Postgraduate Certificate
Biomedical Electronics

Postgraduate Certificate
Biomedical Electronics

- » Modality: **online**
- » Duration: **6 weeks**
- » Certificate: **TECH Technological University**
- » Schedule: **at your own pace**
- » Exams: **online**

Website: **www.techtitute.com/us/engineering/postgraduate-certificate/biomedical-electronics**

Index

01
Introduction

The future of medicine and electronics are clearly linked. The use of electronics to create medical instruments that favor the quality of life of people and the increase in life expectancy is growing, and its remarkable benefits make investment in this area increase constantly. But, in order to have a positive evolution in this field, it is essential to have highly qualified professionals, which is why TECH has designed this very complete academic program.

The benefits that electronics brings to medicine make it a relevant sector in society, which demands highly qualified professionals"

The advances in Biomedical Electronics in the last decades have been absolutely amazing, with the appearance of new devices that favor the diagnosis and treatment of patients, resulting in a better quality of life. Thinking about the academic needs of IT professionals in this field, TECH has designed this very complete program, which covers essential issues to improve students' training.

The objective of this Postgraduate Certificate in Biomedical Electronics is to develop specific knowledge in students that will make them experts in the field, allowing them to access high-level jobs, where they will be able to develop and grow professionally. Specifically, the program addresses electrophysiology, the origin, conduction and acquisition of bioelectrical signals, as well as their filtering and amplification. It also analyzes the most important biomedical systems, such as ECG, EEG, EMG, spirometry and oximetry.

In this way, the importance of electrical safety of biomedical instrumentation is substantiated, presenting the damages produced by electricity when it passes through the human body, even more so when the purpose of biomedical instrumentation is to measure, and even electro-stimulate, vital organs such as the heart.

A 100% online program that will allow students to distribute their study time, not being conditioned by fixed schedules or the need to move to another physical location, being able to access all the contents at any time of the day, and therefore able to balance their work and personal life with their academic life.

This **Postgraduate Certificate in Biomedical Electronics** contains the most complete and up-to-date program on the market. The most important features include:

- Practical cases presented by experts in IT
- 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
- Special emphasis on innovative methodologies in Biomedical Electronics
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection

The realization of multiple case studies will allow students to easily reinforce the theoretical contents"

"Electronics has favored the advancement of biomedicine, bringing significant benefits to patients"

TECH is a prestigious university at the forefront of technology.

A high-level program for professionals seeking excellence.

It includes, in its teaching team, professionals belonging to the field of computer science, who pour into this program the experience of their work, in addition to recognized specialists from leading companies and prestigious universities.

Its multimedia content, developed with the latest educational technology, will provide professionals with situated and contextualized learning, that is, a simulated environment that will provide immersive study set up to prepare them in real-life situations.

This program is designed around Problem-Based Learning, whereby the student 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 experts.

02
Objectives

TECH has devised this Postgraduate Certificate in Biomedical Electronics with the main objective of offering computer scientists a unique study opportunity with which to understand the particularities of electronic systems applied to the medical field, and to be able to carry out the design of new devices for this professional branch. A program that includes the main novelties of the sector and that will be fundamental to increase the employability of students in this field.

*Specialize in Biomedical Electronics and acquire the necessary skills to stand out in the sector"*

General Objectives

- Identify and evaluate bioelectrical signals involved in a biomedical application
- Determine a design protocol of a biomedical application
- Analyze and evaluate biomedical instruments designs
- Identify and define the interferences and noise of a biomedical application
- Evaluate and apply electrical safety regulations

