

# Professional Master's Degree Human Microbiota for Nursing





## Professional Master's Degree Human Microbiota for Nursing

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

Website: [www.techtitute.com/us/nursing/professional-master-degree/master-human-microbiota-nursing](http://www.techtitute.com/us/nursing/professional-master-degree/master-human-microbiota-nursing)

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# 01

# Introduction

Scientific research in the field of the microbiota has been booming in recent decades due to its impact on people's health. The ease of access to information and the interest aroused among nurses in topics related to the Microbiota, its eubiosis and dysbiosis or the advances in probiotics and prebiotics makes it necessary for professionals to know their implication in the different locations of the body. For this reason, this 100% online program provides the latest knowledge on the bidirectional relationship between the microbiota and the neuroimmune system, the regulation of bacterial flora or its relationship with allergies. All this, in addition to innovative multimedia content that can be easily accessed at any time from a computer.





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*In as little as 12 months' time, you will be aware of the benefits of maintaining an adequate gastrointestinal, oral, urinary tract or reproductive tract microbiota"*

Numerous pieces of scientific evidence have implicated the intestinal microbiome and its metabolic potential in various pathological conditions in recent years, giving rise to new therapeutic strategies to control and regulate this ecosystem. The study of this ecosystem is a field that is rapidly advancing scientifically, and it is universally accepted that to achieve an adequate state of health it is also necessary to have a "healthy" Microbiota.

Our Microbiota undergoes changes as a consequence of the influence of multiple factors, diet, lifestyle, pharmacological treatments... generating alterations in this bacterial ecosystem; this abnormal interaction that the organism could have with it is related to certain processes: allergic, acute and chronic intestinal diseases, obesity and metabolic syndrome, neurological diseases, dermatitis and other alterations in the dermis and even some types of cancer.

The increasing availability on the market of new products with very specific strains for very specific problems and diseases makes it necessary for nursing professionals to be up to date with all the scientific advances in this area in order to offer patients more specialized and higher-quality care.

Therefore, from this Professional Master's Degree in Human Microbiota, the best professionals will focus on offering the latest information to nursing professionals on the importance of flora to maintain a healthy state, and provide them with the most recent studies, which will allow them to expand their knowledge on the benefits and applications of the human microbiota in their daily clinical practice.

A program without face-to-face classes or fixed schedules, which also gives the professional the freedom to access the syllabus from an electronic device with internet connection and distribute the teaching load according to their needs. Students are therefore faced with a university education that is compatible with the most demanding responsibilities.

This **Professional Master's Degree in Human Microbiota for Nursing** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ♦ Clinical cases presented by experts in Human Microbiota
- ♦ Its graphic, schematic and practical contents, with which they are conceived, gather scientific and assistance information on those disciplines that are essential for professional practice.
- ♦ New diagnostic-therapeutic developments on assessment, diagnosis, and intervention in problems or disorders related to the Microbiota
- ♦ Contains practical exercises, where the process of self-assessment can be carried out to improve learning
- ♦ An algorithm-based interactive learning system for decision-making in the clinical situations presented throughout the course
- ♦ With special emphasis on evidence-based medicine and research methodologies in Human Microbiota
- ♦ All of 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.



*The study of the human microbiota opens a door to the knowledge of multiple diseases, bringing great value to the usual practice of the nurse"*

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*Thanks to this Professional Master's Degree you will easily delve into studies focused on the microbiota and disorders of the nervous system”*

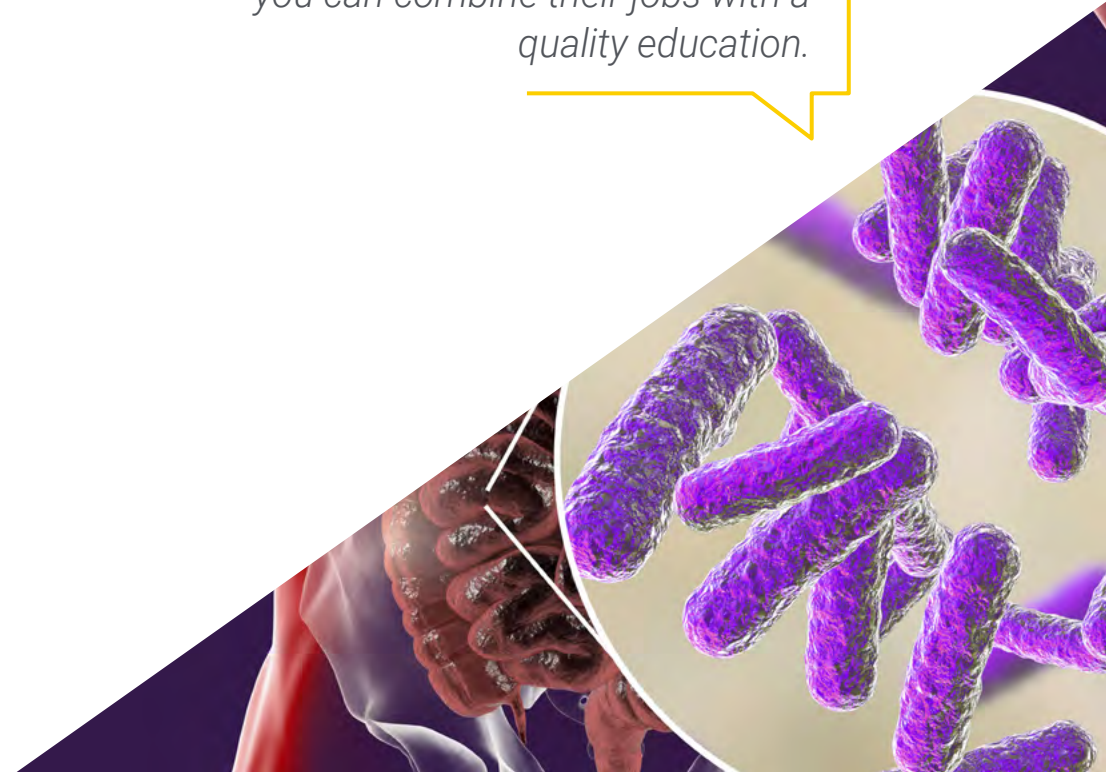
The program's teaching staff includes professionals from the sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

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 academic year. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

