



Clinical and Molecular
Management of Infections
Caused by MultidrugResistant Bacteria for Nursing

» Modality: online

» Duration: 6 months

» Certificate: TECH Global University

» Accreditation: 18 ECTS

» Schedule: at your own pace

» Exams: online

Website: www.techtitute.com/us/nursing/postgraduate-diploma/postgraduate-diploma-clinical-molecular-management-infections-caused-multidrug-resistant-bacteria-nursing

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06 Certificate

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01 Introduction

Antimicrobial resistance has become a global public health concern, especially in the hospital setting, where Multidrug-Resistant Bacteria can severely complicate the treatment of infections. Given this reality, nurses play a crucial role in the implementation of infection control measures. These professionals provide direct care to patients, ensuring the correct administration of medications and evaluating the response to treatments. Therefore, it is of vital importance that these experts remain at the forefront of advances in this field to meet the evolving challenges associated with antimicrobial resistance. In this context, TECH presents an innovative online program focused on the management of these bacteria.



tech 06 | Introduction

A new study by the World Health Organization estimates that more than 20,000 people die each year from infections that do not respond to antibiotics. Faced with this scenario, the organization urges nurses to implement strict control measures to prevent the spread of Multidrug-Resistant Bacteria and to advocate for the rational use of antibiotics. Only in this way will professionals be able to provide comprehensive care to their patients, while carrying out strategies to prevent the spread of bacteria in clinical care settings.

In this framework, TECH launches a revolutionary Postgraduate Diploma in Clinical and Molecular Management of Infections Caused by Multidrug-Resistant Bacteria for Nursing. The academic itinerary will delve into the mechanisms of intrinsic resistance to antibiotics, which will allow nurses to adjust treatments in a timely manner. In this line, the syllabus will provide the keys to perform an optimal management of patients with infections in Intensive Care Units. Therefore, graduates will optimize the use of antibiotics and prevent the selection of multiresistant bacteria. On the other hand, the program will delve into Proteomics in Clinical Microbiology, enabling professionals to evaluate the efficacy of treatments and detect changes in resistance.

In addition, the university program is delivered in a convenient 100% online format. This will make it possible for nurses to combine their studies with the rest of their daily obligations, since the schedules and evaluation timetables can be planned individually. At the same time, they will only need a device with Internet access to access the Virtual Campus and have access to high quality contents. Likewise, in this digital environment they will find a library full of multimedia resources, such as infographics or interactive summaries, which will strengthen their skills in a dynamic way.

This Postgraduate Diploma in Clinical and Molecular Management of Infections

Caused by Multidrug-Resistant Bacteria for Nursing contains the most complete and
updated scientific program on the market. Its most notable features are:

- The development of practical cases presented by experts in Microbiology, Medicine and Parasitology
- The graphic, schematic and eminently practical contents with which it is conceived gather scientific and practical information on those disciplines that are indispensable for professional practice
- Practical exercises where self-assessment can be used to improve learning.
- Its special emphasis on innovative methodologies
- 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



You will be able to download the entire syllabus from the first day of the course, being able to study it comfortably from your smartphone or tablet of choice"



You will deepen your understanding of the Bioinformatics Tools for Genomics and improve your understanding of Human Health"

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

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

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

Are you looking to incorporate into your practice the most innovative strategies to prevent Multidrug-Resistant Bacteria infections in the ICU? Get it with this program in only 540 hours.

TECH's revolutionary Relearning system will allow you to update your knowledge at your own pace, without depending on external teaching constraints.





Through this Postgraduate Diploma, the nursing staff will have a solid understanding of the molecular and genetic mechanisms that contribute to antimicrobial resistance in bacteria. In this sense, professionals will acquire skills to use advanced diagnostic techniques for the rapid and accurate identification of Multidrug-Resistant Bacteria. In addition, graduates will be able to evaluate nosocomial infection control programs, applying preventive measures to minimize the transmission of these microorganisms. In addition, the experts will provide advice to citizens on the importance of the adequate use of antimicrobials.



tech 10 | Objectives



General Objectives

- Understand how bacterial resistance evolves as new antibiotics are introduced into clinical practice
- Understand the colonization and infection of patients in Intensive Care Units (ICUs), the different types and risk factors associated with infection
- Evaluate the impact of Nosocomial Infections in the critically ill patient, including the importance of risk factors and their impact on length of stay in the ICU
- Substantiate the importance of Proteomics and Genomics in the Microbiology laboratory including recent advances and technical and bioinformatics challenges



