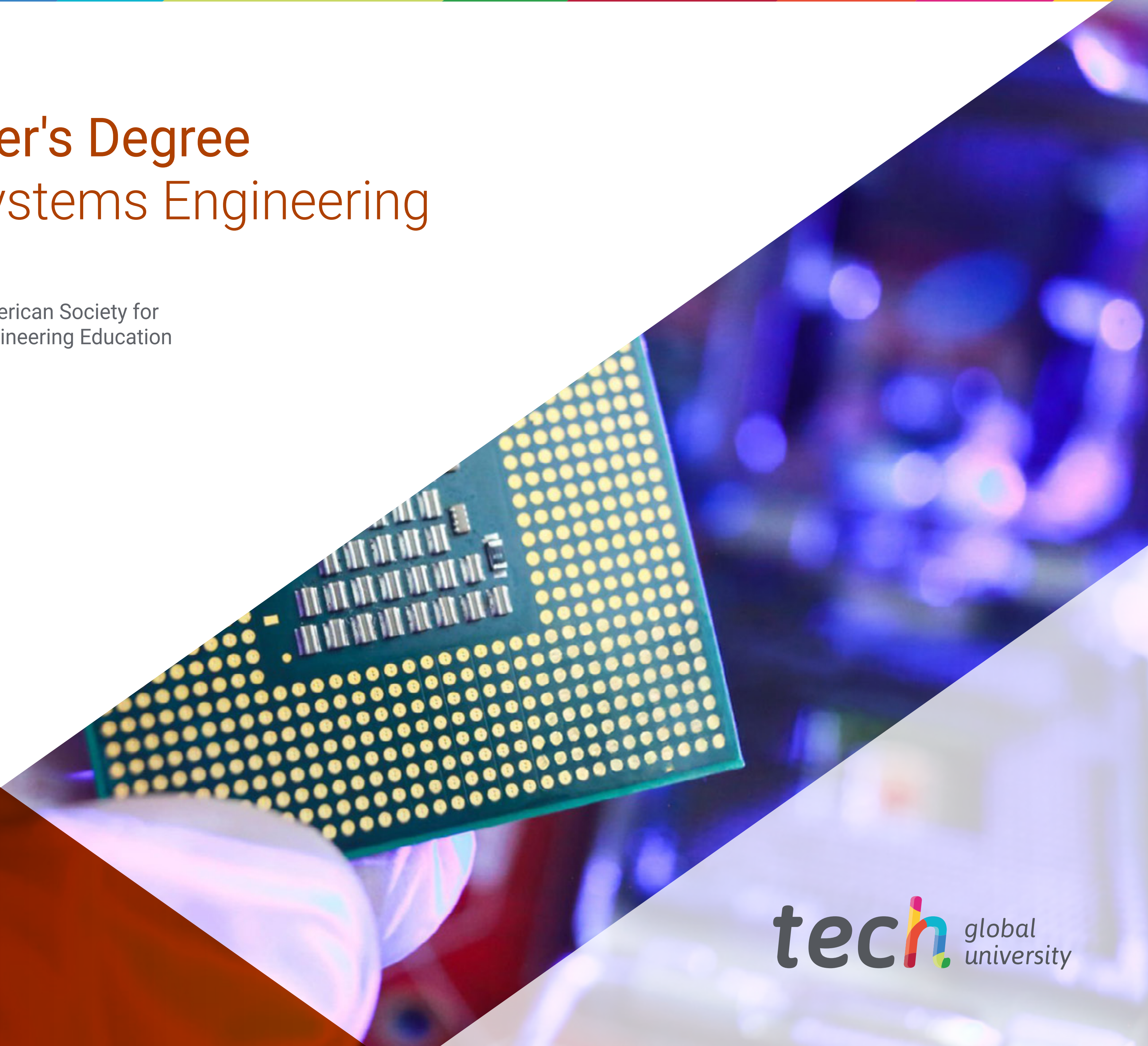
Hybrid Master's Degree
Electronic Systems Engineering

Accreditation/Membership

ASEE American Society for Engineering Education



tech global university

Hybrid Master's Degree
Electronic Systems Engineering

Modality: **Hybrid (Online + Internship)**
Duration: **12 months**
Certificate: **TECH Global University**
Credits: **60 + 4 ECTS**
Website: **www.techtitute.com/us/engineering/hybrid-master-degree/hybrid-master-degree-electronic-systems-engineering**

