Postgraduate Certificate
Microelectronics

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Postgraduate Certificate

Microelectronics

- Modality: **online**
- Duration: **6 weeks**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

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

Index

01

Introduction

The field of Microelectronics is a crossover point between several disciplines of science and engineering: electromagnetic field theory, materials science, electrical engineering or programming are just some of the essential fields of the knowledge and development of this sector. A broad knowledge that engineers must have to be successful in this professional field and, therefore, TECH offers them a complete program that compiles the latest developments in Microelectronics and that will place them as professionals at the forefront of the sector.

The completion of this Postgraduate Certificate will provide you with the necessary resources to become more innovative in the creation of Microelectronic devices"

The emergence of ever smaller and more powerful electronic systems has brought about a major revolution in industry, as well as in the way people live, since many of the innovations that have emerged are used in everyday life: remote controls, cell phones, cameras, etc. Devices that are used frequently and although they appear complex and incomprehensible from the outside, they follow relatively simple physical and electromagnetic principles.

However, it is important for electronic engineers to keep abreast of the main developments in this field, in order to innovate and create devices that are becoming increasingly important and relevant in society. This Postgraduate Certificate in Microelectronics by TECH will allow students to update their knowledge with a complete program developed by a top-level faculty. Experienced professionals who have selected the most useful information for professional development at a practical level.

This program analyzes the physical principles that control the behavior of the fundamental elements of electronics; it delves into the most relevant characteristics and applications of transistors, diodes and amplifiers; it interprets signals and develops specialized knowledge so that engineers can correct a system based on its frequency response.

A 100% online Postgraduate Certificate that will allow students to distribute their study time, not being hindered by fixed schedules or the need to move to another physical location, as they can access all the contents at any time of the day, balancing their professional and personal life with their academic life.

This **Postgraduate Certificate in Microelectronics** contains the most complete and up-to-date program on the market. Its most notable features are:

- Case studies presented by engineering experts
- 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 Microelectronics
- 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 emergence of microelectronics led to a great revolution in the industrial field"

A program of great academic value that will give your resume greater prestige in the selection processes"

With the 100% online format of this Postgraduate Certificate, you will be able to choose where and when to study.

Don't miss the opportunity to study at the best online university in Spanish: TECH.

Its teaching staff includes professionals from the field of engineering, who contribute their work experience to this program, as well as renowned specialists from leading companies and prestigious universities.

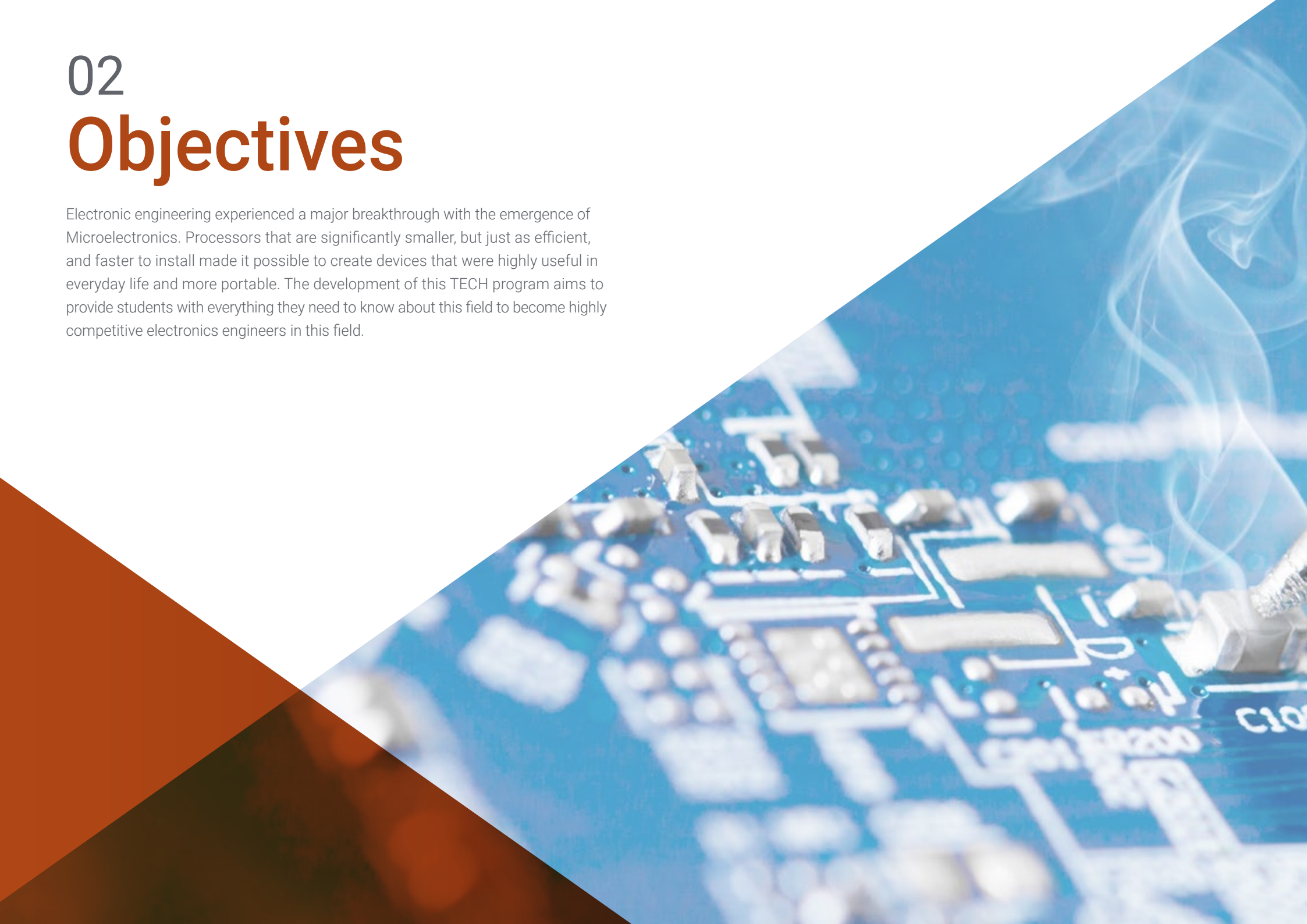
Its multimedia content, developed with the latest educational technology, will allow professionals to learn in a contextual and situated learning environment, i.e., a simulated environment that will provide immersive specialization for real situations.

