

# Professional Master's Degree

## Advances in Antibiotic Therapy and Antibiotic Resistance





## Professional Master's Degree Advances in Antibiotic Therapy and Antibiotic Resistance

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Credits: 60 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/pharmacy/professional-master-degree/master-advances-antibiotic-therapy-antibiotic-resistance](http://www.techtute.com/us/pharmacy/professional-master-degree/master-advances-antibiotic-therapy-antibiotic-resistance)

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# 01

# Introduction

One of the problems that currently worries the scientific community is antibiotic resistance due to overuse or incorrect prescription. In this regard, scientists focus their efforts on finding new antibiotics in collaboration with laboratories. An arduous task where significant advances have been made, which also leads pharmacists to constant updating. That is why this academic institution has designed this program, which will allow students to update on the novel role played by biomarkers, on recently marketed drugs and on the current challenge in microbiological diagnosis. All this includes innovative multimedia resources developed by a teaching team specialized in the field.





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*Thanks to this Professional Master's Degree, you will update on antibiotic therapy by becoming familiar with the most important advances in antibiotic resistance, and you will be able to immediately apply this knowledge to daily practice”*

Antimicrobial resistance has become one of the greatest threats to public health today. Faced with this reality, efforts are focused on finding an answer to the cause and on developing new antibiotics while reducing costs.

Precisely because of this new reality where treatment against increasingly resistant bacteria is of particular concern, laboratories are under greater pressure to combat this danger, which requires pharmacists to continuously update their knowledge in the area, to keep abreast of both progress and the latest recommendations in the use of antituberculosis or respiratory quinolones. For this reason, TECH has created an academic program that brings together a specialized and multidisciplinary teaching team, which will provide professionals with the latest information available on the matter.

Pharmacists are, therefore, presented with a program that will teach them the progress and latest developments in microbiology, antibiotics, antiparasitics or the development of antibiotic resistance in only four months' time. For this purpose, the syllabus takes a theoretical-practical approach and includes multimedia resources and the latest technology applied to academic teaching.

TECH offers a quality academic program, where professionals will be able to update their knowledge in Advances in Antibiotic Therapy and Antibiotic Resistance. Students can conveniently take it from a computer or tablet with an Internet connection, as they will find the program syllabus on the virtual campus. Thus, without face-to-face classes or fixed schedules, professionals can distribute the course load as they wish, while balancing their other responsibilities with an educational experience adapted to the times.

This **Professional Master's Degree in Advances in Antibiotic Therapy and Antibiotic Resistance** contains the most complete and up-to-date educational program on the market. Its most notable features are:

- ◆ The development of case studies presented by experts focused on advances in antibiotic therapy and antibiotic resistance
- ◆ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- ◆ Practical exercises where self-assessment can be used to improve learning
- ◆ Its special emphasis on innovative methodologies in Pediatric Orthopedics
- ◆ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*TECH provides you with innovative didactic tools for you to learn more about the latest news in pest control”*

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*Delve into new therapeutic modalities to control morbidity and mortality due to infectious diseases”*

The program's teaching staff includes professionals from the sector who contribute their work experience to this program, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive specialization programmed to learn in real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise throughout the program. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

*This 100% online program gives you the opportunity to update your knowledge of antibiotic resistance without neglecting your professional responsibilities.*

*It will take you through the most recent changes in the management of herpes antivirals.*



# 02 Objectives

New research in the field of antibiotics makes it necessary for pharmacists to update their knowledge. That is why this Professional Master's Degree provides the most comprehensive knowledge, so that, at the end of the program, students are familiar with the advances in new penicillin drugs, their role in anti-infective therapeutics, developments in oral cephalosporins and their outpatient use or the current impact on the consumption of antimicrobials.







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*In only 12 months' time, you will update on the studies that address the role of biomarkers and antimicrobial therapies of the future”*



## General Objectives

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- ◆ Update your knowledge of the rehabilitation professional in the field of electrotherapy
- ◆ Promote work strategies based on a comprehensive approach to the patient as a standard model for achieving excellent care
- ◆ Encourage the acquisition of technical skills and abilities, through a powerful audiovisual system, and the possibility of development through online simulation workshops and/or specific training
- ◆ Encourage professional stimulation through continuing education and research



*Video summaries, detailed videos and extensive multimedia content are available, so you can get the most up-to-date information on antibiotics in a much more visual and attractive way"*







## Specific Objectives

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### Module 1. Overview of Microbiology

- ◆ Provide students with advanced, in-depth, up-to-date, and multidisciplinary information that allows them to comprehensively approach the health-infectious disease process, the use of antibiotics, and antibiotic resistance
- ◆ Provide training and practical-theoretical improvement that will enable reliable clinical diagnoses supported by the efficient use of diagnostic methods to indicate effective antimicrobial treatments

### Module 2. Introduction to Pharmacology and Treatment

- ◆ Develop skills to implement prophylactic plans for the prevention of these diseases
- ◆ Assess and interpret the epidemiological sanitary characteristics and conditions of countries that are conducive to the emergence and development of antibiotic resistance

### Module 3. Antimicrobials: General Aspects

- ◆ Explain the complex interrelationships between the host, the microorganism, and the antibiotic to be used
- ◆ Address the important role of microbiology and the diagnosis and control of infectious diseases

### Module 4. Antivirals

- ◆ Describe the main mechanisms of antimicrobial resistance
- ◆ Highlight the importance of rational therapeutics in the rational use of antimicrobials

### **Module 5. Antibiotics I**

- ◆ Address the most important elements among the resistance mechanisms of superbugs and other germs in a general sense
- ◆ Delve into drug usage studies within pharmacoepidemiology to facilitate the selection of antimicrobials in daily clinical practice

### **Module 6. Antibiotics II**

- ◆ Emphasize the role of interpretative reading of an antibiogram and the identification of new resistance genotypes that present clinical relevance
- ◆ Describe the most important elements of the absorption, transportation, distribution, metabolism, and excretion of antibiotics

### **Module 7. Antibiotics III**

- ◆ Address, in detail and depth, the most up-to-date scientific evidence on the mechanisms of action, adverse effects, dosage, and use of antimicrobials
- ◆ Explain the pathophysiologic and pathogenic interrelationships between antimicrobial use and immune response

### **Module 8. Antimycotics**

- ◆ Justify the importance of controlling the use of antimicrobials as a means of reducing antibiotic resistance
- ◆ Emphasize the role of immunity and new alternatives for the treatment of infections

### **Module 9. Antiparasitics II**

- ◆ Explain the production process of new antibiotics
- ◆ Delve into the treatment of the most significant infectious diseases with the latest advances in scientific medical knowledge

### **Module 10. Antibiotic Resistance**

- ◆ Address the crucial issue of super-resistant microbes and their relation to antimicrobial use based on the most up-to-date concepts
- ◆ Emphasise the development of future antibiotics and other therapeutic modalities for infectious diseases

### **Module 11. Monitoring and Controlling the Use of Antimicrobials**

- ◆ Emphasize the future challenges of infectious diseases in decreasing infectious diseases morbidity and mortality and antimicrobial treatment
- ◆ Develop normative or referential documents such as clinical practice guidelines or antimicrobial usage policies based on scientifically advanced concepts

### **Module 12. Antibiotics and Antimicrobial Treatments of the Future**

- ◆ Advise pharmaceutical and biotechnology industry teams in the process of research and production of new antimicrobials and alternative treatments for infectious diseases
- ◆ Master the most recent elements of antimicrobial utilization studies





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*Video summaries, detailed videos and extensive multimedia content are available, so you can get the most up-to-date information on antibiotics in a much more visual and attractive way”*

# 03 Skills

The structure of this Professional Master's Degree has been designed to offer pharmacists the latest information on Advances in Antibiotic Therapy and Antibiotic Resistance. Based on this objective, the program also seeks to enhance professional competencies in the identification of adverse reactions to interferons, the progress made in antibiotics in viral hemorrhagic diseases or the detection of virus resistance mechanisms. Detailed videos and clinical cases will enable students to achieve these goals more easily.



