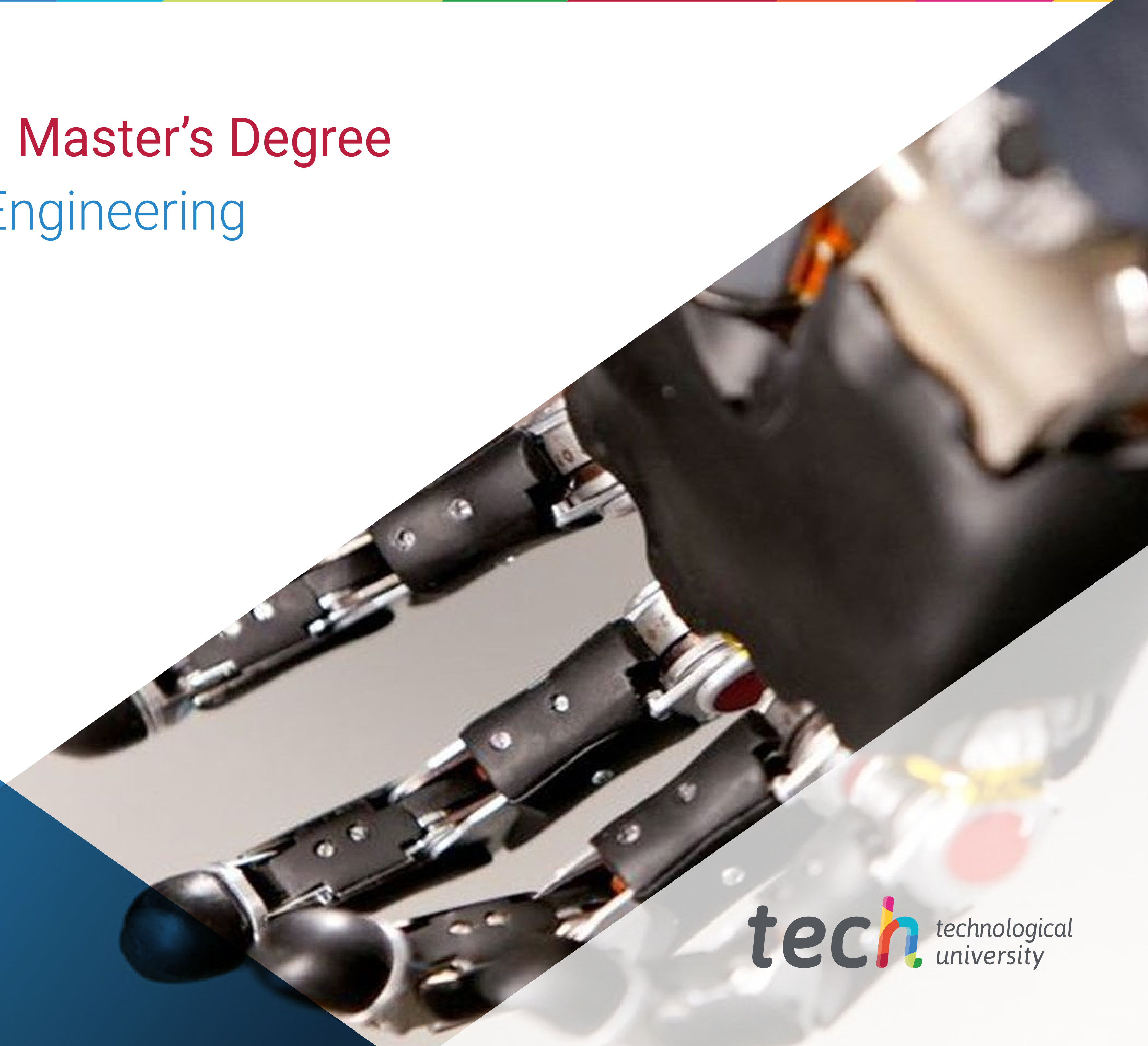
Professional Master's Degree
Biomedical Engineering



tech technological university

Professional Master's Degree
Biomedical Engineering

Course Modality: **Online**
Duration: **12 months**
Certificate: **TECH Technological University**
Official Nº of hours: **1,500 h.**
Website: **www.techtitute.com/us/medicine/professional-master-degree/master-biomedical-engineering**

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01

Introduction

This program has the most recent advances in the field of biomedical engineering, which has undergone numerous innovations in recent years. This field, which has an increasing number of healthcare applications, is extremely complex and rapidly evolving, requiring the physician to keep up to date. This program offers such an update, since it will delve into issues such as biomaterials for tissue engineering, stem cells, the analysis of different biomedical signals or the analysis of medical data using the R programming language, among many others. All this, following an innovative online teaching methodology that allows the specialist to combine their professional life with their studies.

Access the latest developments in this field thanks to this update program and learn more about the use of software for biomedical signal processing"

The integration of new technological tools in the biomedical field has led to rapid progress in this discipline. For this reason, in recent years, biomedical engineering has emerged as one of the most cutting-edge fields of healthcare, as it incorporates the most promising scientific advances to respond to a whole series of current medical challenges. Therefore, the specialist needs access to an up-to-date program such as this one to keep abreast of the latest developments in this field.

This Professional Master's Degree in Biomedical Engineering delves into innovations and in areas such as biodevices and biosensors, fluid mechanics within the field of biomechanics, nanoparticles, metallic biomaterials, computed tomography, the application of artificial intelligence through the field of artificial vision to the medical field or the use of databases, among many others.

All this, following a 100% online learning methodology that allows the professional to choose the time and place to study, since it adapts to their personal circumstances. In addition, a high-level teaching staff specialized in biomedical engineering will guide the physician using numerous multimedia teaching resources such as video procedures and techniques, analysis of clinical cases, theoretical and practical exercises, interactive summaries and master classes.

This **Professional Master's Degree in Biomedical Engineering** contains the most complete and up-to-date scientific program on the market. Its most notable features are:

- Case studies presented by experts in Biomedical Engineering
- 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
- Practical exercises where the self-assessment process can be carried out to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection

Delve into the latest advances in nanoparticles thanks to this innovative online teaching methodology, which allows you to decide when and where to study"

This program will provide you with an expert and highly experienced teaching staff, and numerous multimedia teaching resources with which you can quickly update your knowledge"

With this Professional Master's Degree, you will be able to incorporate the latest techniques in biomedical engineering into your professional practice.

Get up to date with the latest scientific evidence on issues such as bio-devices or biomedical signals.

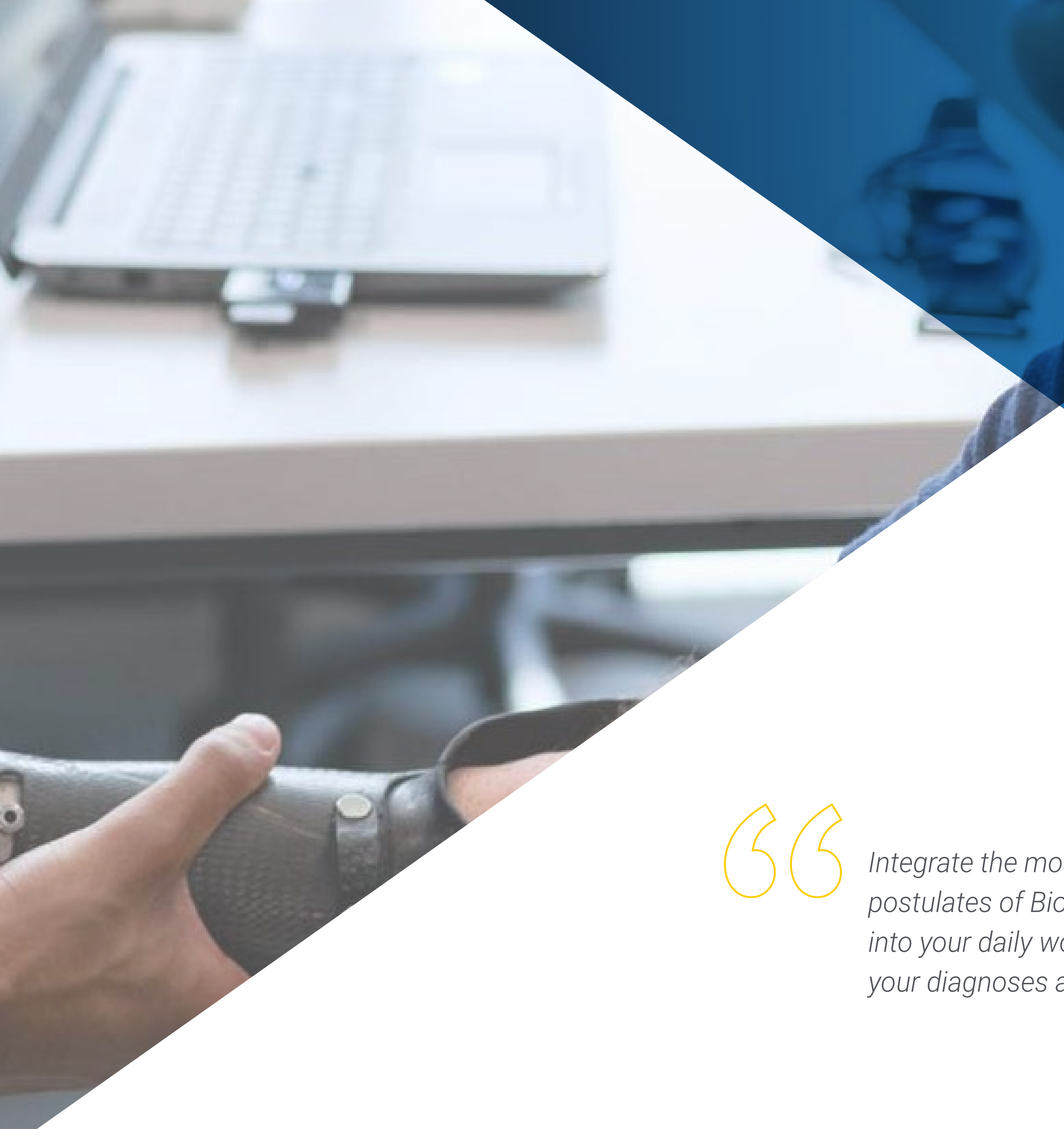
The program's teaching staff includes professionals from the sector who contribute their work experience to this program, as well as renowned specialists from leading societies and prestigious universities.

