

**COURSE DATA****Data Subject**

|                      |                       |
|----------------------|-----------------------|
| <b>Code</b>          | 34103                 |
| <b>Name</b>          | Clinical Microbiology |
| <b>Cycle</b>         | Grade                 |
| <b>ECTS Credits</b>  | 4.5                   |
| <b>Academic year</b> | 2023 - 2024           |

**Study (s)**

| <b>Degree</b>             | <b>Center</b>                         | <b>Acad. year</b> | <b>Period</b> |
|---------------------------|---------------------------------------|-------------------|---------------|
| 1201 - Degree in Pharmacy | Faculty of Pharmacy and Food Sciences | 5                 | First term    |

**Subject-matter**

| <b>Degree</b>             | <b>Subject-matter</b>      | <b>Character</b> |
|---------------------------|----------------------------|------------------|
| 1201 - Degree in Pharmacy | 40 - Clinical microbiology | Optional         |

**Coordination**

| <b>Name</b>           | <b>Department</b>              |
|-----------------------|--------------------------------|
| RICO VIDAL, HORTENSIA | 275 - Microbiology and Ecology |

**SUMMARY**

The course aims to give an overview of the microorganisms that cause infectious diseases in humans, with special emphasis on bacteria (prokaryotic organisms), although there will be a general review of fungal (eukaryotic microorganisms) and viruses.

The major groups within each category (bacteria, fungi and viruses) and the diseases caused by them, classified according to the organs and / or systems affected, are described.

The course also describes the laboratory methods and techniques currently available for identification (diagnosis) of disease-causing microorganisms, and the methods used to determine the pattern of susceptibility / resistance of these microorganisms, once identified, to antimicrobial agents currently available



## 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 previously passed the subjects Microbiology, Microbiological and Parasitological Analysis, Immunology and Anatomy.

## OUTCOMES

### 1201 - Degree in Pharmacy

- To know the general principles of the laboratory diagnosis of infectious diseases.
- To know the basic microbiological, immunological and molecular biology techniques used for the diagnostic of infectious diseases.
- To know the infectious diseases that may affect the different organs and systems of the human body.
- To know about all the aspects related to the determination of susceptibility/resistance of pathogenic microorganisms to the different chemotherapeutic agents commonly used in clinical practice.
- To know all the main groups of microorganisms, bacteria, fungi and viruses, that cause disease in humans.

## LEARNING OUTCOMES

The acquisition of the skills described above will be reflected in a number of capacities and qualifications that will make the student to be self-sufficient to:

- Develop reasoning and theoretical and practical arguments about the role of microorganisms as causative agents of infectious diseases
- Design and conduct experiments for the detection, isolation and identification of microorganisms in different pathological products
- Be able to determine the sensitivity and resistance of microorganisms isolated from the different pathological products to antibiotics commonly used in clinical practice
- Understand future developments that are occurring in the field of Clinical Microbiology



## DESCRIPTION OF CONTENTS

### 1. Introduction

CHAPTER 1. Main characteristics of the major groups of microorganisms with pathogenicity for humans: viruses, bacteria and fungi. Features.

CHAPTER 2. Pathogenesis of infectious diseases.

### 2. Diagnosis of Infectious Diseases. Microbiological Techniques

CHAPTER 3. Diagnosis of infectious diseases. Basic Principles.

CHAPTER 4. Diagnosis of infectious diseases I: phenotypic methods. Microscopic examination, sample processing for culture and interpretation thereof. Procedures for the identification of microorganisms.