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*Acquire the skills to advise pharmaceutical and biotechnology industry work teams in the research process”*





## General Skills

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- ◆ Increase diagnostic and therapeutic capabilities for infectious diseases and improve patient health care in general, through the in-depth study of the latest scientific, epidemiological, clinical, pathophysiological, diagnostic, and therapeutic progress made on these diseases
- ◆ Hone skills to manage, advise, or lead multidisciplinary teams that are studying the use of antibiotics and antibiotic resistance in communities or individual patients, as well as scientific research teams
- ◆ Develop skills for self-improvement, in addition to being able to provide training and professional improvement activities due to the high level of scientific and professional preparation acquired with this program
- ◆ Educate the population in the use of antimicrobials in order to acquire and develop a culture of prevention, based on healthy lifestyle choices







## Specific Skills

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- ◆ Master the host, antibiotic and germ determinants in the prescription of antimicrobials and their impact on morbimortality rates of infectious diseases, based on the study of the progress already made and future challenges in the field of antibiotic therapy and antibiotic resistance
- ◆ Identify and analyze the latest scientific information on antibiotic resistance in order to design plans and programs to control it
- ◆ Apply existing control measures to prevent the transmission of multiresistant germs in real and/or modeled situations
- ◆ Identify, in a timely manner, the appearance of resistant germs and the overuse of antibiotics, based on the application of the scientific method in the profession
- ◆ Timely diagnosis of the most frequent or new infections based on clinical manifestations for their correct treatment, rehabilitation, and control
- ◆ Justify the importance of clinical-therapeutic discussion as an important public health measure for the control of antimicrobial use and antibiotic resistance
- ◆ Identify the biological, social, economic, and medical risk factors that determine the incorrect use of antimicrobials
- ◆ Master the clinical, epidemiological, diagnostic, and therapeutic elements for the main resistant bacterial threats
- ◆ Educate the community on the proper use of antibiotics
- ◆ Identify the fundamental aspects of pharmacokinetics and pharmacodynamics for the selection of antimicrobial therapeutics
- ◆ Halt the progression of antibiotic resistance, based on reasoned therapeutics and supported by the best scientific evidence
- ◆ Correctly use and interpret all microbiological studies and other diagnostic resources in the care of their patients
- ◆ Lead work teams in health institutions, such as pharmacotherapeutic and antimicrobial usage committees



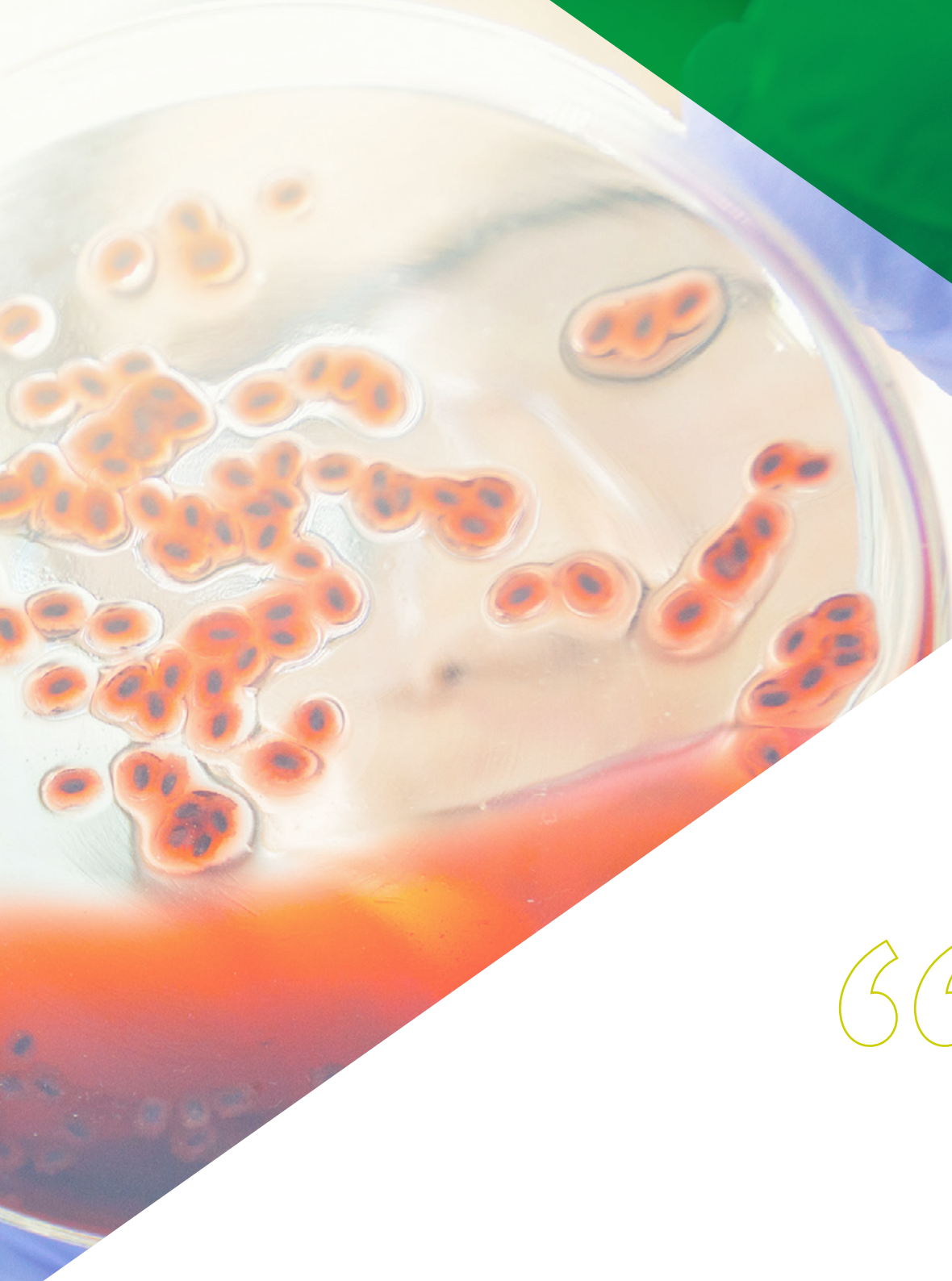
*The case studies provided by the specialized teaching team will prove very useful in your daily practice"*

04

# Course Management

TECH takes great care in the selection of the teaching staff for each of its programs in order to offer all its students a quality education. For this reason, professionals who takes this academic program will benefit from a highly qualified teaching team in the fields of Infectious Diseases, Microbiology and Internal Medicine. Its extensive experience in the field of antibiotics, will enable students to obtain the latest information through content that can be accessed at any time from their electronic device of choice.





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*Together with this multidisciplinary team,  
you will learn about the latest advances in  
Antibiotic Therapy and Microbial Resistance”*



## Management



### Dr. Quintero Casanova, Jesús

- ◆ Head of the Infectious Diseases Department, Héroes del Baire Hospital
- ◆ Medical specialist in Africa (Chad) and Venezuela
- ◆ Master's Degree in Tropical Diseases and Clinical Infectious Diseases, Pedro Kuori Institute, Havana, Cuba
- ◆ Professor on the Medicine Degree and Internal Medicine Speciality at the Faculty of Medical Sciences of Isla de la Juventud
- ◆ Main professor of the Professional Master's Degree in infectious diseases of the Faculty of Medical Sciences of the Isle of Youth
- ◆ Member of the Cuban Society of Internal Medicine
- ◆ Degree in Medicine and Surgery, Medical University of Havana

## Professors

### Dr. Batista Valladares, Adrián

- ◆ Head of Senior Citizen Services in Isla de la Juventud (Cuba)
- ◆ Degree in Medicine and Surgery, University of Havana
- ◆ Specialist in Family and Community Medicine
- ◆ Master's Degree in Clinical Infectology
- ◆ Certificate in Diagnostic Ultrasound
- ◆ Diploma in Healthcare Management
- ◆ Head of Senior Citizen Services, Isla de la Juventud

- ◆ Member of the Cuban Society of Family Medicine
- ◆ Professor of the medicine and family medicine degrees at the Faculty of Medical Sciences in Isla de la Juventud
- ◆ Professor of the Professional Master's Degree in Infectious Diseases in the Faculty of Medical Sciences in Isla de la Juventud
- ◆ Member of state examining boards for the medicine degree and speciality of family medicine
- ◆ Member of tribunals for national scientific events in Cuba



**Dr. Cantalapiedra Torres, Alejandro**

- ◆ Specialist in Pediatrics, Héroes del Baire Hospital
- ◆ Master's Degree in infectious diseases
- ◆ Certificate in Medical Teaching
- ◆ Certificate in Health Management
- ◆ Professor in the Medicine Degree and Pediatrics Specialty in the Faculty of Medical Sciences in Isla de la Juventud
- ◆ Member of the Cuban Society of Pediatrics
- ◆ Medical specialist in Haiti
- ◆ Medical Specialist in Antigua and Barbuda
- ◆ Degree in Medicine and Surgery, University of Havana

