# Hybrid Professional Master's Degree

## Advances in Antibiotic Therapy and Antibiotic Resistance

tech technological university

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## Advances in Antibiotic Therapy and Antibiotic Resistance

Course Modality: **Hybrid (Online + Clinical Internship)**
Duration: **12 months**
Certificate: **TECH Technological University**
Teaching Hours: **1,620 h.**
Website: **www.techtitute.com/us/medicine/hybrid-professional-master-degree/hybrid-professional-master-degree-advances-antibiotic-therapy-antibiotic-resistance**

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# Introduction

Antibiotic resistance is one of the most urgent health problems in the world and therefore science is constantly innovating in the search for alternative therapies that make it possible to significantly reduce the use of this class of drugs. Advances in this field are non-stop, and health professionals rarely manage to master their updates in a holistic way. In order to break with this context, TECH has developed a first level qualification that combines a theoretical update on new contents with a practical stay of 3 weeks in a prestigious hospital center. In this way, the specialist will broaden their skills at the same time as they will be able to apply cutting-edge procedures on real patients.

*Get up to date, with TECH, on therapeutic alternatives against bacteria such as Bacteriophages and Liposomes"*

The excessive use of antibiotics, especially when it is not the correct treatment, is a pressing problem in the health scenario. Its causes are very diverse, but among them prevails the inadequate updating of physicians on the therapeutic strategies that make use of them. Moreover, technological innovations in this area are constant, both for the diagnosis and treatment of specific infectious agents. Therefore, professionals in this medical area must constantly update themselves on these innovations and, in this way, provide the best healthcare to their patients.

For the proper updating of these specialists, TECH has put together a first-rate academic program that integrates the main practical and theoretical innovations in this area of medicine. Therefore, the Hybrid Professional Master's Degree in Advances in Antibiotic Therapy and Antibiotic Resistance offers the epidemiologist the possibility of getting up to date regarding a health field in constant evolution through two very well differentiated phases. The first phase, focused on updating the theoretical contents from an innovative learning platform, will delve into topics such as the formal differences between antivirals, antibiotics, antiparasitics, among others. At the same time, it will examine the harmful impacts of their excessive indication to patients and, gradually, how these actions generate resistance or susceptibility to these drugs. It will also delve into genomic pharmacology and the importance of Precision Medicine and DNA analysis to evaluate the most appropriate treatments for each individual.

In a second instance, the doctor will be part of a practical stay in a hospital center of international importance. This clinical practice will be 100% immersive and face-to-face, through which the student will be able to apply their skills from the first day, providing specialized care to real patients. On the other hand, the student will have the support and supervision of an assistant tutor, who will be in charge of ensuring their academic progress.

This **Hybrid Professional Master's Degree in Advances in Antibiotic Therapy and Antibiotic Resistance** contains the most complete and up-to-date scientific program on the market. The most important features include:

- Development of more than 100 clinical cases presented by epidemiologists specialized in counteracting viral, bacterial, fungal and parasitic infections
- The graphic, schematic and eminently practical contents with which they with, gather scientific and care information on those medical disciplines that are essential for professional practice
- Monitoring of patients with severe clinical pictures of Antibiotic Resistance or latency of super-bacteria in their organisms
- Comprehensive systematized action plans based on the most up-to-date pharmacological and pharmacogenomic therapies in the scientific field
- Presentation of practical workshops on diagnostic and therapeutic techniques in patients affected by viral or bacterial infections
- All this will be complemented by 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
- Furthermore, you will be able to carry out a clinical internship in one of the best hospital centers

*The face-to-face and intensive practice of this qualification will open the doors of a prestigious center in the field of Antibiotic Therapy for 3 weeks"*

*This Hybrid Professional Master's Degree is all you need to expand your academic horizons in the development of Antibacterial and Antiviral therapies"*

*Under the guidance and supervision of top experts, you will delve into Antibiotic Resistance and how to apply treatments that prevent patients from developing this condition.*

*Enroll in this program and get up to date on the implementation of therapeutic targets against bacterial diseases.*

In this Hybrid Professional Master's Degree, with a vocational nature and blended learning modality, the program is aimed at updating physicians with basic knowledge in relation to the application of antibiotic therapies. The contents are based on the latest scientific evidence, and oriented in a didactic way to integrate theoretical knowledge in health practice from the most modern scientific methodologies to identify the pathology present in the patient and which drug is best suited to it, leading to a more accurate decision-making.

Thanks to the multimedia content, developed with the latest educational technology, Medicine professionals will benefit from contextual learning, i.e., a simulated environment that will provide immersive learning programmed to train 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, students will be assisted by an innovative interactive video system created by renowned and experienced experts.

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# Why Study this Hybrid Professional Master's Degree?

The pedagogical scenario, so rich in programs in the health area, does not have qualifications that train the physician with equal thoroughness in the theoretical and practical fields of Advances in Antibiotic Therapy. However, this Hybrid Professional Master's Degree of TECH makes a proud difference by offering an innovative syllabus of studies, accompanied by a first class practical stay in prestigious hospitals. Based on this combination, a pioneer in its field, the specialist will be updated on the latest developments related to Antibiotic Resistance and alternative therapies for this condition.

