

# Postgraduate Diploma

## Microbiology and Control of Antibiotic Resistance



## Postgraduate Diploma Microbiology and Control of Antibiotic Resistance

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

website: [www.techtute.com/pk/pharmacy/postgraduate-diploma/postgraduate-diploma-microbiology-control-antibiotic-resistance](http://www.techtute.com/pk/pharmacy/postgraduate-diploma/postgraduate-diploma-microbiology-control-antibiotic-resistance)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Course Management

---

*p. 12*

04

Structure and Content

---

*p. 18*

05

Methodology

---

*p. 24*

06

Certificate

---

*p. 32*

# 01

# Introduction

Due to the emergence of countless microorganisms, microbiology has become a booming science. In this sense, it has allowed the development of different drugs to fight infections caused by pathogens harmful to human health. On the other hand, over time, these viral and infectious agents develop resistance to the antibiotics used to combat them. These two factors combined have created the need for pharmacists capable of developing new and potent drugs. Therefore, this program will focus on providing the necessary knowledge to achieve new professional objectives.







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*Update your knowledge in microbiology and develop new antivirals to fight respiratory infections.”*

It is considered that only 1% of the planet's microorganisms have been studied, which highlights the importance of continuing research and development of drugs that strengthen the human body's defenses. In addition, the antibiotic resistance that many of the viruses and pathogens already studied develop over the years must be taken into account.

For all these reasons, it is necessary to have programs such as this Postgraduate Diploma to provide pharmacists with the necessary knowledge to develop new antibiotics. In this sense, the contents will begin by providing a theoretical approach to the general elements of microbiology, a science that studies the etiological agents of an infection and determines the susceptibility of the population to certain microbial agents.

Then, the mechanisms of mycobacterial resistance of different diseases, such as staphylococcus, gram-positive and gram-negative germs, will be developed. To this must be added the control strategies that global organizations have developed to prevent this phenomenon from continuing to occur.

Finally, an in-depth approach to the protocols for research, approval and commercialization of new antibiotics will be made, taking into account the clinical trial process and the results of new studies on sepsis and monoclonal antibodies. In this way, the program will help graduating students to conduct appropriate scientific research adapted to the standards of large laboratories.

This **Postgraduate Diploma in Microbiology and Antibiotic Resistance Control** contains the most complete and up-to-date educational program on the market. The most important features include:

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

“Conducts clinical trials to chemically modify old antimicrobials.”

“ *This program will improve your job performance, allowing you to find new ways to combat sepsis.*”

*He aspires to be part of a research team in one of the most important international pharmaceutical companies.*

*Participates in the study of new microorganisms and helps to develop an effective antibiotic against them.*

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

Its multimedia content, developed with the latest educational technology, will allow the professional a situated and contextual learning, that is, a simulated environment that will provide an immersive training 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 during the academic year. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.



02

# Objectives

Considering the growing demand for pharmacists to conduct new research, this program has the main objective of motivating students to develop the appropriate criteria to conduct scientific research that will help the health sector fight antibiotic resistance. They will also be able to spearhead their own microbiology research to prevent future infectious outbreaks.





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*Don't pause your career goals. With this Postgraduate Diploma you will be able to continue advancing while continuing to work”.*



## General Objectives

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- ♦ Guarantee professional improvement by constantly delving deeper and updating what we know.
- ♦ Know the scientific evidence on antibiotic therapy and antimicrobial resistance.
- ♦ Establish the correct use of drugs and the proper treatment of infectious diseases.
- ♦ Use a multidisciplinary and integrative approach to facilitate the control of these pathologies.



*Learn about the latest advances in microbiology and the control of antibiotics today."*





## Specific Objectives

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### Module 1. Overview of Microbiology

- ◆ Know the general elements of microbiology, from the study of infectious diseases to the functions of the laboratory
- ◆ Classify the main viruses that affect human beings, as well as those under investigation
- ◆ Classify the main types of parasites and mycoses affecting humans
- ◆ Determine diagnostic methods for viruses, bacteria, fungi and parasites.