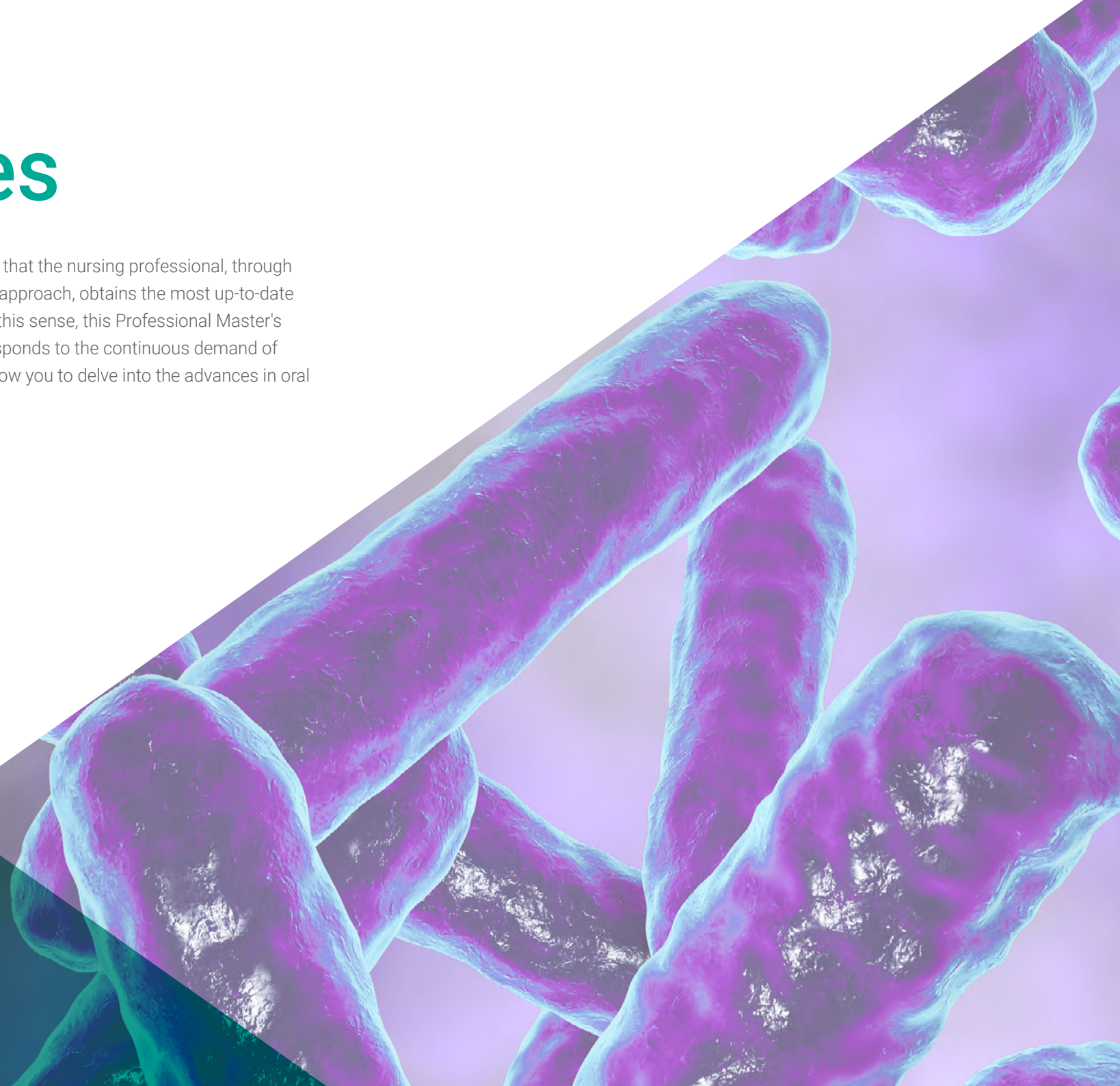
*You will have valuable clinical case studies, so that you can expand your knowledge in a more direct way about the oral, respiratory tract or skin microbiota.*

*This 100% online educational program is designed so that professionals like you can combine their jobs with a quality education.*



# 02 Objectives

The main objective of this online program is that the nursing professional, through a syllabus that offers a theoretical-practical approach, obtains the most up-to-date knowledge about the human microbiota. In this sense, this Professional Master's Degree in Human Microbiota for Nursing responds to the continuous demand of professionals through a syllabus that will allow you to delve into the advances in oral microbiota, skin microbiota or neonatology.





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*This refresher program will lead you to gain the latest knowledge about gut microbiota and its functions"*



## General Objectives

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- ♦ Offer a complete and wide vision of the current situation in the area of the Human Microbiota, in its widest sense, the importance of the balance of this Microbiota as a direct effect on our health, with the multiple factors that influence it positively and negatively
- ♦ Argue with scientific evidence how the microbiota and its interaction with many non-digestive pathologies, of autoimmune nature or its relationship with the dysregulation of the immune system, the prevention of diseases and as a support to other treatments in the daily practice of nursing
- ♦ Promote work strategies based on the integral approach of the patient as a reference model, not only focusing on the symptomatology of the specific pathology, but also looking at its interaction with the microbiota and how it may be influencing it
- ♦ Encourage professional stimulation through continuing education and research
- ♦ Update and clarify general and key terms for a full understanding of the subject such as Microbiome, Metagenomics, Microbiota, Symbiosis, Dysbiosis
- ♦ Study the microbial communities that coexist in symbiosis with the human being, learning more about their structure and functions and how these communities can be altered due to factors such as diet, lifestyle, etc
- ♦ Delve into the knowledge of the intestinal microbiota as the main axis of the human microbiota and its interrelation with the rest of the body, its study methods and its applications in clinical practice to maintain a good state of health
- ♦ Understand the relationship between intestinal pathologies: Small Intestinal Bacterial Overgrowth (SIBO), Irritable Bowel Syndrome (IBS), Crohn's disease, and intestinal dysbiosis
- ♦ Learn how manage in an updated way the different intestinal infections caused by viruses, bacteria, parasites, fungi by modulating the altered intestinal microbiota
- ♦ Delve into the bidirectional relationship between microbiota and neuroimmunological system and to study in depth the intestine-microbiota-brain axis and all the pathologies that are generated in its imbalance
- ♦ Acquire an in-depth knowledge of all the oral and respiratory structure and the ecosystems that live in them, seeing how an alteration of these ecosystems has a direct relationship with many associated pathology
- ♦ Study the mechanisms by virtue of which probiotics are postulated as preventive in the formation of dental caries and periodontal diseases
- ♦ Know how a negative modulation in our microbiota can favor the appearance of food intolerances and allergies
- ♦ Delve into how drugs with human targets can have a negative impact on the gut microbiota, in addition to the known impact of antibiotics
- ♦ Have thorough knowledge of the safety profile of probiotics, since, although their use has become more widespread in recent years thanks to their proven efficacy, both for the treatment and prevention of certain diseases, this does not exempt them from generating adverse effects and potential risks



## Specific Objectives

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### Module 1. Microbiota. Microbiome. Metagenomics

- ◆ Update and clarify general and key terms for a full understanding of the subject such as Microbiome, Metagenomics, Microbiota, Symbiosis, Dysbiosis
- ◆ Deepen knowledge of how drugs designed for humans can have a negative impact on the gut microbiota, in addition to the known impact of antibiotics

### Module 2. Gut Microbiota I. Intestinal homeostasis

- ◆ Study the microbial communities that coexist in symbiosis with humans, learning more about their structure and functions and how these communities can be altered due to factors such as diet, lifestyle, etc
- ◆ Understand the relationship between intestinal pathologies: Small intestinal bacterial overgrowth (SIBO), irritable bowel syndrome (IBS), Crohn's disease and intestinal dysbiosis

### Module 3. Gut Microbiota II. Intestinal Dysbiosis

- ◆ Delve into the knowledge of the Intestinal Microbiota as the main axis of the Human Microbiota and its interrelation with the rest of the body, its study methods, and its applications in clinical practice to maintain a good state of health
- ◆ Learn how to manage the different intestinal infections caused by viruses, bacteria, parasites, fungi affecting the intestinal microbiota