*TECH will provide you with a complete update on the most important infectious diseases of the moment, and the therapeutic advances with the greatest impact on the scientific environment"*

### 1. Updating from the Latest Technology Available

The Hybrid Professional Master's Degree in Advances in Antibiotic Therapy and Antibiotic Resistance of TECH offers a unique opportunity to approach the latest technologies for the specific identification of bacteria and viruses from a theoretical perspective. In turn, the qualification provides a holistic understanding of how these innovations are applied in daily professional practice, through a dynamic and demanding on-site stay.

### 2. Gaining In-depth Knowledge from the Experience of Top Specialists

During this program, TECH students will be accompanied by a team of experts with extensive professional experience. With their help, graduates will develop complex theoretical knowledge and discuss real cases. In addition, during the on-site internship, they will have a designated tutor to complement their skills and provide them with personalized guidance.

### 3. Entering First-Class Clinical Environments

TECH carefully selects all the centers available for the professional internship that is integrated to this Hybrid Professional Master's Degree. In this way, physicians will be able to access the most competitive and demanding work environments in the healthcare market. In these spaces, they will find the best experts and the most up-to-date technologies.



### 4. Combining the Best Theory with State-of-the-Art Practice

In an educational market plagued by programs with excessive academic loads, TECH stands out for its innovative offer. Therefore, epidemiologists interested in mastering Antibiotic Therapies will have access to an excellent theoretical pedagogical preparation complemented by an intensive and exhaustive 3-week classroom practice.

### 5. Expanding the Boundaries of Knowledge

The professional internships of this Hybrid Professional Master's Degree will allow students to access renowned medical centers, located in different latitudes. In this way, each of them will be able to expand their horizons based on international standards. This opportunity is unique in its kind and is possible thanks to the network of contacts and collaborators within TECH's reach.

*You will have full practical immersion at the center of your choice"*

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# Objectives

This Hybrid Professional Master's Degree aims to provide health professionals in the field of epidemiology with a holistic update in the field of antibiotic therapy. To this end, it offers the most modern practical and theoretical considerations of this sector in an innovative study modality. In this way, the physician will delve into an unprecedented learning program, from a 100% online and interactive learning platform, throughout 1,500 educational hours. Afterward, they will be able to put all this knowledge into practice, directly, by providing specialized care to real patients during a 3-week intensive face-to-face stay.

*This qualification will expand your skills in the development of diagnostic tests to determine which bacteria or viruses are affecting the body and then establish the most appropriate treatment for them"*

## General Objective

- As the main objective of this Hybrid Professional Master's Degree in Advances in Antibiotic Therapy and Antibiotic Resistance, TECH seeks to promote medical work strategies based on the comprehensive approach to the patient as a reference model in achieving excellence in health care. The program also aims to improve technical skills on the interpretation of Antibiograms and other analytical tools. On the other hand, it will encourage professional stimulation through continuous training and research

*This Hybrid Professional Master's Degree will bring you up to date on the latest theoretical considerations regarding the use of Antimicrobials as alternatives to reduce Antibiotic resistance"*

## Specific Objectives

### 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 a reliable clinical diagnosis supported by the efficient use of diagnostic methods to indicate an effective antimicrobial treatment

### 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 with 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 the 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 relationship to antimicrobial use based on the most up-to-date concepts
- Emphasize 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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# Skills

After completing this Hybrid Professional Master's Degree, the physician will be equipped with the most up-to-date theoretical and practical skills in the field of Antibiotic Therapy. From them, they will be able to provide personalized treatment to all their patients, offering innovative solutions against Antibiotic Resistance crises or the appearance of super bacteria in the sick organism.

*Throughout this academic program, you will master the main antimicrobial clinical practice guidelines with scientifically cutting-edge concepts"*

## General Skills

- 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

- 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 achieved 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 multi-resistant germs in real and/or modeled situations
- Identifythe appearance of resistant germs and the overuse of antibiotics, in a timely manner, 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
- Support the importance of clinical-therapeutic discussion as an important public health measure for controlling 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 treatment 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

*During this qualification, you will be able to get up to speed on the development of antibiotics for the future and other therapeutic modalities for infectious diseases"*

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# Course Management

The teachers of this Hybrid Professional Master's Degree have been carefully selected by TECH, taking into account their extensive medical experience in the area of Antibiotic therapies. These teachers have composed a syllabus of excellence where the most up-to-date contents on the specific diagnosis of viruses, bacteria, fungi, and parasites and how to combat them through specific and personalized treatments are collected. Moreover, these experts have developed multimedia resources, such as infographics, videos and interactive summaries, that will enable the physician to assimilate the teaching materials more quickly and efficiently.

*TECH's teaching staff will provide you at all times with a personalized update guide, through which you will clarify doubts and concepts of interest"*

## Management

### Dr. Quintero Casanova, Jesús

- Specialist's Degree in Clinical Infectious Diseases Infectious and Tropical Diseases
- Head of the Infectious Diseases Department of the Héroes del Baire Hospital
- Specialist in in Internal Medicine at "Héroes del Baire Hospital
- Degree in Medicine and Surgery from the Medical University of Havana
- Master's Degree in Tropical Diseases and Clinical Infectious Diseases from the Pedro Kuori Institute Havana
- Member of the Cuban Society of Internal Medicine and the Cuban Society of Pedagogues
- Medical specialist in Africa (Chad) and Venezuela
- Professor of Medicine and Internal Medicine Specialty at the Faculty of Medical Sciences of Isla de Juventud, Cuba
- Professor in the Master's Degree in Infectious Diseases Master's Degree at the Faculty of Medical Sciences of Isla de la Juventud
- Member of state examining boards for the medicine degree and internal medicine