**Dr. Dávila, Henry Luis**

- ◆ Specialist in Gynecology and Obstetrics at the Heroes del Baire Hospital (Cuba).
- ◆ Head of the Neck Pathology Service, Heroes del Baire Hospital
- ◆ Medical specialist in Guatemala
- ◆ Master's Degree in comprehensive care for women
- ◆ Member of the Cuban Society of Gynecology and Obstetrics
- ◆ Member of the Cuban Society of Paediatricians
- ◆ Professor of Medicine, Faculty of Medical Sciences, Isla de la Juventud
- ◆ Degree in Medicine and Surgery, University of Havana

**Dr. Dranguet Bouly, José Ismael**

- ◆ Specialist in Internal Medicine and Intensive Therapy, Héroes del Baire Hospital
- ◆ Specialist in Internal Medicine, Héroes del Baire Hospital
- ◆ Medical Specialist in Venezuela
- ◆ Master's Degree in Health Biostatistics
- ◆ Diploma in Epidemiology
- ◆ Member of the Cuban Society of Internal Medicine
- ◆ Member of the Cuban Society of Paediatricians
- ◆ Professor on the Medicine Degree and Internal Medicine Speciality at the Faculty of Medical Sciences of Isla de la Juventud
- ◆ Professor of the Professional Master's Degree in Infectious Diseases in the Faculty of Medical Sciences in Isla de la Juventud
- ◆ Degree in Medicine and Surgery, University of Havana
- ◆ Member of tribunals for national scientific events in Cuba
- ◆ Medical Science Teaching Award, Cuba
- ◆ Professor at the Catholic University of Santiago de Guayaquil Ecuador, 2018.

**Ms. Lawrence Carmenate, Araelis**

- ◆ Microbiology Specialist
- ◆ Master's Degree in infectious diseases
- ◆ Professor on the Medicine Degree in the Faculty of Medical Sciences in Isla de la Juventud
- ◆ Member of the Cuban Society of Microbiology
- ◆ Member of the Association of Pedagogues
- ◆ Degree in Microbiology, University of Havana

**Dr. Jiménez Valdés, Erlivan**

- ◆ Specialist in Pediatrics, Héroes del Baire Hospital
- ◆ Master's Degree in comprehensive childcare
- ◆ Member of the Cuban Society of Pediatrics
- ◆ Professor of Medicine (Degree) and Pediatrics (Specialty)
- ◆ Faculty of Medical Sciences, Isla de la Juventud
- ◆ Member of tribunals for national scientific events in Cuba
- ◆ Medical specialist in Venezuela
- ◆ Degree in Medicine and Surgery, University of Havana

**Dr. Valle Vargas, Mariano**

- ◆ Head of the Internal Medicine Department, Héroes del Baire Hospital
- ◆ Specialist in Internal Medicine, Héroes del Baire Hospital
- ◆ Medical specialist in Venezuela
- ◆ Master's Degree in Health Biostatistics
- ◆ Diploma in Epidemiology
- ◆ Member of the Cuban Society of Internal Medicine
- ◆ Member of the Cuban Society of Paediatricians
- ◆ Professor on the Medicine Degree and Internal Medicine Speciality at the Faculty of Medical Sciences of Isla de la Juventud
- ◆ Professor of the Professional Master's Degree in Infectious Diseases in the Faculty of Medical Sciences in Isla de la Juventud
- ◆ Degree in Medicine and Surgery, University of Havana

**Ms. González Fiallo, Sayli**

- ◆ Director of the Health Analysis, Biostatistics, and Surveillance Unit, Municipal Health Directorate, Isle of Youth
- ◆ Professor of the Faculty of Medical Sciences in Isla de la Juventud
- ◆ Master's Degree in Epidemiology
- ◆ Degree in Hygiene and Epidemiology





05

# Structure and Content

The syllabus for this Professional Master's Degree has been developed by a specialized teaching team versed in Antibiotic Therapy and Antibiotic Resistance. Their extensive knowledge in the field will provide pharmacists with the most advanced and recent knowledge available. Over 12 months, students will take a deep look into progress made in microbiology, pharmacokinetics, pharmacodynamics and antibiotic resistance. All this includes multimedia resources that will facilitate students' update.



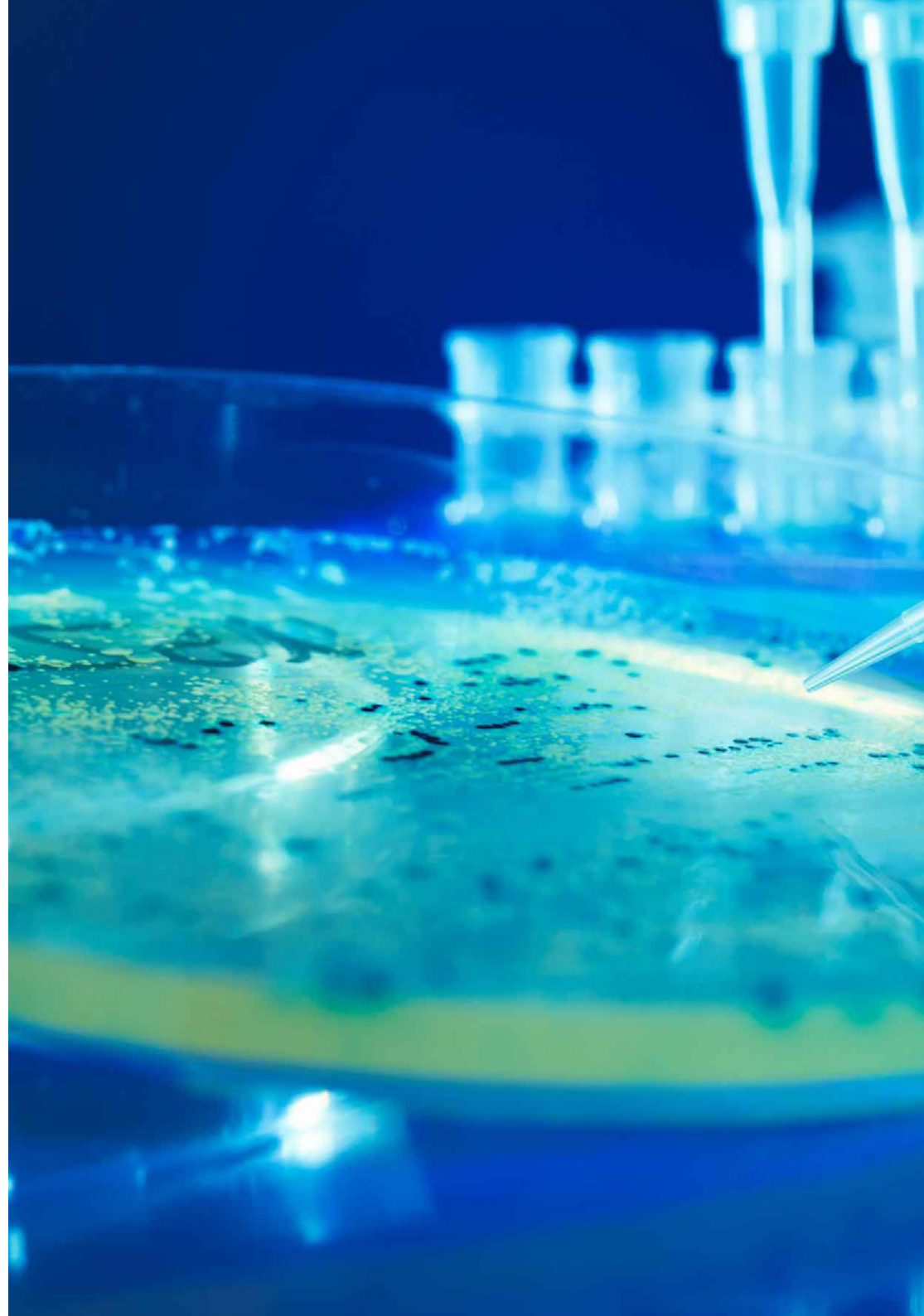


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*Antivirals, antimicrobials, treatments, adverse effects... All this in a 100% online Professional Master's Degree designed for pharmacists like you”*

