COURSE DATA

Data Subject	
Code	34089
Name	Microbiological and Parasitological Analyses
Cycle	Grade
ECTS Credits	6.0
Academic year	2017 - 2018

Study (s)

Degree	Center	Acad. year	Period
1201 - Degree in Pharmacy	Faculty of Pharmacy and Food Sciences	4	First term
1211 - D.D. in Pharmacy-Human Nutrition and Dietetics	Faculty of Pharmacy and Food Sciences	4	First term

Subject-matter

Degree	Subject-matter	Character
1201 - Degree in Pharmacy	24 - Clinical analysis and laboratory diagnostics	Obligatory
1211 - D.D. in Pharmacy-Human Nutrition and Dietetics	1 - Asignaturas obligatorias del PDG Farmacia-Nutrición Humana y Dietética	Obligatory

Coordination

Name	Department
ESTEBAN SANCHIS, JOSE GUILLERMO	21 - Cellular Biology and Parasitology
IRANZO RODENAS, MARIA	275 - Microbiology and Ecology

SUMMARY

The material covers the vast field of clinical analysis applied to the diagnosis and monitoring of human diseases, from the microbiological point of view and parasitological.
Each of the matter presents particular thematic program, which continues as the main criterion carefully selected to allow the student to have a sufficiently broad broad field of microbiological diagnostic laboratory tests and parasitological but stressing and focusing on those aspects which by their frequency or relevance will require a better understanding of the student for further professional development. All

this, trying that, as particular cases, students can draw conclusions, general operational procedures and ways they can apply later.

A) Microbiological Analysis:

- Introduction to clinical microbiological analysis. Sampling and processing.
- Classical microbiological diagnostic methods.
- Rapid diagnostic techniques: serological and molecular methods.
- Analysis of systemic infections, infectious hepatitis, central nervous system infections, respiratory tract and adjoining regions of the gastrointestinal tract, urinary tract and skin.
- Analysis of sexually transmitted diseases and infections, congenital and perinatal transmission.

B) Parasitological Analysis:

In this part of the course is a theoretical program includes 10 songs in which there is the importance of parasitological tests and its problems, as well as anything that involves different stages of analysis, from the collection and transport, to processing, using appropriate techniques, the different biological samples that can become a laboratory for diagnostic purposes. The final stage involves analytical parasitological diagnosis based on the recognition of various parasitic structures. The theoretical part is complemented by a practical part of 6 subjects where the student intends to make all methods and techniques, including microscopic measuring learning, necessary for the diagnosis of all structures that can be detected parasite under a microscope. Specifically, this part of the course includes the following:

- Importance of parasitological analysis in human health.
- Analysis coproparasitological, hemoparasitológicos, genitourinary tissue, aspirates and other body fluids, and their corresponding recognition diagnosis.
- Study skills and recognition of arthropods diagnosis.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

It is recommended to have studied the subjects of "Microbiology" and "Parasitology" to access the subject "Parasitological and Microbiological Analysis." The student should also have completed the subject "Immunology" to facilitate the study of the subject.

OUTCOMES

1201 - Degree in Pharmacy

- To possess and to understand the knowledge in the different areas of study included in the formation of the pharmacist.
- To apply this knowledge to the professional world, contributing to the development of Human Rights, democratic principles, principles of equality between women and men, solidarity, protection of the environment and promotion of a culture of peace with Gender perspective.
- To know how interpret, value and communicate relevant data in the different aspects of pharmaceutical activity, making use of information and communication technologies.
- Skill to communicate ideas, analyze problems and solve them with a critical mind, achieving team-working abilities and assuming leadership whenever required.
- Development of skills to update their knowledge and undertake further studies, including pharmaceutical specialization, scientific research and technological development, and teaching.
- Designing, implementing and evaluating reagents, clinical analytical methods and techniques, knowing the basics of clinical analyses and the nature and contents of laboratory diagnostic reports.
- Develop health and hygiene analyses
- Knowledge and correct application of the terminology and specific elements of the microbiology laboratory.
- Understand that any organism is usually able to produce different clinical pictures, and a particular clinical process may be caused by different aetiological agents.
- Knowledge of the most common infectious processes that affect different organs and systems, as well as the differential diagnosis of the causes or aetiological agents of each one.
- Knowledge of the most common aetiological agents, pathogenesis and laboratory diagnosis.
- Establish the criteria for the differential aetiological diagnosis of infection, especially those that must be followed when taking, transporting and processing a sample at a clinical laboratory.
- Select from the various laboratory tests the most sensitive, reliable and rapid diagnosis of a particular infectious disease or differential aetiological diagnosis of a given syndrome.
- Initiating the practical realization of the microbiological analysis of samples and interpretation of the results for laboratory diagnosis.
- Mastering parasitological analytical terminology.