## Professors

### Dr. Valle Vargas, Mariano

- Specialist in Internal Medicine
- Specialist in Internal Medicine at "Héroes del Baire Hospital General Teaching
- Author of numerous scientific publications
- Teacher in university studies related to Medicine

### Dr. Dranguet Bouly, José Ismael

- Specialist in Internal Medicine and Intensive Therapy
- Specialist in Internal Medicine and Intensive Care at the Hospital General Docente Héroes del Baire
- Teacher in postgraduate studies in Medicine
- Master's Degree in Clinical Infectology

**Dr. Cantalapiedra Torres, Alejandro**

- Specialist in Pediatrics, Héroes del Baire Hospital
- Specialist Pediatrician
- Master's Degree in Infectious Diseases
- Certificate in Medical Teaching
- Certificate in Health Management
- Professor of Medicine and Pediatrics Specialty at the Faculty of Medical Sciences of the Isle of Youth
- Degree in Medicine and Surgery from the University of Havana
- Member of the Cuban Society of Pediatrics

**Ms. Laurence Carmenaty, Araelis**

- Microbiology
- Co-author of several scientific publications
- Lecturer in university studies related to Health Sciences
- Graduate in Microbiology
- Master's Degree in Infectious Diseases

**Dr. Luís Dávila, Heenry**

- Head of the Neck Pathology Service at Heroes del Baire Hospital
- Professor on the Medicine Degree in the Faculty of Medical Sciences in Isla de la Juventud
- Degree in Medicine and Surgery from the University of Havana
- Specialist in Gynecology and Obstetrics at Héroes del Baire Hospital
- Master's Degree in Comprehensive Care for Women
- Member of the Cuban Society of Gynecology and Obstetrics, Cuban Society of Pedagogues

**Dr. Jiménez Valdés, Erlivan**

- Specialist Pediatrician
- Teacher in university studies
- Author of several scientific articles
- Master's Degree in comprehensive childcare
- Member of the Cuban Society of Pediatrics

**Dr. Batista Valladares, Adrián**

- Head of Senior Citizen Services Social Assistance in Isla de la Juventud
- Degree in Medicine and Surgery from the University of Havana
- Specialist in Family and Community Medicine
- Master's Degree in Clinical Infectology
- Postgraduate Certificate in Diagnostic Ultrasound
- Postgraduate Certificate in Healthcare Management
- Member of the Cuban Society of Family Medicine

**Ms. González Fiallo, Sayli**

- Expert in Hygiene and Epidemiology
- Head of the Health Surveillance Department of the Health Directorate of Isla de la Juventud
- Author of several scientific articles
- Master's Degree in Epidemiology
- Degree in Hygiene and Epidemiology

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# Educational Plan

The syllabus of this Hybrid Professional Master's Degree program consists of a large number of didactic modules. In them, the student will examine the main current trends in the development of pharmacological and pharmacogenomic therapies against infectious diseases. They will also analyze the latest clinical methods for determining the presence of a particular virus or bacterium in the organism and how to interpret the results obtained with state-of-the-art equipment. On the other hand, the techniques to determine the resistance or susceptibility to a particular antibiotic or antiviral will be discussed in depth. For this update, the qualification will be supported by an innovative didactic strategy, based on novel methods such as the innovative methods such as Relearning.

*The contents of this qualification will be at your fingertips from an innovative learning platform, 100% online and interactive"*

## **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. Antibiogram: New Concepts for Interpretation and Utilization
- 1.7.1. Traditional Antibiogram Reading
- 1.7.2. Interpreted Antibiogram Reading and the Mechanisms of New Antimicrobial Resistance Phenotypes
- 1.7.3. Antimicrobial Mapping and Resistance Patterns

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 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. Mechanisms of action
- 4.2.1. Mechanisms of Action 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 AntiInfection 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. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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-Lactamase Inhibitors
- 5.10.1. Classification
- 5.10.2. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
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. Mechanism of Action
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. Mechanism of Action
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. Mechanism of Action
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. Mechanism of Action
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. Mechanism of Action
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. Mechanism of Action
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. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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 GramPositive Bacteria
- 7.9.2. Antibiotics for Multidrug-Resistant GramNegative 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. Mechanisms of action
- 8.3.1. Mechanisms of Action 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. Mechanism of Action
- 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. Mechanisms of action
- 9.3.1. Action Mechanisms of Antiparasitics

9.4. Antiparasitics for Intestinal Parasitism: New Advances
- 9.4.1. Classification
- 9.4.2. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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. Mechanism of Action
- 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. Quiste hidatídico
- 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. Mechanisms of Antibiotic Resistance: An Update
- 10.2.1. Mechanisms of Antimicrobial Resistance
- 10.2.2. New Resistance Mechanisms

10.3. Staphylococcal Resistance: Yesterday, Today, and Tomorrow
- 10.3.1. Evolution of Staphylococcal Resistance
- 10.3.2. Mechanisms of Staphylococcal Resistance

10.4. Resistance of Gram-Positive Germs: Latest Figure 2. Principles of Corporate Governance
- 10.4.1. Evolution and Resistance of GramPositive Germs
- 10.4.2. Resistance Mechanisms of GramPositive Germs

10.5. Resistance of Gram-Negative Germs: Current Clinical Implications
- 10.5.1. Evolution of GramNegative Germ Resistance
- 10.5.2. Resistance Mechanisms of GramNegative 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. Mechanisms of Fungal Resistance

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

*This program is not subject to rigid timetables or pre-established evaluation schedules so that you can self-manage your progress in a totally personalized way"*

07

# Clinical Internship

Doctors who pass the theoretical study of this qualification will be able to continue to expand and develop their practical skills through a first level stay in prestigious hospitals. In this way, the epidemiologist will be able to update their practice based on the international reference thanks to their holistic management of patients requiring antibiotic therapy.