CHAPTER 5. Diagnosis of infectious diseases II: no phenotypic methods. Direct antigen detection: methods and indications. Molecular diagnostic techniques. Immunological methods: antibody detection. proteomic methods

### 3. Etiologic diagnosis of Infectious Syndromes

CHAPTER 6. Blood culture

CHAPTER 7. Urinary Tract Infections

CHAPTER 8. Gastrointestinal tract infections

CHAPTER 9. Sexually transmitted infections

CHAPTER 10. Infections of the upper and lower airways

CHAPTER 11. CNS Infections

CHAPTER 12. Chronic wound Infections

CHAPTER 13. Eye infections

CHAPTER 14. Clinical Syndromes and laboratory diagnosis of fungal diseases

### 4. Antimicrobial agents



## CHAPTER 15. Antimicrobial susceptibility. Acquired resistance in bacteria of clinical relevance

**5. General Procedures Organization on Clinical Microbiology Laboratory**

CHAPTER 16. Quality assurance in clinical microbiology laboratories. General procedures of organization: Organization of laboratory services portfolio, sampling, transport and storage, reception and rejection criteria, report results, sample preservation, waste management

**WORKLOAD**

| ACTIVITY                                     | Hours         | % To be attended |
|--|---------------|------------------|
| Theory classes                               | 29,00         | 100              |
| Laboratory practices                         | 10,00         | 100              |
| Seminars                                     | 2,00          | 100              |
| Development of individual work               | 5,00          | 0                |
| Study and independent work                   | 25,00         | 0                |
| Readings supplementary material              | 2,50          | 0                |
| Preparation of evaluation activities         | 10,00         | 0                |
| Preparing lectures                           | 15,00         | 0                |
| Preparation of practical classes and problem | 10,00         | 0                |
| <b>TOTAL</b>                                 | <b>108,50</b> |                  |

**TEACHING METHODOLOGY****Theory:**

Lectures for the presentation by the teacher of the most important concepts and contents of each issue in order for the student to acquire the knowledge related to the subject. Student participation will be encouraged.

**Practical Classroom (workshops, problems):**

The seminars will be used to enhance teamwork and improve oral presentation, by conducting theoretical and practical training to complement that is acquired in class work, and also to make another series of complementary activities of different types (study of cases, management of scientific literature, and discussion of current issues).

**Laboratory and Computer Sessions:**



The aim is to consolidate the theoretical knowledge, through the practical application thereof. The teacher will present the objectives, report on material handling, monitor job performance and help the interpretation of the results.

### **Tutorial Sessions:**

Students come to them in small groups. In them, the teacher will evaluate the learning process of students in a global way. Equally, the tutorials will serve to resolve all doubts that have arisen over classes and guide students on the methods of work more useful for the resolution of the problems they may have. The teacher can raise issues and problems specific to the needs of students.

The competences and learning outcomes to be achieved in this subject integrate the Sustainable Development Goals (SDGs) promoted by the United Nations (Agenda 2030). Among others, the one referred to the reduction of the communicable and noncommunicable diseases and the development of vaccines to combat them (Objective 3: Health and Well-being) together with that of a Quality Education model (Objective 4)

## **EVALUATION**

## **REFERENCES**

### **Basic**

- MICROBIOLOGÍA MÉDICA. 9ª Ed.  
Murray, P.R., Rosenthal, K.S y Pfaller, M.A.  
Editorial Elsevier, 2021
- KONEMAN. DIAGNÓSTICO MICROBIOLÓGICO. 7ª ED.  
Winn, W.C., Allen, S.D., Janda, W.M., Koneman, E.W., Procop, G.W., Schreckenberger, P.C. y Woods, G.L.  
Editorial Médica Panamericana, 2017
- BAILEY & SCOTT'S. DIAGNOSTIC MICROBIOLOGY 15ª ED.  
Tille, P.M.  
Editorial Elsevier, 2021.
- MICROBOIOLOGIA Y PARASITOLOGÍA MÉDICA  
Prats, G.  
Editorial Médica Panamericana, 2013



**Additional**

- MIMS MEDICAL MICROBIOLOGY AND IMMUNOLOGY. 6ª ED. Goering, R.V., Dockrell, H.M., Zuckerman, M. , Roitt, I.M., Chiodini, P.L. Editorial Elsevier, 2018