You will have the best multimedia resources and you will be able to put what you have studied into practice in a much easier way"





Specific Objectives

Module 1. Multidrug-Resistant Bacteria in Human Pathology

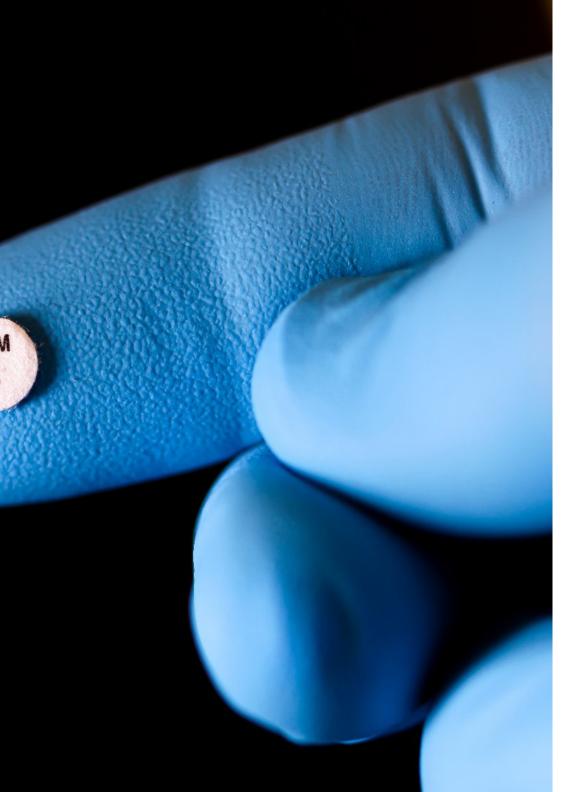
- Evaluate the causes of antibiotic resistance, from the lack of new antibiotics, to socioeconomic factors and health policies
- Examine the current status of antibiotic resistance in the world, including global statistics and trends in different regions

Module 2. Management of Patients with Multidrug-Resistant Bacterial Infections in Intensive Care Units (ICU)

- Acquire specialized knowledge on the diagnosis and treatment of common infections in ICUs
- Develop skills for the prevention of Multiresistant Bacterial Infections in the ICU

Module 3. Proteomics in Clinical Microbiology

- Delve into qualitative and quantitative techniques for protein separation and identification
- Apply bioinformatics tools for Proteomics and Genomics







tech 14 | Course Management

Management



Dr. Ramos Vivas, José

- Director of the Banco Santander-Universidad Europea del Atlántico Chair in Innovation
- Researcher at the Center for Innovation and Technology of Cantabria (CITICAN)
- Academic of Microbiology and Parasitology at the European University of the Atlantic
- Founder and former director of the Cellular Microbiology Laboratory of the Valdecilla Research Institute (IDIVAL)
- PhD in Biology from the University of León
- Doctor in Sciences from the University of Las Palmas de Gran Canaria
- Degree in Biology from the University of Santiago de Compostela
- Master's Degree in Molecular Biology and Biomedicine from the University of Cantabria
- Member of: CIBERINFEC (MICINN-ISCIII), Member of the Spanish Society of Microbiology, Member of the Spanish Network of Research in Infectious Pathology

Professors

Dr. Ruiz de Alegría Puig, Carlos

- FEA at the University Hospital Marqués de Valdecilla, Cantabria
- Rotation in the Area of Molecular Biology and Fungi, Hospital de Basurto, Bilbao
- Specialist in Microbiology and Immunology by the Marqués de Valdecilla University Hospital
- PhD in Molecular Biology and Biomedicine by the University of Cantabria
- Degree in Medicine and Surgery from the University of the Basque Country
- Member of: Spanish Society of Microbiology (SEM) and Center for Biomedical Research in Infectious Diseases Network CIBERINFEC (MICINN-ISCIII)



Course Management | 15 tech

Dr. Suberviola Cañas, Borja

- Principal Investigator and Collaborating Researcher in 6 projects with competitive funding
- Doctor in Medicine by the University of Cantabria
- Specialty in Intensive Care Medicine and Resuscitation at the Marqués de Valdecilla University Hospital in Santander
- Degree in Medicine from the University of the Basque Country
- Master's Degree in Infectious Diseases in the Critically III Patient from the University of Valencia
- Member and Vice-coordinator of the Working Group on Infectious Diseases and Sepsis (GTEIS) of the Spanish Society of Intensive Care Medicine, Critical Care and Coronary Units (SEMICYUC)
- Member of the Group of Infectious Diseases in the Critical Patient of the Spanish Society of Infectious Diseases and Clinical Microbiology (SEIMC)