The design of this program is focused on Problem-Based Learning, by means of which the students will have to try to solve the different professional practice situations that will be presented to them throughout the academic program. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

02

Objectives

Electronic engineering experienced a major breakthrough with the emergence of Microelectronics. Processors that are significantly smaller, but just as efficient, and faster to install made it possible to create devices that were highly useful in everyday life and more portable. The development of this TECH program aims to provide students with everything they need to know about this field to become highly competitive electronics engineers in this field.

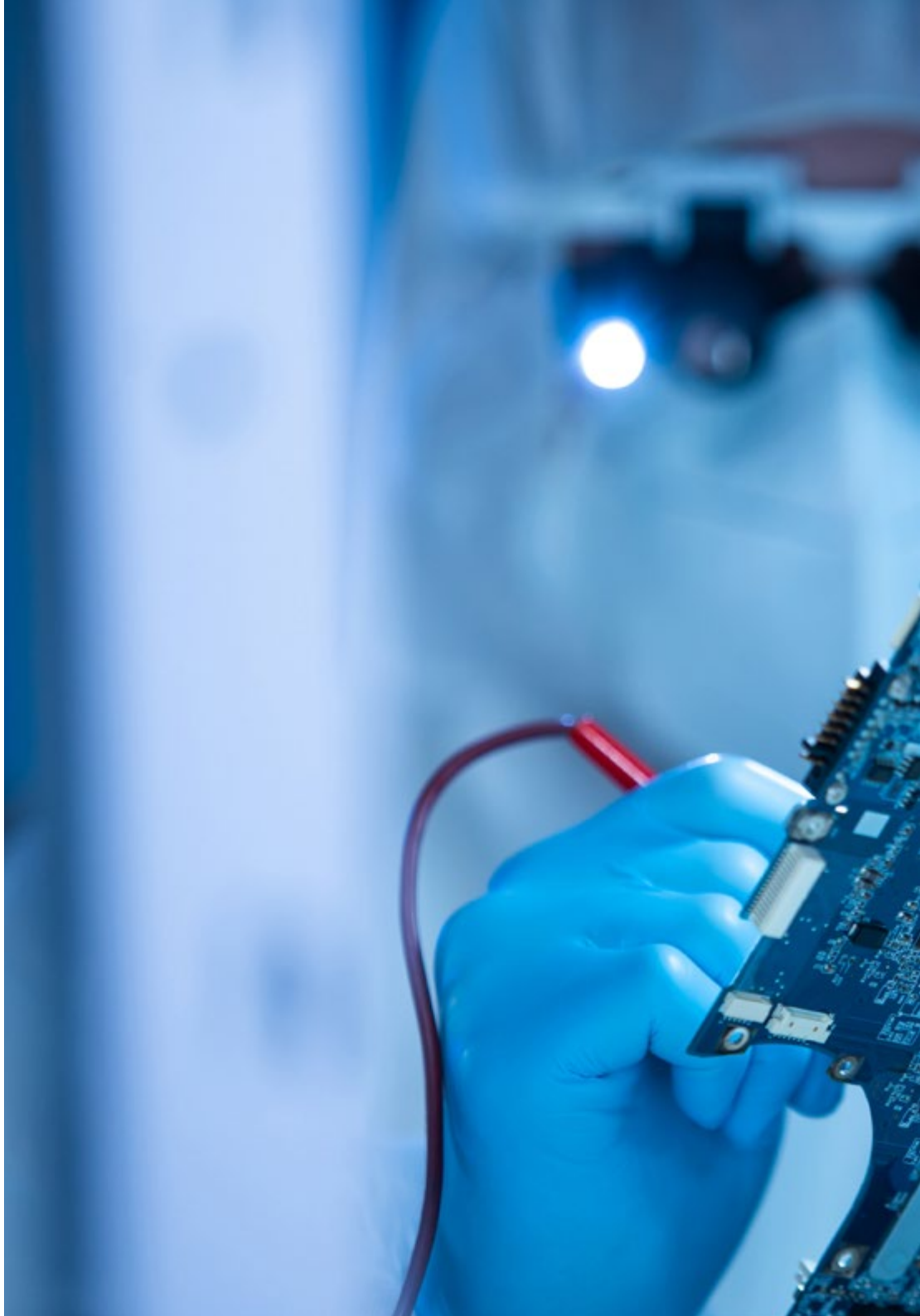


This Microelectronics program will help you develop the skills you need to succeed in the field"

General Objectives

- Compile the main materials involved in microelectronics, properties and applications
- Identify the operation of the fundamental structures of microelectronic devices
- Understand the mathematical principles that govern microelectronics
- Analyze signals and modify them