### Module 4. Microbiota in Neonatology and Pediatrics

- ◆ Delve into the most influential factors of the intestinal microbiota of the mother, both in childbirth and in the gestation period itself
- ◆ Delve in the clinical applications of probiotics and prebiotics in the pediatric patient

### Module 5. Oral Microbiota and Respiratory Tract

- ◆ Study the mechanisms by virtue of which Probiotics are postulated as preventive in the formation of dental caries and periodontal diseases
- ◆ Acquire an in-depth knowledge of all the oral and respiratory structure and the ecosystems that live in them, seeing how an alteration of these ecosystems has a direct relationship with many associated pathologies

### Module 6. Microbiota and Immune System

- ◆ Delve into the bidirectional relationship between Microbiota and Neuroimmunological System and study in depth the intestine-microbiota-brain axis and all the pathologies that are generated in its imbalance
- ◆ Analyze the role of nutrition and lifestyle and their interaction with the immune system and Microbiota

### Module 7. Skin Microbiota

- ◆ Study the factors that regulate the type of bacterial flora in the skin
- ◆ Know the methods of approach to triggered skin diseases

### Module 8. Genitourinary Tract Microbiota

- ◆ Analyze the main microorganisms causing urinary infections and their relationship with the alteration of the Microbiota in men and women
- ◆ An in-depth look at the role of probiotics in the prevention of the main infections of the genitourinary tract

### Module 9. Relationship between Intolerances/Allergies and Microbiota

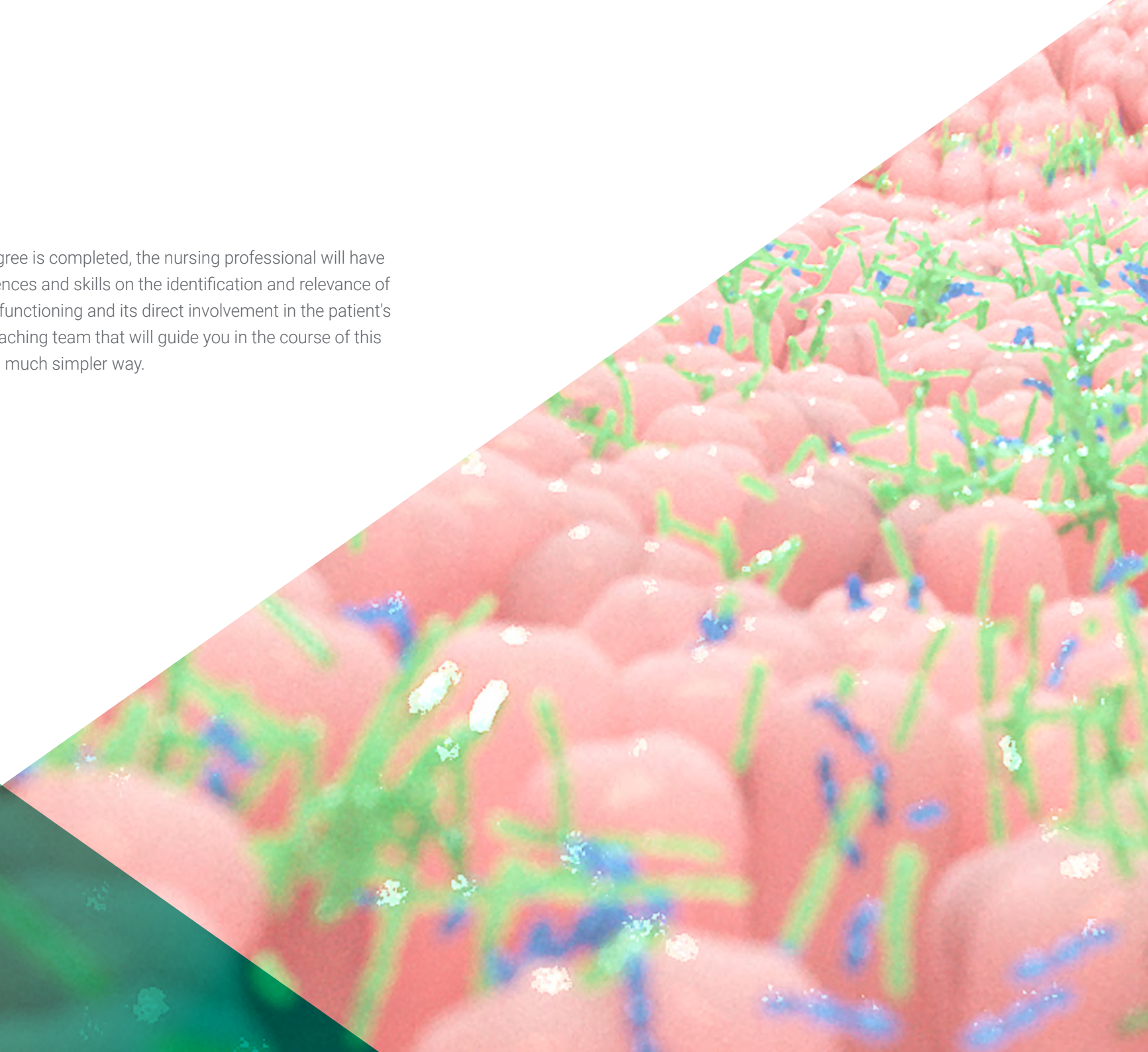
- ◆ Know how a negative modulation in our Microbiota can favor the appearance of food intolerances and allergies
- ◆ Delve into Microbiota changes in patients with food exclusion diets such as gluten

### Module 10. Probiotics, Prebiotics, Microbiota, and Health

- ◆ Know in depth the safety profile of Probiotics, since, although their use has spread in recent years thanks to their proven efficacy, both for the treatment and prevention of certain diseases, this does not exempt them from generating adverse effects and potential risks
- ◆ Analyze the various clinical applications of probiotics and prebiotics in areas such as urology, gynecology, gastroenterology and immunology

# 03 Skills

Once this Professional Master's Degree is completed, the nursing professional will have managed to enhance their competences and skills on the identification and relevance of the intestinal microbiota, its proper functioning and its direct involvement in the patient's health. All this, with a specialized teaching team that will guide you in the course of this program to achieve these goals in a much simpler way.



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*With this university course you will obtain the most recent scientific evidence on vaginal homeostasis and its relationship with infectious pathologies"*



## General Skills

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- ♦ Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context
- ♦ Apply acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study
- ♦ Be able to integrate knowledge and face the complexity of making judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments
- ♦ Communicate conclusions, and the ultimate knowledge and rationale behind them, to specialized and non-specialized audiences in a clear and unambiguous way
- ♦ Acquire the learning skills that will enable them to continue studying in a manner that will be largely self-directed or autonomous





## Specific Skills

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- ◆ Give a global vision of the Human Microbiota, so that the professional has a deeper knowledge of this community of microorganisms that coexist with us and the functions they perform in our body
- ◆ Know the type, importance, and functions of the intestinal microbiota in all patients, but particularly in pediatrics, as well as its relationship with digestive and non-digestive diseases
- ◆ Understand how there are many factors that can alter the balance of this human ecosystem, leading us to a state of illness
- ◆ Knowing what factors can help maintain the balance of this ecosystem to maintain a good state of health
- ◆ Update and expand knowledge with special education and interest in Probiotic Therapy, Prebiotic Therapy and the latest advances in this field, such as fecal transplantation, the current situation and future development pathways, as the main tools we have to optimize the functions of the Microbiota and its future projection



*Get up to speed with this educational program on the relationship between the microbiota and the neuroimmunoendocrine system"*

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# Course Management

This university program includes in its teaching staff, renowned specialists in Human Microbiota and other related areas, who bring to this teaching the experience of their work. In addition, other specialists of recognized prestige participate in its design and elaboration, completing the program in an interdisciplinary manner. All of this, with the aim of providing nursing professionals with the most complete information and content in the educational panorama on Human Microbiota so that they can keep abreast of the progress that has been made in this field, as well as the future of research in this area.