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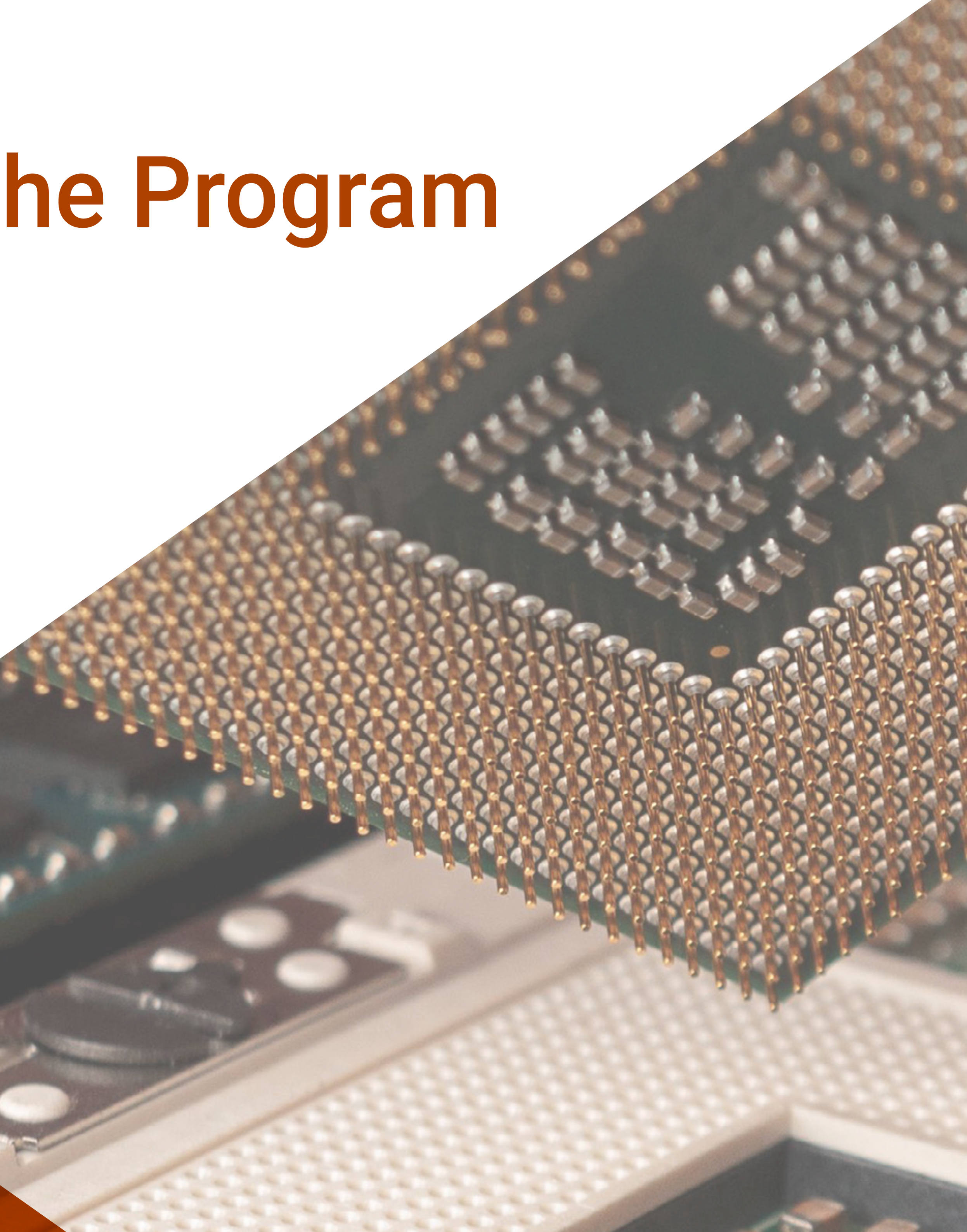
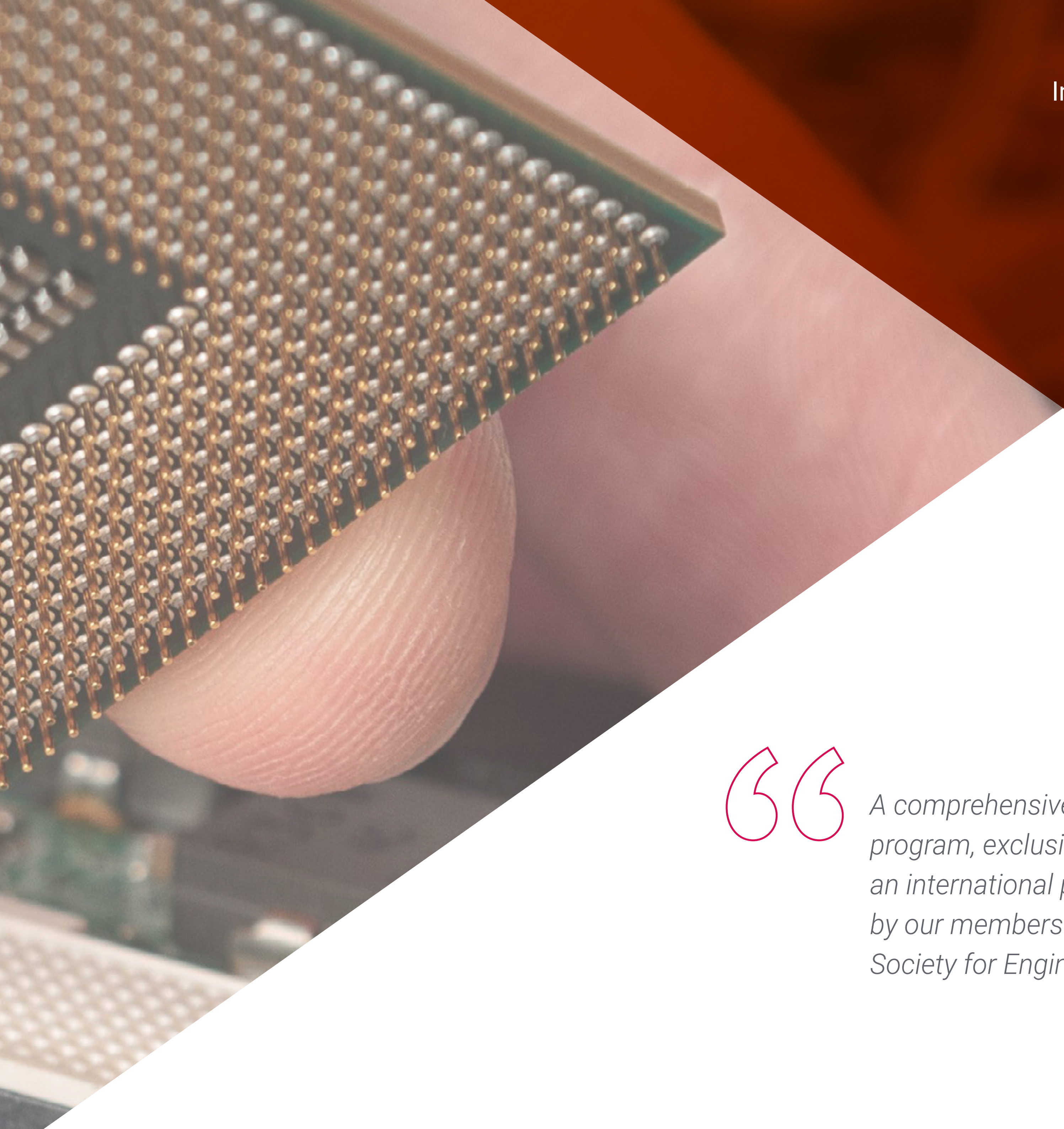
01

Introduction to the Program

In an industrial environment where automation and connectivity are redefining production processes, Electronic Systems Engineering emerges as a strategic discipline capable of integrating intelligence and efficiency across multiple sectors. According to the Institute of Electrical and Electronics Engineers (IEEE), 72% of technology companies have increased their investment in smart electronic systems over the past decade. In this context, TECH's university program arises as a response to the challenges posed by the integration of advanced technologies, offering an academic path focused on continuous updating. Initially, its online methodology facilitates global access to specialized knowledge, while later practical sessions solidify technical skills in real-world scenarios.





A comprehensive and 100% online program, exclusive to TECH, with an international perspective backed by our membership in the American Society for Engineering Education"

Today, technological advancements heavily rely on the development of electronic solutions capable of integrating into various environments. From mobile devices to industrial automation systems, the design and implementation of electronic components are essential to improving the efficiency, connectivity, and intelligence of systems. Therefore, the field of Electronic Systems Engineering has become a key discipline in the digital transformation of multiple sectors.

In this context, TECH Global University has structured an academic plan that will allow students to delve into fundamental areas such as embedded systems, electronic design, and microelectronics. Through a logical and specialized sequence of content, the program focuses on the integration of hardware and software, optimizing circuit performance, and developing technologies aimed at miniaturization. This university program meets the current demands of the sector, focusing on practical applicability and the technical expertise required by the modern electronics industry.

To achieve these results, TECH Global University has designed a flexible and rigorous methodology that combines state-of-the-art digital teaching resources with practical experience in recognized institutions. Through the Relearning model, deep content assimilation is facilitated, promoting long-term retention and the development of transferable skills. This methodological structure enables professionals to learn autonomously, practically, and efficiently, with an academic experience tailored to the demands of today's industry.

Thanks to TECH's membership in the **American Society for Engineering Education (ASEE)**, its students gain free access to annual conferences and regional workshops that enrich their engineering education. Additionally, they enjoy online access to specialized publications such as Prism and the Journal of Engineering Education, enhancing their academic development and expanding their professional network on an international scale.