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

02
Objectives

The main objective of this Professional Master's Degree in Biomedical Engineering is to offer physicians the latest innovations in this discipline, so that they can incorporate them into their professional practice and update their knowledge. This is a very complex field and undergoes continuous transformations, so it requires, on the part of the specialist, an update and this program offers it. Therefore, upon completion, the physician will be in possession of the most advanced techniques in this booming field.



Integrate the most innovative scientific postulates of Biomedical Engineering into your daily work and use them in your diagnoses and treatments"

General Objectives

- Examine the different tissues and organs directly related to tissue engineering
- Analyze tissue balance and the role of the matrix, growth factors and the cells themselves in the tissue microenvironment
- Develop the basis of tissue engineering
- Analyze the relevance of biomaterials today
- Develop a specialized view of the types of biomaterials available and their main characteristics
- Generate specialized knowledge on cell biology and the interaction between biomaterials and tissues
- Generate specialized knowledge on the main types of biomedical signals and their uses
- Develop the physical and mathematical knowledge underlying biomedical signals
- Fundamentals of the principles governing signal analysis and processing systems
- Analyze the main applications, trends and lines of research and development in the field of biomedical signals
- Develop expertise in classical mechanics and fluid mechanics
- Analyze the general functioning of the motor system and its biological mechanisms
- In-depth study of biofluidics and transport systems
- Addressing real case studies
- Develop models and techniques for the design and prototyping of interfaces, based on design methodologies and their evaluation

- Provide the student with critical skills and tools for interface assessment
- Fundamentals of design theory principles and their application to the biomedical field
- Determine the needs and differences of UX/UI design in the healthcare context
- Explore the interfaces used in pioneering technology in the biomedical sector
- Analyze the fundamentals of medical imaging acquisition, inferring its social impact
- Develop specialized knowledge about the operation of the different imaging techniques, understanding the physics behind each modality
- Identify the usefulness of each method in relation to its characteristic clinical applications
- Research post-processing and management of acquired images
- Use and design biomedical information management systems
- Analyze current digital health applications and design biomedical applications in a hospital setting or clinical center
- Examining the variety and use of biodevices
- Analyze the different data and database systems
- Determine the importance of data in health
- Develop the fundamentals of data analysis

Specific Objectives

Module 1. Tissue Engineering
- Generate specialized knowledge on histology and functioning of the cellular environment
- Review the current status of tissue engineering and regenerative medicine
- Address the main challenges facing tissue engineering
- Present the most promising techniques and the future of tissue engineering
- Develop the main trends of the future of regenerative medicine
- Examine the interaction of biomaterials with the cellular environment and the complexity of this process

Module 2. Biomaterials in Biomedical Engineering
- Analyze biomaterials and their evolution throughout history
- Examining traditional biomaterials and their uses
- Determine the biomaterials of biological origin and their applications
- Deepen the knowledge of polymeric biomaterials of synthetic origin
- Determine the behavior of biomaterials in the human body, with special emphasis on their degradation

Module 3. Biomedical Signals
- Distinguish the different types of biomedical signals
- Determine how biomedical signals are acquired, interpreted, analyzed and processed
- Analyze the clinical applicability of biomedical signals through practical case studies
- Apply mathematical and physical knowledge to analyze signals
- Examine the most common signal filtering techniques and how to apply them
- Develop fundamental engineering knowledge of signals and systems
- Understand the operation of a biomedical signal processing system.
- Identify the main components of a digital signal processing system

Module 4. Biomechanics
- Generate specialized knowledge on the concept of biomechanics
- Examine the different types of movements and the forces involved in them
- Understanding the functioning of the circulatory system
- Develop biomechanical analysis methods
- Analyze muscle positions to understand their effect on resultant forces
- Evaluate common problems related to biomechanics
- Identify the main lines of action of biomechanics

Module 5. Medical Bioinformatics

- Develop a reference framework for medical bioinformatics
- Examine computer hardware and software required in medical bioinformatics
- Generate specialized knowledge on data mining techniques in Bioinformatics
- Analyze artificial intelligence and Big Data techniques in medical bioinformatics
- Establish the applications of bioinformatics for prevention, diagnosis and clinical therapies
- Deepen in the methodology and medical bioinformatics workflow
- Assess the factors associated with sustainable bioinformatics applications and future trends

Module 6. Human-Machine Interface Applied to Biomedical Engineering

- Develop the concept of human-machine interaction
- Analyze interface typologies and their adaptation to each context
- Identify the human and technological factors involved in the interaction process
- Examine design theory and its application to interface design
- Deepen UX/UI tools in the design process
- Establish methods for evaluating and validating interfaces
- Training in the use of user-centered methodology and Design Thinking methodology
- Further study of new technologies and interfaces in the biomedical sector
- Address the importance of user perception in the in-hospital context
- Develop critical interface design skills

Module 7. Biomedical Images

- Develop specialized knowledge about medical imaging as well as the DICOM standard
- Analyze the radiological technique for medical imaging, clinical applications and aspects influencing the outcome
- Examine the technique of magnetic resonance imaging for medical imaging, clinical applications, and aspects influencing outcome
- Analyze the radiological technique for medical imaging, clinical applications and aspects influencing the outcome
- Evaluate the effect of noise on clinical images as well as different image processing methods
- Present and analyze image segmentation technologies and explain their usefulness
- Gain a deeper understanding of the direct relationship between surgical interventions and imaging techniques

Module 8. Digital Health Applications in Biomedical Engineering

- Analyze the referential framework of digital health applications
- Examine medical image storage and transmission systems
- Evaluate relational database management for digital health applications
- Establish the operation of digital health applications based on web development
- Develop web applications in a hospital or clinical center environment and telemedicine applications
- Analyze applications with the Internet of Medical Things, IoMT and digital health applications with artificial intelligence techniques

Module 9. Biomedical Technologies: Biodevices and Biosensors

- Generate specialized knowledge in the conception, design, implementation and operation of medical devices through the technologies used in this field
- Determine the main technologies for rapid prototyping
- Discover the main fields of application: diagnostic, therapeutic and support.
- Establish the different types of biosensors and their use for each diagnostic case
- Deepen the understanding of the physical/electrochemical functioning of the different types of biosensors
- Examine the importance of biosensors in modern medicine

Module 10. Biomedical and Healthcare Databases

- Data Structure
- Analyze Relational Systems
- Develop conceptual data modeling
- Designing and standardizing a relational database
- Examine functional dependencies between data
- Generate specialized knowledge on big data
- Deepen the ODMS architecture
- Learn about data integration in medical record systems
- Analyze the bases and restrictions

Achieve your goal of staying completely up to date with this innovative program"

03
Skills

This Professional Master's Degree in Biomedical Engineering develops a series of professional skills that are totally focused on medical practice and that are up to date with the latest scientific and technological discoveries. Therefore, the specialist who completes this program will have been able to incorporate the latest postulates into their daily work, so that they can make diagnoses and apply treatments following the latest innovations in Biomedical Engineering.