### Module 2. Antibiotic Resistance

- ◆ Analyze the antibiotic resistance of infections such as staphylococci, gram-positive and gram-negative germs
- ◆ Identify emerging problems of antibiotic resistance of parasites and viruses
- ◆ Delve deeper into the new mechanisms of antibiotic resistance and superbugs
- ◆ Learn about antibiotic resistance control strategies and global programs to address antibiotic resistance

### Module 3. Monitoring and Controlling the Use of Antimicrobials

- ◆ Know the duration of antibiotic treatment to combat infections, using clinical and laboratory parameters
- ◆ Analyze the importance of antimicrobial utilization studies
- ◆ Delve into antimicrobial utilization policies and the current impact on antimicrobial consumption
- ◆ Know the hospital strategies for rational antimicrobial use control

### Module 4. Antibiotics and Antimicrobial Treatments of the Future

- ◆ Understand the latest research and the commercialization process for new antibiotics
- ◆ Learn about therapeutic targets and new ways to fight infections: the novelty of the research
- ◆ Analyze the use of other drugs to regulate and stimulate the immune response against infections

03

# Course Management

Nationally and internationally renowned professors participate in the program, specializing in medicine and other fields of research. In addition, they have pursued their professional careers in different countries, giving a global and unique component to the knowledge imparted in this Postgraduate Diploma. Therefore, they are a team capable of providing the student with all the tools, knowledge and skills in the sector.







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*The extensive experience of this teaching team will help you to better understand the concepts presented in the program."*



## Management



### Dr. Quintero Casanova, Jesús

- ♦ Degree in Medicine and Surgery from the Medical University of Havana. Cuba
- ♦ Specialist in Internal Medicine. "Héroes del Baire" Hospital
- ♦ Professional Master's Degree in Tropical Diseases and Clinical Infectious Diseases from the Pedro Kuori Institute, Havana. Cuba
- ♦ Head of the Infectious Diseases Department of the Héroes del Baire Hospital
- ♦ Member of the Cuban Society of Internal Medicine
- ♦ Member of the Cuban Society of Paediatricians
- ♦ Medical specialist in Africa (TChad) and Venezuela
- ♦ 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 state examining boards for the medicine degree and internal medicine
- ♦ National Research Award in Cuba
- ♦ Medical Science Teaching Award. Cuba

## Professors

### Dr. Valle Vargas, Mariano

- ♦ Head of the Internal Medicine Department of the Héroes del Baire Hospital
- ♦ Member of the Cuban Society of Internal Medicine
- ♦ Member of the Cuban Society of Paediatricians
- ♦ Medical specialist in Venezuela
- ♦ 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
- ♦ Member of state examining boards for the medicine degree and internal medicine
- ♦ Member of tribunals for national scientific events. Cuba
- ♦ Degree in Medicine and Surgery from the University of Havana. Cuba
- ♦ Specialist in Internal Medicine. "Héroes del Baire" Hospital
- ♦ Master's Degree in Health Biostatistics
- ♦ Diploma in Epidemiology
- ♦ Medical Science Teaching Award. Cuba

### Dr. Cantalapedra Torres, Alejandro

- ♦ Member of the Cuban Society of Pediatrics
- ♦ Professor in the Medicine Degree and Pediatrics Specialty in the Faculty of Medical Sciences in Isla de la Juventud
- ♦ Member of tribunals for national scientific events. Cuba
- ♦ Medical specialist in Haiti
- ♦ Medical specialist in Antigua and Barbuda year 2008
- ♦ Degree in Medicine and Surgery from the University of Havana. Cuba
- ♦ Pediatrician. "Héroes del Baire" Hospital
- ♦ Master's Degree in infectious diseases
- ♦ Certificate in Medical Teaching
- ♦ Certificate in Health Management

### Dr. Laurence Carmenaty, Araelis

- ♦ 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
- ♦ Master's Degree in infectious diseases
- ♦ She has participated in national and international microbiology events in Cuba and Venezuela.

**Dr. Dranguet Bouly, José Ismael**

- ♦ Head of the Internal Medicine Department of the Héroes del Baire Hospital
- ♦ Member of the Cuban Society of Internal medicine and the Cuban Society of Intensive Therapy
- ♦ Member of the Cuban Society of Paediatricians
- ♦ Medical specialist in Mozambique
- ♦ 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
- ♦ Member of state examining boards for the medicine degree and internal medicine
- ♦ Member of tribunals for national scientific events. Cuba
- ♦ Professor at the Catholic University of Santiago de Guayaquil, Ecuador.
- ♦ Degree in Medicine and Surgery from the University of Havana. Cuba
- ♦ Specialist in Internal Medicine and Intensive Therapy. "Héroes del Baire" Hospital
- ♦ Master's Degree in Infectious Diseases from the Pedro Kouri Institute of Cuba
- ♦ Medical Science Teaching Award. Cuba