## Module 1. Overview of Microbiology

- 1.1. General Elements of Microbiology
  - 1.1.1. The Role of Microbiology in the Study of Infectious Diseases
  - 1.1.2. Structure and Function of the Microbiology Laboratory
  - 1.1.3. Indication and Interpretation of Microbiological Studies
- 1.2. Virology
  - 1.2.1. General Characteristics of Viruses
  - 1.2.2. Classification and Main Viruses Affecting Humans
  - 1.2.3. Emerging Viruses
  - 1.2.4. Virological Studies
- 1.3. Bacteriology: Current Concepts for Antibiotic Therapeutics
  - 1.3.1. General Characteristics of Bacteria
  - 1.3.2. Classification and Main Bacteria Affecting Humans
  - 1.3.3. Microbiological Studies
- 1.4. Mycology
  - 1.4.1. General Characteristics of Fungi
  - 1.4.2. Classification and Main Fungi Affecting Humans
  - 1.4.3. Mycological Studies
- 1.5. Parasitology
  - 1.5.1. General Characteristics of Parasites
  - 1.5.2. Classification and Main Parasites Affecting Humans
  - 1.5.3. Parasitological Studies
- 1.6. The Microbiological Sample: Collection, Storage and Transport
  - 1.6.1. The Microbiological Sampling Process: Preanalytical, Analytical, and Postanalytical Stages
  - 1.6.2. Sampling Requirements for the Main Microbiological Studies used in Daily Clinical Practice: Blood, Urine, Stool, Sputum
- 1.7. Antibigram: New Concepts for Interpretation and Utilization
  - 1.7.1. Traditional Antibigram Reading
  - 1.7.2. Interpreted Antibigram Reading and the Mechanisms of New Antimicrobial Resistance Phenotypes
  - 1.7.3. Antimicrobial Mapping and Resistance Patterns





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- 1.8. Rapid Diagnostic Methods: News about their Application
    - 1.8.1. Rapid Diagnostic Methods for Viruses
    - 1.8.2. Rapid Diagnostic Methods for Bacteria
    - 1.8.3. Rapid Diagnostic Methods for Fungi
    - 1.8.4. Rapid Diagnostic Methods for Parasites
  - 1.9. Molecular Biology in Microbiological Diagnostics: Its Role in the Future
    - 1.9.1. Development and Application of Molecular Biology in Microbiological Methods
  - 1.10. Microbiology: Challenges to Improve Antibiotic Usage and Control Antibiotic Resistance
    - 1.10.1. Challenges and Obstacles for Microbiological Diagnostics
    - 1.10.2. Future Challenges of Microbiology Laboratory Management in the Correct and Rational Use of Antibiotics
    - 1.10.3. Future Microbiological Techniques to Study Antibiotic Resistance

## Module 2. Introduction to Pharmacology and Treatment

- 2.1. Utility of Clinical Pharmacology
  - 2.1.1. Concept
  - 2.1.2. Object of Study
  - 2.1.3. Branches of Pharmacology
  - 2.1.4. Use of Clinical Pharmacology
- 2.2. Pharmacokinetics: Certainties and Contradictions in its Practical Use
  - 2.2.1. The Dynamics of Absorption, Distribution, Metabolism, and Elimination of Drugs, Especially Antimicrobials
- 2.3. Pharmacodynamics: Its Use in the Practical Use of New Antimicrobials
  - 2.3.1. Molecular Mechanisms of Action of Drugs, Especially Antimicrobials
  - 2.3.2. Drug-Drug Interactions of Antibiotics with Other Medications
  - 2.3.3. Pharmacokinetics/Pharmacodynamics Models in Antibiotic Use
- 2.4. Pharmacovigilance
  - 2.4.1. Concept
  - 2.4.2. Objectives
  - 2.4.3. Antibiotic Adverse Reactions
- 2.5. Pharmacoepidemiology: Update on Antimicrobial Research
  - 2.5.1. Concept
  - 2.5.2. Objectives
  - 2.5.3. Drug Usage Studies



- 2.6. Clinical Trials
  - 2.6.1. Concept
  - 2.6.2. Methodology
  - 2.6.3. Objectives
  - 2.6.4. The Stages of Clinical Trials
  - 2.6.5. Uses
- 2.7. Meta-Analysis
  - 2.7.1. Concept
  - 2.7.2. Methodology
  - 2.7.3. Objectives
  - 2.7.4. Uses
- 2.8. Rational Treatment: From Old to New and Evidence-Based Medicine
  - 2.8.1. Stages of Rational Treatment
  - 2.8.2. Use and Importance of Rational Treatment
- 2.9. Clinical Practice Guidelines: New Approaches to Practical Application
  - 2.9.1. Creating Clinical Practice Guidelines
  - 2.9.2. The Impact of Clinical Practice Guidelines
- 2.10. Clinical Pharmacology: Advances and Future Perspectives for the Improvement of Antibiotic Treatment
  - 2.10.1. Research Activities and Scientific Advances: Pharmacy Fiction?
  - 2.10.2. Molecular Pharmacology and its Role in Antibiotic Therapy

### Module 3. Antimicrobials: General Aspects

- 3.1. History and Development of Antimicrobials
  - 3.1.1. Emergence and Development of Antimicrobial Treatments
  - 3.1.2. Impact on Morbimortality of Infectious Diseases
- 3.2. Classifications: Practical and Future Use of Each One of Them
  - 3.2.1. Chemical Classification
  - 3.2.2. Classification by Antimicrobial Action
  - 3.2.3. Classification According to their Antimicrobial Spectrum
- 3.3. Update on the Mechanisms of Action of Antimicrobials
  - 3.3.1. Main Antimicrobial Mechanisms of Action
- 3.4. General and Latest Elements of Antimicrobial Treatments
  - 3.4.1. General and Recent Concepts in the Use of Antimicrobials
  - 3.4.2. New Developments in the Use of Antimicrobial Combinations
  - 3.4.3. Interactions between Antimicrobials

- 3.5. Antibiotic Prophylaxis: Its Current Role in Surgical Morbidity and Mortality
  - 3.5.1. Concept
  - 3.5.2. Objectives
  - 3.5.3. Types of Antibiotic Prophylaxis
  - 3.5.4. Perioperative Antibiotic Prophylaxis
- 3.6. Phased Antibiotic Treatment: Current Criteria
  - 3.6.1. Concept
  - 3.6.2. Principles
  - 3.6.3. Objectives
- 3.7. Latest Concepts in the Use of Antibiotics in Renal Failure
  - 3.7.1. Renal Excretion of Antibiotics
  - 3.7.2. Renal Toxicity of Antibiotics
  - 3.7.3. Dose Modification in Renal Failure
- 3.8. Antibiotics and the Blood-Brain Barrier: Recent Findings
  - 3.8.1. The Passage of Antibiotics through the Blood-Brain Barrier
  - 3.8.2. Antibiotics in Central Nervous System Infections
- 3.9. Antibiotics and Liver Failure: Progress and Future Challenges
  - 3.9.1. Hepatic Metabolism of Antibiotics
  - 3.9.2. Hepatic Toxicity of Antimicrobials
  - 3.9.3. Dose Adjustment in Hepatic Insufficiency
- 3.10. Antibiotic Use in the Immunosuppressed: The New Paradigm
  - 3.10.1. Immune Response to Infection
  - 3.10.2. Main Opportunistic Germs in the Immunosuppressed
  - 3.10.3. Principles for the Choice and Duration of Antibiotic Therapy in the Immunosuppressed
- 3.11. Antibiotics in Pregnancy and Lactation: The Safety of their Use According to the Latest Scientific Findings
  - 3.11.1. The Passage of Antibiotics through the Placenta
  - 3.11.2. Antibiotics and Breast Milk
  - 3.11.3. Teratogenicity of Antibiotics

## Module 4. Antivirals

- 4.1. General Features of Antivirals
  - 4.1.1. Classification
  - 4.1.2. Main Indications of Antivirals
- 4.2. Action Mechanisms
  - 4.2.1. Action Mechanisms of Antivirals
- 4.3. Antivirals for Hepatitis: New Recommendations and Future Research Projections
  - 4.3.1. Specific Viral Hepatitis
  - 4.3.2. Hepatitis B Treatment
  - 4.3.3. Hepatitis C Treatment
- 4.4. Antivirals for Respiratory Infections: Current Scientific Evidence
  - 4.4.1. Main Respiratory Viruses
  - 4.4.2. Influenza Treatment
  - 4.4.3. Other Respiratory System Virus Treatments
- 4.5. Antivirals for Herpes Viruses: Recent Changes in Management
  - 4.5.1. Main Herpes Virus Infections
  - 4.5.2. Herpes Simplex Infection Treatment
  - 4.5.3. Treatment of Varicella Zoster Virus Infections
- 4.6. Antiretrovirals for HIV: Certainties and Controversies Future Challenges
  - 4.6.1. Classification of Antiretrovirals
  - 4.6.2. Mechanisms of Action of Antiretrovirals
  - 4.6.3. Antiretroviral Treatment of HIV Infection
  - 4.6.4. Adverse Reactions
  - 4.6.5. Antiretroviral Treatment Failure
- 4.7. Topical Antivirals
  - 4.7.1. Main Viral Infections of the Skin and Mucous Membranes
  - 4.7.2. Topical Antivirals
- 4.8. Update on Interferons: Their Use in Viral and Non-Infectious Diseases
  - 4.8.1. Classification and Action of Interferons
  - 4.8.2. Uses of Interferons
  - 4.8.3. Adverse Reactions of Interferons
- 4.9. New Areas of Antiviral Development
  - 4.9.1. Antibiotics in Viral Hemorrhagic Diseases
  - 4.9.2. Future Prospects for Antiviral Chemotherapy