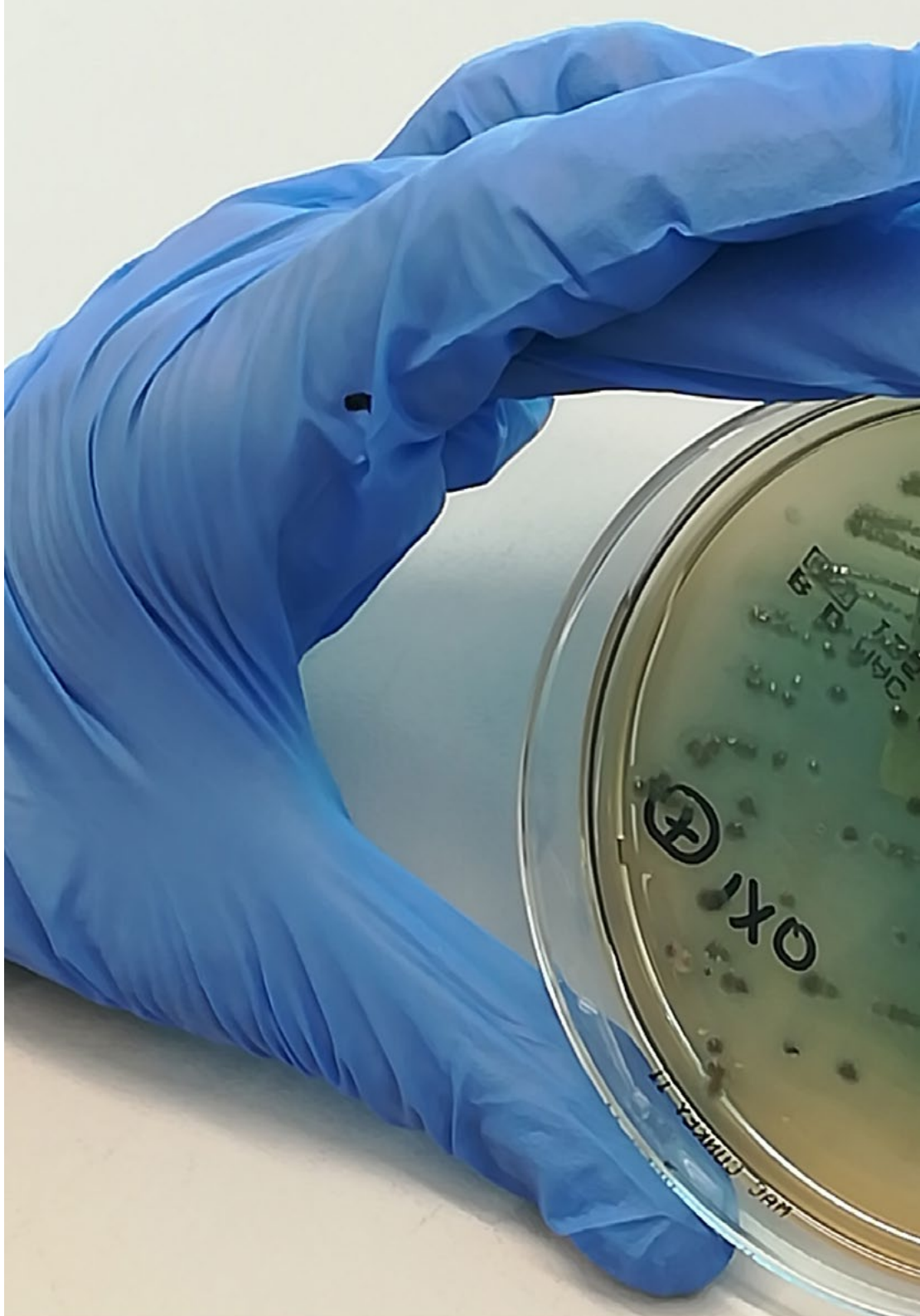
*The clinical practice of this Hybrid Professional Master's Degree will facilitate the access of medical professionals to hospitals located at different geographic latitudes"*

The practical education of this course is designed to enable the physician to apply, in a first class hospital environment, all the knowledge acquired in the theoretical phase of the qualification. In this way, the epidemiologist will indicate innovative treatments based on cutting-edge antibacterial therapies that prevent antibiotic resistance or successfully combat super bacteria. In turn, they will examine the cost and complication prognoses that these treatments can generate in real patients.

This clinical practice will take place during 3 weeks, from Monday to Friday, for 8 consecutive hours. At the health facilities, the specialist will have an assistant tutor who will be in charge of supervising his progress and verifying the quality of his care. At the same time, the physician will be able to corroborate concepts or clarify doubts with the other members of the team of experts that make up the staff of these health facilities.