The latest techniques in artificial vision applied to biomedical engineering will be at your disposal in this program"

General Skills

- Generate a global vision of the main techniques and therapies included in the field of tissue engineering and regenerative medicine
- Examine the various applications of biomaterials
- Establish the basis for obtaining, synthesizing or producing biomaterials
- Deepen the analysis and processing of biomedical signals
- Utilize computer hardware and software tools for genomic analysis
- Analyze programming languages used for DNA sequence analysis
- Apply the concepts of artificial intelligence and big data for use in prevention, diagnosis and medical therapy
- Make use of the workflows that bioinformaticians have in their research and professional fields
- Identify human and technological factors related to interactive system interfaces
- Make use of the different technologies involved in digital health application projects
- Analyze the types of biosensors and their applications
- Build a hospital database
- Establishing how clinical needs are translated into data
- Discover the uses and potential of medical nanotechnology

Specific Skills

- Integrate the key concepts of tissue engineering and how they are used in different therapies
- Detail the characteristics, synthesis and uses of hydrogels
- Explore advanced biomaterials, both with the use of smart biomaterials and nanomaterials
- Develop specific applications of biomaterials, particularly those for neuroengineering and biomedical machines
- Develop a basic software-based biomedical signal processing system
- Determine the use of the statistical programming language R and the use of the multipurpose programming language Python
- Analyze the performance of human genetic sequence analysis methods
- Analyze Ultrasound technique for medical imaging, clinical applications and aspects influencing the outcome
- Develop the technique of Computed tomography imaging for medical imaging, clinical applications, and aspects influencing outcome
- Develop the different applications of machine learning and deep learning in pattern recognition in medical images, thus furthering innovation in the sector
- Determine the main uses of digital health applications with big data and the factors associated with sustainable digital health projects and future trends
- Analyze microfabrication and nanofabrication techniques, develop the lab-on-a-chip concept and its impact

04

Course Management

The faculty of this Professional Master's Degree in Biomedical Engineering is made up of professionals and researchers in this area who are up to date with the most recent technological and scientific innovations. Accordingly, the physician who enrolls in this program will be able to use them to incorporate the most advanced techniques in diagnosis and treatment in different health fields into his or her daily practice.

An expert and experienced faculty will guide you throughout the learning process"

Management

Mr. Ruiz Díez, Carlos

- Researcher at the National Microelectronics Center of the CSIC.
- Researcher. Composting Research Group of the Department of Chemical, Biological and Environmental Engineering of the UAB.
- Founder and product development at NoTime Ecobrand, a fashion and recycling brand.
- Development cooperation project manager for the NGO Future Child Africa in Zimbabwe.
- Graduate in Industrial Technologies Engineering from Universidad Pontificia de Comillas ICAI.
- Master's Degree in Biological and Environmental Engineering from the Autonomous University of Barcelona.
- Master's Degree in Environmental Management from the Universidad Española a Distancia (Spanish Open University)

Professors

Ms. Vivas Hernando, Alicia

- Supply Chain and Network Optimization Analyst. Deloitte UK (Londres, Reino Unido)
- Researcher. École Polytechnique Fédérale de Lausanne (Lausanne, Switzerland).
- Researcher. Universidad Pontificia Comillas (Madrid, Spain).
- Corporate and International Development. Seguros Santalucía (Madrid, Spain).
- Degree in Industrial Technologies Engineering (Mechanical Specialty) Universidad Pontificia Comillas (Madrid, Spain).
- Professional Master's Degree in Industrial Engineering (Specialty Design). Pontificia Comillas University (Madrid, Spain).
- Master's Degree in Materials Science and Engineering (Academic Exchange). École Polytechnique Fédérale de Lausanne (Lausanne, Switzerland).

Mr. Rubio Rey, Javier

- Research Trainee in the *Parkinson's disease* project: *Investigating the cofilin-1 and alpha-synuclein protein interaction* under the direction of Dr. Richard Parsons at Kings College London
- Degree in Pharmacy from CEU San Pablo University.
- Degree in Biotechnology from CEU San Pablo University.
- Double Degree in Pharmacy and Biotechnology.

Mr. Rodríguez Arjona, Antonio

- Project Manager, Technical Manager and Expert in Regulation of Medical Devices in Omologic, Homologation and CE Marking
- Development of the Smart Stent project in collaboration with the TIC-178 research group of the University of Seville
- Technical Engineer in the Logistics Department at Docriluc, S.L.
- Digitization Manager at Ear Protech, the in-ear experience
- Computer Technician at the Maria Zambrano Associated Center of the National University of Distance Education
- Graduate in Health Engineering with mention in Biomedical Engineering from the University of Malaga.
- Master's Degree in Biomedical Engineering and Digital Health, University of Seville

Mr. Somolinos Simón, Francisco Javier

- Biomedical Engineering Researcher at the Bioengineering and Telemedicine Group of the Polytechnic University of Madrid
- Graduate in Biomedical Engineering from the Polytechnic University of Madrid.
- Master's Degree in Management and Development of Biomedical Technologies from Carlos III University of Madrid
- PhD in Biomedical Engineering

Ms. Sirera Pérez, Ángela

- Degree in Biomedical Engineering from the University of Navarra
- Technaid. Design and manufacture of specific parts for 3D printing.
- Use of Inventor CAD Design Software. Knowledge of the mechanics of lower limb exoskeletons for the rehabilitation of persons with reduced mobility.
- Nuclear Medicine. Clinical University of Navarra. Analysis of Nuclear Medicine images. Dose assessment of patients with PET brain studies. Research on the optimization of methionine activity.

Dr. Baselga Lahoz, Marta

- Design Engineer (UX/UI) in the web development and graphic design sector (Madrid, Spain).
- R&D Engineer and Technical Engineer in the automotive sector.
- Graduated in Industrial Design Engineering and Product Development from the University of Zaragoza (Zaragoza, Spain).
- Professional Master's Degree in Biomedical Engineering from the International University of Valencia (Valencia, Spain).
- Professional Master's Degree in Design and Management of Technological Projects from the International University of La Rioja (La Rioja, Spain).
- D. candidate in Biomedical Engineering at the University of Zaragoza (Zaragoza, Spain).
- Doctor of Medicine, University of Zaragoza (Zaragoza, Spain).
- Postgraduate Diploma in Diagnostic Techniques in Health Sciences, Universidad San Jorge (Zaragoza, Spain).

Ms. Ruiz Díez, Sara

- Member of the Neural Rehabilitation Group, Instituto Cajal del CSIC.
- Responsible for illustrations for short treatise on angiology and vascular surgery, by Dr. Ruiz Grande
- Degree in Biomedical Engineering from the Polytechnic University of Madrid.
- Specialty in Biomaterials, Biomechanics and Medical Devices.

Ms. Travesí Bugallo, Blanca

- U4Impact University Coordinator.
- Marketing at GIANT Health Event
- Degree in Biomedical Engineering from the Polytechnic University of Madrid.
- Master's Degree in Biomedical Engineering from the Polytechnic University of Madrid.
- Master's Degree in Health Technology Innovation by Sorbonne Université.
- Coordinator of the Bioengineering course at the Technological Campus of ICAI.

Dr. Vásquez Cevallos, Leonel

- Knowledge transfer and management manager. Officegolden.
- Telemedicine Cayapas Research Project Manager.
- Advisor in the preventive and corrective maintenance and sale of medical equipment and software. Training received in maintenance of medical imaging equipment. Seu, South Korea.
- PhD's Degree in Biomedical Engineering from the Polytechnic University of Madrid.
- Master's Degree in Telemedicine and of Bioengineering from the Polytechnic University of Madrid.
- Engineer and Graduate in Electronics and Telecommunications from the ESPOL University. Academic Training in Ecuador
- Teachers at Polytechnic University of Madrid.
- Teacher at Escuela Superior Politécnica del Litoral. Equator
- Lecturer at the University of Guayaquil.
- Lecturer at Technological University of Business in Guayaquil.

A path to achieve training and professional growth that will propel you towards a greater level of competitiveness in the employment market".

05

Structure and Content

This Professional Master's Degree in Biomedical Engineering is made up of 10 specialized modules in which the physician will be able to delve into the latest developments in stem cells, bionanomaterials, the different types of biomedical signals and the software to collect, measure and analyze them, the R programming language to perform statistical analysis of the data collected or nuclear medicine, among others.