## Module 5. Antibiotics I

- 5.1. Advances in the Knowledge of the Synthesis and Structure of the Beta-Lactam Ring
  - 5.1.1. Structure of the Beta-Lactam Ring
  - 5.1.2. Drugs that Act on the Synthesis of the Beta-Lactam Ring
- 5.2. Penicillins: New Drugs and their Future Role in Anti-Infection Treatments
  - 5.2.1. Classification
  - 5.2.2. Mechanism of Action
  - 5.2.3. Antimicrobial Spectrum
  - 5.2.4. Pharmacokinetics and Pharmacodynamics
  - 5.2.5. Therapeutic Uses
  - 5.2.6. Adverse Effects
  - 5.2.7. Presentation and Dosage
- 5.3. Antistaphylococcal Penicillins: From Old to New and their Practical Implications
  - 5.3.1. Classification
  - 5.3.2. Mechanism of Action
  - 5.3.3. Antimicrobial Spectrum
  - 5.3.4. Pharmacokinetics and Pharmacodynamics
  - 5.3.5. Therapeutic Uses
  - 5.3.6. Adverse Effects
  - 5.3.7. Presentation and Dosage
- 5.4. Antipseudomonal Penicillins: Current Resistance Challenge
  - 5.4.1. Classification
  - 5.4.2. Action Mechanism
  - 5.4.3. Antimicrobial Spectrum
  - 5.4.4. Pharmacokinetics and Pharmacodynamics
  - 5.4.5. Therapeutic Uses
  - 5.4.6. Adverse Effects
  - 5.4.7. Presentation and Dosage
- 5.5. Cephalosporins: Present and Future
  - 5.5.1. Classification
  - 5.5.2. Action Mechanism
  - 5.5.3. Antimicrobial Spectrum
  - 5.5.4. Pharmacokinetics and Pharmacodynamics
  - 5.5.5. Therapeutic Uses
  - 5.5.6. Adverse Effects
  - 5.5.7. Presentation and Dosage

- 5.6. Oral Cephalosporins: New Developments in their Outpatient Use
  - 5.6.1. Classification
  - 5.6.2. Action Mechanism
  - 5.6.3. Antimicrobial Spectrum
  - 5.6.4. Pharmacokinetics and Pharmacodynamics
  - 5.6.5. Therapeutic Uses
  - 5.6.6. Adverse Effects
  - 5.6.7. Presentation and Dosage
- 5.7. Monobactams
  - 5.7.1. Classification
  - 5.7.2. Action Mechanism
  - 5.7.3. Antimicrobial Spectrum
  - 5.7.4. Pharmacokinetics and Pharmacodynamics
  - 5.7.5. Therapeutic Uses
  - 5.7.6. Adverse Effects
  - 5.7.7. Presentation and Dosage
- 5.8. Carbapenemics
  - 5.8.1. Classification
  - 5.8.2. Action Mechanism
  - 5.8.3. Antimicrobial Spectrum
  - 5.8.4. Pharmacokinetics and Pharmacodynamics
  - 5.8.5. Therapeutic Uses
  - 5.8.6. Adverse Effects
  - 5.8.7. Presentation and Dosage
- 5.9. Beta-Lactamases: The Recent Discovery of Strains and their Role in Resistance
  - 5.9.1. Classification
  - 5.9.2. Action on Beta-Lactams
- 5.10. Beta-Lactamases Inhibitors
  - 5.10.1. Classification
  - 5.10.2. Action Mechanism
  - 5.10.3. Antimicrobial Spectrum
  - 5.10.4. Pharmacokinetics and Pharmacodynamics
  - 5.10.5. Therapeutic Uses
  - 5.10.6. Adverse Effects
  - 5.10.7. Presentation and Dosage

## Module 6. Antibiotics II

- 6.1. Glycopeptides: The New Drugs for GramPositive Germs
  - 6.1.1. Classification
  - 6.1.2. Action Mechanism
  - 6.1.3. Antimicrobial Spectrum
  - 6.1.4. Pharmacokinetics and Pharmacodynamics
  - 6.1.5. Therapeutic Uses
  - 6.1.6. Adverse Effects
  - 6.1.7. Presentation and Dosage
- 6.2. Cyclic Lipopeptides: Recent Advances and its Future Role
  - 6.2.1. Classification
  - 6.2.2. Action Mechanism
  - 6.2.3. Antimicrobial Spectrum
  - 6.2.4. Pharmacokinetics and Pharmacodynamics
  - 6.2.5. Therapeutic Uses
  - 6.2.6. Adverse Effects
  - 6.2.7. Presentation and Dosage
- 6.3. Macrolides: Their Role as an Immunomodulator in the Respiratory System
  - 6.3.1. Classification
  - 6.3.2. Action Mechanism
  - 6.3.3. Antimicrobial Spectrum
  - 6.3.4. Pharmacokinetics and Pharmacodynamics
  - 6.3.5. Therapeutic Uses
  - 6.3.6. Adverse Effects
  - 6.3.7. Presentation and Dosage
- 6.4. Ketolides
  - 6.4.1. Classification
  - 6.4.2. Action Mechanism
  - 6.4.3. Antimicrobial Spectrum
  - 6.4.4. Pharmacokinetics and Pharmacodynamics
  - 6.4.5. Therapeutic Uses
  - 6.4.6. Adverse Effects
  - 6.4.7. Presentation and Dosage

- 6.5. Tetracyclines: Old and New Indications According to the Most Recent Advances in Emerging Diseases
  - 6.5.1. Classification
  - 6.5.2. Action Mechanism
  - 6.5.3. Antimicrobial Spectrum
  - 6.5.4. Pharmacokinetics and Pharmacodynamics
  - 6.5.5. Therapeutic Uses
  - 6.5.6. Adverse Effects
  - 6.5.7. Presentation and Dosage
- 6.6. Aminoglycosides: Facts and Realities of their Current and Future Utilization
  - 6.6.1. Classification
  - 6.6.2. Action Mechanism
  - 6.6.3. Antimicrobial Spectrum
  - 6.6.4. Pharmacokinetics and Pharmacodynamics
  - 6.6.5. Current Therapeutic Uses and Future Trends
  - 6.6.6. Adverse Effects
  - 6.6.7. Presentation and Dosage
- 6.7. Quinolones: All Generations and Practical Use
  - 6.7.1. Classification
  - 6.7.2. Action Mechanism
  - 6.7.3. Antimicrobial Spectrum
  - 6.7.4. Pharmacokinetics and Pharmacodynamics
  - 6.7.5. Therapeutic Uses
  - 6.7.6. Adverse Effects
  - 6.7.7. Presentation and Dosage
- 6.8. Respiratory Quinolones: Latest Recommendations on their Use
  - 6.8.1. Classification
  - 6.8.2. Action Mechanism
  - 6.8.3. Antimicrobial Spectrum
  - 6.8.4. Pharmacokinetics and Pharmacodynamics
  - 6.8.5. Therapeutic Uses
  - 6.8.6. Adverse Effects
  - 6.8.7. Presentation and Dosage

- 6.9. Streptogramins
  - 6.9.1. Classification
  - 6.9.2. Action Mechanism
  - 6.9.3. Antimicrobial Spectrum
  - 6.9.4. Pharmacokinetics and Pharmacodynamics
  - 6.9.5. Therapeutic Uses
  - 6.9.6. Adverse Effects
  - 6.9.7. Presentation and Dosage

