic forms.

OBJ 8. Apply biological and epidemiological fundamentals in the prevention and control of parasitic diseases.

PRIOR KNOWLEDGE

It is recommended that basic and compulsory subjects from previous courses be taken, such as: Biology, Anatomy and Physiology.

COURSE SYLLABUS

BLOCK I. GENERAL INFORMATION

Topic 1. Parasitism as a biological association. Biological cycles. Types of parasites and hosts.

Theme 2. Parasitic taxonomy and nomenclature.

Theme 3. Actions of the parasite on the host: parasites as pathogenic organisms. Impact of parasitic diseases on human and animal populations.

Topic 4 (I). Factors that determine the distribution and prevalence of parasitosis: biotic, abiotic and

social. Epidemiology. Parasitic zoonoses.

Topic 4 (II). Antiparasitic drugs.

BLOCK II. PROTOZOOLOGY

Topic 5. Protozoa: introduction, biology and classification.

Theme 6. Intestinal amoeba: Entamoeba histolytica. Amphizoic amoebas: Naegleria, Acanthamoeba and Balamuthia.

Topic 7. Intestinal flagellates: Giardia intestinalis. Urogenital flagellates: Trichomonas vaginalis.

Topic 8. Hemotisular flagellates: Leishmania and Trypanosoma.

Topic 9. Ciliates: Balantidium coli.

Topic 10. Intestinal apicomplexes: Cryptosporidium, Cyclospora and Isospora.

Topic 11. Tissue apicomplexes: Sarcocystis and Toxoplasma.

Topic 12. Hematic apicomplexes: Plasmodium.

BLOCK III. HELMINTHOLOGY

Topic 13. Trematodes: introduction, biology and classification.

Topic 14. Hepatobiliary trematodes: Fasciola, Clonorchis and Opistorchis.

Topic 15. Intestinal trematodes: Fasciolopsis and Heterophyes. Pulmonary flukes: Paragonimus.

Topic 16. Hematic flukes: Schistosoma.

Topic 17. Cestodes: introduction, biology and classification.

Topic 18. Pseudophillids: Diphyllobothrium and Spirometra.

Topic 19. Cyclophiles: Taenia, Echinococcus, and Hymenolepis.

Topic 20. Nematodes: introduction, biology and classification.

Topic 21. Trichurids: Trichuris and Trichinella.

Topic 22. Ascaris: Ascaris, Toxocara and Anisakis.

Topic 23. Strongylides: Ancylostoma and Necator. Rhabditids: Strongyloides.

Topic 24. Pinworms: Enterobius vermicularis.

Topic 25. Filariae: Wuchereria, Brugia, Onchocerca, Loa and Mansonella.

Topic 26. Dracunculus.

BLOCK IV. ARTHROPODOLOGY

Topic 27. Arthropods: introduction, biology and classification. Health interest and vector paper.

Topic 28. Mites: Sarcoptes and Demodex. Ticks: Argas and Ixodes.

Topic 29. Insects. Lice: Pediculus and Pthirus. Bed bugs: Triatoms and Cimex. Fleas: Pulex and Tunga.

Topic 30. Diptera (mosquitoes, flies and horseflies): Anopheles, Culex and Aedes. Phlebotomus and Lutzomyia. Simulium. Culicoids. Glossine. Chrysops. Main etiologic agents of myiasis.

This is the only subject of Parasitology that includes the degree of Pharmacy as a compulsory subject, and includes both the basic concepts of general parasitology (morphology, biology, epidemiology) and the clinical aspects (clinical manifestations) and the main methods of control (diagnosis, treatment and prophylaxis) of human parasitosis.

The program begins with a general topic of Biology, which addresses the basic knowledge to understand that peculiar association that is parasitism. The descriptive part is dedicated to the study of the main human parasites, which are studied from highest to lowest complexity, according to their position on the zoological scale: protozoa, helminths, arthropods. Each parasite is studied for its morphology, biological and epidemiological cycles, main clinical manifestations and control: from diagnostic methods to the main preventive measures, and the drugs available for treatment.