A 100% online program that will be essential in order to turn your career around"
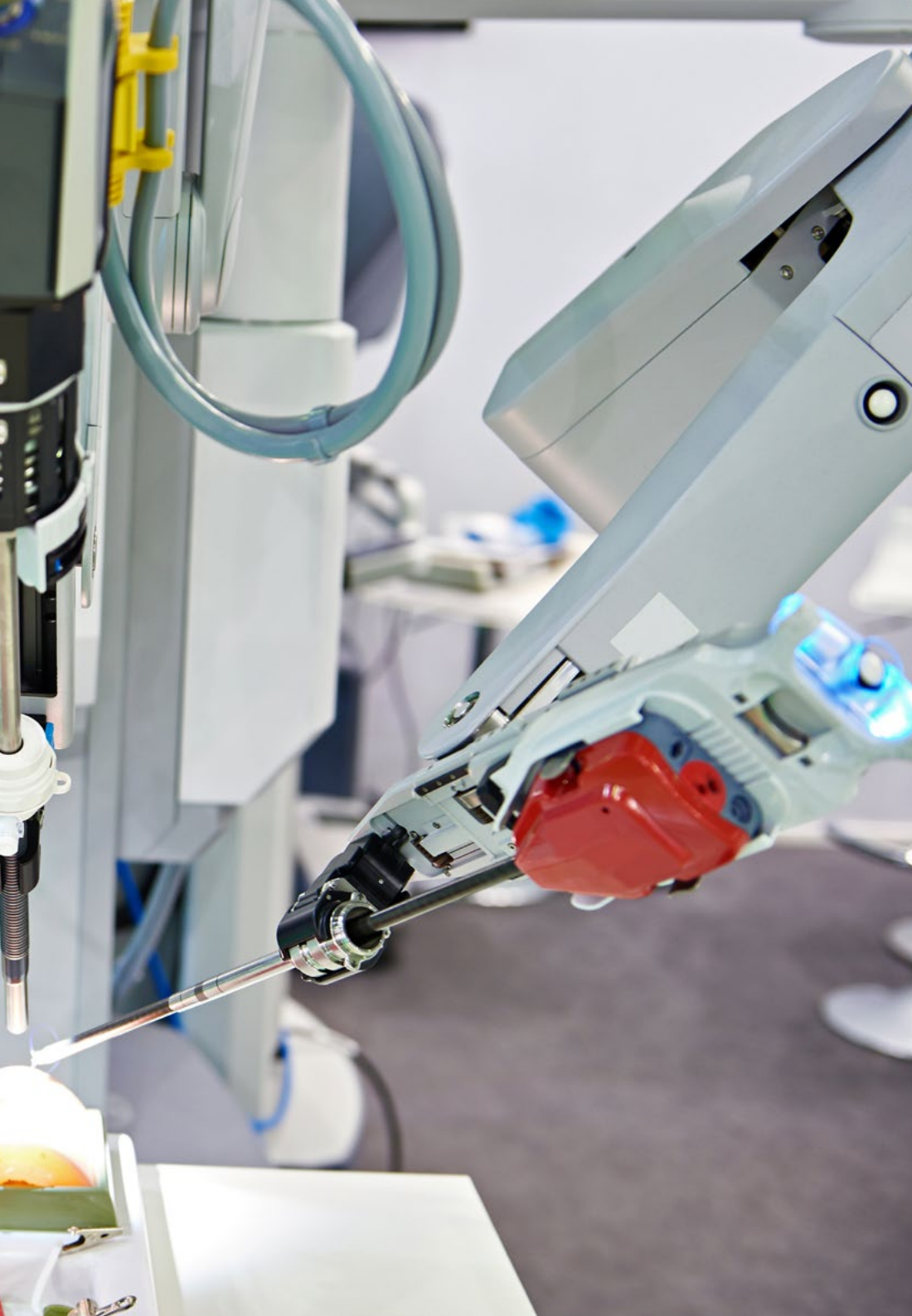
Specific Objectives

- Analyze the signals, direct or indirect, that can be measured with non-implantable devices
- Apply the acquired knowledge of sensors and transduction in biomedical applications
- Determine the use of electrodes in bioelectrical signal measurements
- Develop the use of signal amplification, separation and filtering systems
- Examine the different physiological systems of the human body and signals for behavioral analysis
- Carry out a practical application of the knowledge of physiological systems in the measurement instrumentation of the most important systems: ECG, EEG, EMG, spirometry, and oximetry
- Establish the necessary electrical safety of biomedical instruments

03

Course Management

The teachers of this Postgraduate Certificate in Biomedical Electronics are professionals with extensive qualifications and experience in the sector, who have understood the importance of the application of electronic systems in the healthcare field and, therefore, have sought to offer computer scientists the highest qualification in this field. A first class teaching team with great prestige in the sector that will help students to open up new professional paths.