This **Hybrid Master's Degree in Electronic Systems Engineering** contains the most complete and up-to-date program on the market. The most important features include:

- Development of over 100 practical cases presented by engineers specialized in electronic systems and university instructors with extensive experience in technological development
- Its graphic, schematic and practical contents provide essential information on those disciplines that are indispensable for professional practice
- With a special emphasis on technology-based development and research methodologies applied to advanced electronic systems
- All of this will be complemented by theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an internet connection
- Furthermore, you will be able to carry out an internship in one of the best companies

Be part of an online and practical methodology that offers multiple opportunities to access the most current knowledge in Electronic Systems Engineering"

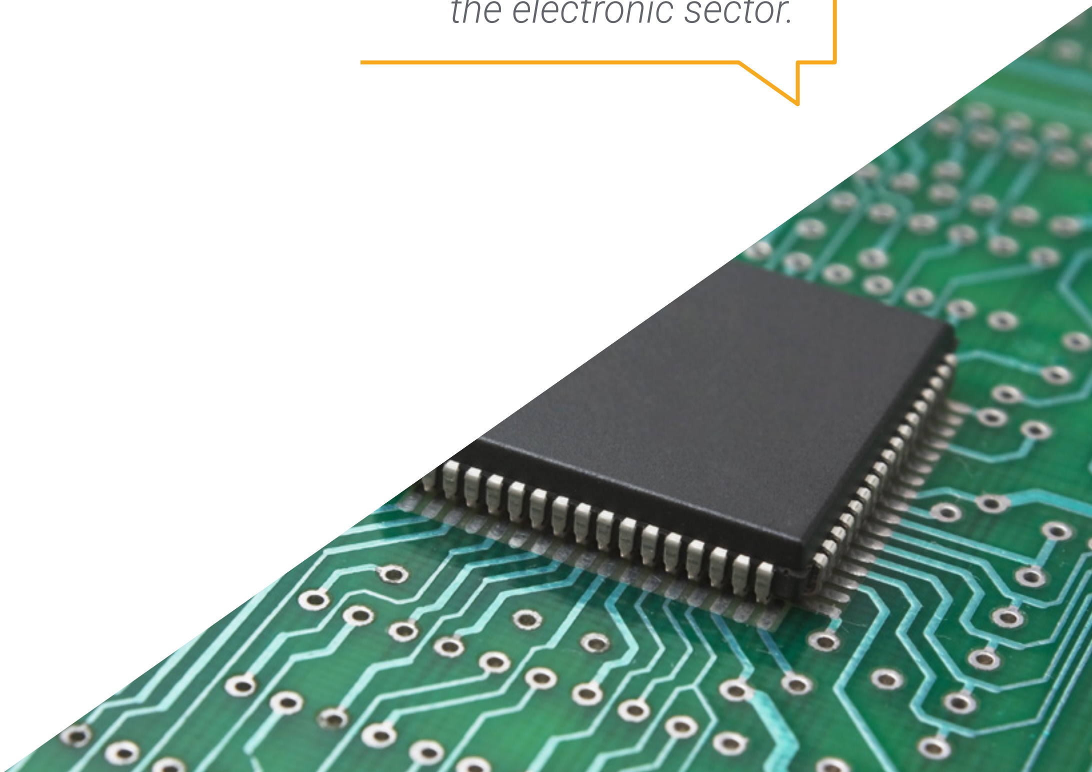
You will explore the most relevant advancements in the electronics sector through educational content presented in innovative multimedia formats"

In this Hybrid Master's Degree, which is professionalizing in nature, the program is aimed at updating professionals in Engineering who work in the advanced technology sector and require a high level of technical qualification. The content is based on the latest scientific evidence and is designed in a didactic manner to integrate theoretical knowledge into professional practice. The theoretical and practical elements will facilitate knowledge updates and enable decision-making in the development and management of electronic systems.

Thanks to its multimedia content developed with the latest educational technology, it will provide engineering professionals with situated and contextualized learning, meaning a simulated environment that will offer an immersive learning experience, preparing them for real-world situations. The design of this program is based on Problem-Based Learning, by means of which the student must try to solve the different professional practice situations that arise during the program. For this purpose, students will be assisted by an innovative interactive video system created by renowned experts.

You will have access to a program with an online methodology and a practical approach, based on knowledge shared by experts.

The competencies you will develop throughout the university program will be key to your future success in the electronic sector.



02

Why Study at TECH?

TECH is the world's largest online university. With an impressive catalog of more than 14,000 university programs, available in 11 languages, it is positioned as a leader in employability, with a 99% job placement rate. In addition, it has a huge faculty of more than 6,000 professors of the highest international prestige.

Study at the largest online university in the world and ensure your professional success. The future begins at TECH"

The world's best online university, according to FORBES

The prestigious Forbes magazine, specialized in business and finance, has highlighted TECH as "the best online university in the world" This is what they have recently stated in an article in their digital edition in which they echo the success story of this institution, "thanks to the academic offer it provides, the selection of its teaching staff, and an innovative learning method oriented to form the professionals of the future".

The best top international faculty

TECH's faculty is made up of more than 6,000 professors of the highest international prestige. Professors, researchers and top executives of multinational companies, including Isaiah Covington, performance coach of the Boston Celtics; Magda Romanska, principal investigator at Harvard MetaLAB; Ignacio Wistumba, chairman of the department of translational molecular pathology at MD Anderson Cancer Center; and D.W. Pine, creative director of TIME magazine, among others.

The world's largest online university

TECH is the world's largest online university. We are the largest educational institution, with the best and widest digital educational catalog, one hundred percent online and covering most areas of knowledge. We offer the largest selection of our own degrees and accredited online undergraduate and postgraduate degrees. In total, more than 14,000 university programs, in ten different languages, making us the largest educational institution in the world.

The most complete syllabuses on the university scene

TECH offers the most complete syllabuses on the university scene, with programs that cover fundamental concepts and, at the same time, the main scientific advances in their specific scientific areas. In addition, these programs are continuously updated to guarantee students the academic vanguard and the most demanded professional skills. and the most in-demand professional competencies. In this way, the university's qualifications provide its graduates with a significant advantage to propel their careers to success.

A unique learning method

TECH is the first university to use Relearning in all its programs. This is the best online learning methodology, accredited with international teaching quality certifications, provided by prestigious educational agencies. In addition, this innovative academic model is complemented by the "Case Method", thereby configuring a unique online teaching strategy. Innovative teaching resources are also implemented, including detailed videos, infographics and interactive summaries.

Google Partner
PREMIER 2025

Google Premier Partner

The American technology giant has awarded TECH the Google Premier Partner badge. This award, which is only available to 3% of the world's companies, highlights the efficient, flexible and tailored experience that this university provides to students. The recognition not only accredits the maximum rigor, performance and investment in TECH's digital infrastructures, but also places this university as one of the world's leading technology companies.

The Official Online University of the NBA

The official online university of the NBA

TECH is the official online university of the NBA. Thanks to our agreement with the biggest league in basketball, we offer our students exclusive university programs, as well as a wide variety of educational resources focused on the business of the league and other areas of the sports industry. Each program is made up of a uniquely designed syllabus and features exceptional guest hosts: professionals with a distinguished sports background who will offer their expertise on the most relevant topics.

4.9/5
★★★★★
★ global score

The top-rated university by its students

Students have positioned TECH as the world's top-rated university on the main review websites, with a highest rating of 4.9 out of 5, obtained from more than 1,000 reviews. These results consolidate TECH as the benchmark university institution at an international level, reflecting the excellence and positive impact of its educational model.