- Acquire and develop relevant skills for the correct management of all durable goods and consumables used in the field of diagnostic parasitology.
- Understand the basic methods and techniques used in the diagnosis of parasitic diseases and the fundamentals of their application.
- Mastering the techniques necessary for correct parasitological processing of any biological sample prone to be analyzed at laboratory
- Knowledge of the diagnostic utility of each method and technique as well as of the biological material needed for the correct diagnosis of each of the different human parasites.
- Knowledge and use of documentary sources of all types within the field of diagnosis of microbial diseases and parasites according to ones own judgment.
- Training in addressing analytical results in an interdisciplinary manner with other professionals.
- Development of future professional awareness based on the relevance of the diagnosis made.

LEARNING OUTCOMES

After having completed this course, students should be able to:

- Master of analytical terminology in all fields;
- Acquire and develop skills relevant to the proper management of all durable goods and consumables used in the field of diagnosis;
- Understand the basics of the methods and techniques used in the diagnosis of microbiological and parasitological diseases, and the fundamentals of application;
- Master the skills necessary for proper processing of any biological sample can be analyzed in a clinical laboratory;
- Know the diagnostic utility of each method and technique, assessing what their actual use, the prognostic value and requires additional tests;
- Know the etiologic agents most common microbiological and parasitological, pathogenesis and laboratory diagnosis;
- Choose among various laboratory tests the most sensitive, reliable and rapid diagnostic of a particular disease or etiologic differential diagnosis of a given syndrome;
- Know and manage standard documentary sources of all types within the field of diagnosis of human diseases;
- Ability to argumentation based and rational criticism;
- Ability to deal with the resolution of the analytical interdisciplinary with other professionals;
- Develop future professional awareness about the relevance of the diagnosis to be made.

DESCRIPTION OF CONTENTS

1. Microbiological laboratory tests. Sampling and processing.

Laboratory diagnosis of infectious diseases. Collecting and transporting samples for microbiological analysis. Regulations governing clinical laboratories.

2. Classical microbiological diagnostic methods.

Methods for culture and isolation of microorganisms. Culture media: types. ID: Microscopic examination of bacteria. Staining. Biochemical tests. Determination of the susceptibility of bacteria to antimicrobial agents. Antibiogram. Interpretation.

3. Rapid diagnostic techniques: serological and molecular methods.

Immunological techniques, agglutination, precipitation reactions and complement fixation. Immunoassay techniques. Immunofluorescence. Molecular diagnostic methods, nucleic acid hybridization, PCR, etc..

4. Systemic infections.

Septicemia. Infective endocarditis. Relapsing fever and Lyme disease. Typhoid. Leptospirosis. Brucellosis. Mycoses.

5. Infectious hepatitis.

Etiology. Study of the serological markers used.

6. Central nervous system infections.

Etiology. Acute bacterial meningitis. Chronic meningitis. Meningitis in the neonate.

7. Upper respiratory tract infections and adjoining regions.

The common cold. Viral pharyngitis and tonsillitis and bacterial infections. Infectious mononucleosis. Sinusitis. Diphtheria. Infections of the oral cavity.

8. Lower respiratory tract infections.

Pertussis. Acute bronchitis. Flu. Pneumonia. Pulmonary tuberculosis.

9. Gastrointestinal tract infections.

Gastroenteristis caused by Salmonella, Shigella, Campylobacter, Yersinia, Vibrio, Aeromonas and Escherichia coli. Helicobacter pylori infections. Viral infections. Foodborne intoxication.

10. Urinary Tract Infections.

Cystitis, pyelonephritis and prostatitis.

11. Sexually Transmitted Diseases.

Gonococcal infections. Gonococcal urethritis. Genital herpes. Syphilis. AIDS. Other sexually transmitted diseases.

12. Other infections.

Other infections.

Other infections.

Other infections.

Other infections

Conjunctivitis. Keratitis. Endolftalmitis. Infections of the skin and soft tissue. Congenital and perinatal transmission.

13. Fungal Infections.

Superficial mycoses, cutaneous, subcutaneous, systemic, and opportunistic.

14. Importance of parasitological analysis in human health.

Clinical and laboratory diagnosis in parasitology - The problem of laboratory diagnosis in human parasitology - False positives and false negatives - Types of Parasitological Analysis - The interpretation of analytical results: interest.

15. Coprology parasitic I.

Diet and warnings to the patient - The fecal sample collection, sample size and precautions .- Treatment: Factors to consider locking fluid - Conservation: types, advantages and disadvantages.

16. Coprology parasitic II

Macroscopic and microscopic examination .- Analytical Techniques: Direct examination types - Study of digestion fecal occult blood smear -: his interest - Fecal smear stains, types and basics.

17. Coprology parasitic III.

Concentration techniques: principles and types - Concentration by flotation: Techniques of Willis and concentration by sedimentation Faust - dysphasic Analytical techniques: MIF Formaldehyde and ethyl ether.

18. Coprology parasitic IV.

Special techniques for the egg hunt and / or larvae - Graham Tape parasitological Stool culture: principles and types .- Enterotest count eggs and larvae: a quantitative assessment.

19. Helminthology - Study of adults.

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General techniques for morphological and anatomical study of the entire adult and / or fragments of helminthes parasites - Trematode Digene, Cestodes, and Nematodes acanthocephalan: fixation, preservation, staining, preparation and assembly.