A unique, crucial and decisive learning experience to boost your professional development"





tech 18 | Structure and Content

Module 1. Multidrug-Resistant Bacteria in Human Pathology

- 1.1. Mechanisms of Acquired Resistance to Antibiotics
 - 1.1.1. Acquisition of Resistance Genes
 - 1.1.2. Mutations
 - 1.1.3. Acquisition of Plasmids
- 1.2. Mechanisms of Intrinsic Resistance to Antibiotics
 - 1.2.1. Blockage of Antibiotic Entry
 - 1.2.2. Modification of the Antibiotic Target
 - 1.2.3. Inactivation of the Antibiotic
 - 1.2.4. Antibiotic Expulsion
- 1.3. Chronology and Evolution of Antibiotic Resistance
 - 1.3.1. Discovery of Antibiotic Resistance
 - 1.3.2. Plasmids
 - 133 Evolution of Resistance
 - 1.3.4. Current Trends in the Evolution of Antibiotic Resistance
- 1.4. Antibiotic Resistance in Human Pathology
 - 1.4.1. Increased Mortality and Morbidity
 - 1.4.2. Impact of Resistance on Public Health
 - 1.4.3. Economic Cost Associated with Antibiotic Resistance
- 1.5. Multidrug-Resistant Human Pathogens
 - 1.5.1. Acinetobacter Baumannii
 - 1.5.2. Pseudomonas Aeruginosa
 - 153 Enterobacteriaceae
 - 1.5.4. Enterococcus Faecium
 - 1.5.5. Staphylococcus Aureus
 - 1.5.6. Helicobacter Pylori
 - 1.5.7. Campylobacter Spp
 - 1.5.8. Salmonellae
 - 1.5.9. Neisseria Gonorrhoeae
 - 1.5.10 Streptococcus Pneumoniae
 - 1.5.11 Hemophilus Influenzae
 - 1.5.12 Shigella Spp

- 1.6. Bacteria Highly Dangerous to Human Health: Update of the WHO List
 - 1.6.1. Critical Priority Pathogens
 - 1.6.2. High Priority Pathogens
 - 1.6.3. Pathogens with Medium Priority
- 1.7. Analysis of the Causes of Antibiotic Resistance
 - 1.7.1. Lack of New Antibiotics
 - 1.7.2. Socioeconomic Factors and Health Policies
 - 1.7.3. Poor Hygiene and Sanitation
 - 1.7.4. Health Policies and Antibiotic Resistance
 - 1.7.5. International Travel and Global Trade
 - 1.7.6. Dispersal of High-Risk Clones
 - 1.7.7. Emerging Pathogens with Resistance to Multiple Antibiotics
- 1.8. Antibiotic Use and Abuse in the Community
 - 1.8.1. Prescription
 - 1.8.2. Acquisition
 - 1.8.3. Misuse of Antibiotics
- 1.9. Current Status of Antibiotic Resistance in the World
 - 1.9.1. Global Statistics
 - 1.9.2. Central and South America
 - 1.9.3. Africa
 - 1.9.4. Europe
 - 1.9.5. North America
 - 1.9.6. Asia and Oceania
- 1.10. Perspectives on Antibiotic Resistance
 - 1.10.1. Strategies to Mitigate the Problem of Multidrug-Resistance
 - 1.10.2. International Actions
 - 1.10.3. Actions at the Global Level

Module 2. Management of Patients with Multidrug-Resistant Bacterial Infections in Intensive Care Units (ICU)

