

Professional Master's Degree

Human Microbiota



Professional Master's Degree Human Microbiota

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

Website: www.techtute.com/us/medicine/professional-master-degree/master-human-microbiota

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01

Introduction

In recent years, there have been important advances in human microbiota, placing great importance on the set of microorganisms that allow the correct development of an individual, even from the moment of pregnancy. The population is also becoming increasingly aware of its impact on their health. In this scenario, the medical professional must be aware of the most recent progress in order to apply it in their practices, but also to adequately convey the information to patients. This 100% online program offers students up-to-date information in this area with the support of a highly qualified teaching team.



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This Professional Master's Degree will contribute to gaining the up-to-date knowledge you are looking for in a field that has made great scientific progress in recent years"

The creation of individualized diets according to the intestinal microbiota of each person, the nutritional adaptation of pregnant women in favor of the microbiota of their babies and the approach to patients with diabetes or Parkinson's disease are just some of the scientific studies that have achieved important advances in this area. This research has given a boost to this specialty and requires medical professionals to constantly update their knowledge.

This Professional Master's Degree provides professionals with the opportunity to update their knowledge in this area with the help of a team of professionals specialized in this field and with extensive experience in the field of research and patient management based on their microbiota. A program, taught exclusively online, that will allow you to delve into the factors that influence the balance and imbalance of the microbiota, the intestinal and oral microbiota, as well as its relationship with the newborn, the immune system and the application of prebiotics and probiotics in medical specialties such as Urology, Gynecology, Gastroenterology and Immunology. All this, with a library of multimedia resources that can be accessed 24 hours a day from an electronic device.

TECH offers an excellent opportunity to all medical professionals who wish to update their knowledge with a flexible university education. To study this program, all you need is a computer, tablet or cell phone with an internet connection to access the virtual platform, where the syllabus of this program is hosted. This content is also available, in its entirety, from the beginning of this Professional Master's Degree. This will allow you to distribute the workload according to your needs and to combine your work and/or personal responsibilities with an education that is at the forefront of academic education.

This **Professional Master's Degree in Human Microbiota** 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
- ◆ The graphic, schematic, and practical contents with which they are created provide scientific and practical information on the disciplines that are essential for professional practice
- ◆ New diagnostic-therapeutic developments on evaluation, diagnosis, and intervention in problems or disorders related to Human Microbiota
- ◆ Practical exercises where the self-evaluation process 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 available from any fixed or portable device with an Internet connection



A university program with a theoretical-practical approach that will take you through the most recent studies on the benefits of maintaining a correct microbiota"

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A program with which you can delve into the approach to the different intestinal infections caused by viruses, bacteria, parasites and fungi modulating the altered intestinal microbiota"

The program's teaching staff includes professionals from the sector who contribute the experience of their work to this program, as well as renowned specialists from reference 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 learning programmed to train in real situations.

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

An academic option designed for professionals seeking to recycle their knowledge in the field of microbiota with the support of an outstanding teaching team.

Reduce the long hours of study thanks to the Relearning system used by TECH in all its university programs.



02 Objectives

At the end of the 12 months of this program, the medical professional will have acquired an in-depth knowledge of the most recent advances in the field of Human Microbiota, allowing them to recycle their knowledge in this field. A renewal that will be possible thanks to the teaching team that makes up this program and that will accompany you throughout this Professional Master's Degree so that you can achieve your goals with agility and simplicity.





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TECH provides you with a quality and flexible education, so that you can combine it with your professional responsibilities"



General Objectives

- ♦ Offer a complete and broad 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 the backing of scientific evidence how the microbiota is in a privileged position based on its interaction with many non-digestive pathologies, those of autoimmune nature or its relationship with immune system dysregulation, disease prevention and as a support to other medical treatments
- ♦ 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 continued specialization and research



Specific Objectives

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: SIBO, irritable bowel syndrome (IBS), Crohn's disease... etc. 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

- ♦ Gain in-depth knowledge of the most influential factors of the intestinal microbiota of the mother, both in childbirth and in the gestation period itself
- ♦ Know 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 positioned 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 the 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 the microbiota

Module 7. Skin Microbiota

- ♦ Studies factors that regulate the type of bacterial flora in the skin
- ♦ Know the methods for approaching 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
- ♦ Gain in-depth knowledge of how to use 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
- ♦ Gain in-depth knowledge of the changes in the microbiota in patients with food exclusion diets such as gluten

Module 10. Probiotics, Prebiotics, Microbiota, and Health

- ♦ Have a 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
- ♦ Analyze the different clinical applications of probiotics and prebiotics in areas such as urology, gynecology, gastroenterology and immunology



You will get a deeper insight into the changes in the microbiota of patients on certain diets in a much more dynamic way thanks to the multimedia content"

03 Skills

This Professional Master's Degree offers students the opportunity to update their skills in the field of Human Microbiota. This will be possible thanks to the syllabus of this program, in which students will find an exhaustive content with a theoretical-practical approach that will allow them to be aware of the factors that influence the alteration of the equilibrium of the human ecosystem and the diseases derived from it. Case study simulations will be very useful in the advancement of the professional's skills in this area.