Delve into the study of Microelectronics and design mechanisms that are part of everyday life"



Specific Objectives

- Generate specialized knowledge on microelectronics
- Examine analog and digital circuits
- Determine the fundamental characteristics and uses of a diode
- Determine how an amplifier works
- Develop proficiency in the design of transistors and amplifiers according to the desired use
- Demonstrate the mathematics behind the most common components in electronics
- Analyze signals from their frequency response
- Evaluating the stability of a control
- Identify the main lines of technology development

03

Course Management

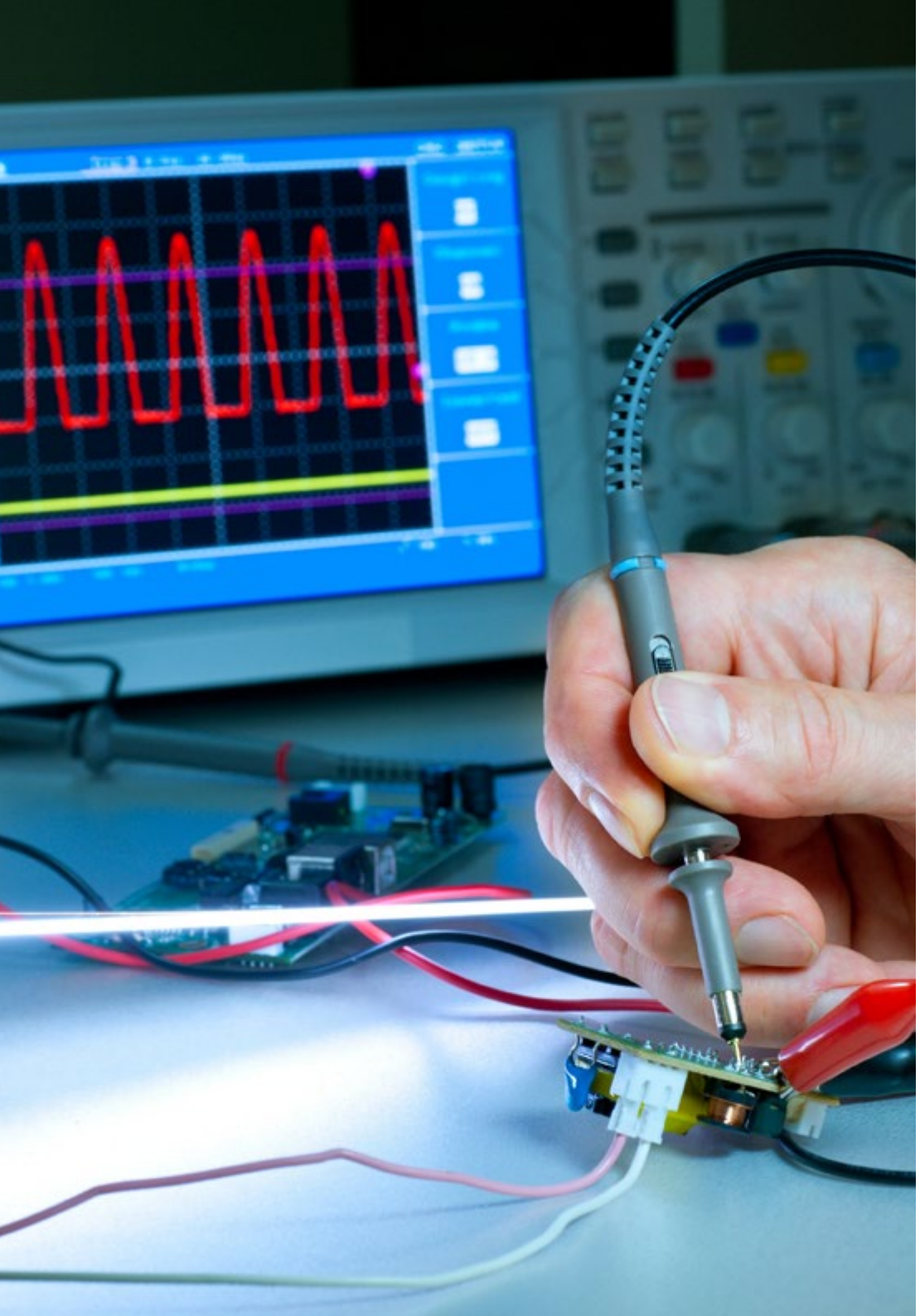
Faculty experts in Microelectronics have compiled the most complete information available to offer students the best program on the current academic scene. A group of specialists engaged in quality teaching, who have dedicated a large part of their academic and professional life to the study and research in Microelectronics, to become the leading specialists in the sector at a national level. There is no doubt, the best teaching staff that TECH can offer to its students.