The practical part will be carried out with the active participation of the student performing the activities and procedures of each area of competence (learning to learn and learning to do), with the accompaniment and guidance of teachers and other fellow trainees that facilitate teamwork and multidisciplinary integration as transversal competencies for of medicine praxis (learning to be and learning to relate).

The procedures described below will form the basis of the practical part of the internship, and their implementation is subject to both the suitability of the patients and the availability of the center and its workload, with the proposed activities being as follows:



| Module | Practical Activity |
|---|---|
| Pharmacology and therapeutics based on the generalities of microbiology | Implement prophylactic plans for the prevention of these infectious pathologies |
| | To inquire into the environmental, social and economic aspects of the patient that lead to the emergence and development of infectious diseases and antibiotic and antibiotic resistance |
| | Evaluate history of infectious disease in the patient's immediate environment, and examine the response of the family environment to the use of a given drug |
| | Prescribe medications safely, taking into account the size, weight, and age of each patient |
| Antivirals and Antibiotics today | Treat the patient with antiviral drugs or antibiotics that fit the specific type of pathology that affects them by means of Antibiogram studies |
| | Indicate Antivirals or Antiretrovirals, taking into account their latent differences and how they may affect the patient |
| | Verify the impact of Antiviral and Antibiotic therapies on the patient's individual microbiota to combat other health problems resulting from pharmacological excess |
| | Specify, in detail, the duration of Antiviral and Antibiotic therapies to the patient to avoid over-consumption of drugs or early and unwarranted discontinuation of these |
| Antimicrobials, Antimycotics, Antimycotics and Antiparasitics nowadays | Using Antimicrobials as Alternatives to Reduce Antibiotic Resistance |
| | Prescribe therapy with injectable Fluconazole to patients presenting with yeast infections following chemotherapy or radiotherapy sessions |
| | Perform a metabolic panel of women with persistent C auris (vaginal candidiasis) to determine the antifungal best suited to their disease |
| | Combining antiparasitic drugs such as Albendazole with surgical techniques to combat serious conditions such as the dog tapeworm that can damage various organs |
| Antibiotic resistance and therapies of the near future | To perform a genetic analysis of patients, based on pharmacogenomics, in order to determine which drugs are most accurate for them according to their DNA |
| | Indicate to the patient a blood, urine, or sputum culture to assess their sensitivity to antibiotics their sensitivity to antibiotics |
| | Develop alternative and innovative therapies with Bacteriophages, non-harmful viruses that feed on harmful bacteria to the human body |
| | Treat patients with infections with novel techniques such as Liposome nanoparticles, used as bait to trap bacterial toxins |
| | Use novel technologies such as RA01, an anti-infective therapy based on the existence of antibodies that act as facilitators of infections |

## Civil Liability Insurance

This institution's main concern is to guarantee the safety of the trainees and other collaborating agents involved in the internship process at the company. Among the measures dedicated to achieve this is the response to any incident that may occur during the entire teaching-learning process.

To this end, this entity commits to purchasing a civil liability insurance policy to cover any eventuality that may arise during the course of the internship at the center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the practical training period. That way, professionals will not have to worry in case of having to face an unexpected situation and will be covered until the end of the internship program at the center.

## General Conditions for Practical Training

The general terms and conditions of the internship agreement for the program are as follows:

1. TUTOR: During the Hybrid Professional Master's Degree, students will be assigned with two tutors who will accompany them throughout the process, answering any doubts and questions that may arise. On the one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned with an academic tutor whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the student will be accompanied and will be able to discuss any doubts that may arise, both clinical and academic.

2. DURATION: The internship program will have a duration of three continuous weeks, in 8-hour days, 5 days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

3. ABSENCE: If the students does not show up on the start date of the Hybrid Professional Master's Degree, they will lose the right to it, without the possibility of reimbursement or change of dates. Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination of the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor.

4. CERTIFICATION: Professionals who pass the Hybrid Professional Master's Degree will receive a certificate accrediting their stay at the center.

5. EMPLOYMENT RELATIONSHIP: The Hybrid Professional Master's Degree shall not constitute an employment relationship of any kind.

6. PRIOR EDUCATION: Some centers may require a certificate of prior education for the Hybrid Professional Master's Degree. In these cases, it will be necessary to submit it to the TECH internship department so that the assignment of the chosen center can be confirmed.

7. DOES NOT INCLUDE: The Hybrid Professional Master's Degree will not include any element not described in the present conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed

However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.

08

# Where Can I Do the Clinical Internship?

The practical stay of this Hybrid Professional Master's Degree will take place in medical institutions of international reference. In this way, the professional will be able to update their skills based on global standards and will be able to apply, in real cases, the learned procedures. On the other hand, the specialist will become familiar with cutting-edge contexts, where prestigious experts are able to handle the most innovative technologies of the moment.

*You will face, thanks to this academic program, real cases that require the direct intervention of an expert in highly efficient Antibiotic therapies"*

The student will be able to complete the practical part of this Hybrid Professional Master's Degree at the following centers:


### Policlínico HM Sanchinarro

Country
Spain BORRAR

City
Madrid

Management: Av. de Manoteras, 10, 28050, Madrid

Network of private clinics, hospitals and specialized centers distributed throughout Spain.