First-class help will teach you how to specialize in Biomedical Electronics"

Management

Ms. Casares Andrés, María Gregoria

- Specialist teacher in Research and Information Technology at Polytechnic University of Madrid
- Evaluator and Creator of OCW courses at Carloss III University of Madrid
- INTEF courses tutor
- Support Technician, Ministry of Education Directorate General of Bilingualism and Quality of Education of the Community of Madrid
- Secondary Education Professor with specialty in IT
- Associate professor at the Pontificia de Comillas University
- Postgraduate Diploma in Teaching Unit, Community of Madrid
- Analyst/ IT Project manager, Banco Urquijo
- IT Analyst at ERIA
- Associate Professors, Carlos III University of Madrid

Professors

Ms. Sánchez Fernández, Elena

- Field Service Engineer at BD Medical
- Degree in Biomedical Engineering from the Carlos III University of Madrid.
- Master's Degree in Electronic Systems Engineering, Polytechnic University of Madrid

04
Structure and Content

This TECH Postgraduate Certificate in Biomedical Electronics has been structured in such a way that students can carry out a self-guided and contextual learning. Thus, they will start from the most basic concepts to the most complex ones, which will allow them to specialize in a new sector that is bringing significant benefits to health. Undoubtedly, a very complete theoretical-practical syllabus that will mark a before and after in their training and way of working.