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The case studies provided by the specialists who teach this program will be of great use to you in achieving your goals of updating your knowledge”



General Skills

- ◆ 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
- ◆ Know how to apply acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the 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
- ◆ Know how to communicate conclusions, knowledge, and supporting arguments 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



OTICS



Specific Skills

- ♦ Give a global vision of 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
- ♦ Ensure that the physiotherapist understands how there are many factors that can alter the balance of the human ecosystem, leading to a state of illness
- ♦ Know which factors can help maintain the balance of this ecosystem to maintain a good state of health
- ♦ Update and expand the knowledge of students with special education and interest in probiotic therapy, prebiotic therapy and the latest advances in this field, such as fecal transplantation. Focus on the current situation and future development paths of these as the main tools we have to optimize the functions of the microbiota and its future projection



Update your knowledge on probiotic therapy and prebiotic therapy with this university program"

04

Course Management

TECH remains committed to offering its students quality education that is accessible to all. To ensure this, it meticulously selects the management and teaching staff that make up its degree programs. Thus, in this 100% online program, the medical professional will have the support of a highly qualified and experienced faculty in the field of Human Microbiota. Teachers who will accompany you throughout the course of this Professional Master's Degree and who will answer any questions you may have about the syllabus.





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TECH rigorously selects all the teachers who teach its programs. This time you have a specialized and renowned faculty from the field of Human Microbiota"

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

- 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



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

Guest Directors



Ms. 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

Direction



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)
- Postgraduate Diploma in Nutrition, Dietetics, and Diet Therapy
- Postgraduate Diploma in Microbiological Analysis of Foodstuffs
- 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 the Pharmacy and Parapharmacy Office
- 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. 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. López Vázquez, Antonio

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

05

Structure and Content

The Relearning system, which TECH uses in all its programs, will allow the medical professional to advance through the 1,500 teaching hours in a much more natural way through the syllabus that makes up this course. A syllabus consisting of 10 modules in which you will delve into the field of Human Microbiota with a theoretical and practical approach. Video summaries of each topic, in-depth videos, case studies and specialized readings are part of the multimedia resources to which you will have access, and which will update your knowledge on the microbiome, metagenomics, gut microbiota, as well as the different diseases associated with them and the most recent clinical applications of probiotics.



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A syllabus that allows you to stay abreast of the most recent studies on microbiota, microbiome and metagenomics"

Module 1. Microbiota. Microbiome. Metagenomics

- 1.1. Definition and Relationship Between Them
- 1.2. Composition of the Microbiota: Types, 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. Gut-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"
 - 3.6.2. Composition of the Intestinal Microbiota in Adulthood. "Stable Period"
 - 3.6.3. 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. Pathology: Functional Digestive Disorders, Diarrhea, Necrotizing Enterocolitis. Intolerances
 - 4.4.2. Pathology: 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. Oral Ecosystems and Structure
 - 5.1.1. Main Ecosystems that are Found in the Oral Cavity. 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: Microbial Immigration, Microbial Elimination and Reproduction Rates
 - 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 that Intervene 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 and their 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
- 6.11. Microbiota, Immunity, and Nervous System Disorders: Anxiety, Depression, Autism, Schizophrenia, or Alzheimer's Disease
- 6.12. The Gut-Microbiota-Brain Axis
- 6.13. Current Lines of Research