The most complete and up-to-date content in Biomedical Engineering is here"

Module 1. Tissue Engineering

1.1. Histology
- 1.1.1 Cellular Organization in Higher Structures: Tissues and Organs
- 1.1.2 Cell Cycle: Tissue Regeneration
- 1.1.3 Regulation: Interaction with the Extracellular Matrix
- 1.1.4 Importance of Histology in Tissue Engineering

1.2. Tissue Engineering
- 1.2.1 Tissue Engineering
- 1.2.2 Scaffolding
  - 1.2.2.1. Properties
  - 1.2.2.2. The Ideal Scaffolding
- 1.2.3 Biomaterials for Tissue Engineering
- 1.2.4 Bioactive Materials
- 1.2.5 Cells

1.3. Stem Cells
- 1.3.1 Stem Cells
  - 1.3.1.1. Potentiality
  - 1.3.1.2. Tests to Evaluate Potentiality
- 1.3.2 Regulation: Niche
- 1.3.3 Types of Stem Cells
  - 1.3.3.1. Embryonic
  - 1.3.3.2. IPS
  - 1.3.3.3. Adult Stem Cells

1.4. Nanoparticles
- 1.4.1 Nanomedicine: Nanoparticles
- 1.4.2 Types of Nanoparticles
- 1.4.3 Methods of Obtaining
- 1.4.4 Bionanomaterials in Tissue Engineering

1.5. Gene Therapy
- 1.5.1 Gene Therapy
- 1.5.2 Uses: Gene Supplementation, Cell Replacement, Cellular Reprogramming
- 1.5.3 Vectors for the Introduction of Genetic Material
  - 1.5.3.1. Viral Vectors

1.6. Biomedical Applications of Tissue Engineering Products: Regeneration, Grafts and Replacements
- 1.6.1 Cell Sheet Engineering
- 1.6.2 Cartilage Regeneration: Joint Repair
- 1.6.3 Corneal Regeneration
- 1.6.4 Skin Grafting for Major Burn Injuries
- 1.6.5 Oncology
- 1.6.6 Bone Replacement

1.7. Biomedical Applications of Tissue Engineering Products: Circulatory, Respiratory and Reproductive System
- 1.7.1 Cardiac Tissue Engineering
- 1.7.2 Hepatic Tissue Engineering
- 1.7.3 Lung Tissue Engineering
- 1.7.4 Reproductive Organs and Tissue Engineering

1.8. Quality Control and Biosecurity
- 1.8.1 NCF Applied to Advanced Therapy Drugs
- 1.8.2 Quality Control
- 1.8.3 Aseptic Processing: Viral and Microbiological Safety
- 1.8.4 Cell Production Unit: Characteristics and Design

1.9. BORRAR
- 1.9.1 Current Legislation
- 1.9.2 Authorization
- 1.9.3 Regulation of Advanced Therapies

1.10. Future Perspectives
- 1.10.1 Current Status of Tissue Engineering
- 1.10.2 Clinical Needs
- 1.10.3 Main Challenges at Present
- 1.10.4 Focus and Future Challenges

Module 2. Biomaterials in Biomedical Engineering

2.1. Biomaterials
- 2.1.1 Biomaterials
- 2.1.2 Types of Biomaterials and Application
- 2.1.3 Biomaterial Selection

2.2. Metallic Biomaterials
- 2.2.2 Types of Metallic Biomaterials
- 2.2.2 Properties and Current Challenges
- 2.2.3 Applications

2.3. Ceramic Biomaterials
- 2.3.1 Types of Ceramic Biomaterials
- 2.3.2 Properties and Current Challenges
- 2.3.3 Applications

2.4. Natural Polymeric Biomaterials
- 2.4.1 Cell–Environment Interaction
- 2.4.2 Types of Biomaterials of Biological Origin
- 2.4.3 Applications

2.5. Synthetic Polymeric Biomaterials: In Vivo Behavior
- 2.5.1 Biological Response to Foreign Bodies (FBR)
- 2.5.2 In Vivo Behavior of Biomaterials
- 2.5.3 Biodegradation of Polymers: Hydrolysis
  - 2.5.3.1. Biodegradation Mechanisms
  - 2.5.3.2. Degradation by Diffusion and Erosion
  - 2.5.3.3. Hydrolysis Rate
- 2.5.4 Specific Applications

2.6. Synthetic Polymeric Biomaterials: Hydrogels
- 2.6.1 Hydrogels
- 2.6.2 Classification of Hydrogels
- 2.6.3 Hydrogel Properties
- 2.6.4 Hydrogel Synthesis
  - 2.6.4.1. Physical Cross-Linking
  - 2.6.4.2. Enzymatic Cross-Linking
  - 2.6.4.3. Physical Cross-Linking
- 2.6.5 Structure and Swelling of Hydrogels
- 2.6.6 Specific Applications

2.7. Advanced Biomaterials: Intelligent Materials
- 2.7.1 Shape Memory Materials
- 2.7.2 Intelligent Hydrogels
  - 2.7.2.1. Thermo-Responsive Hydrogels
  - 2.7.2.2. pH Sensitive Hydrogels
  - 2.7.2.3. Electrically Actuated Hydrogels
- 2.7.3 Electroactive Materials

2.8. Advanced Biomaterials: Nanomaterials
- 2.8.1 Properties
- 2.8.2 Biomedical Applications
  - 2.8.2.1. Biomedical Images
  - 2.8.2.2. Coatings
  - 2.8.2.3. Focused Ligands
  - 2.8.2.4. Stimulus-Sensitive Connections
  - 2.8.2.5. Bio Markers

2.9. Specific Applications: Neuroengineering
- 2.9.1 The Nervous System
- 2.9.2 New Approaches to Standard Biomaterials
  - 2.9.2.1. Soft Biomaterials
  - 2.9.2.2. Bioabsorbable Materials
  - 2.9.2.3. Implantable Materials
- 2.9.3 Emerging Biomaterials: Tissue Interaction

2.10. Specific Applications: Biomedical Micromachines
- 2.10.1 Artificial Micronadators
- 2.10.2 Contractile Microactuators
- 2.10.3 Small Scale Manipulation
- 2.10.4 Biological Machines

Module 3. Biomedical Signals

3.1. Biomedical Signals
- 3.1.1 Origin of Biomedical Signals
- 3.1.2 Biomedical Signals
  - 3.1.2.1. Amplitude
  - 3.1.2.2. Period
  - 3.1.2.3. Frequency (F)
  - 3.1.2.4. Wavelength
  - 3.1.2.5. Phase
- 3.1.3 Classification and Examples of Biomedical Signals

3.2. Types of Biomedical Signals: Electrocardiography, Electroencephalography and Magnetoencephalography
- 3.2.1 Electrocardiography (ECG)
- 3.2.2 Electroencephalography (EEG)
- 3.2.3 Magnetoencephalography (MEG)

3.3. Types of Biomedical Signals: Electroneurography and Electromyography
- 3.3.1 Electroneurography (ENG)
- 3.3.2 Electromyography (EMG)
- 3.3.3 Event-Related Potentials (ERPs)
- 3.3.4 Other Types

3.4. Signals and Systems
- 3.4.1 Signals and Systems
- 3.4.2 Continuous and Discrete Signals: Analog vs. Digital
- 3.4.3 Systems in the Time Domain
- 3.4.4 Systems in Frequency Domain: Spectral Method

3.5. Fundamentals of Signals and Systems
- 3.5.1 Sampling: Nyquist
- 3.5.2 The Fourier Transform: Discrete Fourier Transform (DFT)

3.5.3 Stochastic Processes
- 3.5.3.1. Deterministic vs. Random Signals
- 3.5.3.2. Types of Stochastic Processes
- 3.5.3.3. Stationarity
- 3.5.3.4. Ergodicity
- 3.5.3.5. Relationships Between Signals

3.5.4 Power Spectral Density

3.6. Processing of Biomedical Signals
- 3.6.1 Processing of Signals
- 3.6.2 Objectives and Processing Steps
- 3.6.3 Key Elements of a Digital Processing System
- 3.6.4 Applications: Trends

3.7. Filtering: Removal of Artifacts
- 3.7.1 Motivation: Types of Filtering
- 3.7.2 Time Domain Filtering
- 3.7.3 Frequency Domain Filtering
- 3.7.4 Applications and Examples

3.8. Time-Frequency Analysis
- 3.8.1 Motivation
- 3.8.2 Time-Frequency Plane
- 3.8.3 Short-Time Fourier Transform (STFT)
- 3.8.4 Wavelet Transform
- 3.8.5 Applications and Examples