**Dr. González Fiallo, Sayli**

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

**Dr. Dávila, Henry Luis**

- ♦ Member of the Cuban Society of Gynecology and Obstetrics
- ♦ Member of the Cuban Society of Paediatricians
- ♦ Medical specialist in Guatemala
- ♦ Professor on the Medicine Degree in the Faculty of Medical Sciences in Isla de la Juventud
- ♦ Member of state examination boards in the field of medicine
- ♦ Member of tribunals for national scientific events. Cuba
- ♦ National research award. Cuba
- ♦ Degree in Medicine and Surgery from the University of Havana. Cuba
- ♦ Specialist in Gynecology and Obstetrics at Héroes del Baire Hospital. Cuba
- ♦ Master's Degree in comprehensive care for women
- ♦ Head of the Neck Pathology Service at Héroes del Baire Hospital
- ♦ Medical Science Teaching Award. Cuba

**Dr. Jiménez Valdés, Erlivan**

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



**Dr. Batista Valladares, Adrián**

- ◆ Head of Senior Citizen Services in Isla de la Juventud. Cuba
- ◆ Member of the Cuban Society of Family Medicine
- ◆ Professor of the career of medicine and speciality of family medicine at the Isle of Youth Faculty of Medical Sciences.
- ◆ 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. Cuba
- ◆ Degree in Medicine and Surgery from the University of Havana. Cuba
- ◆ Specialist in Family and Community Medicine
- ◆ Master's Degree in Clinical Infectology
- ◆ Certificate in Diagnostic Ultrasound
- ◆ Diploma in healthcare management

# 04

## Structure and Content

This Postgraduate Diploma in Microbiology and Antibiotic Resistance Control has been designed with the intention of providing empirical and practical knowledge of the latest advances in the field. Therefore, together with a group of international experts, the student will learn the general elements of microbiology and its role in the detection of infectious diseases. Thus, upon completion of the program you will be ready to participate in a research team, executing the protocols of a clinical trial, as well as the process to commercialize a new drug.







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*The industry needs professionals with your talent to continue researching new antibiotics against viruses and bacteria.”*

## 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



- 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. Antibiotic Resistance

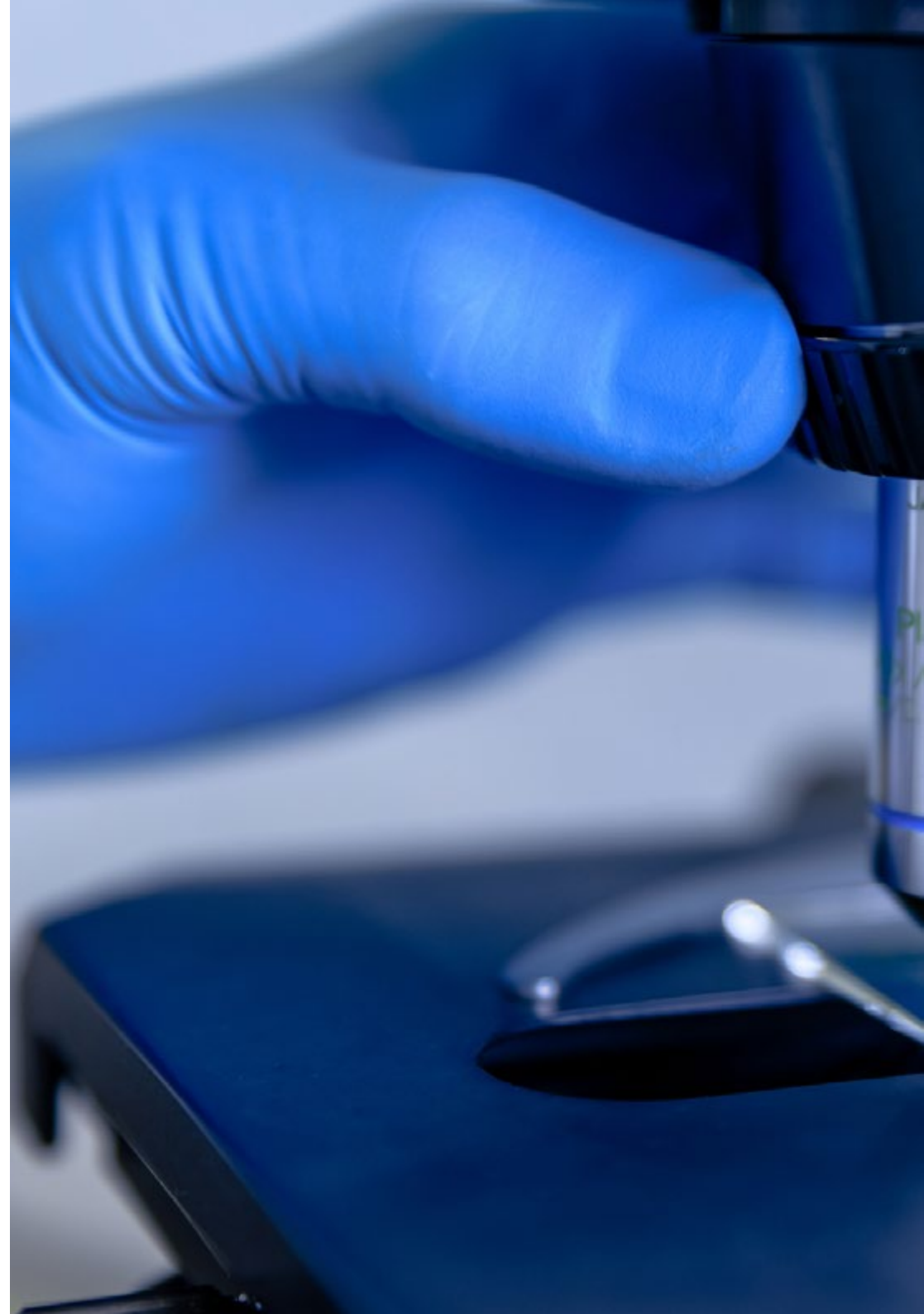
- 2.1. Emergence and Development of Antibiotic Resistance
  - 2.1.1. Concept
  - 2.1.2. Classification
  - 2.1.3. Origins and Development
- 2.2. Mechanisms of Antibiotic Resistance: An Update
  - 2.2.1. Mechanisms of Antimicrobial Resistance
  - 2.2.2. New Resistance Mechanisms
- 2.3. Staphylococcal Resistance: Yesterday, Today, and Tomorrow
  - 2.3.1. Evolution of Staphylococcal Resistance
  - 2.3.2. Mechanisms of Staphylococcal Resistance
- 2.4. Resistance of Gram-Positive Germs: Latest Recommendations
  - 2.4.1. Evolution and Resistance of GramPositive Germs.
  - 2.4.2. Resistance Mechanisms of GramPositive Germs.
- 2.5. Resistance of Gram-Negative Germs: Current Clinical Implications.
  - 2.5.1. Evolution of GramNegative Germ Resistance
  - 2.5.2. Resistance Mechanisms of GramNegative Germs