**Related internship programs:**
- Gynecological Care for Midwives
- Nursing in the Digestive Tract Department

*Make the most of this opportunity to surround yourself with expert professionals and learn from their work methodology"*

09

# Methodology

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

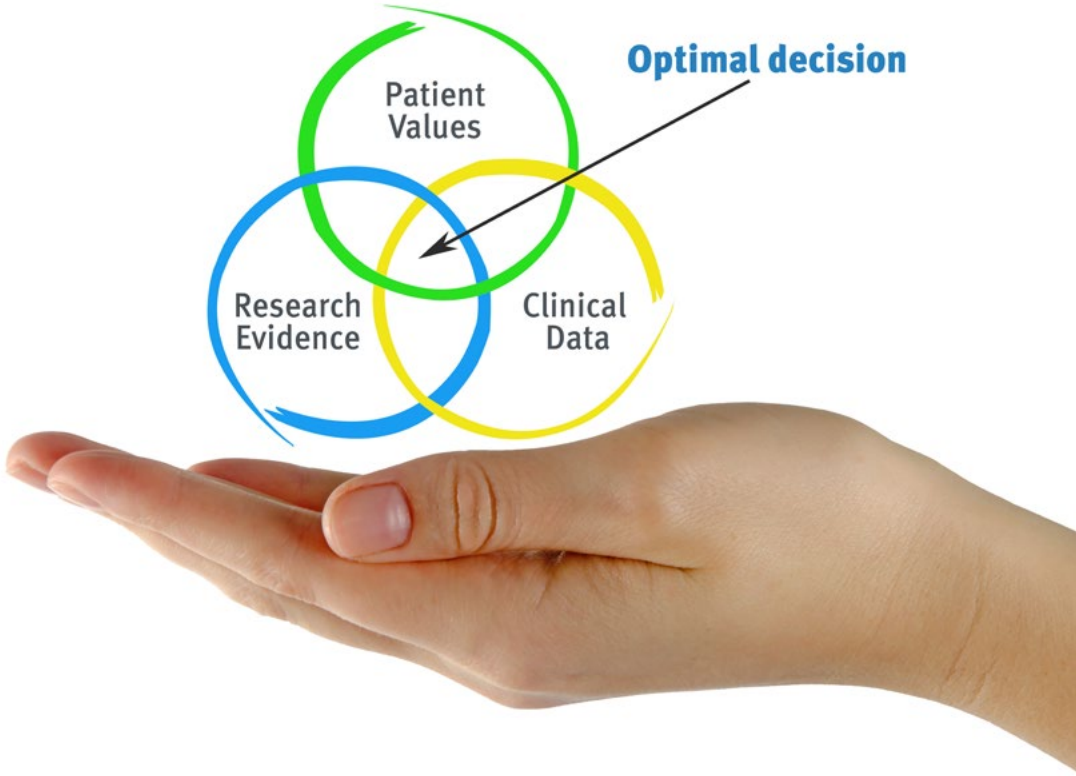
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

*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 face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, 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. Gérvas, 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, trying to recreate the real conditions in the physician'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:**

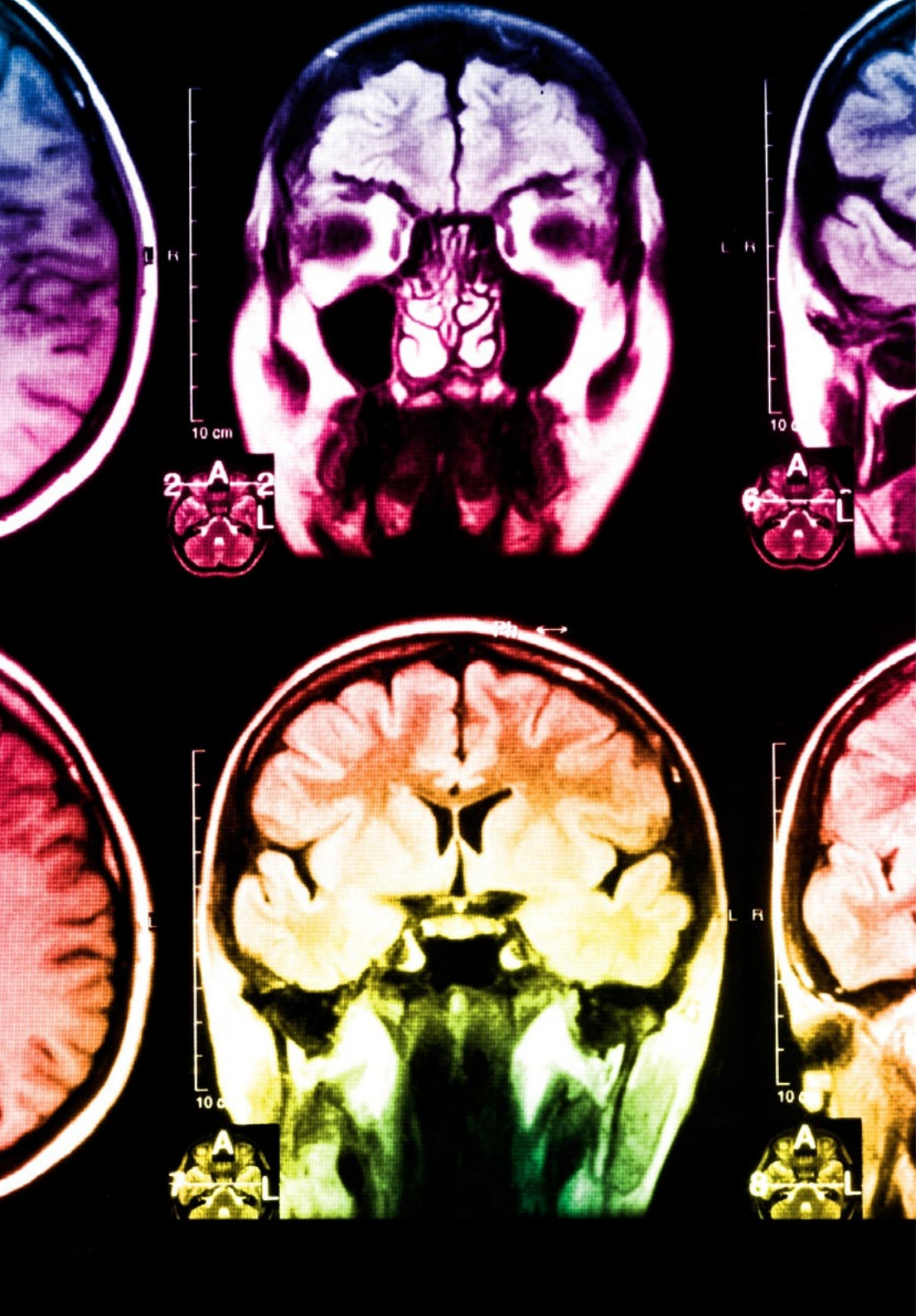
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better 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.