3.9. Event Detection
- 3.9.1 Case Study I: ECG
- 3.9.2 Case Study II: EEG
- 3.9.3 Evaluation of Detection

3.10. Software for Biomedical Signal Processing
- 3.10.1 Applications, Environments and Programming Languages
- 3.10.2 Libraries and Tools
- 3.10.3 Practical Application: Basic Biomedical Signal Processing System

Module 4. Biomechanics

4.1. Biomechanics
- 4.1.1 Biomechanics
- 4.1.2 Qualitative and Quantitative Analysis

4.2. Basic Mechanics
- 4.2.1 Functional Mechanisms
- 4.2.2 Basic Units
- 4.2.3 The Nine Fundamentals of Biomechanics

4.3. Mechanical Fundamentals Linear and Angular Kinematics
- 4.3.1 Linear Movement
- 4.3.2 Relative Movement
- 4.3.3 Angular Movement

4.4. Mechanical Fundamentals: Linear Kinetics
- 4.4.1 Newton's Laws
- 4.4.2 Principle of Inertia
- 4.4.3 Energy and Work
- 4.4.4 Stress Angle Analysis

4.5. Mechanical Fundamentals: Angular Kinetics
- 4.5.1 Torque
- 4.5.2 Angular Momentum
- 4.5.3 Newton's Angles
- 4.5.4 Balance and Gravity

4.6. Fluid Mechanics
- 4.6.1 Fluid
- 4.6.2 Flows
  - 4.6.2.1. Laminar Flow
  - 4.6.2.2. Turbulent Flow
  - 4.6.2.3. Pressure-Velocity: The Venturi Effect
- 4.6.3 Forces in Fluids

4.7. Human Anatomy: Limitations
- 4.7.1 Human Anatomy
- 4.7.2 Muscles: Active and Passive Tension
- 4.7.3 Mobility Range
- 4.7.4 Mobility-Strength Principles
- 4.7.5 Limitations in the Analysis

4.8. Mechanisms of the Motor System: Bone, Muscle-Tendon and Ligament Mechanics
- 4.8.1 Tissue Functioning
- 4.8.2 Biomechanics of Bones
- 4.8.3 Biomechanics of the Muscle-Tendon Unit
- 4.8.4 Biomechanics of Ligaments

4.9. Mechanisms of the Motor System: Mechanics of Muscles
- 4.9.1 Mechanical Characteristics of Muscles
  - 4.9.1.1. Force-Speed Relationship
  - 4.9.1.2. Force-Distance Relationship
  - 4.9.1.3. Force-Time Relationship
  - 4.9.1.4. Traction-Compression Cycles
  - 4.9.1.5. Neuromuscular Control
  - 4.9.1.6. The Spine and Backbone

4.10. Mechanics of Biofluids
- 4.10.1 Mechanics of Biofluids
  - 4.10.1.1. Transport, Stress and Pressure
  - 4.10.1.2. The Circulatory System
  - 4.10.1.3. Blood Characteristics
- 4.10.2 General Problems in Biomechanics
  - 4.10.2.1. Problems in Nonlinear Mechanical Systems
  - 4.10.2.2. Problems in Biofluids
  - 4.10.2.3. Solid-Liquid Problems

Module 5. Medical Bioinformatics

5.1. Medical Bioinformatics
- 5.1.1 Computing in Medical Biology
- 5.1.2 Medical Bioinformatics
  - 5.1.2.1. Bioinformatic Applications
  - 5.1.2.2. Computer Systems, Networks and Medical Databases
  - 5.1.2.3. Applications of Medical Bioinformatics in Human Health

5.2. Computer Equipment and software Required in Bioinformatics
- 5.2.1 Scientific Computing in Biological Sciences
- 5.2.2 The Computer
- 5.2.3 Hardware, Software and Operating Systems
- 5.2.4 Workstations and Personal Computers
- 5.2.5 High-Performance Computing Platforms and Virtual Environments
- 5.2.6 Linux Operating System
  - 5.2.6.1. Linux Installation
  - 5.2.6.2. Using the Linux Command Line Interface

5.3. Data Analysis Using R Programming Language
- 5.3.1 R Statistical Programming Language
- 5.3.2 Installation and Uses of R
- 5.3.3 Data Analysis Methods With R
- 5.3.4 R Applications in Medical Bioinformatics

5.4. Data Analysis Using R Programming Language
- 5.4.1 Multipurpose Programming Language Python
- 5.4.2 Installation and Uses of Python
- 5.4.3 Data Analysis Methods with Python
- 5.4.4 Python Applications in Medical Bioinformatics

5.5. Methods of Human Genetic Sequence Analysis
- 5.5.1 Human Genetics
- 5.5.2 Techniques and Methods for Sequencing Analysis of Genomic Data
- 5.5.3 Sequence Alignments
- 5.5.4 Tools for Detection, Comparison and Modeling of Genomes

5.6. Data Mining in Bioinformatics
- 5.6.1 Phases of Knowledge Discovery in Databases, KDD
- 5.6.2 Processing Techniques
- 5.6.3 Knowledge Discovery in Biomedical Databases
- 5.6.4 Human Genomics Data Analysis

5.7. Artificial Intelligence and Big Data Techniques in Medical Bioinformatics
- 5.7.1 Machine Learning for Medical Bioinformatics
  - 5.7.1.1. Supervised Learning: Regression and Classification
  - 5.7.1.2. Unsupervised Learning: Clustering and Association Rules
- 5.7.2 Big Data
- 5.7.3 Computing Platforms and Development Environments

5.8. Applications of Bioinformatics for Prevention, Diagnosis and Clinical Therapies
- 5.8.1 Disease-Causing Gene Identification Procedures
- 5.8.2 Procedure to Analyze and Interpret the Genome for Medical Therapies
- 5.8.3 Procedures to Assess Genetic Predispositions of Patients for Prevention and Early Diagnosis

5.9. Medical Bioinformatics Workflow and Methodology
- 5.9.1 Creation of Workflows to Analyze Data
- 5.9.2 Application Programming Interfaces, APIs
  - 5.9.2.1. R and Python Libraries for Bioinformatics Analysis
  - 5.9.2.2. Bioconductor: Installation and Uses
- 5.9.3 Uses of Bioinformatics Workflows in Cloud Services

5.10. Factors Associated with Sustainable Bioinformatics Applications and Future Trends
- 5.10.1 Best Practices in the Development of Medical Bioinformatics Projects
- 5.10.2 Future Trends in Bioinformatics Applications

Module 6. Human-Machine Interface Applied to Biomedical Engineering

6.1. Human-Machine Interface
- 6.1.1 Human-Machine Interface
- 6.1.2 Model, System, User, Interface and Interaction
- 6.1.3 Interface, Interaction and Experience

6.2. Human-Machine Interaction
- 6.2.1 Human-Machine Interaction
- 6.2.2 Principles and Laws of Interaction Design
- 6.2.3 Human Factors
    - 6.2.3.1. Importance of the Human Factor in the Interaction Process
    - 6.2.3.2. Psychological-Cognitive Perspective: Information Processing, Cognitive Architecture, User Perception, Memory, Cognitive Ergonomics and Mental Models
- 6.2.4 Technological Factors
- 6.2.5 Basis of Interaction: Levels and Styles of Interaction
- 6.2.6 At the Forefront of Interaction

6.3. Interface Design (I): Design Process
- 6.3.1 Design Process
- 6.3.2 Value Proposition and Differentiation
- 6.3.3 Requirements Analysis and Briefing
- 6.3.4 Collection, Analysis and Interpretation of Information
- 6.3.5 The Importance of UX and UI in the Design Process

6.4. Interface Design (II): Prototyping and Evaluation
- 6.4.1 Prototyping and Evaluation of Interfaces
- 6.4.2 Methods for the Conceptual Design Process
- 6.4.3 Techniques for Idea Organization
- 6.4.4 Prototyping Tools and Process
- 6.4.5 Evaluation Methods
- 6.4.6 Evaluation Methods with Users: Interaction Diagrams, Modular Design, Heuristic Evaluation
- 6.4.7 Evaluation Methods Without Users: Surveys and Interviews, Card Sorting,A/B Testing and Experiment Design
- 6.4.8 Applicable ISO Norms and Standards

6.5. User Interfaces (I): Interaction Methods in Today's Technologies
- 6.5.1 User Interface (UI)
- 6.5.2 Classical User Interfaces: Graphical User Interfaces (GUI), Web, Touch, Voice, etc
- 6.5.3 Human Interfaces and Limitations: Visual, Hearing, Motor and Cognitive Diversity
- 6.5.4 Innovative User Interfaces: Virtual Reality, Augmented Reality, Collaborative