Leading experts in Microelectronics have come together to teach you the main developments in this field"

Management

Ms. Casares Andrés, María Gregoria

- Associate Professors, Carlos III University of Madrid
- Degree in IT, Polytechnic University of Madrid
- Research Sufficiency, Polytechnic University of Madrid
- Research Sufficiency, Carlos III 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



Professors

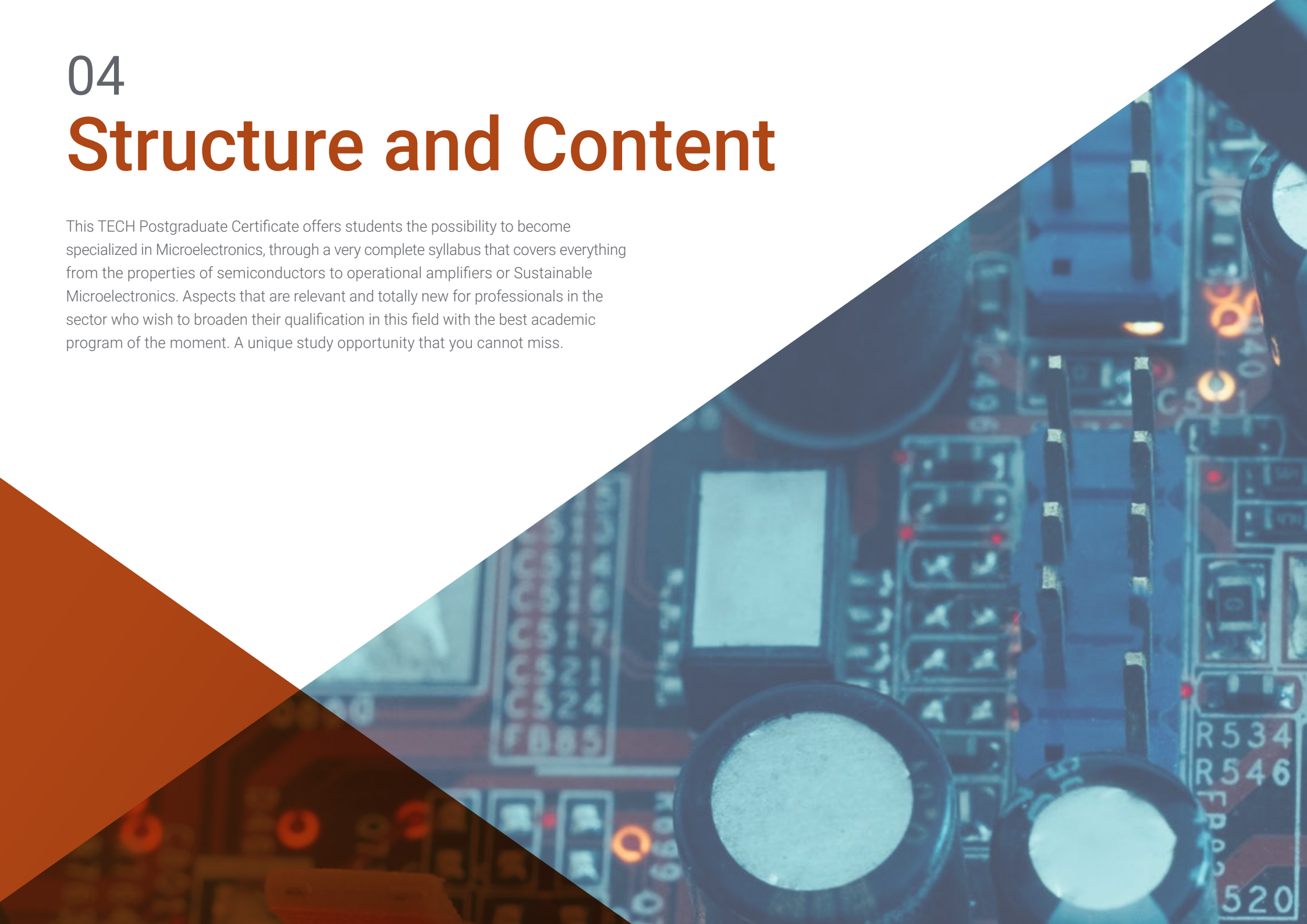
Mr. Ruiz Díez, Carlos

- Researcher at the National Microelectronics Center of the CSIC
- Director of Competitive Engineering Training at ISC
- Volunteer trainer at Caritas Employment Classroom
- Research intern in the 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
- ICAI Speed Club: motorcycle racing team
- Graduate in Industrial Technologies Engineering from Pontificia University 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 Spanish Distance Learning University

04

Structure and Content

This TECH Postgraduate Certificate offers students the possibility to become specialized in Microelectronics, through a very complete syllabus that covers everything from the properties of semiconductors to operational amplifiers or Sustainable Microelectronics. Aspects that are relevant and totally new for professionals in the sector who wish to broaden their qualification in this field with the best academic program of the moment. A unique study opportunity that you cannot miss.