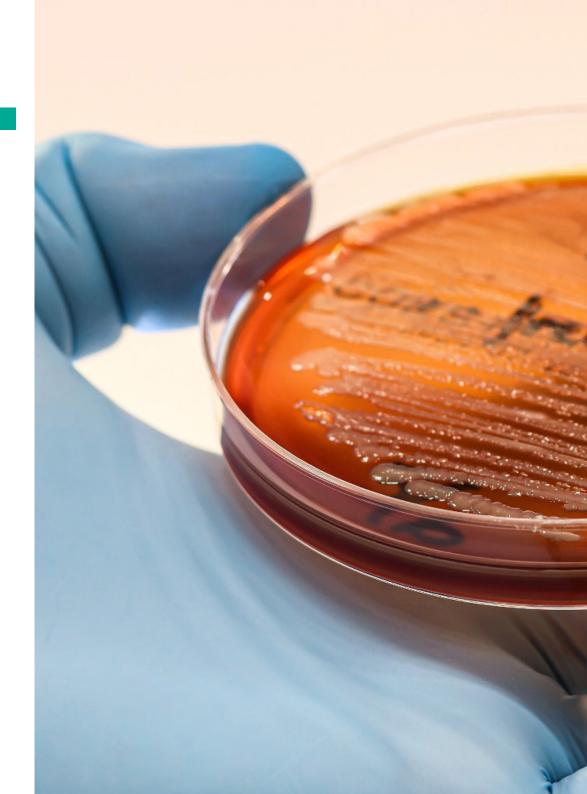
- 2.1. Colonization and Infection of Patients in ICUs
 - 2.1.1. Types of ICUs
 - 2.1.2. Epidemiology
 - 2.1.3. Risk Factors Associated with Infection in ICUs
- 2.2. Impact of Nosocomial Infections in the Critically III Patient
 - 2.2.1. Importance of Nosocomial Infections in ICUs
 - 2.2.2. Risk Factors for Nosocomial Infections
 - 2.2.2.1. Patient Factors
 - 2.2.2. Factors of the ICU Environment
 - 2.2.2.3. Factors Related to the Healthcare Personnel
 - 2.2.3. Impact of Nosocomial Infections in Immunocompromised Patients
 - 2.2.4. Impact on Length of Stay in the ICU
- 2.3. Pneumonia Associated with Mechanical Ventilation
 - 2.3.1. Etiology
 - 2.3.2. Diagnosis
 - 2.3.3. Treatment
- 2.4. Urinary Tract Infections Associated with Catheters
 - 2.4.1. Etiology
 - 2.4.2. Diagnosis
 - 2.4.3. Treatment
- 2.5. Primary Bacteremias and Catheter-Related Bacteremias
 - 2.5.1. Etiology
 - 2.5.2. Diagnosis
 - 2.5.3. Treatment

- 2.6. Pseudomembranous Colitis
 - 2.6.1. Etiology
 - 2.6.2. Diagnosis
 - 2.6.3. Treatment
- 2.7. Infections by Opportunistic Pathogens
 - 2.7.1. Etiology
 - 2.7.2. Diagnosis
 - 2.7.3. Treatment
- 2.8. Appropriate Use of Antibiotics
 - 2.8.1. Programs for the Optimization of Antibiotic use (PROA) in the ICU
 - 2.8.2. Antibiotic Therapy Strategies for the Treatment of Gram-Negative Patients
 - 2.8.3. Antibiotic Therapy Strategies for the Treatment of Gram-Positive Patients
 - 2.8.4. Antibiotic Therapy Strategies for the Treatment of Co-Infections
- 2.9. Strategies for the Prevention of BMR Infections in the ICU
 - 2.9.1. Hygiene Measures
 - 2.9.2. Infection Control Measures
 - 2.9.3. Protocols and Clinical Practice Guidelines
 - 2.9.4. Education and Training of ICU Personnel
 - 2.9.5. Participation of Patients and their Families
- 2.10. Infection Prevention Strategies in the ICU
 - 2.10.1. Infection Prevention Strategies in the ICU According to the Focus
 - 2.10.1.1. Pneumonia
 - 2.10.1.2. Bacteremia
 - 2.10.1.3. Urinary Infection
 - 2.10.2. Evaluation and Quality Indicators in the Prevention of Infections
 - 2.10.3. Evaluation and Continuous Improvement Tools
 - 2.10.4. Successful Examples of Infection Prevention in ICUs

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Module 3. Proteomics in Clinical Microbiology