6.6. User Interfaces (II): Interaction Design
- 6.6.1 The Importance of Graphic Design
- 6.6.2 Design Theory
- 6.6.3 Design Rules: Morphological Elements, Wireframes, Use and Color Theory, Graphic Design Techniques, Iconography, Typography
- 6.6.4 Semiotics Applied to Interfaces

6.7. User Experience (I): Methodologies and Design Fundamentals
- 6.7.1 User Experience (UX)
- 6.7.2 Evolution of Usability Effort-to-Benefit Ratio
- 6.7.3 Perception, Cognition and Communication
    - 6.7.3.1. Mental Models
- 6.7.4 User Focused Design Methodology
- 6.7.5 Methodology of Design Thinking

6.8. The User Experience (II): User Experience Principles
- 6.8.1 UX Principles
- 6.8.2 UX Hierarchy: Strategy, Scope, Structure, Skeleton and Visual Component
- 6.8.3 Usability and Accessibility
- 6.8.4 Information Architecture: Classification, Labeling, Navigation, and Search Systems
- 6.8.5 Affordances and Signifiers
- 6.8.6 Heuristics: Heuristics of Understanding, Interaction and Feedback

6.9. Interfaces in the Field of Biomedicine (I): the Interaction of the Health Care Worker
- 6.9.1 Usability in the Intrahospital Context
- 6.9.2 Interaction Processes in Healthcare Technology
- 6.9.3 Health Care Provider and Patient Perception
- 6.9.4 Healthcare Ecosystem: Primary Care Physician vs. Operating Room Surgeon

6.9.5 Interaction of the Healthcare Worker in a Context of Stress
6.9.5.1. The Case of ICUs
6.9.5.2. The Case of Extreme Circumstances and Emergencies
6.9.5.3. The Case of the Operating Rooms
6.9.6 Open Innovation
6.9.7 Persuasive Design
6.10. Interfaces in the Field of Biomedicine (II): Current Overview and Future Trends
6.10.1 Classical Biomedical Interfaces in Healthcare Technologies
6.10.2 Innovative Biomedical Interfaces in Healthcare Technologies
6.10.3 The Role of Nanomedicine
6.10.4 Biochips
6.10.5 Electronic Implants
6.10.6 Brain-Computer Interfaces (BCI)

Module 7. Biomedical Imaging

7.1. Biomedical Imaging
7.1.1 Medical Imaging
7.1.2 Objectives of Imaging Systems in Medicine
7.1.3 Types of Images
7.2. Radiology
7.2.1 Radiology
7.2.2 Conventional Radiology
7.2.3 Digital Radiology
7.3. Ultrasound
7.3.1 Medical Imaging with Ultrasound
7.3.2 Training and Image Quality
7.3.3 Doppler Ultrasound
7.3.4 Implementing and New Technologies
7.4. Computerized Tomography
7.4.1 CT Imaging Systems
7.4.2 Reconstruction and CT Image Quality
7.4.3 Clinical Applications
7.5. Magnetic Resonance
7.5.1 Magnetic Resonance Imaging (MRI)
7.5.2 Resonance and Nuclear Magnetic Resonance
7.5.3 Nuclear Relaxation
7.5.4 Tissue Contrast and Clinical Applications
7.6. Nuclear Medicine
7.6.1 Generation and Image Detection
7.6.2 Image Quality
7.6.3 Clinical Applications
7.7. Image Processing
7.7.1 Noise
7.7.2 Intensification
7.7.3 Histograms
7.7.4 Magnification
7.7.5 Processing
7.8. Analysis and Image Segmentation
7.8.1 Segmentation.
7.8.2 Segmentation by Region
7.8.3 Edge Detection Segmentation
7.8.4 Generation of Biomodels from Images
7.9. Image-Guided Interventions
7.9.1 Visualization Methods
7.9.2 Image-Guided Surgeries
7.9.2.1. Planning and Simulation
7.9.2.2. Surgical Visualization
7.9.2.3. Virtual Reality
7.9.3 Robotic Vision
7.10. Deep Learning and Machine Learning in Medical Imaging
7.10.1 Types of Recognition
7.10.2 Supervised Techniques
7.10.3 Unsupervised Techniques

Module 8. Digital Health Applications in Biomedical Engineering

8.1. Digital Health Applications
- 8.1.1 Medical Hardware and Software Applications
- 8.1.2 Digital Health Software Systems Applications
- 8.1.3 Usability of Digital Health Systems

8.2. Medical Image Storage and Transmission Systems
- 8.2.1 Image Transmission Protocol: DICOM
- 8.2.2 Medical Image Storage and Transmission Server Installation: PAC System

8.3. Relational Database Management for Digital Health Applications
- 8.3.1 Relational Database, Concept and Examples
- 8.3.2 Database Language
- 8.3.3 Database With MySQL and PostgreSQL
- 8.3.4 Applications: Connection and Uses in Web Programming Language

8.4. Digital Health Applications Based on Web Development
- 8.4.1 Web Application Development
- 8.4.2 Web Development Model, Infrastructure, Programming Languages and Working Environments
- 8.4.3 Examples of Web Applications with Different Languages: PHP, HTML, AJAX, CSS Javascript, AngularJS, NodeJS
- 8.4.4 Development of Applications in Web Frameworks: Symfony and Laravel
- 8.4.5 Development of Applications in Content Management Systems (CMS): Joomla and WordPress

8.5. Web Applications in a Hospital Environment or Clinical Center
- 8.5.1 Applications for Patient Management: Reception, Scheduling, and Billing
- 8.5.2 Applications for Medical Professionals: Consultations or Medical Care, Medical History, Reports, etc.
- 8.5.3 Web and Mobile Applications for Patients: Scheduling Requests, Monitoring, etc.

8.6. Telemedicine Applications
- 8.6.1 Service Architecture Models
- 8.6.2 Telemedicine Applications: Teleradiology, Teleradiology, Telecardiology and Teledermatology
- 8.6.3 Rural Telemedicine

8.7. Applications With the Internet of Medical Things, IoMT
- 8.7.1 Models and Architectures
- 8.7.2 Medical Data Acquisition Equipment and Protocols
- 8.7.3 Applications: Patient Monitoring

8.8. Digital Health Applications Using Artificial Intelligence Techniques
- 8.8.1 Machine Learning
- 8.8.2 Computing Platforms and Development Environments
- 8.8.3 Examples

8.9. Digital Health Applications with Big Data
- 8.9.1 Digital Health Applications with Big Data
- 8.9.2 Technologies Used in Big Data
- 8.9.3 Use Cases of Big Data in Digital Health

8.10. Factors Associated with Sustainable Digital Health Applications and Future Trends
- 8.10.1
- 8.10.2 Best Practices in the Development of Digital Health Application Projects
- 8.10.3 Future Trends in Digital Health Applications

Module 9. Biomedical Technologies: Biodevices and Biosensors

9.1. Medical Devices
- 9.1.1 Product Development Methodology
- 9.1.2 Innovation and creativity
- 9.1.3 CAD Technologies

9.2. Nanotechnology
- 9.2.1 Medical Nanotechnology
- 9.2.2 Nanostructured Materials
- 9.2.3 Nano-Biomedical Engineering

9.3. Micro and Nanofabrication
- 9.3.1 Design of Micro and Nano Products
- 9.3.2 Techniques
- 9.3.3 Tools for Manufacturing

9.4. Prototypes
- 9.4.1 Additive Manufacturing
- 9.4.2 Rapid Prototyping
- 9.4.3 Classification
- 9.4.4 Applications
- 9.4.5 Study Cases
- 9.4.6 Conclusions

9.5. Diagnostic and Surgical Devices
- 9.5.1 Development of Diagnostic Methods
- 9.5.2 Surgical Planning
- 9.5.3 Biomodels and Instruments Made with 3D Printing
- 9.5.4 Device-Assisted Surgery

9.6. Biomechanic Devices
- 9.6.1 Prosthetics
- 9.6.2 Intelligent Materials
- 9.6.3 Orthotics

9.7. Biosensors
- 9.7.1 The Biosensor
- 9.7.2 Sensing and Transduction
- 9.7.3 Medical Instrumentation for Biosensors

9.8. Types of Biosensors: Optic Sensors
- 9.8.1 Reflectometry
- 9.8.2 Interferometry and Polarimetry
- 9.8.3 Evanescent Field
- 9.8.4 Fiber Optic Probes and Guides

9.9. Types of Biosensors (II): Physical, Electrochemical and Acoustic Sensors
- 9.9.1 Physical Sensors
- 9.9.2 Electrochemical Sensors
- 9.9.3 Acoustic Sensors