- 2.6. Virus Resistance
  - 2.6.1. Evolution of Virus Resistance
  - 2.6.2. Virus Resistance Mechanisms
- 2.7. Fungal Resistance
  - 2.7.1. Evolution of Fungal Resistance
  - 2.7.2. Mechanisms of Fungal Resistance
- 2.8. Parasite Resistance: An Emerging Problem
  - 2.8.1. Evolution of Parasite Resistance
  - 2.8.2. Mechanisms of Parasite Resistance
  - 2.8.3. Resistance to Antimalarials
- 2.9. New Mechanisms of Antibiotic Resistance and Superbugs
  - 2.9.1. Emergence and Progression of Superbugs
  - 2.9.2. New Resistance Mechanisms of Superbugs
- 2.10. Antibiotic Resistance Control Mechanisms and Programs
  - 2.10.1. Antibiotic Resistance Control Strategies
  - 2.10.2. Global Program and International Experiences in the Control of Antibiotic Resistance

## Module 3. Monitoring and Controlling the Use of Antimicrobials

- 3.1. Antibiotic Treatment Duration in the Treatment of Infections: New Role of Biomarkers
  - 3.1.1. Update on the Adequate Duration of the Most Frequent Infections
  - 3.1.2. Clinical and Laboratory Parameters to Determine the Duration of Treatment
- 3.2. Antimicrobial Usage Studies: Most Recent Impacts
  - 3.2.1. The Significance of Antimicrobial Usage Studies
  - 3.2.2. Results of Greater Impact in Recent Years by Antimicrobial Usage Studies
- 3.3. Antibiotic Committees in Hospitals: Their Role in the Future
  - 3.3.1. Structure and Operation
  - 3.3.2. Objectives
  - 3.3.3. Activities
  - 3.3.4. Impacts

- 3.4. Antimicrobial Use Policies: Current Impact on Antimicrobial Use.
  - 3.4.1. Concepts
  - 3.4.2. Types of Policies
  - 3.4.3. Objectives
  - 3.4.4. Impacts
- 3.5. Pharmacotherapeutic Committees: Practical Importance
  - 3.5.1. Structure and Function
  - 3.5.2. Objectives
  - 3.5.3. Activities
  - 3.5.4. Impacts
- 3.6. Infectious Disease Specialists and their Role in the Rational Use of Antimicrobials
  - 3.6.1. Functions and Activities of Infectious Disease Specialists to Promote and Encourage the Rational Use of Antimicrobials
- 3.7. Impact of Training and Professional Development on Antimicrobial Usage
  - 3.7.1. Importance of Training and Professional Development
  - 3.7.2. Types
  - 3.7.3. Impacts
- 3.8. Hospital Strategies for Rational Antimicrobial Use: What the Evidence Says
  - 3.8.1. Hospital Strategies for the Control of the Rational Use of Antimicrobials
  - 3.8.2. Impacts
- 3.9. Scientific Research for the Future Control and Monitoring of Antibiotic Therapy in Patients with Sepsis
  - 3.9.1. Search for New Parameters and Markers for Monitoring and Control of Antibiotic Therapeutics