Learn about the main aspects of Microelectronics and become an expert in the field"

Module 1. Microelectronics

1.1. Microelectronics vs. Electronics
- 1.1.1. Analog Circuits
- 1.1.2. Digital Circuits
- 1.1.3. Signals and Waves
- 1.1.4. Semiconductor Materials

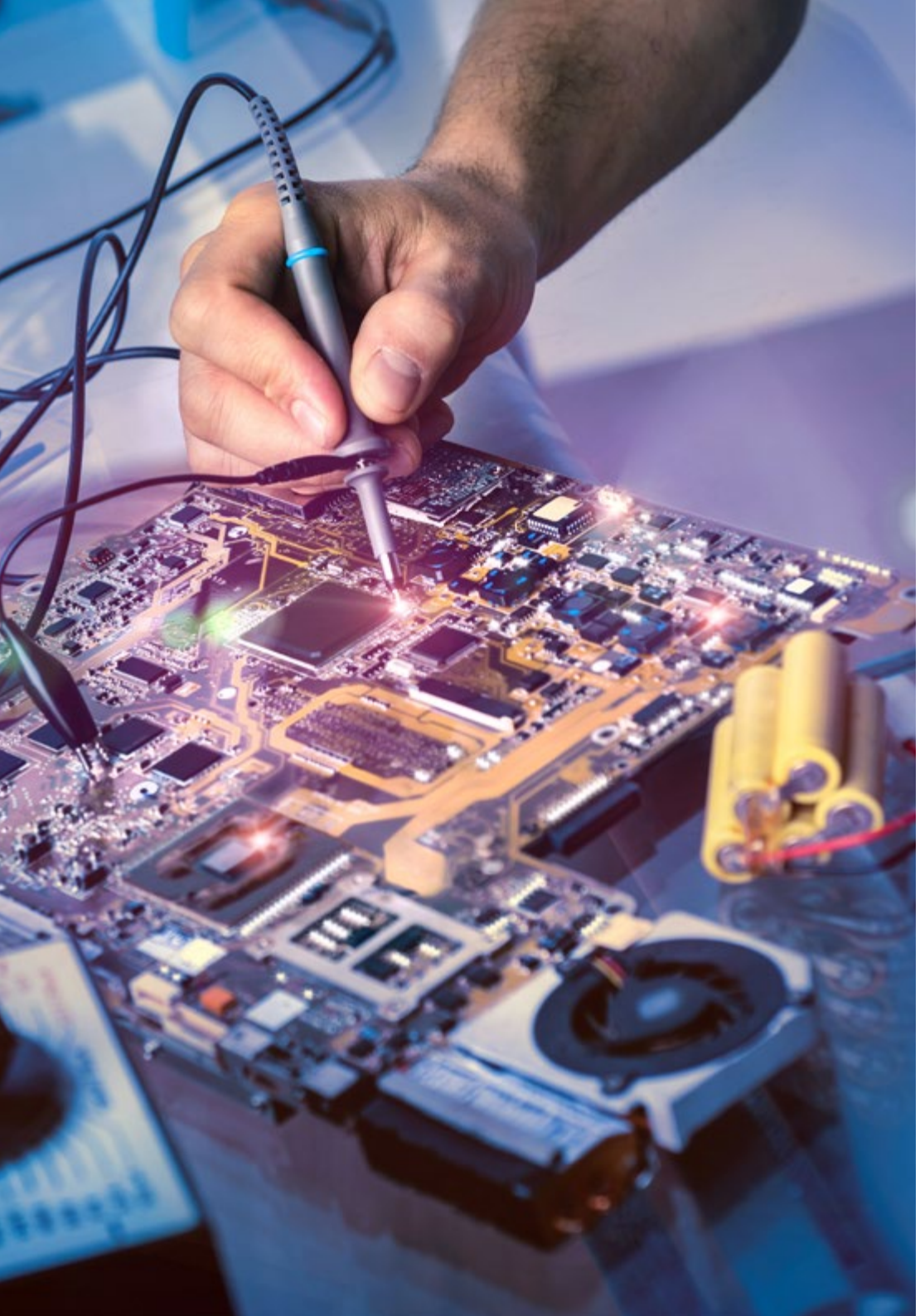
1.2. Semiconductor Properties
- 1.2.1. PN Joint Structure
- 1.2.2. Reverse Breakdown
  - 1.2.2.1. Zener Breakdown
  - 1.2.2.2. Avalanche Breakdown