09:21:16

Tool   Print Mode

Press   CP Pres

Heart

CP Temp

Vent   CP
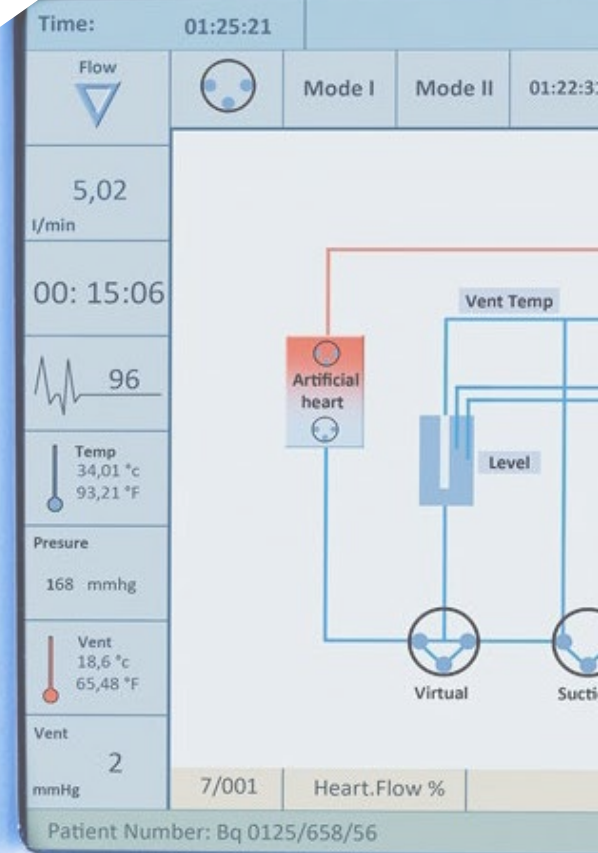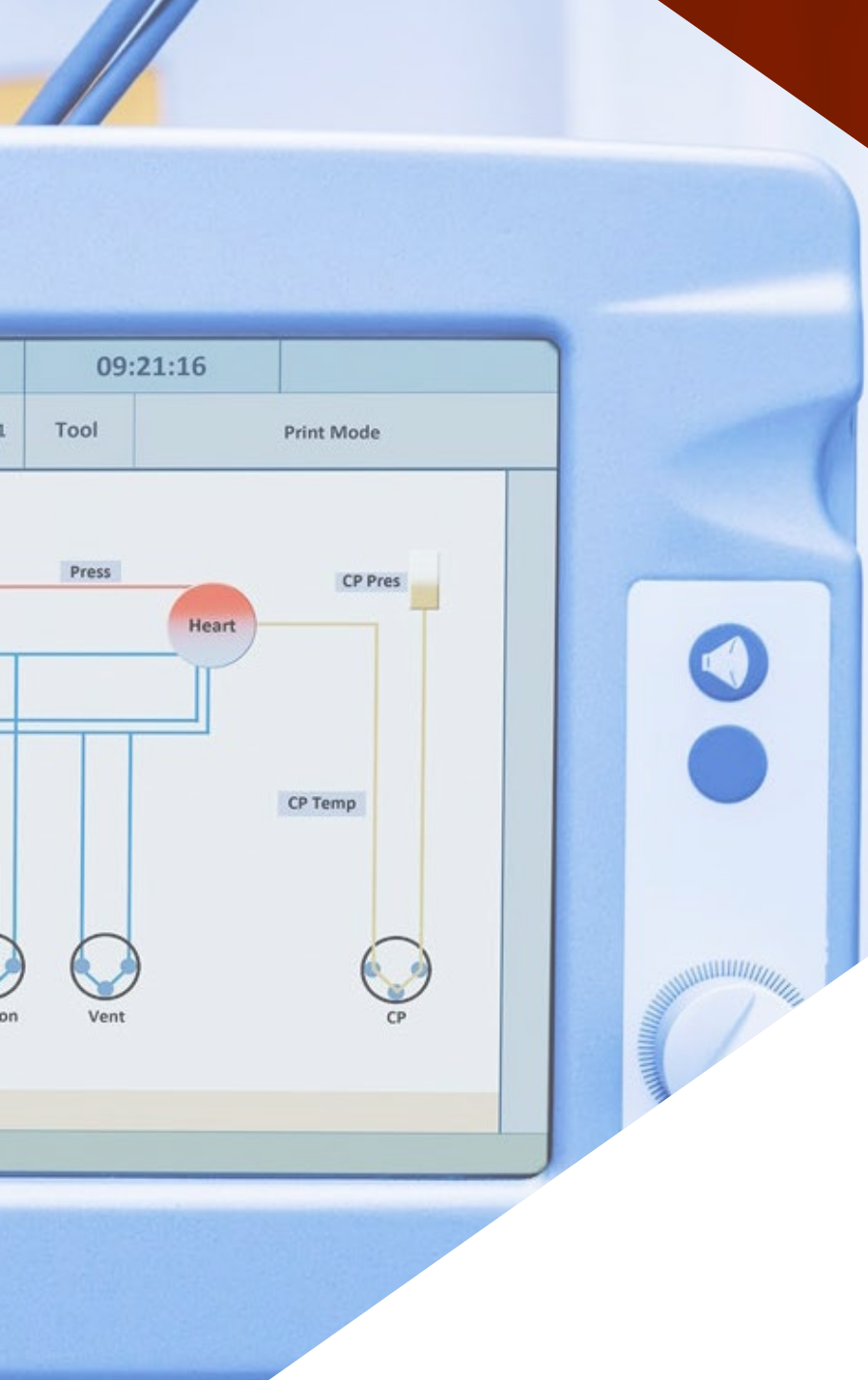
A very well-structured syllabus that will be a great support for the students' learning"

Module 1. Biomedical Electronics

1.1.   Biomedical Electronics
    1.1.1.   Biomedical Electronics
    1.1.2.   Characteristics of Biomedical Electronics
    1.1.3.   Biomedical Instrument Systems
    1.1.4.   Structure of a Biomedical Instrumentation System

1.2.   Bioelectrical Signals
    1.2.1.   Origin of Bioelectrical Signals
    1.2.2.   Conduction
    1.2.3.   Potential
    1.2.4.   Propagation of Potentials

1.3.   Bioelectrical Signal Processing
    1.3.1.   Bioelectrical Signal Acquisition
    1.3.2.   Amplification Techniques
    1.3.3.   Safety and Insulation

1.4.   Bioelectrical Signal Filter
    1.4.1.   Noise
    1.4.2.   Noise Detection
    1.4.3.   Noise Filtering

1.5.   Electrocardiogram
    1.5.1.   Cardiovascular System
        1.5.1.1. Action Potentials
    1.5.2.   ECG Waveform Nomenclature
    1.5.3.   Cardiac Electric Activity
    1.5.4.   Electrocardiography Module Instrumentation