## Module 7. Antibiotics III

- 7.1. Oxazolidinones
  - 7.1.1. Classification
  - 7.1.2. Action Mechanism
  - 7.1.3. Antimicrobial Spectrum
  - 7.1.4. Pharmacokinetics and Pharmacodynamics
  - 7.1.5. Therapeutic Uses
  - 7.1.6. Adverse Effects
  - 7.1.7. Presentation and Dosage
- 7.2. Sulfas
  - 7.2.1. Classification
  - 7.2.2. Action Mechanism
  - 7.2.3. Antimicrobial Spectrum
  - 7.2.4. Pharmacokinetics and Pharmacodynamics
  - 7.2.5. Therapeutic Uses
  - 7.2.6. Adverse Effects
  - 7.2.7. Presentation and Dosage
- 7.3. Lincosamides
  - 7.3.1. Classification
  - 7.3.2. Action Mechanism
  - 7.3.3. Antimicrobial Spectrum
  - 7.3.4. Pharmacokinetics and Pharmacodynamics
  - 7.3.5. Therapeutic Uses
  - 7.3.6. Adverse Effects
  - 7.3.7. Presentation and Dosage



- 7.4. Rifamycins: Practical Use in TB and Other Infections Today
  - 7.4.1. Classification
  - 7.4.2. Action Mechanism
  - 7.4.3. Antimicrobial Spectrum
  - 7.4.4. Pharmacokinetics and Pharmacodynamics
  - 7.4.5. Therapeutic Uses
  - 7.4.6. Adverse Effects
  - 7.4.7. Presentation and Dosage
- 7.5. Antifolates
  - 7.5.1. Classification
  - 7.5.2. Action Mechanism
  - 7.5.3. Antimicrobial Spectrum
  - 7.5.4. Pharmacokinetics and Pharmacodynamics
  - 7.5.5. Therapeutic Uses
  - 7.5.6. Adverse Effects
  - 7.5.7. Presentation and Dosage
- 7.6. Antibiotics for Leprosy: Recent Advances
  - 7.6.1. Classification
  - 7.6.2. Action Mechanism
  - 7.6.3. Antimicrobial Spectrum
  - 7.6.4. Pharmacokinetics and Pharmacodynamics
  - 7.6.5. Therapeutic Uses
  - 7.6.6. Adverse Effects
  - 7.6.7. Presentation and Dosage
- 7.7. Antituberculosis Drugs: Latest Recommendations for their Use
  - 7.7.1. Classification
  - 7.7.2. Action Mechanism
  - 7.7.3. Antimicrobial Spectrum
  - 7.7.4. Pharmacokinetics and Pharmacodynamics
  - 7.7.5. Therapeutic Uses
  - 7.7.6. Adverse Effects
  - 7.7.7. Presentation and Dosage

- 7.8. Parenteral Antibiotic Use in Outpatients: Latest Recommendations
  - 7.8.1. Main Indications for Parenteral Antibiotics in Outpatients
  - 7.8.2. Monitoring Outpatients Receiving Parenteral Antibiotic Treatment
- 7.9. The Latest on Antibiotics for Multidrug Resistant Bacteria
  - 7.9.1. Antibiotics for Multidrug-Resistant Gram-Positive Bacteria
  - 7.9.2. Antibiotics for Multidrug-Resistant Gram-Negative Bacteria

## Module 8. Antimycotics

- 8.1. General Elements
  - 8.1.1. Concept
  - 8.1.2. Origins and Development
- 8.2. Classification
  - 8.2.1. Classification According to Chemical Structure
  - 8.2.2. Classification According to Action: Local and Systemic
- 8.3. Action Mechanisms
  - 8.3.1. Action Mechanisms of Antifungal Agents
- 8.4. Systemic Antifungal Agents: News on their Toxicity and their Present and Future Indications
  - 8.4.1. Antimicrobial Spectrum
  - 8.4.2. Pharmacokinetics and Pharmacodynamics
  - 8.4.3. Therapeutic Uses
  - 8.4.4. Adverse Effects
  - 8.4.5. Presentation and Dosage
- 8.5. Amphotericin B: Novel Concepts in its Use
  - 8.5.1. Action Mechanism
  - 8.5.2. Antimicrobial Spectrum
  - 8.5.3. Pharmacokinetics and Pharmacodynamics
  - 8.5.4. Therapeutic Uses
  - 8.5.5. Adverse Effects
  - 8.5.6. Presentation and Dosage
- 8.6. Deep Mycosis Treatment: Current Events and Future Perspectives
  - 8.6.1. Aspergillosis
  - 8.6.2. Coccidioidomycosis
  - 8.6.3. Cryptococcosis
  - 8.6.4. Histoplasmosis

- 8.7. Local Antifungals
  - 8.7.1. Antimicrobial Spectrum
  - 8.7.2. Pharmacokinetics and Pharmacodynamics
  - 8.7.3. Therapeutic Uses
  - 8.7.4. Adverse Effects
  - 8.7.5. Presentation and Dosage
- 8.8. Treatment of Skin and Mucous Mycosis
  - 8.8.1. Tinea Capitis
  - 8.8.2. Skin Tinea
  - 8.8.3. Onychomycosis
- 8.9. Liver Toxicity of Systemic Antifungal Agents: Future Challenges
  - 8.9.1. Liver Metabolism of Antifungal Agents
  - 8.9.2. Hepatotoxicity of Antifungal Agents

## Module 9. Antiparasitics II

- 9.1. General Elements
  - 9.1.1. Concept
  - 9.1.2. Origins and Development
- 9.2. Classification
  - 9.2.1. Classification by Chemical Structure
  - 9.2.2. Classification by Action Against Different Parasites
- 9.3. Action Mechanisms
  - 9.3.1. Action Mechanisms of Antiparasitics
- 9.4. Antiparasitics for Intestinal Parasitism: New Advances
  - 9.4.1. Classification
  - 9.4.2. Action Mechanism
  - 9.4.3. Antimicrobial Spectrum
  - 9.4.4. Pharmacokinetics and Pharmacodynamics
  - 9.4.5. Therapeutic Uses
  - 9.4.6. Adverse Effects
  - 9.4.7. Presentation and Dosage
- 9.5. Antimalarials: Latest WHO Recommendations
  - 9.5.1. Classification
  - 9.5.2. Action Mechanism
  - 9.5.3. Antimicrobial Spectrum
  - 9.5.4. Pharmacokinetics and Pharmacodynamics
  - 9.5.5. Therapeutic Uses
  - 9.5.6. Adverse Effects
  - 9.5.7. Presentation and Dosage
- 9.6. Update on Antiparasitics for Filariasis
  - 9.6.1. Classification
  - 9.6.2. Action Mechanism
  - 9.6.3. Antimicrobial Spectrum
  - 9.6.4. Pharmacokinetics and Pharmacodynamics
  - 9.6.5. Therapeutic Uses
  - 9.6.6. Adverse Effects
  - 9.6.7. Presentation and Dosage
- 9.7. Latest Advances in Antiparasitics for Trypanosomiasis
  - 9.7.1. Classification
  - 9.7.2. Action Mechanism
  - 9.7.3. Antimicrobial Spectrum
  - 9.7.4. Pharmacokinetics and Pharmacodynamics
  - 9.7.5. Therapeutic Uses
  - 9.7.6. Adverse Effects
  - 9.7.7. Presentation and Dosage
- 9.8. Antiparasitics for Schistosomiasis
  - 9.8.1. Classification
  - 9.8.2. Action Mechanism
  - 9.8.3. Antimicrobial Spectrum
  - 9.8.4. Pharmacokinetics and Pharmacodynamics
  - 9.8.5. Therapeutic Uses
  - 9.8.6. Adverse Effects
  - 9.8.7. Presentation and Dosage

- 9.9. Antiparasitics for Leishmaniasis
  - 9.9.1. Classification
  - 9.9.2. Action Mechanism
  - 9.9.3. Antimicrobial Spectrum
  - 9.9.4. Pharmacokinetics and Pharmacodynamics
  - 9.9.5. Therapeutic Uses
  - 9.9.6. Adverse Effects
  - 9.9.7. Presentation and Dosage
- 9.10. Treatment of Other Less Common Parasitosis
  - 9.10.1. Dracunculosis
  - 9.10.2. Hydatid Cyst
  - 9.10.3. Other Tissue Parasites