99%
maximun employability guaranteed

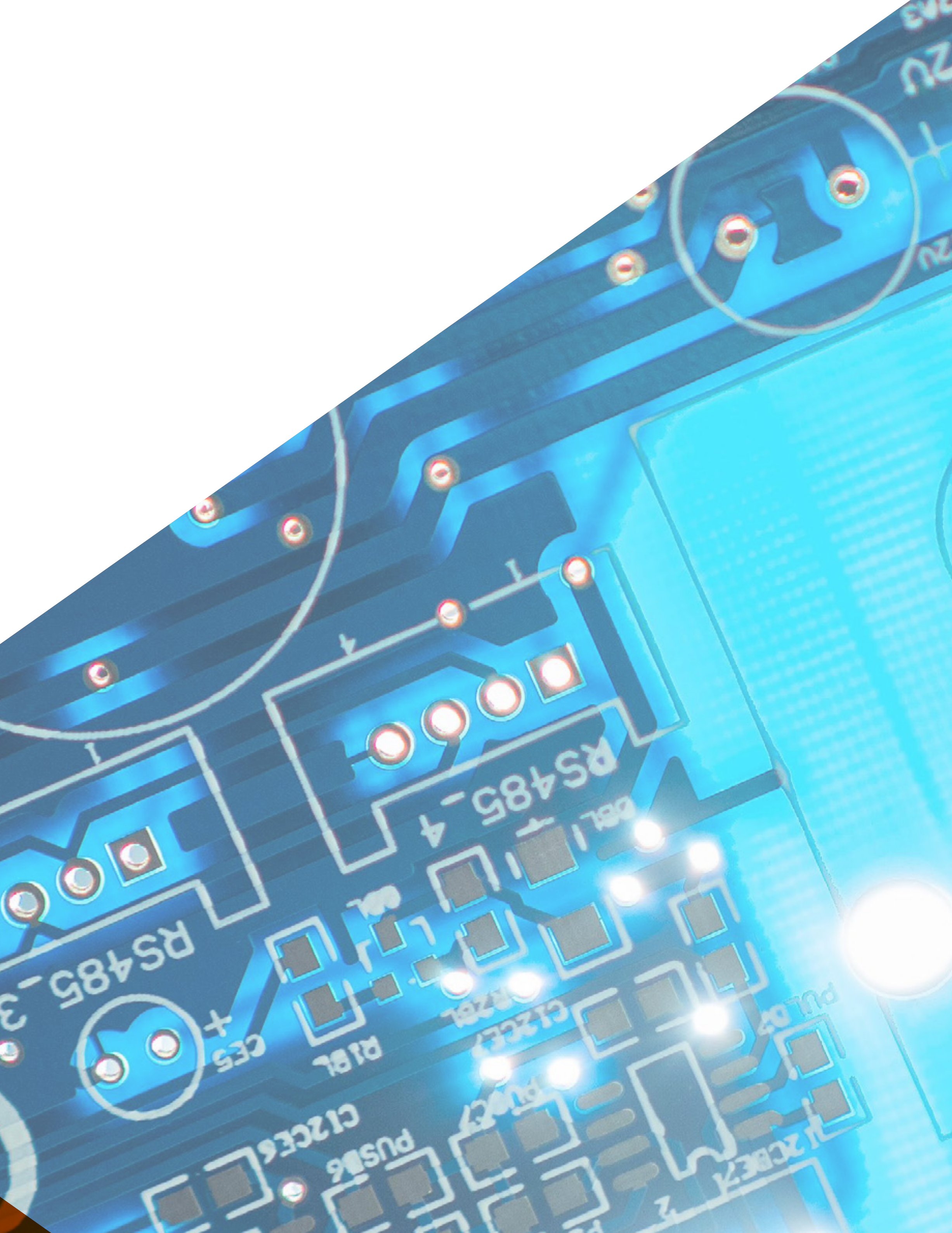
Leaders in employability

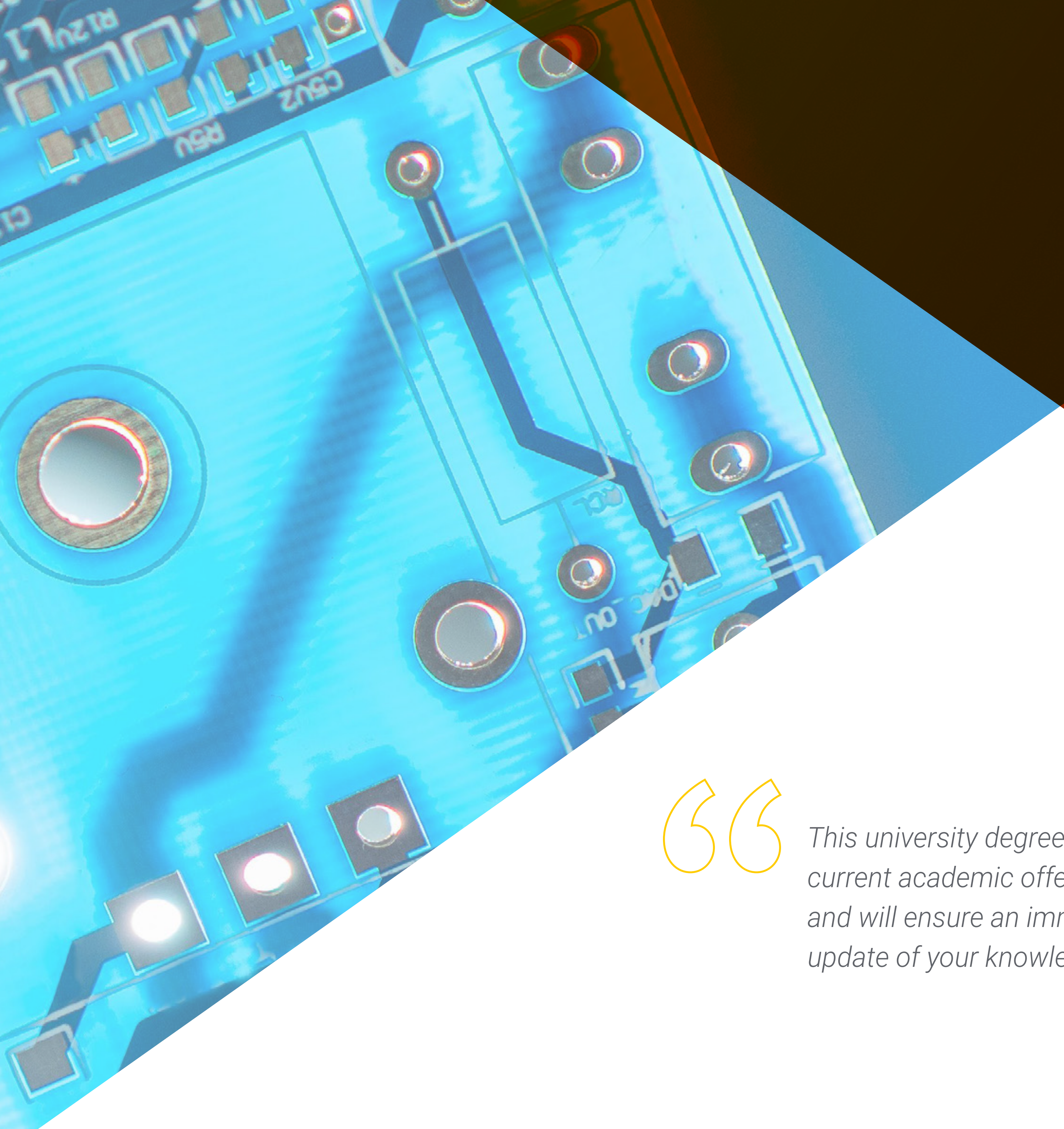
TECH has become the leading university in employability. Ninety-nine percent of its students obtain jobs in the academic field they have studied within one year of completing any of the university's programs. A similar number achieve immediate career enhancement. All this thanks to a study methodology that bases its effectiveness on the acquisition of practical skills, which are absolutely necessary for professional development.