This 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, a real revolution with respect to the mere study and analysis of cases.

*Professionals will learn through real cases and by resolving 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 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

*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 produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

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.

### Surgical Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current medical techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.

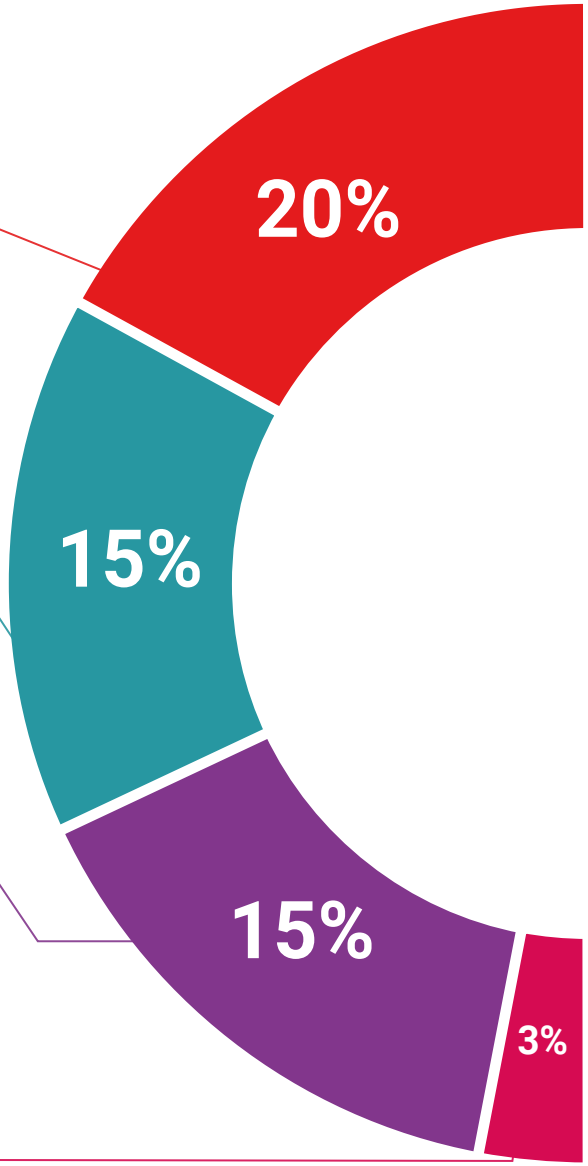
### Interactive Summaries

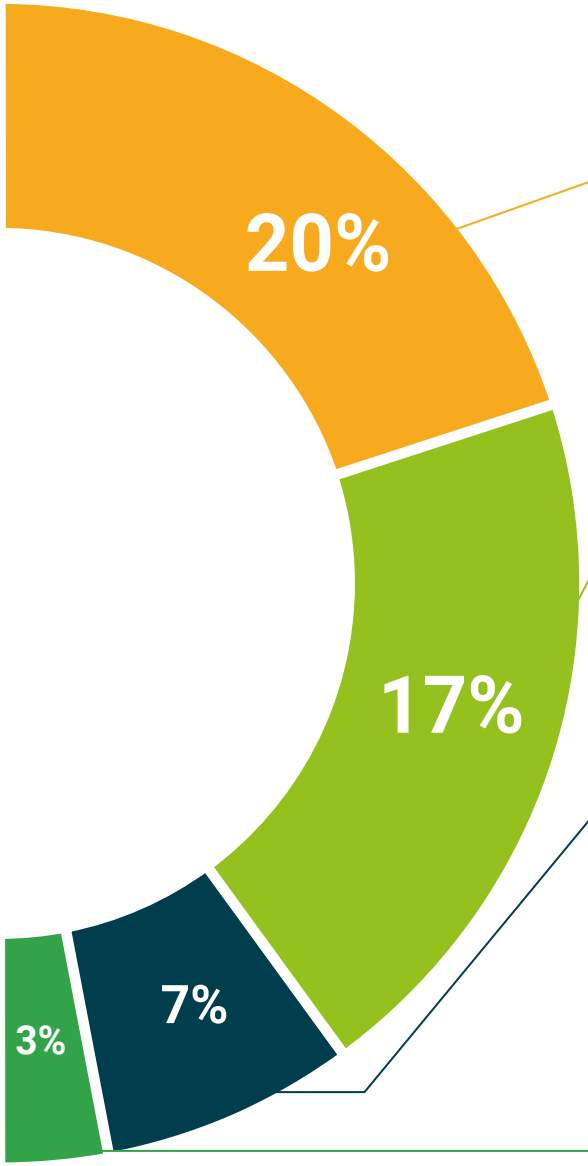
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content 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, TECH presents real cases in which the expert will guide students, 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.