1.6.   Electroencephalogram
    1.6.1.   Neurological System
    1.6.2.   Electrical Brain Activity
        1.6.2.1. Brain Waves
    1.6.3.   Electroencephalography Module Instrumentation

Expand your employability options with the higher qualification offered by this program"

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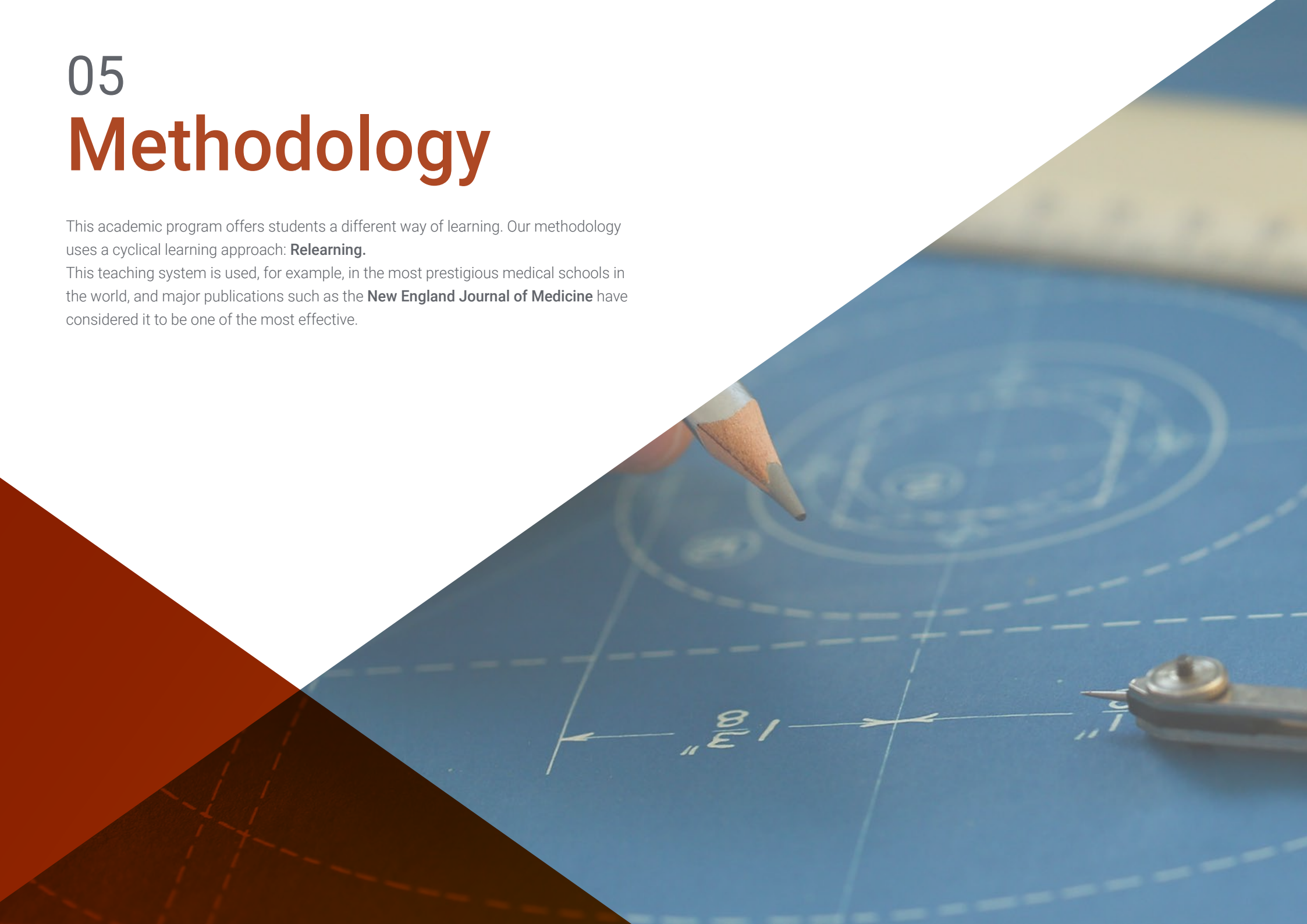
Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

"

At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world"

You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.