## Module 10. Antibiotic Resistance

- 10.1. Emergence and Development of Antibiotic Resistance
  - 10.1.1. Concept
  - 10.1.2. Classification
  - 10.1.3. Origins and Development
- 10.2. Antibiotic Resistance Mechanisms: An Update
  - 10.2.1. Antimicrobial Resistance Mechanisms
  - 10.2.2. New Resistance Mechanisms
- 10.3. Staphylococcal Resistance: Yesterday, Today, and Tomorrow
  - 10.3.1. Evolution of Staphylococcal Resistance
  - 10.3.2. Staphylococcal Resistance Mechanisms
- 10.4. Resistance of Gram-Positive Germs: Latest Recommendations
  - 10.4.1. Evolution and Resistance of Gram-Positive Germs
  - 10.4.2. Resistance Mechanisms of Gram-Positive Germs
- 10.5. Resistance of Gram-Negative Germs: Current Clinical Implications
  - 10.5.1. Evolution of Gram-Negative Germ Resistance
  - 10.5.2. Resistance Mechanisms of Gram-Negative Germs
- 10.6. Virus Resistance
  - 10.6.1. Evolution of Virus Resistance
  - 10.6.2. Virus Resistance Mechanisms

- 10.7. Fungal Resistance
  - 10.7.1. Evolution of Fungal Resistance
  - 10.7.2. Fungal Resistance Mechanisms
- 10.8. Parasite Resistance: An Emerging Problem
  - 10.8.1. Evolution of Parasite Resistance
  - 10.8.2. Mechanisms of Parasite Resistance
  - 10.8.3. Resistance to Antimalarials
- 10.9. New Mechanisms of Antibiotic Resistance and Superbugs
  - 10.9.1. Emergence and Progression of Superbugs
  - 10.9.2. New Resistance Mechanisms of Superbugs
- 10.10. Antibiotic Resistance Control Mechanisms and Programs
  - 10.10.1. Antibiotic Resistance Control Strategies
  - 10.10.2. Global Program and International Experiences in the Control of Antibiotic Resistance

## Module 11. Monitoring and Controlling the Use of Antimicrobials

- 11.1. Antibiotic Treatment Duration in the Treatment of Infections: New Role of Biomarkers
  - 11.1.1. Update on the Adequate Duration of the Most Frequent Infections
  - 11.1.2. Clinical and Laboratory Parameters to Determine the Duration of Treatment
- 11.2. Antimicrobial Usage Studies: Most Recent Impacts
  - 11.2.1. The Significance of Antimicrobial Usage Studies
  - 11.2.2. Results of Greater Impact in Recent Years by Antimicrobial Usage Studies
- 11.3. Antibiotic Committees in Hospitals: Their Role in the Future
  - 11.3.1. Structure and Operation
  - 11.3.2. Objectives
  - 11.3.3. Activities
  - 11.3.4. Impacts
- 11.4. Antimicrobial Use Policies: Current Impact on Antimicrobial Use
  - 11.4.1. Concepts
  - 11.4.2. Types of Policies
  - 11.4.3. Objectives
  - 11.4.4. Impacts
- 11.5. Pharmacotherapeutic Committees: Practical Importance
  - 11.5.1. Structure and Function

- 11.5.2. Objectives
- 11.5.3. Activities
- 11.5.4. Impacts
- 11.6. Infectious Disease Specialists and their Role in the Rational Use of Antimicrobials
  - 11.6.1. Functions and Activities of Infectious Disease Specialists to Promote and Encourage the Rational Use of Antimicrobials
- 11.7. Impact of Training and Professional Development on Antimicrobial Usage
  - 11.7.1. Importance of Training and Professional Development
  - 11.7.2. Types
  - 11.7.3. Impacts
- 11.8. Hospital Strategies for Rational Antimicrobial Use: What the Evidence Says
  - 11.8.1. Hospital Strategies for the Control of the Rational Use of Antimicrobials
  - 11.8.2. Impacts
- 11.9. Scientific Research for the Future Control and Monitoring of Antibiotic Therapy in Patients with Sepsis
  - 11.9.1. Search for New Parameters and Markers for Monitoring and Control of Antibiotic Therapeutics

## Module 12. Antibiotics and Antimicrobial Treatments of the Future

- 12.1. Research, Approval, and Commercialization of New Antibiotics
  - 12.1.1. Antimicrobial Research
  - 12.1.2. Antimicrobial Approval Process
  - 12.1.3. Antimicrobial Marketing and Large Pharmaceutical Companies
- 12.2. Ongoing Clinical Trials for the Approval of New Antibiotics
  - 12.2.1. New Clinical Trials on Antimicrobials
- 12.3. Old Antibiotics with New Uses
  - 12.3.1. The Role of Old Antibiotics with New Uses
  - 12.3.2. Antimicrobial Withdrawal
  - 12.3.3. Chemical Alterations of Old Antimicrobials
- 12.4. Treatment Goals and New Ways to Fight Infections: What's New in Research
  - 12.4.1. New Treatment Goals
  - 12.4.2. New Ways to Treat Sepsis

- 12.5. Monoclonal Antibodies in Infections: Present and Future
  - 12.5.1. Origin and Emergence of Monoclonal Antibodies
  - 12.5.2. Classification
  - 12.5.3. Clinical Uses
  - 12.5.4. Impact Results in Infectious Diseases
- 12.6. Other Drugs to Regulate and Stimulate Immune Response against Infection
  - 12.6.1. Drugs to Regulate and Control the Immune Response
- 12.7. Futuristic Antibiotics
  - 12.7.1. The Future of Antimicrobials
  - 12.7.2. Antibiotics of the Future



*Take a deep dive into futuristic antibiotics with a flexible academic training that you can access whenever you want from your electronic device of choice”*



06

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning**.

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.



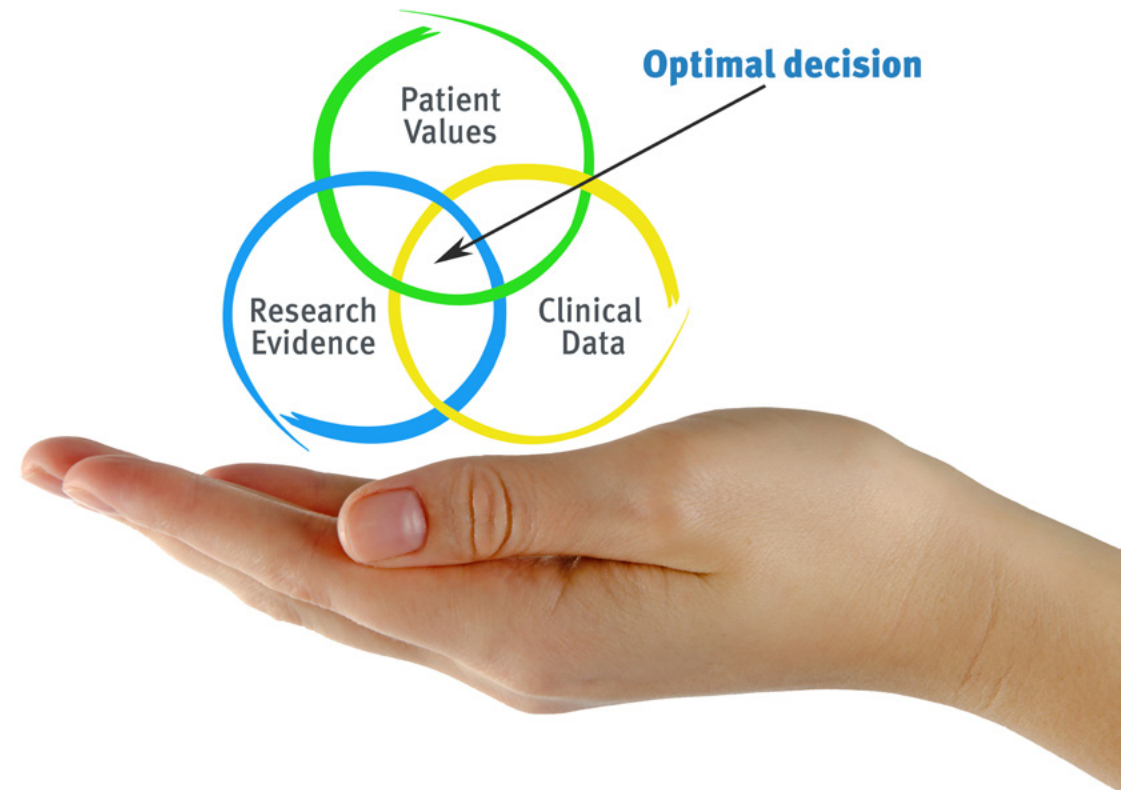


*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program, students will be confronted with multiple simulated clinical cases based on real patients, in which they will have to investigate, establish hypotheses and ultimately, resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Pharmacists learn better, more quickly and more sustainably over time.

*With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.*



According to Dr. Gervas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, attempting to recreate the actual conditions in a pharmacist's professional practice.