1.3. Diodes
- 1.3.1. Ideal Diode
- 1.3.2. Rectifier
- 1.3.3. Diode Junction Characteristics
  - 1.3.3.1. Direct Polarization Current
  - 1.3.3.2. Inverse Polarization Current
- 1.3.4. Applications

1.4. Transistors
- 1.4.1. Structure and Physics of a Bipolar Transistor
- 1.4.2. Operation of a Transistor
  - 1.4.2.1. Active Mode
  - 1.4.2.2. Saturation Mode

1.5. MOS Field-Effect Transistors (MOSFETs)
- 1.5.1. Structure
- 1.5.2. The I-V Features
- 1.5.3. DC MOSFET Circuits
- 1.5.4. The Body Effect

1.6. Operational Amplifier
- 1.6.1. Ideal Amplifier
- 1.6.2. Settings
- 1.6.3. Differential Amplifiers
- 1.6.4. Integrators and Differentiators



1.7. Operational Amplifiers. Uses
- 1.7.1. Bipolar Amplifiers
- 1.7.2. CMOS
- 1.7.3. Amplifiers as Black Boxes

1.8. Frequency Response
- 1.8.1. Analysis of Frequency Response
- 1.8.2. High-Frequency Response
- 1.8.3. Low-Frequency Response
- 1.8.4. Examples:

1.9. Feedback
- 1.9.1. General Structure of Feedback
- 1.9.2. Properties and Methodology of Feedback Analysis
- 1.9.3. Stability: Bode Method
- 1.9.4. Frequency Compensation

1.10. Sustainable Microelectronics and Future Trends
- 1.10.1. Sustainable Energy Sources
- 1.10.2. Bio-Compatible Sensors
- 1.10.3. Future Trends in Microelectronics

Get access to the most complete material on Microelectronics and specialize in an important field of electronic engineering"

05

Methodology

This academic program offers students a different way of learning. Our methodology follows a cyclical learning process***: 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 method of skills and knowledge development. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

At TECH, you will experience a way of learning 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

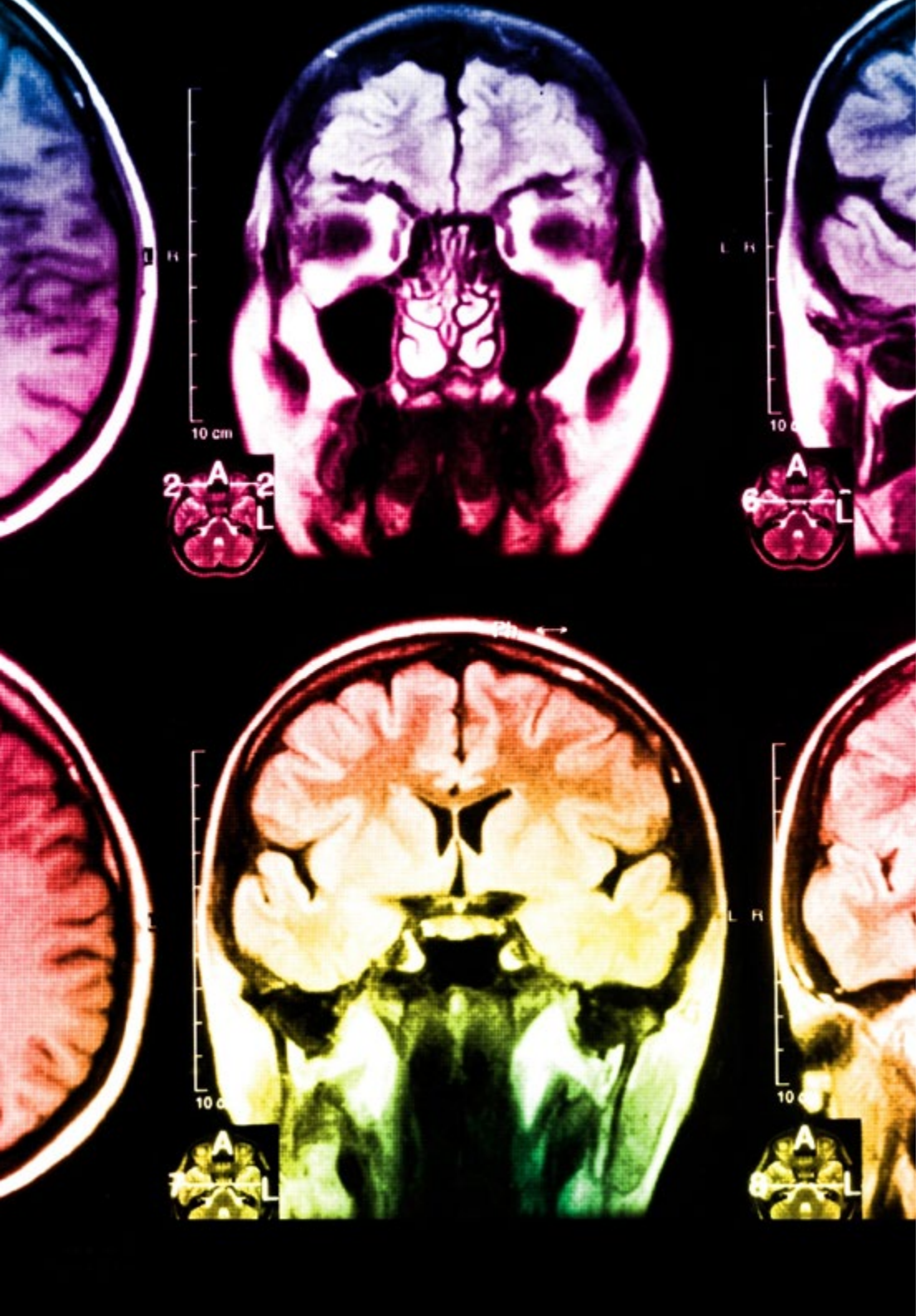
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