## Module 4. Antibiotics and Antimicrobial Treatments of the Future

- 4.1. Research, Approval, and Commercialization of New Antibiotics
  - 4.1.1. Antimicrobial Research
  - 4.1.2. Antimicrobial Approval Process
  - 4.1.3. Antimicrobial Marketing and Large Pharmaceutical Companies
- 4.2. Ongoing Clinical Trials for the Approval of New Antibiotics
  - 4.2.1. New Clinical Trials on Antimicrobials
- 4.3. Old Antibiotics with New Uses
  - 4.3.1. The Role of Old Antibiotics with New Uses
  - 4.3.2. Antimicrobial Withdrawal
  - 4.3.3. Chemical Alterations of Old Antimicrobials
- 4.4. Treatment Goals and New Ways to Fight Infections: What's New in Research
  - 4.4.1. New Treatment Goals
  - 4.4.2. New Ways to Treat Sepsis
- 4.5. Monoclonal Antibodies in Infections: Present and Future
  - 4.5.1. Origin and Emergence of Monoclonal Antibodies
  - 4.5.2. Classification
  - 4.5.3. Clinical Uses
  - 4.5.4. Impact Results in Infectious Diseases
- 4.6. Other Drugs to Regulate and Stimulate the Immune Response to Infection: Drugs Under Study
  - 4.6.1. Drugs to Regulate and Control the Immune Response
- 4.7. Futuristic Antibiotics
  - 4.7.1. The Future of Antimicrobials
  - 4.7.2. Antibiotics of the Future



05

# Methodology

This training provides you with a different way of learning. Our methodology uses a cyclical learning approach: ***Re-learning***.

This teaching system is used 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 Re-learning, 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

In a given clinical situation, what would you do? Throughout the program, you will be presented with multiple simulated clinical cases based on real patients, where you will have to investigate, establish hypotheses and, finally, resolve the situation. There is abundant scientific evidence on the effectiveness of the method. Pharmacists learn better, more quickly and more sustainably over time.

*With TECH you can 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 potential 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.

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*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 achieve the assimilation of concepts, but also develop their mental capacity through exercises to evaluate real situations and apply their knowledge.
2. The learning process has a clear focus on 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.





## Re-Learning Methodology

At TECH we enhance the Harvard case method with the best 100% online teaching methodology available: Re-learning.

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 Re-learning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best Spanish-speaking online university (Columbia University).

With this methodology we have trained more than 115,000 pharmacists with unprecedented success, in all clinical specialties. Our 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 old.

*Re-learning 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 (we learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

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



In this program you will have access to the best educational material, prepared with you 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.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



### Video Techniques and Procedures

We bring you closer to the latest techniques, to the newest educational advances, to the forefront of current pharmaceutical care procedures. All this, in first person, with the maximum rigor, explained and detailed for your assimilation and understanding. And best of all, you can watch them as many times as you want.



### Interactive Summaries

We present 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, international guides. in our virtual library you will have access to everything you need to complete your training.





### 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 & Re-testing

We periodically evaluate and re-evaluate your knowledge throughout the program, through assessment and self-assessment activities and exercises: so that you can see how you are achieving your goals.



### Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an expert strengthens knowledge and memory, and generates confidence in our future difficult decisions.



### Quick Action Guides

We offer you the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help you progress in your learning.





06

# Certificate

This Postgraduate Diploma in Microbiology and Control of Antibiotic Resistance guarantees you, in addition to the most rigorous and up-to-date training, access to a Postgraduate Diploma issued by TECH - Technological University.



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

This **Postgraduate Diploma in Microbiology and Control of Antibiotic Resistance** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH - Technological University** via **tracked delivery**.

The certificate issued by **TECH - Technological University**, specifies the qualification obtained through the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in Microbiology and Control of Antibiotic Resistance**

ECTS: **19**

Official Number of Hours: **475**



\*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.

future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
development language  
classroom

**tech** technological  
university

**Postgraduate Diploma**  
Microbiology and Control  
of Antibiotic Resistance

- » Modality: online
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