03

Syllabus

This university program offers a broad range of key topics in Electronic Systems Engineering. Designed by experts, the academic itinerary will delve into technologies related to microelectronics, circuit design, and embedded systems, covering everything from the fabrication of high-precision devices to the integration of components in smart platforms. In this regard, professional competencies will be strengthened, focused on the creation of hardware-software solutions with high standards of performance, energy efficiency, and scalability. As such, an advanced preparation is provided that will enable professionals to effectively address the technical challenges present in demanding sectors.





This university degree represents the most current academic offering on the market and will ensure an immediate and rigorous update of your knowledge"

Module 1. Embedded Systems

1.1. Embedded Systems
  - 1.1.1. Embedded System
  - 1.1.2. Requirements for Embedded Systems and Benefits
  - 1.1.3. Evolution of Embedded Systems

1.2. Microprocessors
  - 1.2.1. Evolution of Microprocessors
  - 1.2.2. Families of Microprocessors
  - 1.2.3. Future Trend
  - 1.2.4. Commercial Operating System

1.3. Structure of a Microprocessor
  - 1.3.1. Basic Structure of a Microprocessor
  - 1.3.2. Central Processing Unit
  - 1.3.3. Inputs and Outputs
  - 1.3.4. Buses and Logical Levels
  - 1.3.5. Structure of a System Based on Microprocessors

1.4. Processing Platforms
  - 1.4.1. Cyclic Executive Operation
  - 1.4.2. Events and Interruptions
  - 1.4.3. Hardware Management
  - 1.4.4. Distributed Systems

1.5. Analysis and Design of Programs for Embedded Systems
  - 1.5.1. Requirements Analysis
  - 1.5.2. Design and Integration
  - 1.5.3. Implementation, Tests and Maintenance

1.6. Operating Systems in Real Time
  - 1.6.1. Real Time, Types
  - 1.6.2. Operating Systems in Real Time. Requirements
  - 1.6.3. Microkernel Architecture
  - 1.6.4. Planning
  - 1.6.5. Task Management and Interruptions
  - 1.6.6. Advanced Operating Systems

1.7. Design Technique of Embedded Systems
  - 1.7.1. Sensors and Magnitudes
  - 1.7.2. Low Power Modes
  - 1.7.3. Embedded Systems Languages
  - 1.7.4. Peripherals

1.8. Networks and Multiprocessors in Embedded Systems
  - 1.8.1. Types of Networks
  - 1.8.2. Distributed Embedded Systems Networks
  - 1.8.3. Multiprocessors

1.9. Embedded Systems Simulators
  - 1.9.1. Commercial Simulators
  - 1.9.2. Simulation Parameters
  - 1.9.3. Error Checking and Error Handling

1.10. Embedded Systems for the Internet of Things (IoT)
  - 1.10.1. IoT
  - 1.10.2. Wireless Sensor Networks
  - 1.10.3. Attacks and Protective Measures
  - 1.10.4. Resource Management
  - 1.10.5. Commercial Platforms

Module 2. Electronic Systems Design

2.1. Electronic Design
  - 2.1.1. Resources for the Design
  - 2.1.2. Simulation and Prototype
  - 2.1.3. Testing and Measurements

2.2. Circuit Design Techniques
  - 2.2.1. Schematic Drawing
  - 2.2.2. Current Limiting Resistors
  - 2.2.3. Voltage Dividers
  - 2.2.4. Special Resistance
  - 2.2.5. Transistors
  - 2.2.6. Errors and Precision

2.3. Power Supply Design
- 2.3.1. Choice of Power Supply
  - 2.3.1.1. Common Voltage
  - 2.3.1.2. Design of a Battery
- 2.3.2. Switch-Mode Power Supplies
  - 2.3.2.1. Types
  - 2.3.2.2. Pulse Width Modulation
  - 2.3.2.3. Components

2.4. Amplifier Design
- 2.4.1. Types
- 2.4.2. Specifications
- 2.4.3. Gain and Attenuation
  - 2.4.3.1. Input and Output Impedances
  - 2.4.3.2. Maximum Power Transfer
- 2.4.4. Design with Operational Amplifiers (OP AMP)
  - 2.4.4.1. DC Connection
  - 2.4.4.2. Open Loop Operation
  - 2.4.4.3. Frequency Response
  - 2.4.4.4. Upload Speed
- 2.4.5. OP AMP Applications
  - 2.4.5.1. Inverters
  - 2.4.5.2. Buffer
  - 2.4.5.3. Adder
  - 2.4.5.4. Integrator
  - 2.4.5.5. Restorer
  - 2.4.5.6. Instrumentation Amplification
  - 2.4.5.7. Error Source Compensator
  - 2.4.5.8. Comparator
- 2.4.6. Power Amplifier

2.5. Oscillator Design
- 2.5.1. Specifications
- 2.5.2. Sinusoidal Oscillators
  - 2.5.2.1. Vienna Bridge
  - 2.5.2.2. *Colpitts*
  - 2.5.2.3. Quartz Crystal
- 2.5.3. Clock Signal
- 2.5.4. Multivibrators
  - 2.5.4.1. Schmitt Trigger
  - 2.5.4.2. 555
  - 2.5.4.3. XR2206
  - 2.5.4.4. LTC6900
- 2.5.5. Frequency Synthesizers
  - 2.5.5.1. Phase Tracking Loop (PTL)
  - 2.5.5.2. Direct Digital Synthesizer (DDS)

2.6. Design of Filters
- 2.6.1. Types
  - 2.6.1.1. Low Pass
  - 2.6.1.2. High Pass
  - 2.6.1.3. Band Pass
  - 2.6.1.4. Band Eliminator
- 2.6.2. Specifications
- 2.6.3. Behavior Models
  - 2.6.3.1. Butterworth
  - 2.6.3.2. Bessel
  - 2.6.3.3. Chebyshev
  - 2.6.3.4. *Elliptical*
- 2.6.4. RC Filters
- 2.6.5. LC Filters Band Pass
- 2.6.6. Band-Stop Filter
  - 2.6.6.1. Twin-T
  - 2.6.6.2. LC Notch
- 2.6.7. Active RC Filters

2.7. Electromechanical Design
  2.7.1. Contact Switch
  2.7.2. Electromechanical Relays
  2.7.3. Solid State Relays (SSR)
  2.7.4. Coils
  2.7.5. Engines
    2.7.5.1. Ordinary
    2.7.5.2. Servomotors
2.8. Digital Design
  2.8.1. Basic Logic of Integrated Circuits (ICs)
  2.8.2. Programmable Logic
  2.8.3. Microcontrollers
  2.8.4. Demorgan Theorem
  2.8.5. Functional Integrated Circuits
    2.8.5.1. Decoders
    2.8.5.2. Multiplexers
    2.8.5.3. Demultiplexers
    2.8.5.4. Comparators
2.9. Programmable Logic Devices and Microcontrollers
  2.9.1. Programmable Logic Device (PLD)
    2.9.1.1. Programming
  2.9.2. Field Programmable Logic Gate Array (FPGA)
    2.9.2.1. VHDL and Verilog Language
  2.9.3. Microcontrollers Design
    2.9.3.1. Embedded Microcontroller Design