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 prepare 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.



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

Classes

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

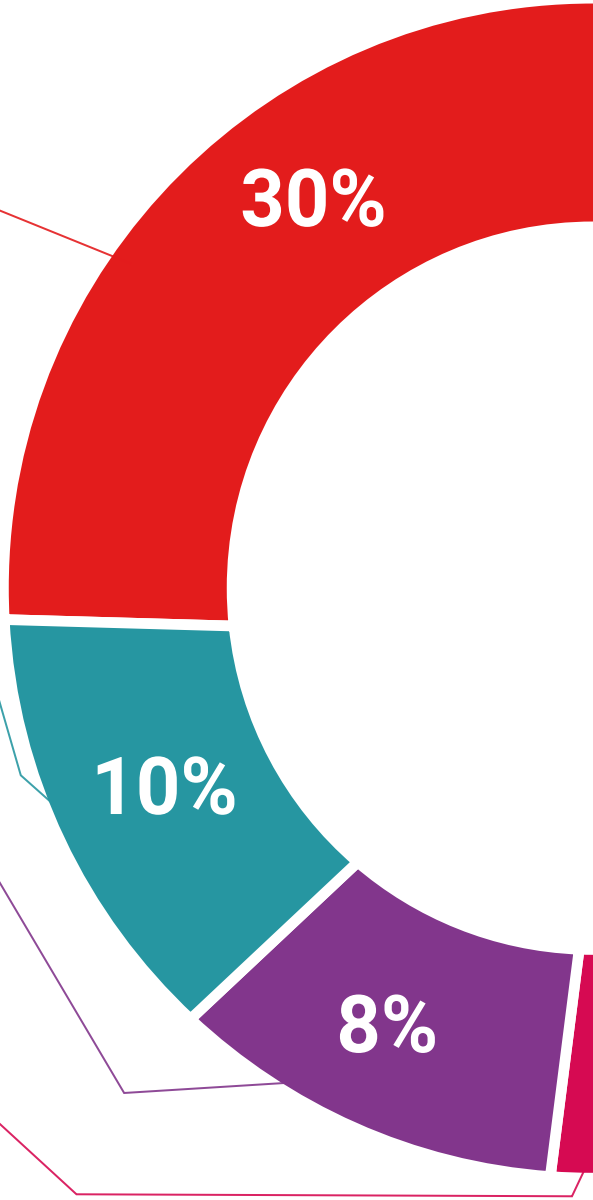
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