“

*Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method”*

The effectiveness of the method is justified by four fundamental achievements:

1. Pharmacists who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.





## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

Our University is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, which represent a real revolution with respect to simply studying and analyzing cases.

*Pharmacists will learn through real cases and by solving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.*



At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology, more than 115,000 pharmacists have been trained with unprecedented success in all clinical specialties, regardless of the surgical load. This pedagogical methodology is developed in a highly demanding environment, with a university student body with a high socioeconomic profile and an average age of 43.5 years.

*Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.*

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.



This program offers the best educational material, prepared with professionals in mind:



### Study Material

All teaching material is created specifically for the course by specialist pharmacists who will be teaching the course, so that the didactic development is highly specific and accurate.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



### Video Techniques and Procedures

TECH introduces students to the latest techniques, to the latest educational advances, to the forefront of current pharmaceutical care procedures. All of this, first hand, and explained and detailed with precision to contribute to assimilation and a better understanding. And best of all, you can watch them as many times as you want.



### Interactive Summaries

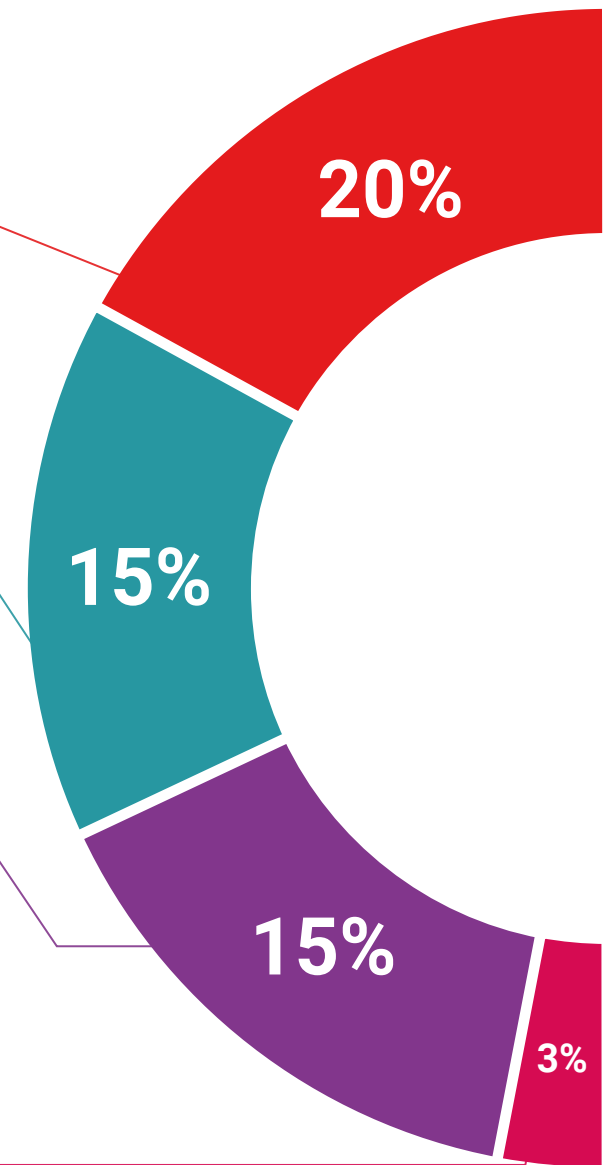
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

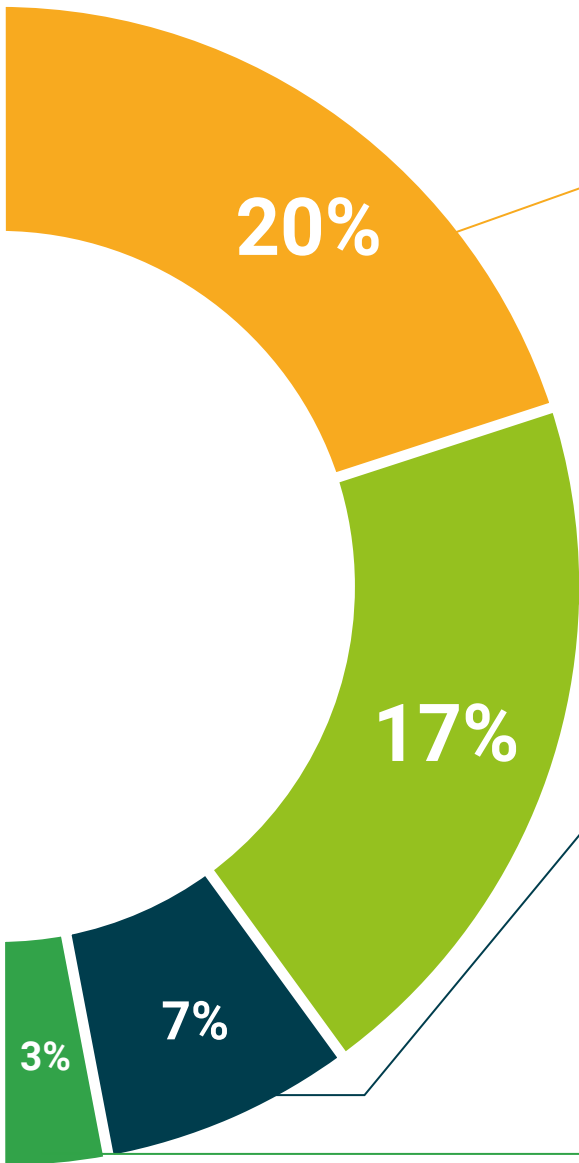
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".



### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





#### Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, we will present you with real case developments in which the expert will guide you through focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



#### Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.



#### Classes

There is scientific evidence on the usefulness of learning by observing experts. The system known as Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



#### Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.





07

# Certificate

The Professional Master's Degree in Advances in Antibiotic Therapy and Antibiotic Resistance guarantees you, in addition to the most rigorous and updated training, access to a Professional Master's Degree issued by TECH Global University.



“

*Successfully complete this program  
and receive your university degree  
without travel or laborious paperwork”*

This private qualification will allow you to obtain a **Professional Master's Degree diploma in Advances in Antibiotic Therapy and Antibiotic Resistance** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University** is an official European University publicly recognized by the Government of Andorra ([official bulletin](#)). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

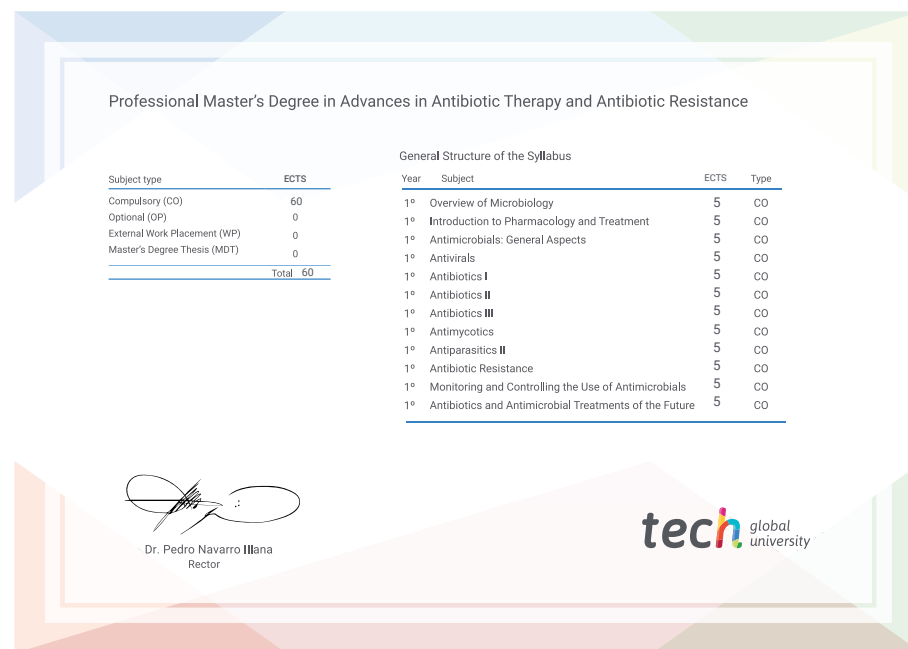
This **TECH Global University** private qualification is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Professional Master's Degree in Advances in Antibiotic Therapy and Antibiotic Resistance**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**



\*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.



**Professional Master's Degree**  
Advances in Antibiotic Therapy  
and Antibiotic Resistance

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Credits: 60 ECTS
- » Schedule: at your own pace
- » Exams: online



# Professional Master's Degree

## Advances in Antibiotic Therapy and Antibiotic Resistance