2.10. Choosing Components
2.10.1. Resistance
2.10.1.1. Resistor Encapsulation
2.10.1.2. Manufacturing Materials
2.10.1.3. Standard Values
2.10.2. Capacitors
2.10.2.1. Capacitor Packages
2.10.2.2. Manufacturing Materials
2.10.2.3. Code of Values
2.10.3. Coils
2.10.4. Diodes
2.10.5. Transistors
2.10.6. Integrated Circuits

Module 3. Microelectronics

3.1. Microelectronics vs. Electronics
3.1.1. Analog Circuits
3.1.2. Digital Circuits
3.1.3. Signals and Waves
3.1.4. Semiconductor Materials
3.2. Semiconductor Properties
3.2.1. PN Joint Structure
3.2.2. Reverse Breakdown
3.2.2.1. Zener Breakdown
3.2.2.2. Avalanche Breakdown
3.3. Diodes
3.3.1. Ideal Diode
3.3.2. Rectifier
3.3.3. Diode Junction Characteristics
3.3.3.1. Direct Polarization Current
3.3.3.2. Inverse Polarization Current
3.3.4. Applications

3.4. Transistors
 3.4.1. Structure and Physics of a Bipolar Transistor
 3.4.2. Operation of a Transistor
 3.4.2.1. Active Mode
 3.4.2.2. Saturation Mode
3.5. MOS *Field-Effect Transistors* (MOSFETs)
 3.5.1. Structure
 3.5.2. The I-V Features
 3.5.3. DC MOSFET Circuits
 3.5.4. The Body Effect
3.6. Operational Amplifier
 3.6.1. Ideal Amplifier
 3.6.2. Settings
 3.6.3. Differential Amplifiers
 3.6.4. Integrators and Differentiators
3.7. Operational Amplifiers. Uses
 3.7.1. Bipolar Amplifiers
 3.7.2. CMOS (Complementary Metal-Oxide-Semiconductor)
 3.7.3. Amplifiers as Black Boxes
3.8. Frequency Response
 3.8.1. Analysis of Frequency Response
 3.8.2. High-Frequency Response
 3.8.3. Low-Frequency Response
 3.8.4. Examples
3.9. *Feedback*
 3.9.1. General Structure of *Feedback*
 3.9.2. Properties and Methodology of *Feedback* Analysis
 3.9.3. Stability: Bode Method
 3.9.4. Frequency Compensation
3.10. Sustainable Microelectronics and Future Trends
 3.10.1. Sustainable Energy Sources
 3.10.2. Biocompatible Sensors
 3.10.3. Future Trends in Microelectronics

Module 4. Instruments and Sensors

4.1. Measurement
 4.1.1. Measurement and Control Characteristics
 4.1.1.1. Accuracy
 4.1.1.2. Loyalty
 4.1.1.3. Repeatability
 4.1.1.4. Reproducibility
 4.1.1.5. Derivatives
 4.1.1.6. Linearity
 4.1.1.7. Hysteresis
 4.1.1.8. Resolution
 4.1.1.9. Scope
 4.1.1.10. Errors
 4.1.2. Classification of Instruments
 4.1.2.1. According to its Functionality
 4.1.2.2. According to the Variable to Control
4.2. Regulation
 4.2.1. Regulatory Systems
 4.2.1.1. Open Loop Systems
 4.2.1.2. Closed Loop Systems
 4.2.2. Types of Industrial Processes
 4.2.2.1. Continuous Processes
 4.2.2.2. Discrete Processes
4.3. Caudal Sensors
 4.3.1. Flow Rate
 4.3.2. Units Used for Caudal Measurement
 4.3.3. Types of Caudal Sensors
 4.3.3.1. Volume Flow Measurement
 4.3.3.2. Flow Measurement by Mass

4.4. Pressure Sensors
4.4.1. Pressure
4.4.2. Units Used for Pressure Measurement
4.4.3. Types of Pressure Sensors
4.4.3.1. Pressure Measurement via Mechanical Elements
4.4.3.2. Pressure Measurement via Electromechanical Elements
4.4.3.3. Pressure Measurement via Electronic Elements
4.5. Temperature Sensors
4.5.1. Temperature
4.5.2. Units Used for Temperature Measurement
4.5.3. Types of Temperature Sensors
4.5.3.1. Bimetallic Thermometer
4.5.3.2. Glass Thermometer
4.5.3.3. Resistance Thermometer
4.5.3.4. Thermistors
4.5.3.5. Thermocouples
4.5.3.6. Radiation Pyrometers
4.6. Level Sensors
4.6.1. Liquids and Solids Level
4.6.2. Units Used for Temperature Measurement
4.6.3. Types of Level Sensors
4.6.3.1. Liquid Level Gauges
4.6.3.2. Solid Level Gauges
4.7. Sensors for Other Physical and Chemical Variables
4.7.1. Sensors for Other Physical Variables
4.7.1.1. Weight Sensors
4.7.1.2. Speed Sensors
4.7.1.3. Density Sensors
4.7.1.4. Humidity Sensors
4.7.1.5. Flame Sensors
4.7.1.6. Solar Radiation Sensors
4.7.2. Sensors for Other Chemical Variables
4.7.2.1. Conduction Sensors
4.7.2.2. pH Sensors
4.7.2.3. Gas Concentration Sensors
4.8. Actuators
4.8.1. Actuators
4.8.2. Engines
4.8.3. Servo-Valves
4.9. Automatic Control
4.9.1. Automatic Regulation
4.9.2. Types of Regulators
4.9.2.1. Two-Step Controller
4.9.2.2. Proportional-Differential Controller
4.9.2.3. Differential Controller
4.9.2.4. Proportional-Differential Controller
4.9.2.5. Integral Controller
4.9.2.6. Proportional-Integral Controller
4.9.2.7. Proportional-Integral-Differential Controller
4.9.2.8. Digital Electronic Controller
4.10. Control Applications in Industry
4.10.1. Selection Criteria of a Control System
4.10.2. Examples of Typical Controls in Industry
4.10.2.1. Ovens
4.10.2.2. Dryer
4.10.2.3. Combustion Control
4.10.2.4. Level Control
4.10.2.5. Heat Exchangers
4.10.2.6. Central Nuclear Reactor

Module 5. Power Electronic Converters

5.1. Power Converter
- 5.1.1. Power Electronics
- 5.1.2. Applications of Power Electronics
- 5.1.3. Power Conversion Systems

5.2. Converters
- 5.2.1. Converters
- 5.2.2. Types of Converters
- 5.2.3. Characteristic Parameters
- 5.2.4. Fourier Series

5.3. AC/DC Conversion. Single-Phase Uncontrolled Rectifiers
- 5.3.1. AC/DC Converters
- 5.3.2. Diode
- 5.3.3. Uncontrolled Half-Wave Rectifier
- 5.3.4. Full-Wave Uncontrolled Rectifier