PRACTICAL CLASSES:

They are proposed in three sessions in which the main techniques used in parasitology will be applied. The identification of the different parasitic species according to their morphology will be carried out through microscopic observation.

Practice 1. Description and operation of the microscope. The microscope in parasitological diagnosis. Microscope calibration.

Practice 2. Coproparasitological examination: Direct coproparasitoscopic method and sedimentation concentration method.

Practice 3. Protozoa: morphological characteristics of amoebas, flagellates, ciliates and apicomplexes. Observation of preparations: Entamoeba histolytica, Leishmania donovani, Trypanosoma cruzi, Toxoplasma gondii, Plasmodium falciparum.

Practice 4. Trematodes: morphological characteristics of adults, eggs and larval stages. Biological cycles. Observation of preparations: Fasciola hepatica, Schistosoma mansoni.

Practice 5. Cestodes: morphological characteristics of adults, eggs and larval stages. Biological cycles. Observation of preparations: Taenia solium, Taenia saginata, Hymenolepis nana, Echinococcus granulosus. Practice 6. Nematodes: morphological characteristics of adults, eggs and larval stages. Biological cycles. Observation of preparations: Ascaris lumbricoides, Enterobius vermicularis, Trichinella spiralis, Ancylostoma, Trichuris trichiura, Strongyloides.

Practice 7: Arthropods: morphological characteristics of mites and insects. Observation of preparations with different stages of development: Ixodes sp., Sarcoptes scabiei, Anopheles, Culex pipiens, Pediculus humanus.

EDUCATION ACTIVITIES

FACE-TO-FACE:

AFP1. Theory classes. Teacher presentations on the contents of the subject, encouraging participation and debate among students

AFP2. Practices. Training activity: Teaching various practical aspects of parasitology. They will be developed in the laboratory.

The content of these practices is considered to be very important for student training and will therefore be part of the content of the objective tests that are developed throughout the academic year.

The student will not be evaluated if they do not do the laboratory practices.

AFP3. Exercise classes and problems. Clinical cases published in the scientific literature are presented for two purposes: to update knowledge and to develop capacities to solve practical problems.

AFP4. Realization and exhibition of group work. Preparation and presentation of topics included in the course program or related to them. The topics are proposed by the teacher and supervised by him.

AFP5. Tutoring. Clarification of doubts, readings and other proposed tasks. The tutoring schedule can be consulted in the degree coordinator and will be informed by the teacher at the beginning of the course. AFP6. Conducting exams.

NOT IN PERSON:

AFNP1. Study of theory, exercises and problems.

AFNP2. Preparation and study of practices.

AFNP3. Preparation of works.

AFNP4. Tutoring preparation.

DISTRIBUTION OF WORK TIME

| TEACHER-LED TRAINING ACTIVITIES | INDIVIDUAL WORK |
|---------------------------------|-----------------|
| 65 Horas | 85 Horas |

To nurture an attitude of intellectual curiosity and a quest for truth in all areas of life.

To be able to approach a subject by means of rigorous, profound and comprehensive thought.

To be able to assess knowledge acquired.

To be able to apply the theoretical knowledge learnt in the of solving problems and practical cases linked to the various subjects.

LEARNING RESULTS

Understand the relationship between the life cycle of infectious agents and the properties of active ingredients.

Know the nature and behavior of infectious agents.

SPECIFIC LEARNING RESULTS

Acquire knowledge of the main aspects of the morphology and biological cycle of parasites affecting humans and domestic animals.

Relate the knowledge acquired with the pathology, epidemiology and prophylaxis of parasitic diseases.

Managing the basics of antiparasitic therapy

Formulate a parasitological laboratory diagnosis

Design counseling and health advice plans for the prevention and control of parasitic diseases.

LEARNING APPRAISAL SYSTEM

The evaluation of this subject, which will be carried out continuously throughout the course, will focus on the theoretical and practical knowledge that the student must have acquired and their reasoned assimilation to enable their correct interrelation and application.