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*TECH has brought together the best specialists in Human Microbiota, so that you can obtain the most specialized and recent information in this field”*

## International Guest Director

Dr. Harry Sokol is internationally recognized in the field of **Gastroenterology** for his research on the **gut microbiota**. With more than 2 decades of experience, he has established himself as a true scientific authority thanks to his numerous studies on the role of **microorganisms in the human body** and their impact on **chronic inflammatory bowel diseases**. In particular, his work has revolutionized medical understanding of this organ, often referred to as the «**second brain**.»

Among Dr. Sokol's contributions, he and his team have opened a new line of advances on the bacterium **Faecalibacterium prausnitzii**. In turn, these studies have led to crucial discoveries about its **anti-inflammatory effects**, opening the door to **revolutionary treatments**.

In addition, the expert is distinguished by his **commitment to the dissemination of knowledge**, whether by teaching academic programs at the Sorbonne University or by publishing works such as the **comic book** *The Extraordinary Powers of the Belly*. His scientific publications appear continuously in **world-renowned journals** and he is invited to **specialized congresses**. At the same time, he carries out his clinical work at the **Saint-Antoine Hospital** (AP-HP/University Hospital Federation IMPEC/Sorbonne University), one of the most renowned hospitals in Europe.

On the other hand, Dr. Sokol began his **medical studies** at Paris Cité University, showing early on a strong interest in **health research**. A chance meeting with the eminent Professor Philippe Marteau led him to **Gastroenterology** and the enigmas of the **Intestinal Microbiota**. Throughout his career, he also broadened his horizons by training in the United States, at Harvard University, where he shared experiences with **leading scientists**. Upon his return to France, he founded his **own team** where he researches on **Fecal Transplantation**, offering state-of-the-art therapeutic innovations.



## Dr. Sokol, Harry

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- Director of Microbiota, Gut and Inflammation at Sorbonne University, Paris, France
- Specialist Physician at the Gastroenterology Department of the Saint-Antoine Hospital (AP-HP), Paris, France
- Group Leader at the Institut Micalis (INRA)
- Coordinator of the Center of Microbiome Medicine of Paris FHU
- Founder of the pharmaceutical company Exeliom Biosciences (Nextbiotix)
- President of the Fecal Microbiota Transplantation Group
- Medical Specialist in different hospitals in Paris
- Doctorate in Microbiology at the Université Paris-Sud
- Postdoctoral Fellowship at the Massachusetts General Hospital, Harvard University Medical School
- Degree in Medicine, Hepatology and Gastroenterology at Université Paris Cité

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*Thanks to TECH you will be able to learn with the best professionals in the world”*

## Guest Directors



### Dr. Sánchez Romero, María Isabel

- ♦ Area Specialist in the Microbiology Department of the Puerta de Hierro University Hospital, Madrid
- ♦ Medical Specialist in Clinical Microbiology and Parasitology
- ♦ Member of the Spanish Society of Infectious Diseases and Clinical Microbiology
- ♦ Technical Secretary of the Madrid Society of Clinical Microbiology
- ♦ Doctor in Medicine and Surgery from the University of Salamanca (2003) with the qualification of outstanding cum laude
- ♦ Degree in Medicine and Surgery from the University of Salamanca



### Dr. Portero, María Francisca

- ♦ Acting Head of the Microbiology Department of the Puerta de Hierro University Hospital, Madrid
- ♦ Specialist in Clinical Microbiology and Parasitology, Puerta de Hierro University Hospital, Madrid
- ♦ Postgraduate in Clinical Management by Gaspar Casal Foundation
- ♦ Doctorate in Medicine from the Autonomous University Madrid
- ♦ Degree in Medicine and Surgery from the Autonomous University of Madrid



### **Dr. Alarcón Cavero, Teresa**

- ♦ Specialist in the Microbiology Department at the La Princesa University Hospital
- ♦ Head of Group 52 of the Research Institute of the La Princesa Hospital
- ♦ Master's Degree in Medical Microbiology from the Complutense University of Madrid
- ♦ Degree in Biological Sciences with a major in Fundamental Biology from the Complutense University of Madrid



### **Dr. Muñoz Algarra, María**

- ♦ Area Specialist in the Microbiology Department of the Puerta de Hierro Majadahonda University Hospital, Madrid
- ♦ Head of Patient Safety of the Microbiology Service in the H.U. Puerto de Hierro Hospital Majadahonda
- ♦ Teaching collaborator at the School of Medicine in the subject of Microbiology at the Autonomous University of Madrid
- ♦ Doctorate in Pharmacy from the Complutense University of Madrid
- ♦ Degree in Pharmacy from the University of Valencia



### Dr. López Dosil, Marcos

- Specialist Physician of the Microbiology and Parasitology Department of the Hospital de Móstoles
- Master's Degree in Infectious Diseases and Antimicrobial Treatment from CEU Cardenal Herrera University
- Master's Degree in Tropical and Health Medicine from the Autonomous University of Madrid
- Expert in Tropical Medicine from the Autonomous University Madrid
- Degree in Medicine from the University of Santiago de Compostela



### Dr. Anel Pedroche, Jorge

- Facultative Area Specialist. Microbiology Department, Puerta de Hierro University Hospital, Majadahonda, Spain
- Degree in Pharmacy from the Complutense University of Madrid

## Management



### Ms. Fernández Montalvo, María Ángeles

- Parapharmacy Manager, Nutrition and Natural Medicine Professor
- Specialist in Food Intolerances and the Study of Intestinal Microbiota
- Member of the Spanish Society of Probiotics and Prebiotics (SEPyP)
- Member of the Spanish Society of Dietetics (SEDCA)
- Member of the Spanish Society of Nutrition (SEÑ)
- Specialist Degree in Nutrition, Dietetics and Diet Therapy
- Expert in Microbiological Food Analysis
- Expert in Nutrition, Food, and Cancer. Prevention and Treatment
- Expert in Vegetarian, Clinical, and Sports Nutrition
- Expert in the current use of Nutricosmetics and Nutraceuticals in general
- Expert in point-of-sale management in Pharmacies and Parapharmacies
- Diploma in Natural and Orthomolecular Medicine
- Member of the Spanish Society of Probiotics and Prebiotics (SEPyP)
- Member of the Spanish Society of Dietetics (SEDCA)
- Member of the Spanish Society of Nutrition (SEÑ)
- Degree in Biochemistry from the University of Valencia