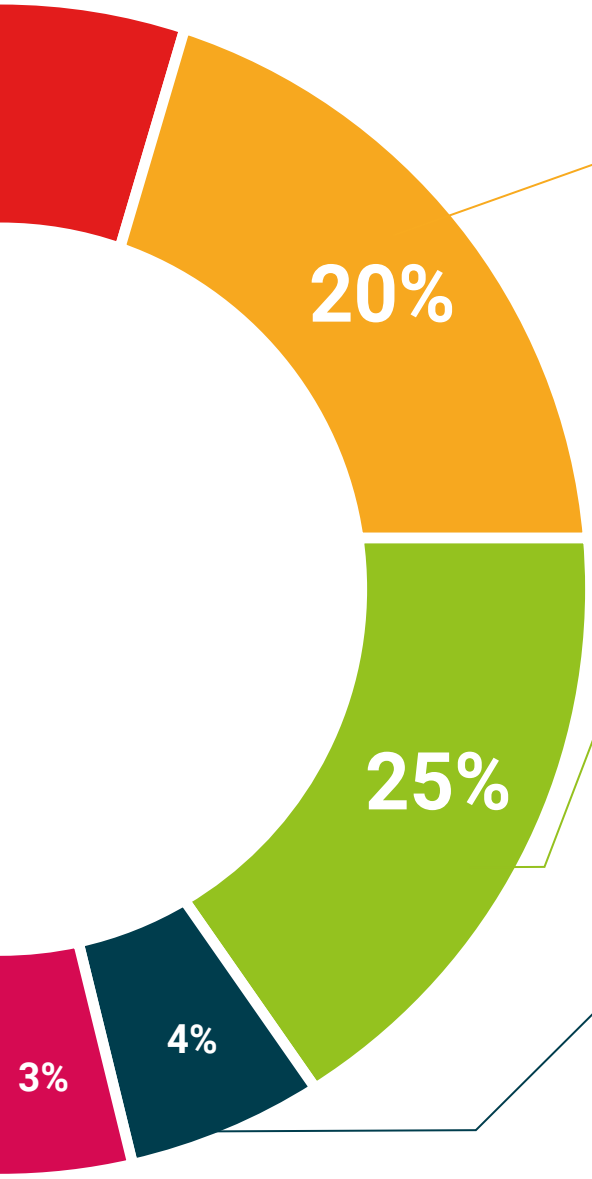
Practising Skills and Abilities

They will carry out activities to develop specific competencies and skills in each thematic field. 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.





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".

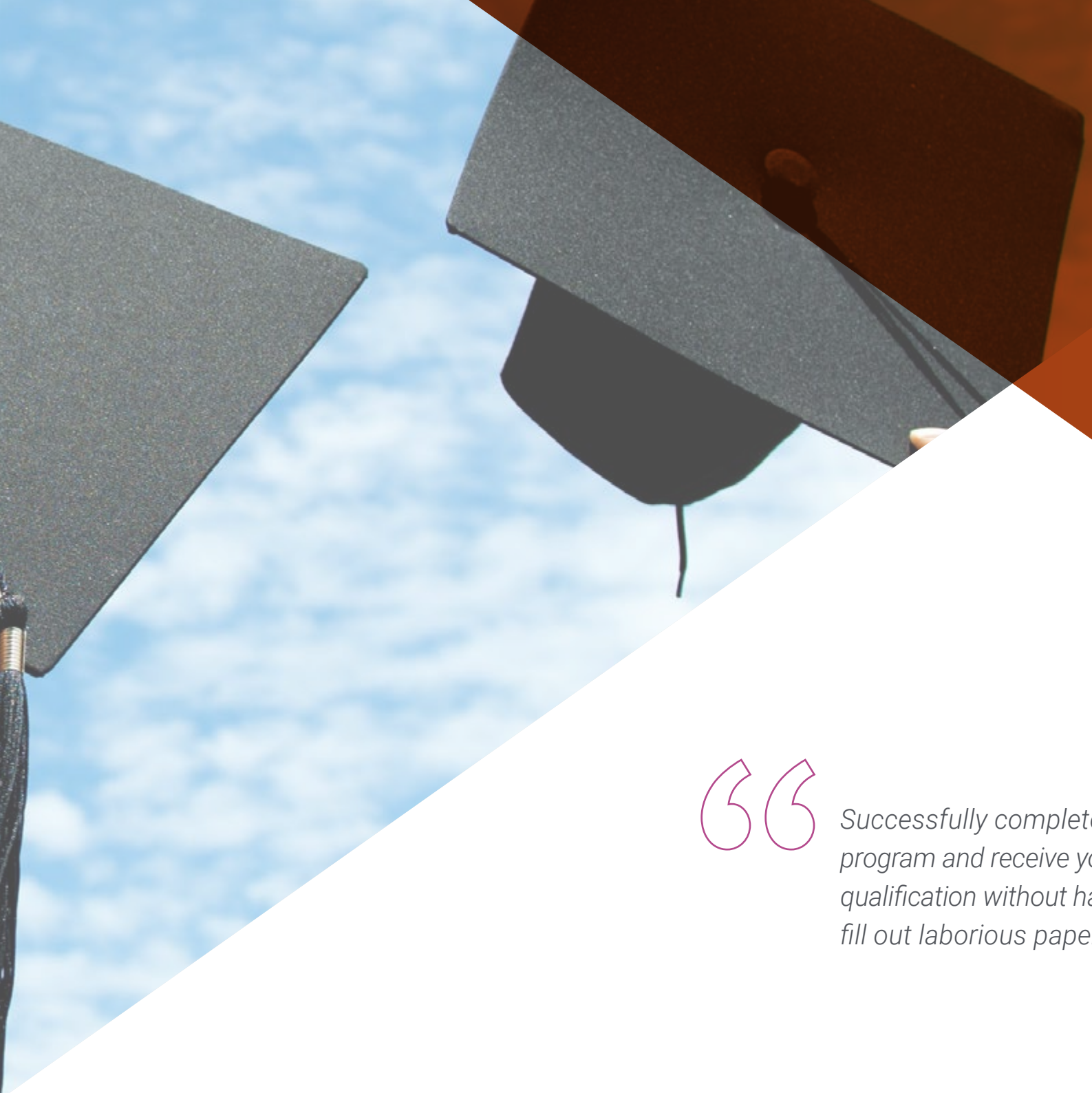
Testing & Retesting

We periodically assess and re-assess 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 Microelectronics 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 Microelectronics** 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.

Title: **Postgraduate Certificate in Microelectronics**

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

Microelectronics

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

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.

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