The student will learn to solve complex situations in real business environments through collaborative activities and real cases.

A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

"

Our program prepares you to face new challenges in uncertain environments and achieve success in your career"

The case method is the most widely used learning system in the best faculties in the world. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

In 2019, we obtained the best learning results of all online universities in the world.

At TECH, you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.

01 learning from evidence

02 relearning from evidence

03 testing

04 learning from an expert

05 neurocognitive context dependent learning

06 Von-Restorff effect

07 case based learning through storytelling

08 competencies testing (retesting)

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. This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

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

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.

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.

Classes

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

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

Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.

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.

30%

10%

8%

20%

25%

4%

3%
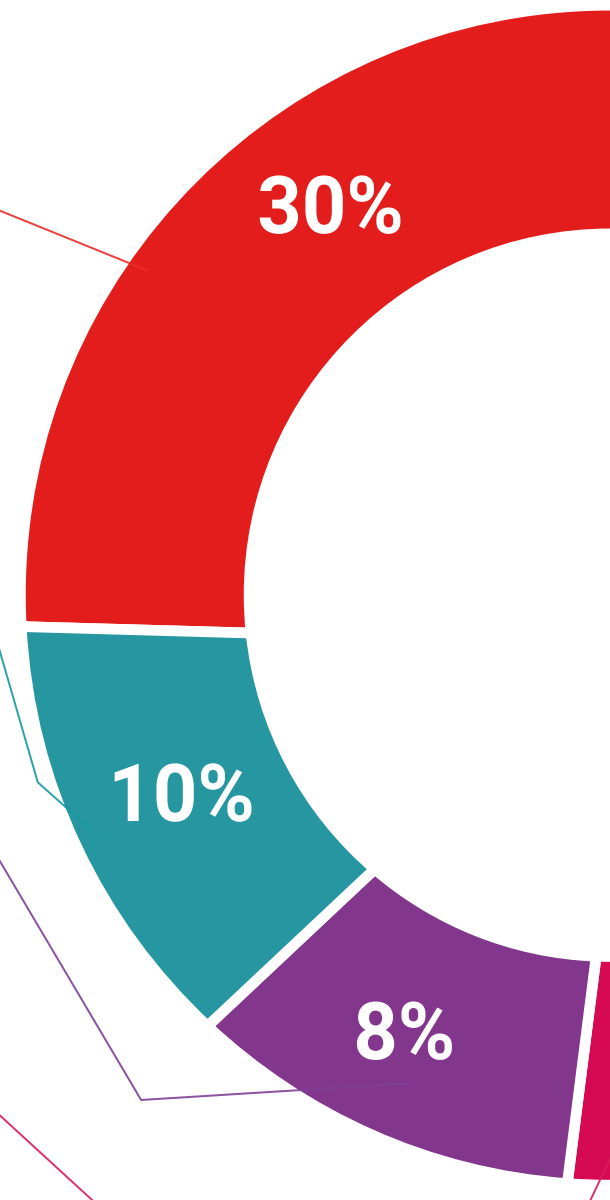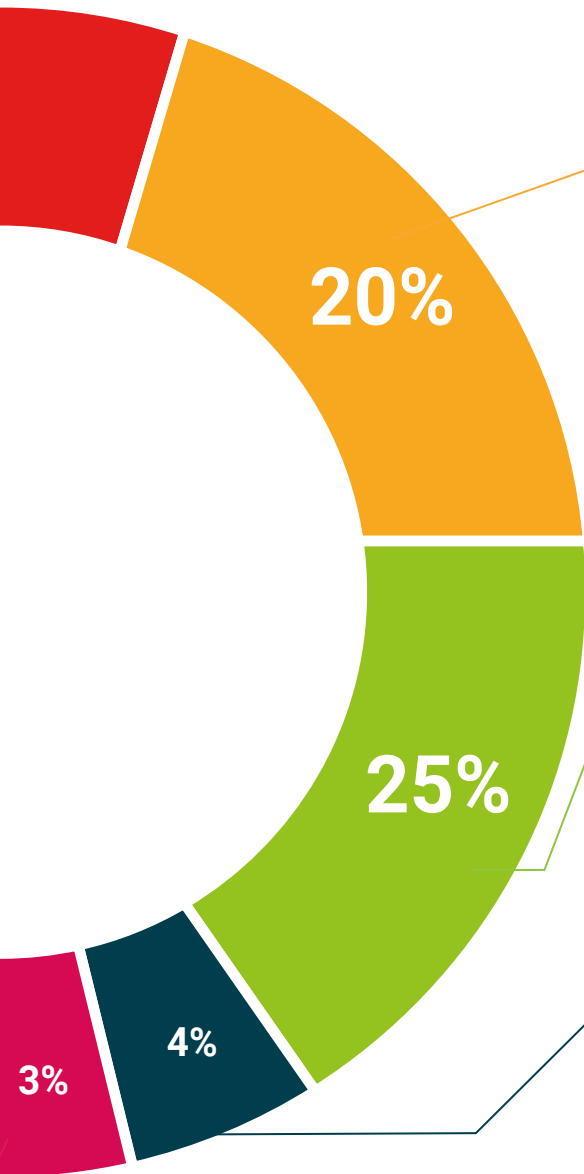
Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.