5.4. AC/DC Conversion. Single-Phase Uncontrolled Rectifiers
- 5.4.1. Thyristor
- 5.4.2. Half-Wave Controlled Rectifier
- 5.4.3. Full-Wave Controlled Rectifier

5.5. Three-Phase Rectifiers
- 5.5.1. Three-Phase Rectifiers
- 5.5.2. Three-Phase Controlled Rectifiers
- 5.5.3. Three-Phase Uncontrolled Rectifiers

5.6. DC/AC Conversion. Single-Phase Inverters
- 5.6.1. DC/AC Converters
- 5.6.2. Single-Phase Square Wave Controlled Inverters
- 5.6.3. Single-Phase Inverters Using Sinusoidal PWM Modulation

5.7. DC/AC Conversion. Three-Phase Inverters
- 5.7.1. Three-Phase Inverters
- 5.7.2. Three-Phase Square Wave Controlled Inverters
- 5.7.3. Three-Phase Inverters Using Sinusoidal PWM Modulation

5.8. DC/DC Conversion
- 5.8.1. DC/DC Converters
- 5.8.2. DC/DC Converters Classification
- 5.8.3. DC/DC Converters Control
- 5.8.4. Reducing Converter

5.9. DC/DC Conversion. Elevating Converter
- 5.9.1. Elevating Converter
- 5.9.2. Reducing-Elevating Converter
- 5.9.3. Cúk Converter

5.10. AC/AC Conversion
- 5.10.1. AC/AC Converters
- 5.10.2. AC/AC Converters Classification
- 5.10.3. Voltage Regulators
- 5.10.4. Cycloconverters

Module 6. Digital Processing

6.1. Discrete Systems
- 6.1.1. Discrete Signals
- 6.1.2. Stability of Discrete Systems
- 6.1.3. Frequency Response
- 6.1.4. Fourier Transform
- 6.1.5. The Z Transform
- 6.1.6. Signal Sample

6.2. Convolution and Correlation
- 6.2.1. Signal Correlation
- 6.2.2. Signal Convolution
- 6.2.3. Application Examples

6.3. Digital Filters
- 6.3.1. Classes of Digital Filters
- 6.3.2. Hardware Used for Digital Filters
- 6.3.3. Frequency Analysis
- 6.3.4. Effects of the Filter on the Signals

6.4. Non-Recursive Filters (FIR)
- 6.4.1. Non-Infinite Impulse Response
- 6.4.2. Linearity
- 6.4.3. Determination of Poles and Zeros
- 6.4.4. Design of FIR Filters

6.5. Recursive Filters (IIR)
- 6.5.1. Recursion in Filters
- 6.5.2. Infinite Impulse Response
- 6.5.3. Determination of Poles and Zeros
- 6.5.4. Design of IIR Filters

6.6. Signal Modulation
- 6.6.1. Modulation in Amplitude
- 6.6.2. Modulation in Frequency
- 6.6.3. Modulation in Phase
- 6.6.4. Demodulators
- 6.6.5. Simulators

6.7. Digital Image Processing
- 6.7.1. Color Theory
- 6.7.2. Sample and Quantification
- 6.7.3. Digital Processing with OpenCV

6.8. Advanced Techniques in Image Digital Processing
- 6.8.1. Image Recognition
- 6.8.2. Evolutionary Algorithms for Images
- 6.8.3. Image Databases
- 6.8.4. *Machine Learning* Applied to Writing

6.9. Voice Digital Processing
- 6.9.1. Voice Digital Processing Model
- 6.9.2. Representation of the Voice Signal
- 6.9.3. Voice Codification

6.10. Advanced Voice Processing
- 6.10.1. Voice Recognition
- 6.10.2. Speech Signal Processing for Diction
- 6.10.3. Digital Speech Therapy Diagnosis

Module 7. Biomedical Electronics

7.1. Biomedical Electronics
- 7.1.1. Biomedical Electronics
- 7.1.2. Characteristics of Biomedical Electronics
- 7.1.3. Biomedical Instrument Systems
- 7.1.4. Structure of a Biomedical Instrumentation System

7.2. Bioelectrical Signals
- 7.2.1. Origin of Bioelectrical Signals
- 7.2.2. Ball Conduction
- 7.2.3. Potential
- 7.2.4. Propagation of Potentials

7.3. Bioelectrical Signal Processing
- 7.3.1. Bioelectrical Signal Acquisition
- 7.3.2. Amplification Techniques
- 7.3.3. Safety and Insulation

7.4. Bioelectrical Signal Filter
- 7.4.1. Noise
- 7.4.2. Noise Detection
- 7.4.3. Noise Filtering

7.5. Electrocardiogram
- 7.5.1. Cardiovascular System
  - 7.5.1.1. Action Potentials
- 7.5.2. ECG Waveform Nomenclature
- 7.5.3. Cardiac Electric Activity
- 7.5.4. Electrocardiography Module Instrumentation

7.6. Electroencephalogram
- 7.6.1. Neurological System
- 7.6.2. Electrical Brain Activity
  - 7.6.2.1. Brain Waves
- 7.6.3. Electroencephalography Module Instrumentation

7.7. Electromyogram
- 7.7.1. Muscular System
- 7.7.2. Electrical Muscular Activity
- 7.7.3. Electromyography Module Instrumentation

7.8. Spirometry
- 7.8.1. Respiratory System
- 7.8.2. Spirometric Parameters
  - 7.8.2.1. Interpretation of the Spirometric Test
- 7.8.3. Spirometry Module Instrumentation

7.9. Oximetry
- 7.9.1. Circulatory System
- 7.9.2. Operation Principle
- 7.9.3. Accuracy of Measurements
- 7.9.4. Oximetry Module Instrumentation

7.10. Electrical Safety and Regulations
- 7.10.1. Effects of Electric Currents on Living Things
- 7.10.2. Electrical Accidents
- 7.10.3. Electrical Safety of Electromedical Equipment
- 7.10.4. Classification of Electromedical Equipment

Module 8. Energetic Efficiency, Smart Grid

8.1. Smart Grids and Microgrids
- 8.1.1. *Smart Grids*
- 8.1.2. Benefits
- 8.1.3. Obstacles for its Implementation
- 8.1.4. Microgrids

8.2. Measuring Equipment
- 8.2.1. Architecture
- 8.2.2. *Smart Meters*
- 8.2.3. Sensor Networks
- 8.2.4. Phasor Measurement Units

8.3. Advanced Measuring Infrastructure (AMI)
- 8.3.1. Benefits
- 8.3.2. Services
- 8.3.3. Protocols and Standards
- 8.3.4. Safety

8.4. Distributed Generation and Energy Storage
- 8.4.1. Generation Technologies
- 8.4.2. Storage Systems
- 8.4.3. Electric Vehicle
- 8.4.4. Microgrids

8.5. Power Electronics in the Energy Field
- 8.5.1. Smart Grid Requirements
- 8.5.2. Technologies
- 8.5.3. Applications

8.6. Demand Response
- 8.6.1. Objectives
- 8.6.2. Applications
- 8.6.3. Models

8.7. General Architecture of a Smart Grid
- 8.7.1. Models
- 8.7.2. Local Networks: HAN, BAN, IAN
- 8.7.3. *Neighborhood Area Network and Field Area Network*
- 8.7.4. *Wide Area Network*

8.8. Smart Grid in Communications
- 8.8.1. Requirements
- 8.8.2. Technologies
- 8.8.3. Communications Standards and Protocols