9.10. Integrated Systems
- 9.10.1 Lab-On-A-Chip
- 9.10.2 Microfluids
- 9.10.3 Medical Applications

Module 10. Biomedical and Healthcare Databases

10.1. Hospital Databases
- 10.1.1 Data Bases
- 10.1.2 The Importance of Data
- 10.1.3 Data in a Clinical Context

10.2. Conceptual Modeling
- 10.2.1 Data Structure
- 10.2.2 Systematic Data Model
- 10.2.3 Data Standardization

10.3. Relational Data Model
- 10.3.1 Advantages and Disadvantages
- 10.3.2 Formal Languages

10.4. Designing from Relational Databases
- 10.4.1 Functional Dependence
- 10.4.2 Relational Forms
- 10.4.3 Standardization

10.5. SQL Language
- 10.5.1 Relational Model
- 10.5.2 Object-Relationship Model
- 10.5.3 XML-Object-Relationship Model

10.6. NoSQL
- 10.6.1 JSON
- 10.6.2 NoSQL
- 10.6.3 Differential Amplifiers
- 10.6.4 Integrators and Differentiators

10.7. MongoDB
- 10.7.1 ODMS Architecture
- 10.7.2 NodeJS
- 10.7.3 Mongoose
- 10.7.4 Aggregation

10.8. Data Analysis
- 10.8.1 Data Analysis
- 10.8.2 Qualitative Analysis
- 10.8.3 Quantitative Analysis

10.9. BORRAR
- 10.9.1 General Data Protection Regulation
- 10.9.2 Cybersecurity Considerations
- 10.9.3 Regulations Applied to Health Data

10.10. Integration of Databases in Medical Records
- 10.10.1 Medical History
- 10.10.2 HIS Systems
- 10.10.3 HIS Data

In this program, you will have a teaching staff of excellence, the most updated contents in the discipline and a teaching methodology that will allow you to combine your studies with your professional career"

06

Methodology

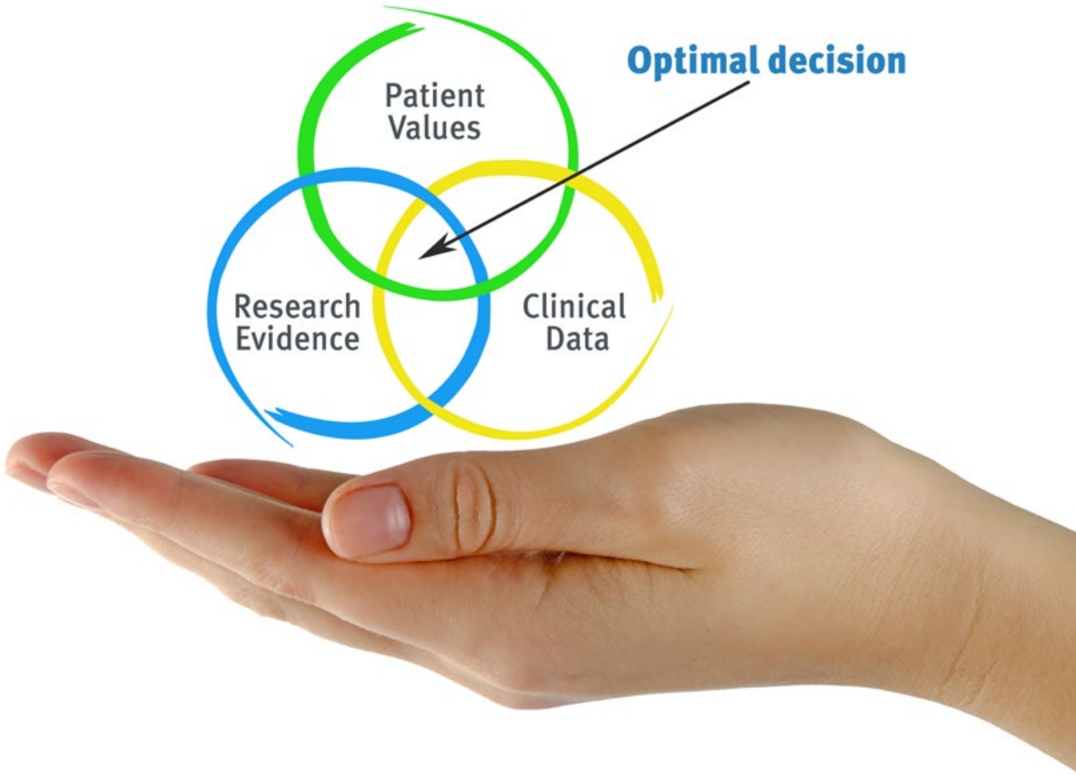
This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

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.

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

At TECH we use the Case Method

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



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

According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions in the physician's professional practice.

Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method"

The effectiveness of the method is justified by four fundamental achievements:

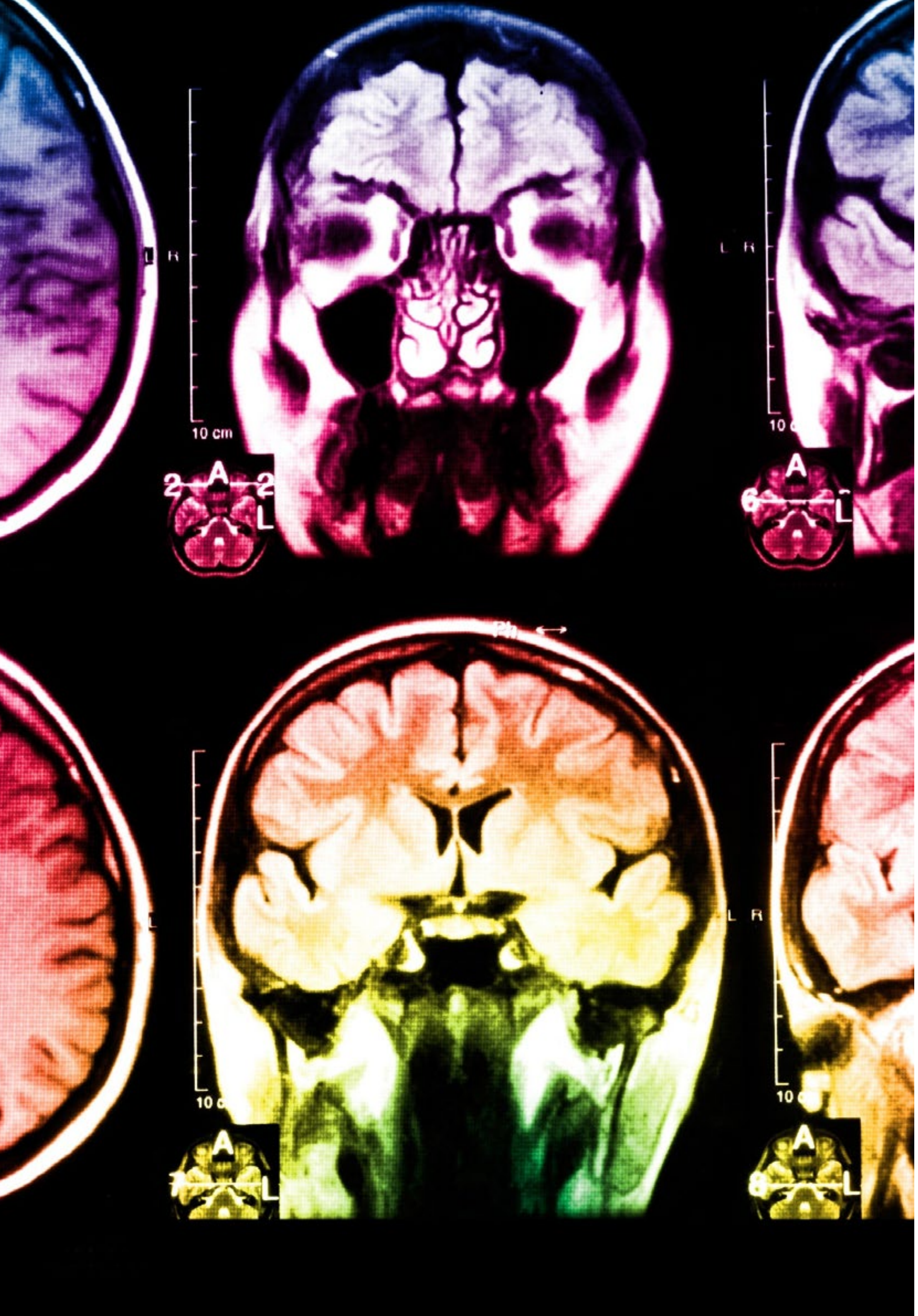
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