At the end of the academic period, in addition, there will be a mandatory final test whose passing (obtaining a grade higher than 5.0) is essential to pass the subject.

The formative approach to evaluation aims to promote the active participation of the student throughout the

teaching-learning process, so the evaluation of the student's learning will be carried out based on:

SE1- Theory exam (60%).

SE2- Daily activities and exercises (clinical cases) (5%)

SE3- Preparation and presentation of teamwork (15%).

SE4- Attitude and participation in teaching-learning activities (collaborative learning) (5%).

SE8- Practices (15%).

ORDINARY EVALUATION:

To pass the subject, it will be necessary to obtain a grade equal to or greater than 5 in each of the following sections:

- Theory test
- Practices

*Attendance at all practical sessions is mandatory (regardless of where they take place). The unjustified absence of any of these sessions leads to the loss of the right to an internship evaluation in the ordinary call and a suspension of the course. Students in this situation should immediately contact the teacher.

**The theory and practice parts must be approved (grade equal to or greater than 5). If any of the parts have not been passed, this must be recovered in the extraordinary call and the score of the surpassed party is kept.

EVALUATION OF STUDENTS IN SECOND ENROLLMENT AND SUBSEQUENT STUDENTS AND STUDENTS WITH ACADEMIC EXEMPTION:

- Students who are in any of these circumstances can choose to take advantage of the previously specified system (in which case they must meet all the requirements, including class attendance) or to take advantage of the alternative system in which the following percentages will apply:

- Final theory exam: 60%
- Practical skills: 15%
- Submission of a written work on a topic proposed by the teacher: 15%
- Delivery of exercises proposed by the teacher: 10%

Students in second or subsequent enrollment must contact the teacher to take advantage of this system.

NOTE 1: Plagiarism, as well as the use of illegitimate means in evaluation tests, will be sanctioned in accordance with the university's Evaluation Regulations and Coexistence Regulations.

ETHICAL AND RESPONSIBLE USE OF ARTIFICIAL INTELLIGENCE

1.- The use of any Artificial Intelligence (AI) system or service shall be determined by the lecturer, and may only be used in the manner and under the conditions indicated by them. In all cases, its use must comply with the following principles:

a) The use of AI systems or services must be accompanied by critical reflection on the part of the student regarding their impact and/or limitations in the development of the assigned task or project.

b) The selection of AI systems or services must be justified, explaining their advantages over other tools or methods of obtaining information. The chosen model and the version of AI used must be described in as much detail as possible.

c) The student must appropriately cite the use of AI systems or services, specifying the parts of the work where they were used and describing the creative process followed. The use of citation formats and usage examples may be consulted on the Library website(<u>https://www.ufv.es/gestion-de-la-informacion_biblioteca/</u>).

d) The results obtained through AI systems or services must always be verified. As the author, the student is

responsible for their work and for the legitimacy of the sources used.

2.- In all cases, the use of AI systems or services must always respect the principles of responsible and ethical use upheld by the university, as outlined in the <u>Guide for the Responsible Use of Artificial Intelligence in Studies at UFV</u>. Additionally, the lecturer may request other types of individual commitments from the student when deemed necessary.

3.- Without prejudice to the above, in cases of doubt regarding the ethical and responsible use of any AI system or service, the lecturer may require an oral presentation of any assignment or partial submission. This oral evaluation shall take precedence over any other form of assessment outlined in the Teaching Guide. In this oral defense, the student must demonstrate knowledge of the subject, justify their decisions, and explain the development of their work.

BIBLIOGRAPHY AND OTHER RESOURCES

Basic

Lawrence R. Ash, Thomas C. Orihel. Atlas of Human Parasitology/5th ed. Buenos Aires: Panamerican Medicine, 2010.

(Lawrence R. Ash, Thomas C. Orihel. Atlas of Human Parasitology/5th ed. Buenos Aires:Panamerican Medicine, 2010., ||Lawrence R. Ash, Thomas C. Orihel. Atlas of Human Parasitology/5th ed. Madrid: Panamericana, 2010.)