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".

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.

06
Certificate

The Postgraduate Certificate in Biomedical Electronics guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.

Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"
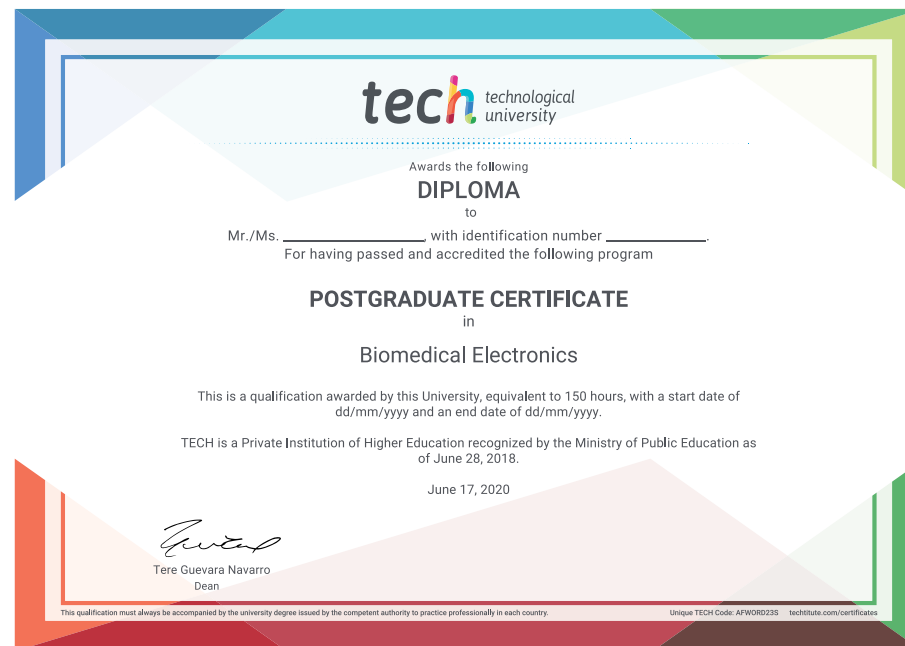
This **Postgraduate Certificate in Biomedical Electronics** contains the most complete and up-to-date program on the market.

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

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

Program: **Postgraduate Certificate in Biomedical Electronics**

Official No. of Hours: **150 h.**

tech technological university

Awards the following
DIPLOMA
to
Mr./Ms. _____, with identification number _____.
For having passed and accredited the following program

POSTGRADUATE CERTIFICATE
in

Biomedical Electronics

This is a qualification awarded by this University, equivalent to 150 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

*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.

tech technological university

Postgraduate Certificate
Biomedical Electronics

» Modality: **online**
» Duration: **6 weeks**
» Certificate: **TECH Technological University**
» Schedule: **at your own pace**
» Exams: **online**

Postgraduate Certificate
Biomedical Electronics

tech *technological university*