Relearning Methodology

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

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

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



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

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

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

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

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

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

Study Material

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

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

Surgical Techniques and Procedures on Video

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

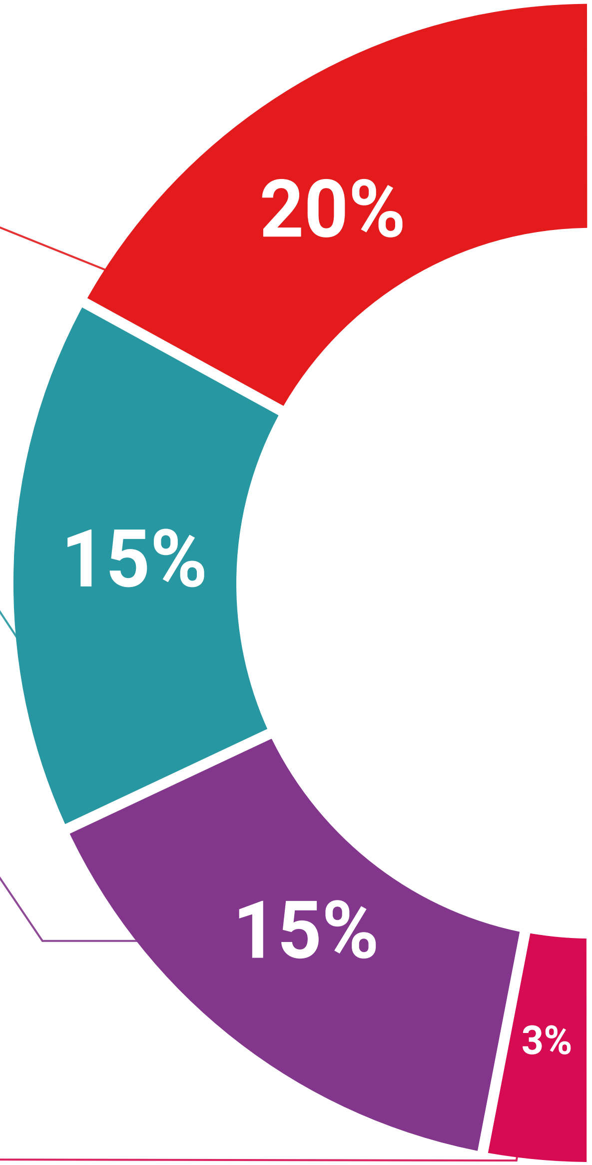
Interactive Summaries

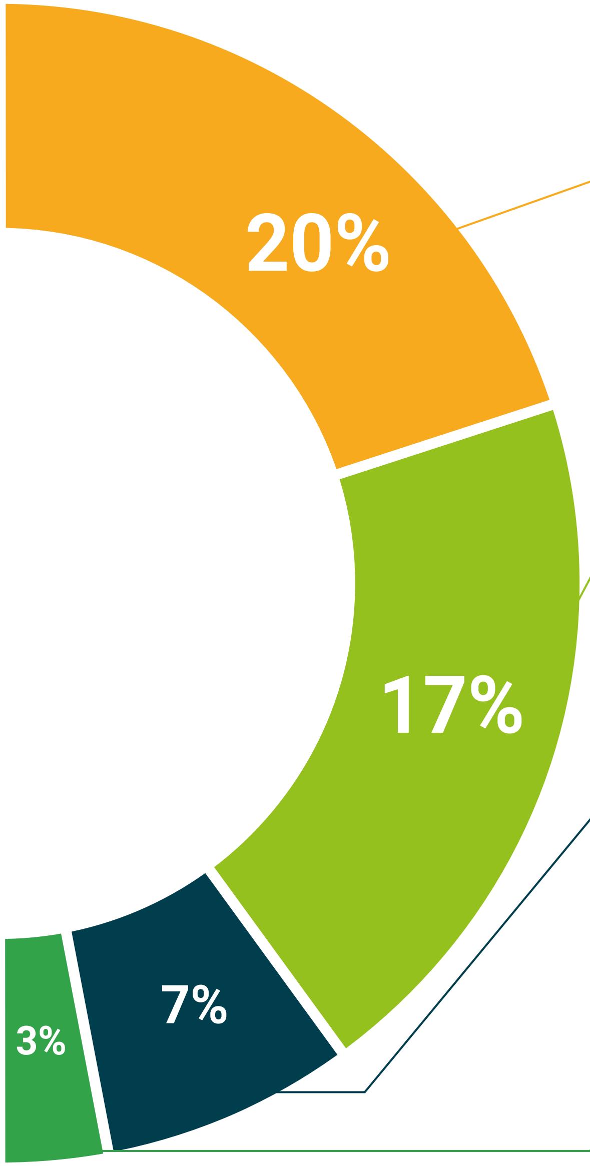
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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

Additional Reading

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





Expert-Led Case Studies and Case Analysis

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

Testing & Retesting

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

Classes

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

Quick Action Guides

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

07
Certificate

The PRofessional Master's Degree in Biomedical Engineering guarantees you, in addition to the most rigorous and updated training, access to a Professional Master's Degree issued by TECH Technological University.

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

This **Professional Master's Degree in Biomedical Engineering** contains the most complete and updated scientific program on the market.

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

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the Professional Master's Degree, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Professional Master's Degree in Biomedical Engineering**

Official Nº of hours: **1,500 h.**


tech technological university

Awards the following

DIPLOMA

to

Mr./Ms. _________________, with identification number ____________.

For having successfully passed and accredited the following program

PROFESSIONAL MASTER'S DEGREE

in

Biomedical Engineering

This is a qualification awarded by this University, equivalent to 1,500 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

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

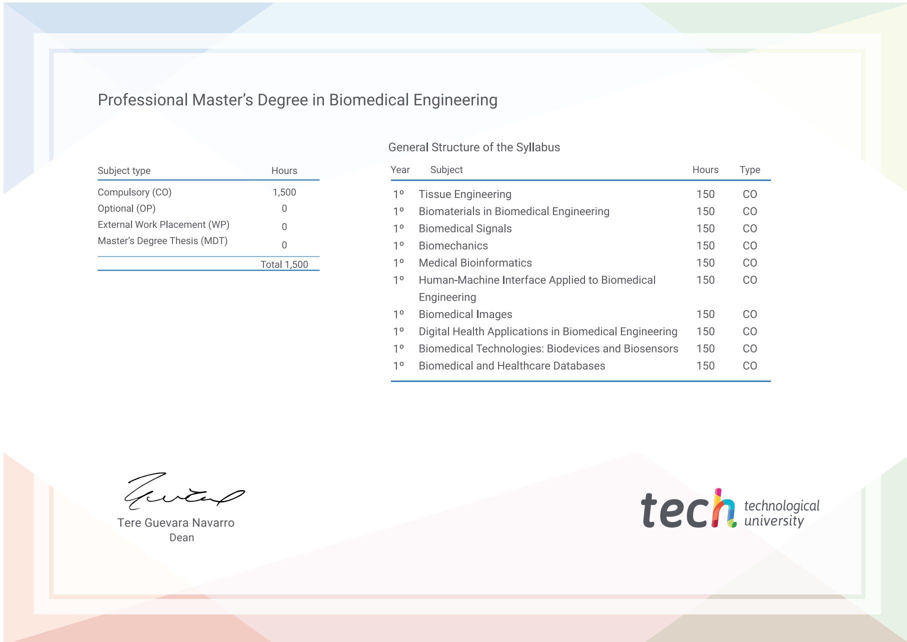
June 17, 2020

Tere Guevara Navarro

Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.

Unique TECH Code: AFWORD23S techtitute.com/certificates


Professional Master's Degree in Biomedical Engineering

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

General Structure of the Syllabus

Year	Subject	Hours	Type
1º	Tissue Engineering	150	CO
1º	Biomaterials in Biomedical Engineering	150	CO
1º	Biomedical Signals	150	CO
1º	Biomechanics	150	CO
1º	Medical Bioinformatics	150	CO
1º	Human-Machine Interface Applied to Biomedical Engineering	150	CO
1º	Biomedical Images	150	CO
1º	Digital Health Applications in Biomedical Engineering	150	CO
1º	Biomedical Technologies: Biodevices and Biosensors	150	CO
1º	Biomedical and Healthcare Databases	150	CO

Tere Guevara Navarro

Dean

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

technological university

Professional Master's Degree

Biomedical Engineering

Course Modality: **Online**

Duration: **12 months**

Certificate: **TECH Technological University**

Official Nº of hours: **1,500 h.**

Professional Master's Degree
Biomedical Engineering

tech technological university