## Professors

### Dr. Uberos, José

- ◆ Neonatal Intensive Care Unit Clinical Assistant, San Cecilio Clinical Hospital
- ◆ Associate Professor of Pediatrics, University of Granada
- ◆ Associate Professor at the Faculty of Medicine at the University of Granada
- ◆ Vocal Bioethics Research Committee of the Province of Granada (Spain)
- ◆ Coeditor of the Signs and Symptoms Journal
- ◆ Professor Antonio Galdo Award. Society of Pediatrics of Eastern Andalusia. For the article entitled: Analysis of nutritional intake in very low birth weight infants and its impact on the severity of bronchopulmonary dysplasia and other comorbidities
- ◆ Editor of the Journal of the Pediatric Society of Eastern Andalusia (Bol. SPAO)
- ◆ Member of the Organizing Committee of the XIV Congress of the Spanish Society of Adolescent Medicine

### Dr. López Martínez, Rocío

- ◆ Resident Internal Biologist of Clinical Immunology at the Central University Hospital of Asturias
- ◆ Degree in Biochemistry from the University of Murcia
- ◆ Professional Master's Degree in Bioinformatics and Biostatistics from the Catalan Open University (UOC) and the University of Barcelona

### Dr. Bueno García, Eva

- ◆ Pre-doctoral researcher in the research group of Immunosenescence of the Immunology Service of the Central University Hospital of Asturias (HUCA)
- ◆ Master's Degree in Biomedicine and Molecular Oncology from the University of Oviedo
- ◆ Degree in Biology from the University of Oviedo





**Dr. Verdú López, Patricia**

- ◆ Specialty of Allergology at the University Hospital Dr. Negrín in Las Palmas of Gran Canaria
- ◆ Professional Master's Degree in Esthetic and Anti-Aging Medicine at the Complutense University of Madrid
- ◆ Degree in Medicine from the University of Oviedo

**Dr. Rodríguez Fernández, Carolina**

- ◆ Degree in Biology from the University of Oviedo

**Dr. Gonzalez Rodríguez, Silvia Pilar**

- ◆ Medical Subdirector, Research Coordinator and Clinical Chief of the Menopause and Osteoporosis Unit at the Velázquez Medical Cabinet (Madrid)
- ◆ PhD in Medicine and Surgery from the University of Alcalá de Henares. Gynecology Specialist

**Dr. Rioseras de Bustos, Beatriz**

- ◆ Immunology Resident at HUCA
- ◆ Bachelor's Degree in Biology. University of Oviedo
- ◆ Master's Degree in Neuroscience Research, University of Oviedo
- ◆ Doctorate from the University of Oviedo. "Streptomyces development: regulation and industrial applications."

**Dr. Lombó Burgos, Felipe**

- ◆ Associate Professor at University of Oviedo
- ◆ PhD in Biology and head Professor from the University of Oviedo

**Dr. Alonso Arias, Rebeca**

- ◆ Specialist Immunology Physician at the Central University Hospital of Asturias
- ◆ Heads the Immunosenescence research group of the Central University Hospital of Asturias Immunology Service

- ◆ 1st National Award for Research in Sports Medicine
- ◆ Degree in Biology from the University of Oviedo
- ◆ Doctorate in Biological Sciences from the Complutense University of Madrid

**Dr. Álvarez García, Verónica**

- ◆ Digestive system specialist at the Central Hospital of Asturias (HUCA)
- ◆ Degree in Medicine

**Dr. Gabaldon Estevani, Toni**

- ◆ Co-Founder and Scientific Advisor (CSO) Microomics SL
- ◆ ICREA Research Professor and Group Leader of the Comparative Genomics Laboratory
- ◆ Dr. in Biology, researcher at Centre for Genomic Regulation | CRG – Bioinformatics and Genomics

**Dr. Fernández Madera, Juan**

- ◆ Allergy Specialist
- ◆ Degree in Medicine

**Dr. Méndez García, Celia**

- ◆ Doctorate in Microbiology from the University of Oviedo
- ◆ Research at Novartis Laboratories (Boston)

**Dr. Narbona López, Eduardo**

- ◆ Professor of Pediatrics, University of Granada, Spain
- ◆ Speciality Neonatal Unit, San Cecilio University Hospital

**Dr. López Vázquez, Antonio**

- ◆ Specialist in Immunology, Central University Hospital of Asturias (HUCA)

**Dr. Losa Domínguez, Fernando**

- ◆ Obstetrician-Gynecologist and Maternologist
- ◆ Expert in Menopause certified by the AEEM (Spanish Association for the Study of Menopause)
- ◆ Expert in Gynecoesthetics from the University of Barcelona

**Dr. López López, Aranzazu**

- ◆ Ph.D. in Biological Sciences
- ◆ Researcher in oral microbiology at FISABIO foundation

**Dr. Suárez Rodríguez, Marta**

- ◆ Neonatologist of the Central University Hospital of Asturias (HUCA)
- ◆ Researcher and Professor of the Professional Master's Degree in Early Care and the Professional Master's Degree in Critical Care Nursing at the University of Oviedo and other training courses

**Dr. Solís Sánchez, Gonzalo**

- ◆ Neonatologist at the Hospital Universitario Central de Asturias (HUCA)
- ◆ Researcher, Associate Professor of the University of Oviedo

**Dr. Álvarez García, Verónica**

- ◆ Digestive system specialist at the Central Hospital of Asturias (HUCA)
- ◆ Degree in Medicine

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**Dr. Fernández Madera, Juan**

- ◆ Allergy Specialist
- ◆ Degree in Medicine





**Dr. Méndez García, Celia**

- ◆ Doctorate in Microbiology from the University of Oviedo
- ◆ Research at Novartis Laboratories (Boston)

**Dr. Narbona López, Eduardo**

- ◆ Professor of Pediatrics, University of Granada, Spain
- ◆ Speciality Neonatal Unit, San Cecilio University Hospital

**Dr. López Vázquez, Antonio**

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**Dr. Solís Sánchez, Gonzalo**

- ◆ Neonatologist at the Hospital Universitario Central de Asturias (HUCA)
- ◆ Researcher, Associate Professor of the University of Oviedo

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# Structure and Content

The structure of the contents of this 100% online program has been designed by a team of professionals from the best hospitals and universities, aware of the importance of updating the knowledge of nursing professionals in order to prevent, detect and intervene in those pathologies related to alterations in the human microbiota. For this purpose, the syllabus is divided into 10 modules in which you will find advanced and visual content, which will lead you to delve into the microbiota, the microbiome and metagenomics.