10

# Certificate

The Hybrid Professional Master's Degree in Advances in Antibiotic Therapy and Antibiotic Resistance guarantees, in addition to the most rigorous and up-to-date qualification, access to a Hybrid Professional Master's Degree issued by TECH Technological University.

*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"*

This **Hybrid Professional Master's Degree in Advances in Antibiotic Therapy and Antibiotic Resistance** contains the most complete and up-to-date program on the professional and academic field.

After the student has passed the assessments, they will receive their corresponding Hybrid Professional Master's Degree diploma issued by TECH Technological University via tracked delivery*.

In addition to the diploma, students will be able to obtain an academic transcript, as well as a certificate outlining the contents of the program. In order to do so, students should contact their academic advisor, who will provide them with all the necessary information.

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

Course Modality: **Hybrid (Online + Clinical Internship)**

Duration: **12 months**

Certificate: **TECH Technological University**

Teaching Hours: **1,620 hours.**

tech technological university

Awards the following

DIPLOMA

to

Mr./Ms. _____, with identification number _____.

For having successfully passed and accredited the following program

HYBRID PROFESSIONAL MASTER'S DEGREE

in

Advances in Antibiotic Therapy and Antibiotic Resistance

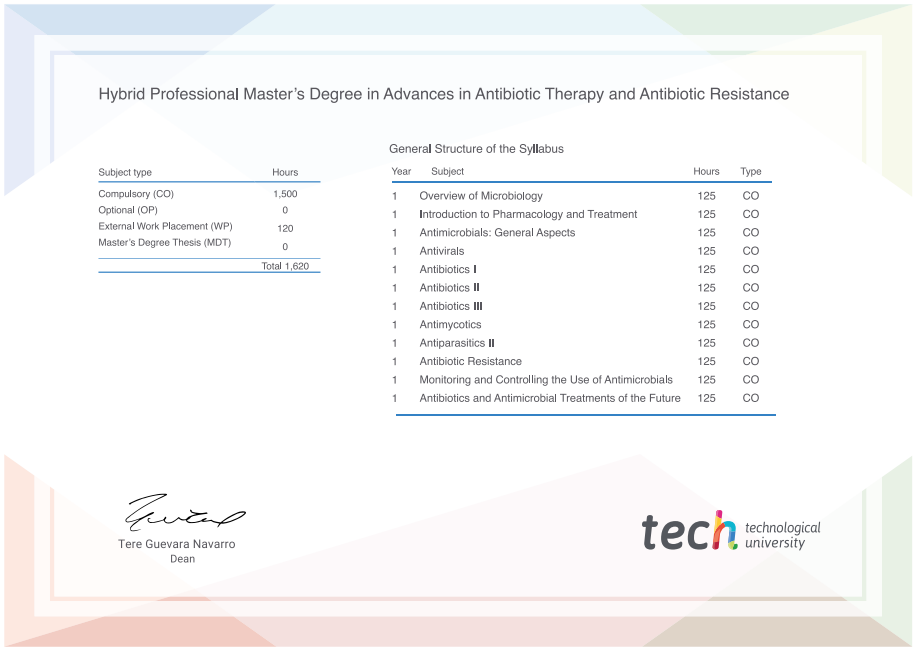
This is a qualification awarded by this University, with a duration of 1,620 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates



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

| Subject type | Hours |
|---|---|
| Compulsory (CO) | 1,500 |
| Optional (OP) | 0 |
| External Work Placement (WP) | 120 |
| Master's Degree Thesis (MDT) | 0 |
| | Total 1,620 |

General Structure of the Syllabus

| Year | Subject | Hours | Type |
|---|---|---|---|
| 1 | Overview of Microbiology | 125 | CO |
| 1 | Introduction to Pharmacology and Treatment | 125 | CO |
| 1 | Antimicrobials: General Aspects | 125 | CO |
| 1 | Antivirals | 125 | CO |
| 1 | Antibiotics I | 125 | CO |
| 1 | Antibiotics II | 125 | CO |
| 1 | Antibiotics III | 125 | CO |
| 1 | Antimycotics | 125 | CO |
| 1 | Antiparasitics II | 125 | CO |
| 1 | Antibiotic Resistance | 125 | CO |
| 1 | Monitoring and Controlling the Use of Antimicrobials | 125 | CO |
| 1 | Antibiotics and Antimicrobial Treatments of the Future | 125 | CO |

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

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# Hybrid Professional Master's Degree

## Advances in Antibiotic Therapy and Antibiotic Resistance

Course Modality: **Hybrid (Online + Clinical Internship)**
Duration: **12 months**
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# Hybrid Professional Master's Degree

## Advances in Antibiotic Therapy and Antibiotic Resistance

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