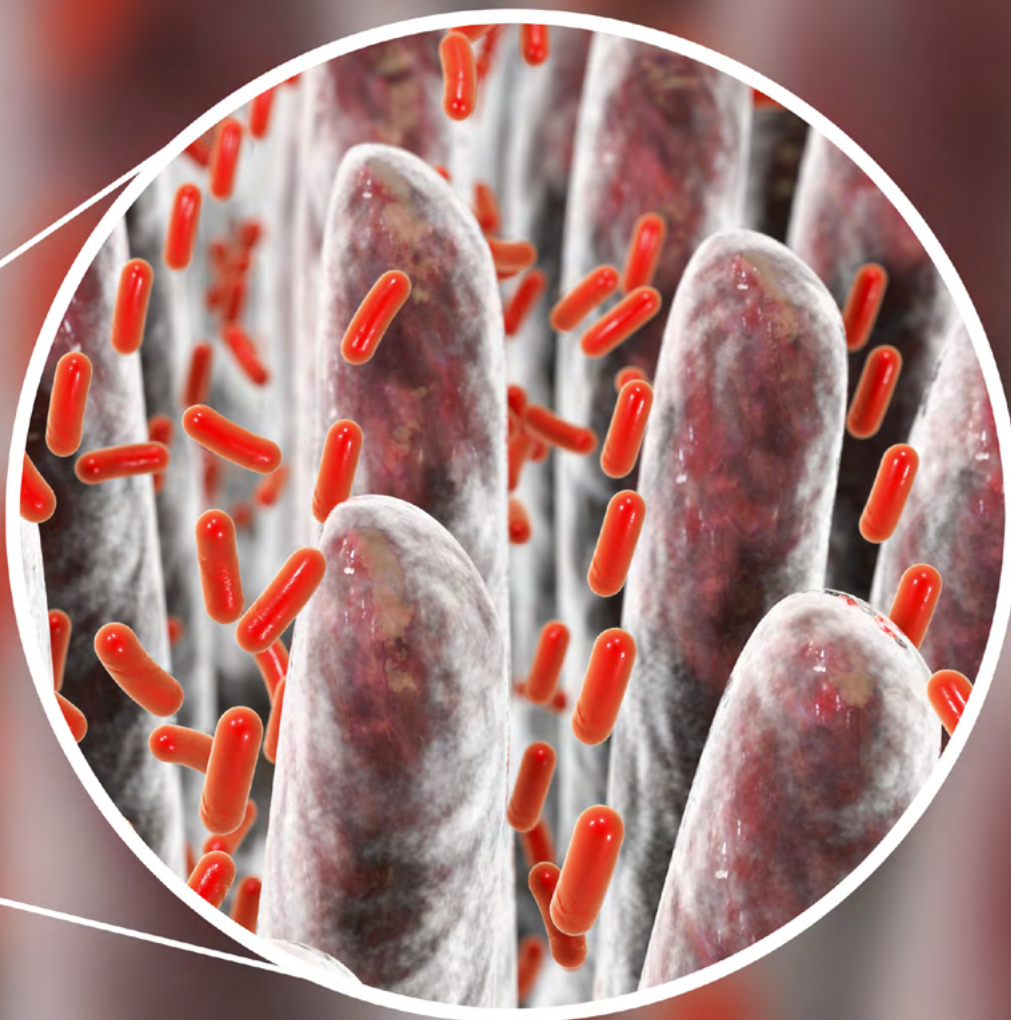
Module 7. Skin Microbiota

- 7.1. Skin Physiology
 - 7.1.1. Structure of the Skin: 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 Skin Immune System: Cytokines, 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 Males
 - 8.1.2. In Females
- 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. Relationship between Intolerances/Allergies and Microbiota

- 9.1. Changes in Patients on Food Exclusion Diets
 - 9.1.1. Eosinophilic Esophagitis (EoE)
- 9.2. Microbiota Changes in Patients on Food Exclusion Diets: Lactose 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 Celiac Patients
- 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, Pulmonology, 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 Patients. Cancer
- 10.11. Dairy Products as a Natural Source of Probiotics and Prebiotics. Fermented Milk

06

Methodology

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

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



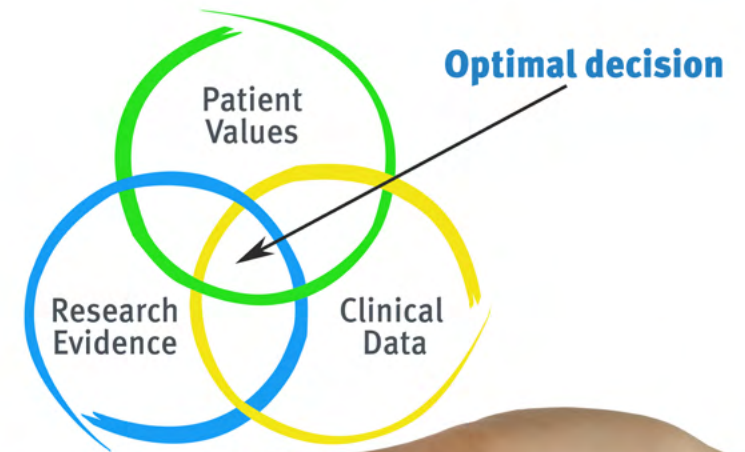
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Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

At TECH we use the Case Method

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

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



According to Dr. Gervas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions in the physician'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. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.



Relearning Methodology

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

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

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



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

With this methodology, more than 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

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

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

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



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



Study Material

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

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



Surgical Techniques and Procedures on Video

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



Interactive Summaries

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

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



Additional Reading

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





Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



Testing & Retesting

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



Classes

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



Quick Action Guides

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



07 Certificate

The Professional Master's Degree in Human Microbiota guarantees you, in addition to the most rigorous and updated education, access to a Professional Master's Degree issued by TECH Global University.





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

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

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

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

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

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

- » 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