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*This Professional Masters' Degree contains the most complete and up-to-date scientific program on the Human Microbiota”*

## Module 1. Microbiota. Microbiome. Metagenomics

- 1.1. Definition and Relationship Between Them
- 1.2. Microbiota Composition: Genera, Species and Strains
- 1.3. Different Human Microbiota. General Overview of Eubiosis and Dysbiosis
  - 1.3.1. Gastrointestinal Microbiota
  - 1.3.2. Oral Microbiota
  - 1.3.3. Skin Microbiota
  - 1.3.4. Respiratory Tract Microbiota
  - 1.3.5. Urinary Tract Microbiota
  - 1.3.6. Reproductive System Microbiota
- 1.4. Factors that Influence Microbiota Balance and Imbalance
  - 1.4.1. Diet and Lifestyle. Intestine-Brain Axis
  - 1.4.2. Antibiotic Therapy
  - 1.4.3. Epigenetic-Microbiota Interaction. Endocrine Disruptors
  - 1.4.4. Probiotics, Prebiotics, Symbiotics. Concepts and Overviews
  - 1.4.5. Fecal Transplant, Latest Advances

## Module 2. Gut Microbiota I. Intestinal Homeostasis

- 2.1. Gut Microbiota Studies
  - 2.1.1. Projects MetaHIT, Meta-Biomed, MyNewGut, Human Microbiome Project
- 2.2. Microbiota Composition
  - 2.2.1. Protective Microbiota (*Lactobacillus*, *Bifidobacterium*, *Bacteroides*)
  - 2.2.2. Immunomodulatory Microbiota (*Enterococcus faecalis* and *Escherichia coli*)
  - 2.2.3. Mucoprotective or Muconutritive Microbiota (*Faecalibacterium prausnitzii* and *Akkermansia muciniphila*)
  - 2.2.4. Microbiota with Proteolytic or Proinflammatory Activities (*E. coli* Biovare, *Clostridium*, *Proteus*, *Pseudomonas*, *Enterobacter*, *Citrobacter*, *Klebsiella*, *Desulfovibrio*, *Bilophila*)
  - 2.2.5. Fungal Microbiota (*Candida*, *Geotrichum*)

- 2.3. Digestive System Physiology. Composition of the Microbiota in the Different Parts of the Digestive Tract. Resident Flora and Transient or Colonizing Flora. Sterile Areas in the Digestive Tract
  - 2.3.1. Esophageal Microbiota
    - 2.3.1.1. Healthy Individuals
    - 2.3.1.2. Patients (Gastric Reflux, Barrett's Esophagus, etc.)
  - 2.3.2. Gastric Microbiota
    - 2.3.2.1. Healthy Individuals
    - 2.3.2.2. Patients (Gastric Ulcer, Gastric Cancer, MALT, etc)
  - 2.3.3. Gallbladder Microbiota
    - 2.3.3.1. Healthy Individuals
    - 2.3.3.2. Patients (Cholecystitis, Cholelithiasis, etc.)
  - 2.3.4. Small Intestine Microbiota
    - 2.3.4.1. Healthy Individuals
    - 2.3.4.2. Patients (Inflammatory Bowel Disease, Irritable Bowel Syndrome, etc.)
  - 2.3.5. Colon Microbiota
    - 2.3.5.1. Healthy Individuals. Enterotypes
    - 2.3.5.2. Patients (Inflammatory Bowel Disease, Crohn's Disease, Colon Carcinoma, Appendicitis, etc)
- 2.4. Gut Microbiota Functions: Metabolic. Nutritional and Trophic. Protective and Barrier. Immunological
  - 2.4.1. Interrelationships Between the Intestinal Microbiota and Distant Organs (Brain, Lung, Heart, Liver, Pancreas, etc.)
- 2.5. Intestinal Mucosa and Mucosal Immune System
  - 2.5.1. Anatomy, Characteristics, and Functions (MALT, GALT, and BALT System)
- 2.6. What is Intestinal Homeostasis? Role of Bacteria in Intestinal Homeostasis
  - 2.6.1. Effects on Digestion and Nutrition
  - 2.6.2. Defence Stimulation, Hindering Colonization by Pathogenic Microorganisms
  - 2.6.3. Production of Vitamin B and K
  - 2.6.4. Production of Short Chain Fatty Acids (Butyric, Propionic, Acetic, etc.)
  - 2.6.5. Production of Gases (Methane, Carbon Dioxide, Molecular Hydrogen). Properties and Functions
  - 2.6.6. Lactic Acid



### Module 3. Gut Microbiota II. Intestinal Dysbiosis

- 3.1. What is Intestinal Dysbiosis? Consequences
- 3.2. Intestinal Barrier. Physiology. Function. Intestinal Permeability and Hyperpermeability. Relationship between Intestinal Dysbiosis and Intestinal Hyperpermeability
- 3.3. Relationship of Intestinal Dysbiosis and Other Types of Disorders: Immunological, Metabolic, Neurological and Gastric (*Helicobacter Pylori*)
- 3.4. Consequences of the Alteration of the Intestinal Ecosystem and its Relationship to Functional Digestive Disorders
  - 3.4.1. Inflammatory Bowel Disease IBD
  - 3.4.2. Chronic Inflammatory Bowel Diseases: Crohn's Disease. Ulcerative Colitis
  - 3.4.3. Irritable Bowel Syndrome (IBS) and Diverticulitis
  - 3.4.4. Intestinal Motility Disorders. Diarrhea. Diarrhea Caused by *Clostridium Difficile*. Constipation
  - 3.4.5. Digestive Disorders and Nutrient Malabsorption Problems: Carbohydrates, Proteins and Fats
  - 3.4.6. Markers of Intestinal Inflammation: Calprotectin. Eosinophil Cationic Protein (ECP). Lactoferrin. Lysozyme
  - 3.4.7. Leaky Gut Syndrome. Permeability Markers: Alpha-1 Antitrypsin. Zonulin. Tight Junctions and their Main Function
- 3.5. Alteration of the Intestinal Ecosystem and its Relationship with Intestinal Infections
  - 3.5.1. Viral Intestinal Infections
  - 3.5.2. Bacterial Intestinal Infections
  - 3.5.3. Intestinal Infections due to Parasites
  - 3.5.4. Fungal Intestinal Infections. Intestinal Candidiasis
- 3.6. Composition of the Intestinal Microbiota in the Different Stages of Life
  - 3.6.1. Variation in Gut Microbiota Composition from the Neonatal-Early Childhood Stage to Adolescence. "Unstable Period"
    - 3.6.1.1. Composition of the Intestinal Microbiota in Adulthood. "Stable Period"
    - 3.6.1.2. Gut Microbiota Composition in the Elderly "Unstable Stage". Aging and Microbiota
- 3.7. Nutritional Modulation of Intestinal Dysbiosis and Hyperpermeability: Glutamine, Zinc, Vitamins, Probiotics, Prebiotics
- 3.8. Techniques for Quantitative Analysis of Microorganisms in Feces
- 3.9. Current Lines of Research

#### Module 4. Microbiota in Neonatology and Pediatrics

- 4.1. Mother-Child Symbiosis
- 4.2. Influencing Factors on the Gut Microbiota of the Mother during Pregnancy and during Birth. Influence of the Type of Delivery on the Microbiota of the New-born
- 4.3. Type and Duration of Breastfeeding, Influence on the Infant's Microbiota
  - 4.3.1. Breast Milk: Composition of the Breast Milk Microbiota. Importance of Breastfeeding in the New-born's Microbiota
  - 4.3.2. Artificial Breastfeeding. Use of Probiotics and Prebiotics in Infant Milk Formulas
- 4.4. Clinical Applications of Probiotics and Prebiotics in Pediatric Patients
  - 4.4.1. Digestive Pathologies: Functional Digestive Disorders, Diarrhea, Necrotizing Enterocolitis. Intolerances
  - 4.4.2. Non-digestive Pathologies: Respiratory and ENT, Atopic Diseases, Metabolic Diseases. Allergies
- 4.5. Influence of Antibiotic and other Psychotropic Treatment on the Microbiota of the Infant
- 4.6. Current Lines of Research