- 3.1. Proteomics in the Microbiology Laboratory
 - 3.1.1. Evolution and Development of Proteomics
 - 3.1.2. Importance in Microbiological Diagnosis
 - 3.1.3. Proteomics of Multi-Resistant Bacteria
- 3.2. Qualitative Protein Separation Techniques
 - 3.2.1. Two-Dimensional Electrophoresis (2DE)
 - 3.2.2. DIGE Technology
 - 3.2.3. Applications in Microbiology
- 3.3. Quantitative Protein Separation Techniques
 - 3.3.1. Isotopic Labelling
 - 3.3.2. High Performance Liquid Chromatography (HPLC)
 - 3.3.3. Mass Spectrometry (MS)
 - 3.3.3.1. MALDI-TOF Technologies in the Clinical Microbiology Laboratory
 - 3.3.3.1.1. VITEK®MS System
 - 3.3.3.1.2. MALDI Biotyper® System
- 3.4. MALDI-TOF Applications in Clinical Microbiology
 - 3.4.1. Identification of Microorganisms
 - 3.4.2. Characterization of Antibiotic Resistance
 - 3.4.3. Bacterial Typing
- 3.5. Bioinformatics Tools for Proteomics
 - 3.5.1. Proteomic Databases
 - 3.5.2. Protein Sequence Analysis Tools
 - 3.5.3. Visualization of Proteomic Data
- 3.6. Genomics in the Microbiology Laboratory
 - 3.6.1. Evolution and Development of Genomics
 - 3.6.2. Importance in Microbiological Diagnosis
 - 3.6.3. Genomics of Multi-Resistant Bacteria





Structure and Content | 21 tech

- 3.7. Types of Sequencing
 - 3.7.1. Sequencing of Genes with Taxonomic Value
 - 3.7.2. Sequencing of Genes of Taxonomic Value
 - 3.7.3. Massive Sequencing
- 3.8. Applications of Massive Sequencing in Clinical Microbiology
 - 3.8.1. Whole Bacterial Genome Sequencing
 - 3.8.2. Comparative Genomics
 - 3.8.3. Epidemiological Surveillance
 - 3.8.4. Microbial Diversity and Evolution Studies
- 3.9. Bioinformatics Tools for Genomics
 - 3.9.1. Genomic Databases
 - 3.9.2. Sequence Analysis Tools
 - 3.9.3. Visualization of Genomic Data
- 3.10. Future of Genomics and Proteomics in the Clinical Laboratory
 - 3.10.1. Recent and Future Developments in Genomics and Proteomics
 - 3.10.2. Development of New Therapeutic Strategies
 - 3.10.3. Technical and Bioinformatics Challenges
 - 3.10.4. Ethical and Regulatory Implications