20. Hematology parasitic.

Direct smear examination - fine. Stains - thick. Concentration techniques. - Analysis - Techniques genitourinary direct.- Study of the urinary sediment concentration techniques.- Crop stains.

21. Other biological materials and arthropods.

Analysis of tissues and other body fluids aspirated .- Crop and animal inoculation study techniques Arthropods likely social impact analysis.

22. Immunological and molecular diagnosis parasite.

Nonspecific diagnosis: eosinophilia - specific diagnosis: applications of the immune response to the diagnosis of parasitic diseases - Brief notions about the main reactions of immunologic diagnosis in parasitology.- Advantages and limitations of immunodiagnostic parasite. Brief notions of parasite molecular diagnosis.

23. LABORATORY PROGRAM

Parasitological analysis.- Study of digestion and its impact on parasitological analytical.
Direct vision and with the help of vital dyes. Fecal smears: preparation and staining.
Conducting techniques and centrifugation concentration flotation most common
Making and viewing the tape of Graham and Kato-Katz.
Preparation of final preparations of helminthes
Urinalysis.- Study of the urinary sediment.
Observation of final preparations of human parasitic species.- Case studies: observation of preparations problem.
Observation of final preparations arthropod species of medical interest.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	28,00	100
Laboratory practices	25,00	100
Tutorials	3,00	100
Seminars	2,00	100
Development of group work	8,00	0
Preparing lectures	52,00	0
Preparation of practical classes and problem	30,00	0
TOTAL	**148,00**	

TEACHING METHODOLOGY

• ***Theoretical classes.*** In these classes the professor will give an overview of the topic under study with special emphasis on new aspects or special complexity and use new teaching tools. During these mandatory hours of classes, the professor explained the problems surrounding the diagnosis of diseases caused by microorganisms or parasites, as well as the basic methodology to be followed for proper collection and processing of each and every one of the biological samples that can be processed in a laboratory for the diagnosis of this disease. Meanwhile, students should take note of the information they receive, at the same time they should try to raise any doubts and questions that arise at the time.

• ***Practical classes.*** Practical classes in the lab focus on two parts: the teacher will present the objectives, report on material handling, will oversee the job done and help the interpretation of results; by contrast, students conducted individually the technical procedure.

• ***Tutorials.*** In these sessions, each student should present his/her needs, while the teacher guides and resolves any doubts, aiming at the achievement of adequate knowledge of the matter. Students will attend

in small groups.

• ***Seminars.*** Students, in groups of up to four students, will develop and give presentations on some of the issues proposed by the teacher. These seminars are meant to gather, synthesize and express information. Teamwork is also to be encouraged.

EVALUATION

To evaluate the learning taking place, it is considered essential to direct observation of the level acquired by the student, which may be made at all hours of attendance, especially and primarily in regard to the observation of daily work performed. This should allow the professor directly establish a dynamic picture of the progress of each student through each part of matter.

However, the numerical grade of knowledge and skills acquired must be established based on methods that allow objective and comparable measure of the same, with record results, which means qualifying written tests.

The evaluation of each part of the course will be done through a final review of the theoretical. The final rating will be assessed, in addition, seminars and presentations by students.
The maximum score can get final is 10 points, corresponding to 60% (6 points) to the microbiological and the remaining 40% (4 points) to the parasite, to break down in:

A) MICROBIOLOGY

1. Evaluation of theoretical content that will be up to 80% of the final grade, and assessed by means of a final exam. In special cases, oral examinations can be made.

2. Evaluation of practical content will be 10% of the final grade, with required implementation, and the presentation of a final report of the work. In addition, a specific examination for the evaluation of this section.

3. Evaluation of seminars and tutorials, will be 10% of the final mark, taking into account the attitude, ability, dedication and work done by students.

4. The final grade will be global, and to pass the course should be obtained at least 50% of the points in the "assessment of the theoretical" to be able to add the other notes. Those students who fail the subject in the June, they keep note of courses, seminars and tutorials for 2 years.

B) PARASITOLOGY

1. 80% of the final mark is obtained through the completion of a final written exam, where they evaluate the content of the lectures. In exceptional cases may make the oral examination.

2. 5% of the final grade will come from the evaluation of practical content through compulsory attendance and attitude in the practical classroom. Furthermore, it may require the submission of a final report of work done, and even a specific review of the work performed.

3. 5% of the final grade will come from the performance and dedication in Tutorial sessions.

4. The remaining 10% of the final mark will be obtained from the evaluation of the seminars, taking into account the attitude, ability, dedication and work done by students.

5. The final grade will be global in parasitology, and to pass the course should be obtained at least 50% of the points in assessing the theoretical content to be added to the other notes.

6. Students not being present at the first theoretical exam (first call) will officially be considered absent, i.e. the assessment of tutorial and seminars will be carried over to the second call of the exam. Finally, students who do not pass the subject within the academic year, will keep the assessment of tutorial and seminars for 2 years.

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