#### Module 5. Oral Microbiota and Respiratory Tract

- 5.1. Structure and Oral Ecosystems
  - 5.1.1. Main Ecosystems that are Differentiated in the Oral Cavity
  - 5.1.2. Characteristics and Composition of Each of Them. Nostrils, Nasopharynx and Oropharynx
- 5.2. Alterations of the Oral Microbial Ecosystem: Oral Dysbiosis. Relationship with Different Oral Disease States
  - 5.2.1. Cavities
  - 5.2.2. Halitosis
  - 5.2.3. Periodontal and Gingival Diseases
  - 5.2.4. Peri-Implant Diseases
  - 5.2.5. Other Infectious Diseases: Candida Albicans
- 5.3. Influence of External Agents in Oral Eubiosis and Dysbiosis. Hygiene
- 5.4. Structure of the Respiratory Tract and Composition of the Microbiota and Microbiome
  - 5.4.1. Upper Respiratory Tract (Nasopharynx, Middle Ear, Sinuses, and Tonsils)
  - 5.4.2. Lower Respiratory Tract (Trachea, Lungs, Bronchi, Bronchioles and Alveoli)



- 5.5. Factors that Regulate the Respiratory Microbiota
  - 5.5.1. Microbial Immigration
  - 5.5.2. Elimination of Microbes and the Reproduction Rates of its Members
- 5.6. Alteration of the Respiratory Tract Microbiota and its Relationship with Different Respiratory Tract Diseases
- 5.7. Therapeutic Manipulation of the Microbiome of the Oral Cavity in Prevention and Treatment of Diseases Related to it
- 5.8. Therapeutic Manipulation of the Microbiome of the Respiratory Tract in Prevention and Treatment of Related Diseases
- 5.9. Current Lines of Research and Clinical Applications

## Module 6. Microbiota and Immune System

- 6.1. Immune System Physiology. What is Immunity?
  - 6.1.1. Immune System Components
    - 6.1.1.1. Lymphoid Tissue
    - 6.1.1.2. Immune Cells
    - 6.1.1.3. Chemical Systems
- 6.2. Organs Involved in Immunity
  - 6.2.1. Primary Organs
  - 6.2.2. Secondary Organs
- 6.3. Innate, Non-Specific, or Natural Immunity
- 6.4. Acquired, Adaptive, or Specific Immunity
- 6.5. Nutrition and Lifestyle: Interaction with the Immune System and the Microbiota
- 6.6. Functional Foods and their Effect on the Immune System
  - 6.6.1. Probiotics, Prebiotics, and Symbiotics
  - 6.6.2. Nutraceuticals and Functional Foods
- 6.7. Bidirectional Relationship between Microbiota and Neuroimmunoendocrine System
- 6.8. Microbiota, Immunity and Nervous System Disorders: Anxiety, Depression, Autism, Schizophrenia, or Alzheimer's Disease
- 6.9. The Gut-Microbiota-Brain Axis
- 6.10. Current Lines of Research

## Module 7. Skin Microbiota

- 7.1. Skin Physiology
  - 7.1.1. Skin Structure Epidermis, Dermis and Hypodermis
  - 7.1.2. Functions of the Skin
  - 7.1.3. Microbial Composition of the Skin
- 7.2. Factors that Regulate the Type of Bacterial Flora in the Skin
  - 7.2.1. Sweat Glands, Sebaceous Glands, Desquamation
  - 7.2.2. Factors that Alter the Ecology of the Skin and its Microbiota
- 7.3. Skin Immune System
  - 7.3.1. Epidermis; Essential Element of our Defences
  - 7.3.2. Elements of the Cutaneous Immune System: Cytosines, Keratinocytes, Dendritic Cells, Lymphocytes, Antimicrobial Peptides
  - 7.3.3. Influence of the Skin Microbiota on the Skin Immune System. Staphylococcus Epidermidis, Staphylococcus Aureus
- 7.4. Alteration of the Normal Skin Microbiota (Dysbiosis)
  - 7.4.1. Impaired Barrier Function
- 7.5. Triggered Skin Diseases
  - 7.5.1. Psoriasis (Streptococcus Pyogenes)
  - 7.5.2. Acne Vulgaris
  - 7.5.3. Atopic Dermatitis
  - 7.5.4. Rosacea
- 7.6. Influence of the use of Probiotics in the Prevention and Treatment of Different Skin Diseases
- 7.7. Current Lines of Research

## Module 8. Genitourinary Tract Microbiota

- 8.1. Genitourinary Tract Physiology and Microbial Composition
  - 8.1.1. In Men
  - 8.1.2. In Women
- 8.2. Microorganisms Causing Urinary Tract Infections: Uropathogens. Relationship with the Alteration of the Microbiota in Men and Women
  - 8.2.1. Enteric Bacteria, Generally Gram-Negative Aerobic Bacteria: E. Coli, Enterobacteria. Klebsiella or Proteus Mirabilis or Pseudomonas Aeruginosa
  - 8.2.2. Gram-Positive Bacteria: Staphylococcus Saprophyticus, etc

- 8.3. Vaginal Microbiota and its Modification with Age
  - 8.3.1. Infant Age
  - 8.3.2. Fertile Age
  - 8.3.3. Adult Age (Menopause)
- 8.4. Alteration of the Vaginal Homeostasis and its Relationship with Infectious Pathologies
  - 8.4.1. Vaginitis
    - 8.4.1.1. Chlamydia
    - 8.4.1.2. Bacterial Vaginosis
    - 8.4.1.3. Vaginal Candidiasis
    - 8.4.1.4. Vaginitis Trichomoniasis
    - 8.4.1.5. Viral Vaginitis
  - 8.4.2. Non-Infectious Vaginitis
- 8.5. Probiotics in the Prevention of the Main Genitourinary Tract Infections: UTI (Cystitis/ Urethritis), Prostatitis, Pyelonephritis, Vaginal infections, and infertility
- 8.6. Current Lines of Research

## Module 9. The Relationship between Intolerances/Allergies and the Microbiota

- 9.1. Microbiota changes in Patients on Food Exclusion Diets
  - 9.1.1. Eosinophilic Esophagitis (EoE)
- 9.2. Microbiota Changes in Patients on Food Exclusion Diets: Dairy Intolerance
  - 9.2.1. Lactose Intolerance
  - 9.2.2. Intolerant to Lactic Proteins: Caseins, Albumins, etc
  - 9.2.3. People Allergic to Milk
- 9.3. Microbiota Changes in Patients on Food Exclusion Diets: Gluten
  - 9.3.1. Alteration of the Intestinal Microbiota in Patients with Gluten Intolerance
  - 9.3.2. Alteration of the Intestinal Microbiota in Celiac Patients
  - 9.3.3. Role of Probiotics and Prebiotics in the Recovery of the Microbiota in Gluten Intolerant and Coeliacs
- 9.4. Microbiota and Biogenic Amines
- 9.5. Current Lines of Research