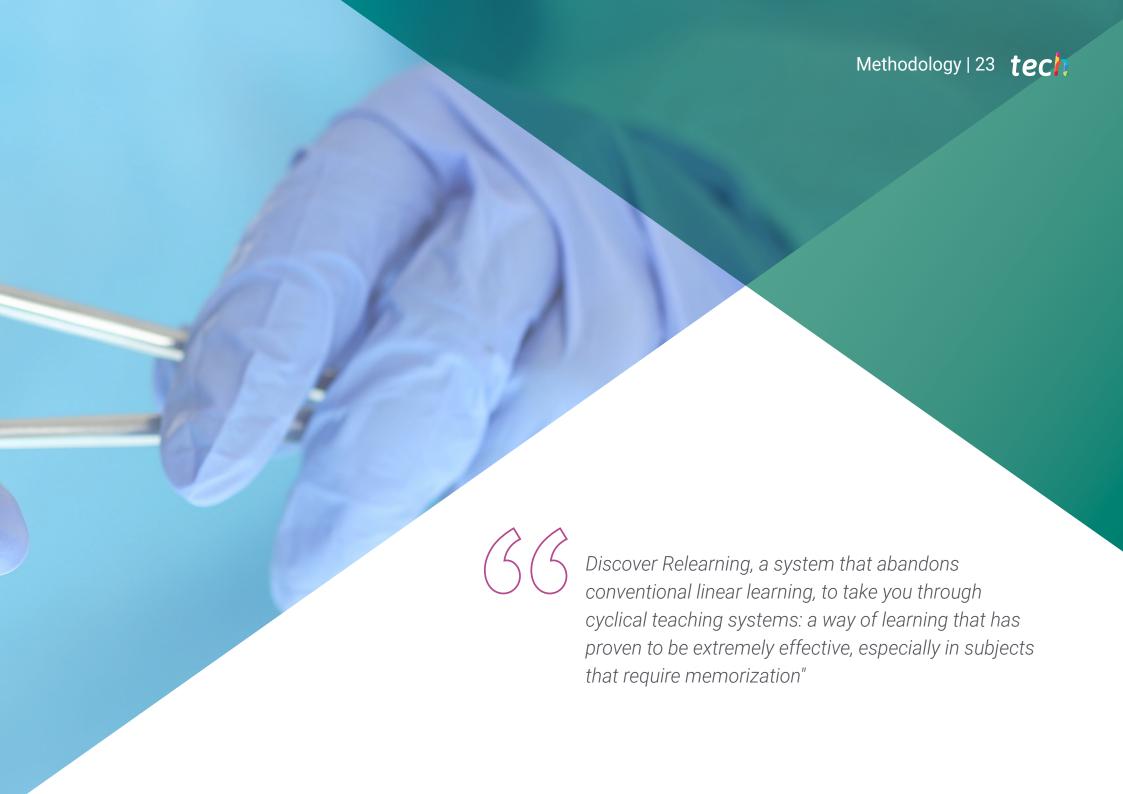


You will have at your disposal the most modern educational resources, with free access to the virtual classroom 24 hours a day. Enroll now!"



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.

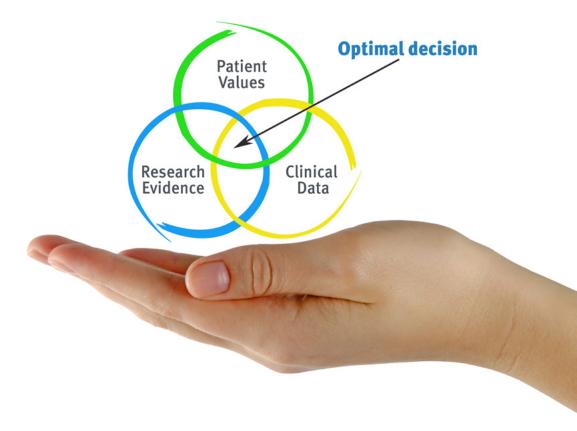


tech 24 | Methodology

At TECH Nursing School we use the Case Method

In a given situation, what should a professional do? 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. Nurses learn better, faster, and more sustainably over time.

With TECH, nurses can experience a learning methodology 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, in an attempt to recreate the real conditions in professional nursing 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:

- Nurses who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
- 2. The learning process has a clear focus on practical skills that allow the nursing professional to better integrate knowledge acquisition into the hospital setting or primary care.
- 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 case studies with a 100% online learning system based on repetition combining a minimum of 8 different elements in each lesson, which is a real revolution compared to the simple study and analysis of cases.

The nurse 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.



Methodology | 27 tech

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 we have trained more than 175,000 nurses with unprecedented success in all specialities regardless of practical workload. 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 really specific and precise.

These contents are then adapted in 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.



Nursing Techniques and Procedures on Video

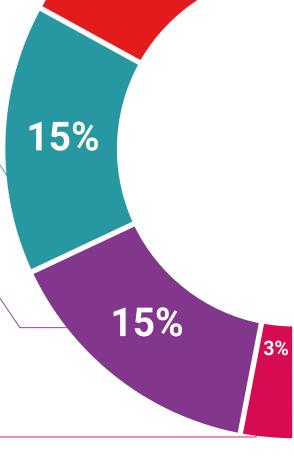
We introduce you to the latest techniques, to the latest educational advances, to the forefront of current medical techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch them as many times as you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



Interactive Summaries

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

This 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.



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

The student's knowledge is periodically assessed and re-assessed throughout the program, through evaluative and self-evaluative activities and exercises: in this way, students can check how they are doing in terms of achieving their goals.



Classes

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





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.





20%

17%





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This private qualification will allow you to obtain a **Postgraduate Diploma in Clinical** and Molecular Management of Infections Caused by Multidrug-Resistant Bacteria for **Nursing** endorsed by **TECH Global University**, the world's largest online university.

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

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

Title: Postgraduate Diploma in Clinical and Molecular Management of Infections Caused by Multidrug-Resistant Bacteria for Nursing

Modality: online

Duration: 6 months

Accreditation: 18 ECTS



This is a private qualification of 540 hours of duration equivalent to 18 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024



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

health
guarantee

tech global
university

Postgraduate Diploma

Clinical and Molecular
Management of Infections
Caused by MultidrugResistant Bacteria for Nursing

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Global University
- » Accreditation: 18 ECTS
- » Schedule: at your own pace
- » Exams: online