**Module 10. Probiotics, Prebiotics, Microbiota, and Health**

- 10.1. Probiotics: Definition, History, Mechanisms of Action
- 10.2. Prebiotics: Definition, Types of Prebiotics (Starch, Inulin, FOS Oligosaccharides), Mechanisms of Action
- 10.3. Clinical Applications of Probiotics and Prebiotics in Gastroenterology
- 10.4. Clinical Applications of Endocrinology and Cardiovascular Disorders
- 10.5. Clinical Applications of Probiotics and Prebiotics in Urology
- 10.6. Clinical Applications of Probiotics and Prebiotics in Gynecology
- 10.7. Clinical Applications of Probiotics and Prebiotics in Immunology: Autoimmunity, Pneumology, Dermatology, Vaccinology, Vaccines
- 10.8. Clinical Applications of Probiotics and Prebiotics in Nutritional Diseases. Obesity and Eating Disorders. Metabolism, Malnutrition, and Malabsorption of Nutrients
- 10.9. Clinical Applications of Probiotics and Prebiotics in Neurological Diseases. Mental Health. Old Age
- 10.10. Clinical Applications of Probiotics and Prebiotics in Critically Ill Cancer Patients
- 10.11. Dairy Products as a Natural Source of Probiotics and Prebiotics. Fermented Milk
- 10.12. Safety and Legislation in the Use of Probiotics

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*You are looking at a program that will provide you with the most current scientific information on the benefits of the use of probiotics and prebiotics”*

# 05

# 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.





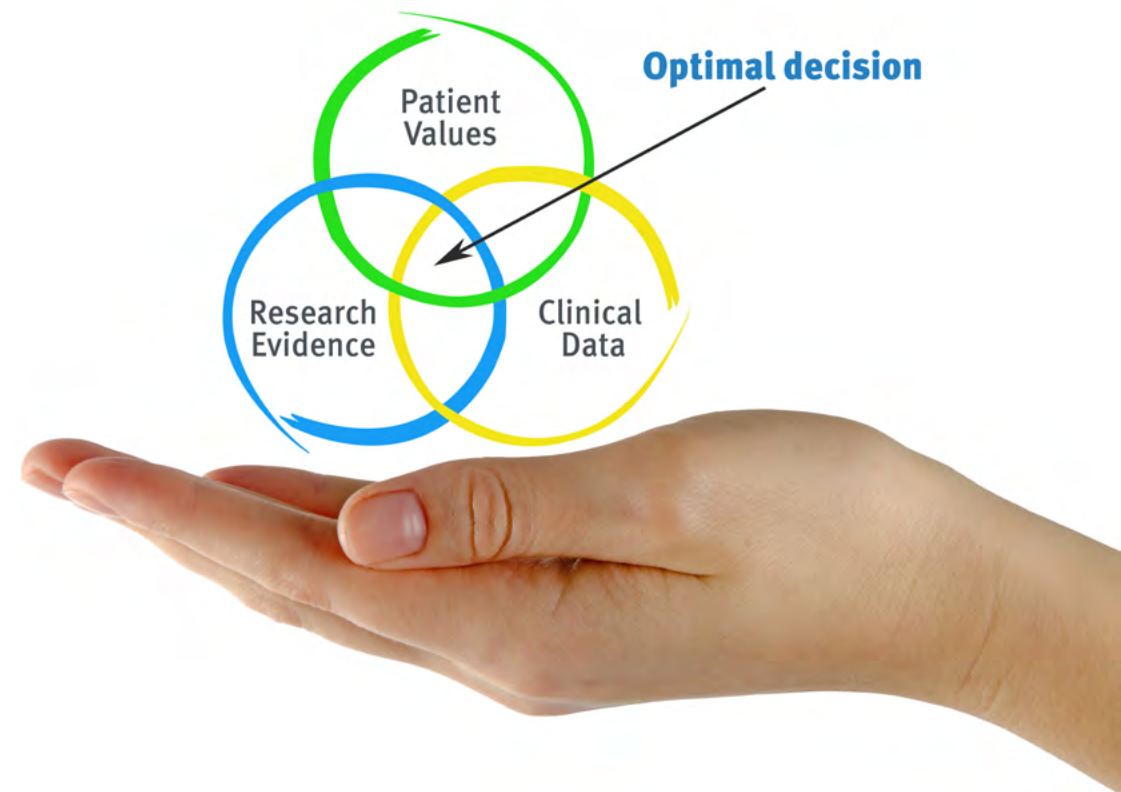
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*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## At TECH 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:

1. 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.*



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 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.



### 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.





### 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 suggesting that observing third-party experts can be useful.

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



### Quick Action Guides

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



07

# Certificate

The Professional Master's Degree in Human Microbiota for Nursing guarantees students, in addition to the most rigorous and up-to-date education, access to a Professional Master's Degree issued by TECH Global University.





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

This program will allow you to obtain your **Professional Master's Degree diploma in Human Microbiota 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.

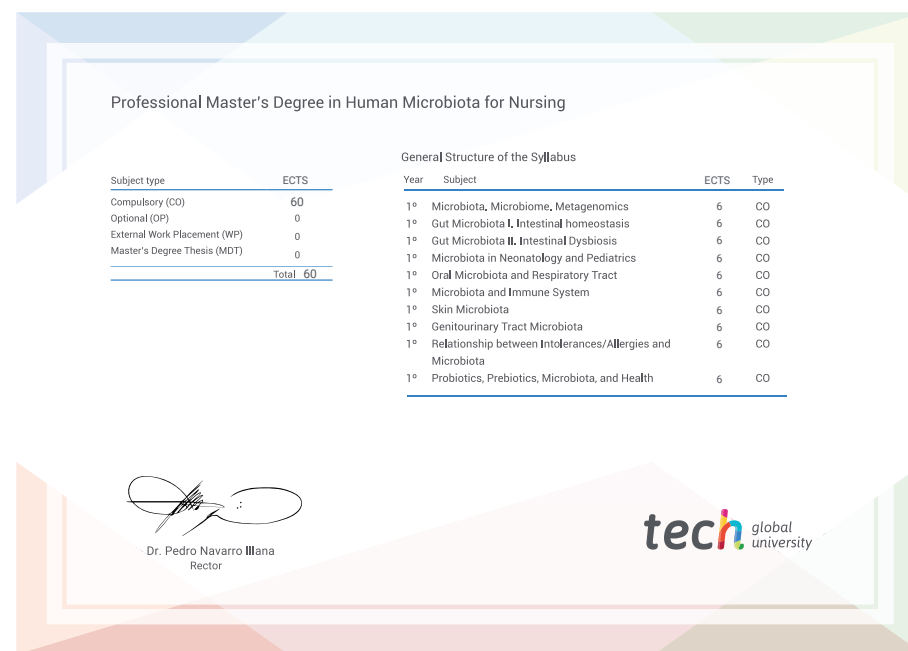
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Professional Master's Degree in Human Microbiota for Nursing**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**



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



## Professional Master's Degree Human Microbiota for Nursing

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

# Professional Master's Degree Human Microbiota for Nursing