8.9. Interoperability, Standards and Security in Smart Grids
- 8.9.1. Interoperability
- 8.9.2. Standards
- 8.9.3. Safety

8.10. Big Data for Smart Grids
- 8.10.1. Analytical Models
- 8.10.2. Areas of Application
- 8.10.3. Data Sources
- 8.10.4. Storage Systems
- 8.10.5. *Frameworks*

Module 9. Industrial Communications

9.1. The Systems in Real Time
- 9.1.1. Classification
- 9.1.2. Programming
- 9.1.3. Planning

9.2. Communication Networks
- 9.2.1. Transmission of medium
- 9.2.2. Basic Configurations
- 9.2.3. CIM Pyramid
- 9.2.4. Classification
- 9.2.5. OSI Model
- 9.2.6. TCP/IP Model

9.3. Fieldbuses
- 9.3.1. Classification
- 9.3.2. Distributed and Centralized Systems
- 9.3.3. Distributed Control Systems

9.4. AS-i (Actuator Sensor Interface
- 9.4.1. Physical Level
- 9.4.2. Level of Scope
- 9.4.3. Error Control
- 9.4.4. Elements

9.5. CANopen
- 9.5.1. Physical Level
- 9.5.2. Level of Scope
- 9.5.3. Error Control
- 9.5.4. DeviceNet
- 9.5.5. ControlNet

9.6. Profibus
- 9.6.1. Physical Level
- 9.6.2. Level of Scope
- 9.6.3. Level of Application
- 9.6.4. Communication Model
- 9.6.5. Operation System
- 9.6.6. Profinet

9.7. Modbus
- 9.7.1. Physical Media
- 9.7.2. Access to the Media
- 9.7.3. Series Transmission Modes
- 9.7.4. Protocol
- 9.7.5. TCP Modbus

9.8. Industrial Ethernet
- 9.8.1. Profinet
- 9.8.2. TCP Modbus
- 9.8.3. Ethernet/IP
- 9.8.4. EtherCAT

9.9. Wireless Communication
- 9.9.1. 802.11 Networks (Wifi)
- 9.9.2. 802.15.1 Networks (*BlueTooth*)
- 9.9.3. 802.15.4 Networks (ZigBee)
- 9.9.4. WirelessHART
- 9.9.5. WiMAX
- 9.9.6. Mobile Phone-Based Networks
- 9.9.7. Satellite Communications

9.10. IoT in Industrial Environments
- 9.10.1. The Internet of Things
- 9.10.2. IoT Device Characteristics
- 9.10.3. Application of IoT in Industrial Environments
- 9.10.4. Security Requirements
- 9.10.5. Communication Protocols MQTT and CoAP

Module 10. Industrial Marketing

10.1. Marketing and Analysis of the Industrial Market
- 10.1.1. Marketing
- 10.1.2. Understanding the Market and Customer Guidance
- 10.1.3. Differences Between Industrial Marketing and Consumer Marketing
- 10.1.4. Industrial Market

10.2. Marketing Planning
- 10.2.1. Strategic Planning
- 10.2.2. Environmental Analysis
- 10.2.3. Business Mission and Objectives
- 10.2.4. The Marketing Plan in Industrial Companies

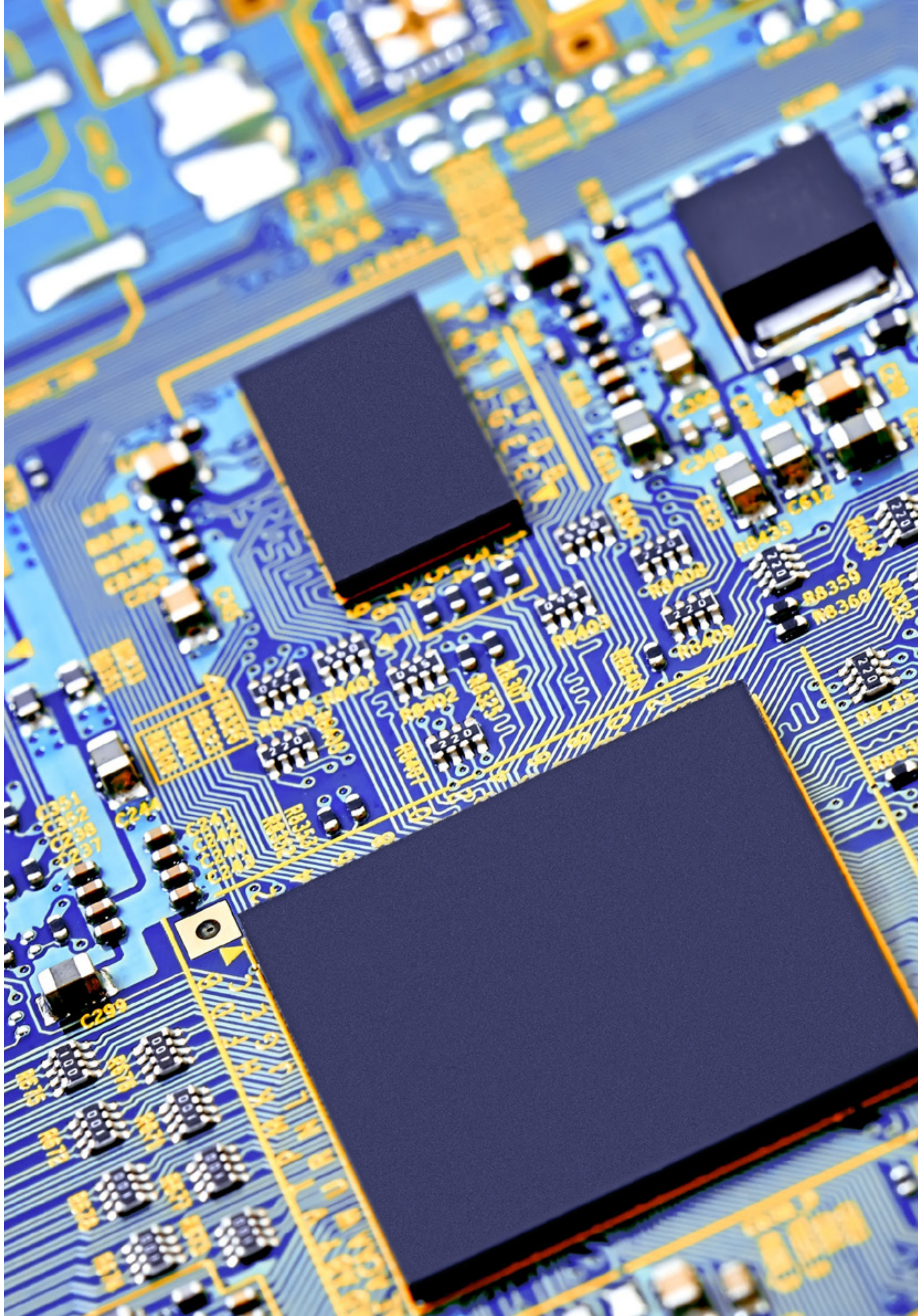
10.3. Managing the Marketing Information
- 10.3.1. Knowledge of the Client in the Industrial sector
- 10.3.2. Learning from the Market
- 10.3.3. MIS (Marketing Information System)
- 10.3.4. Commercial Research

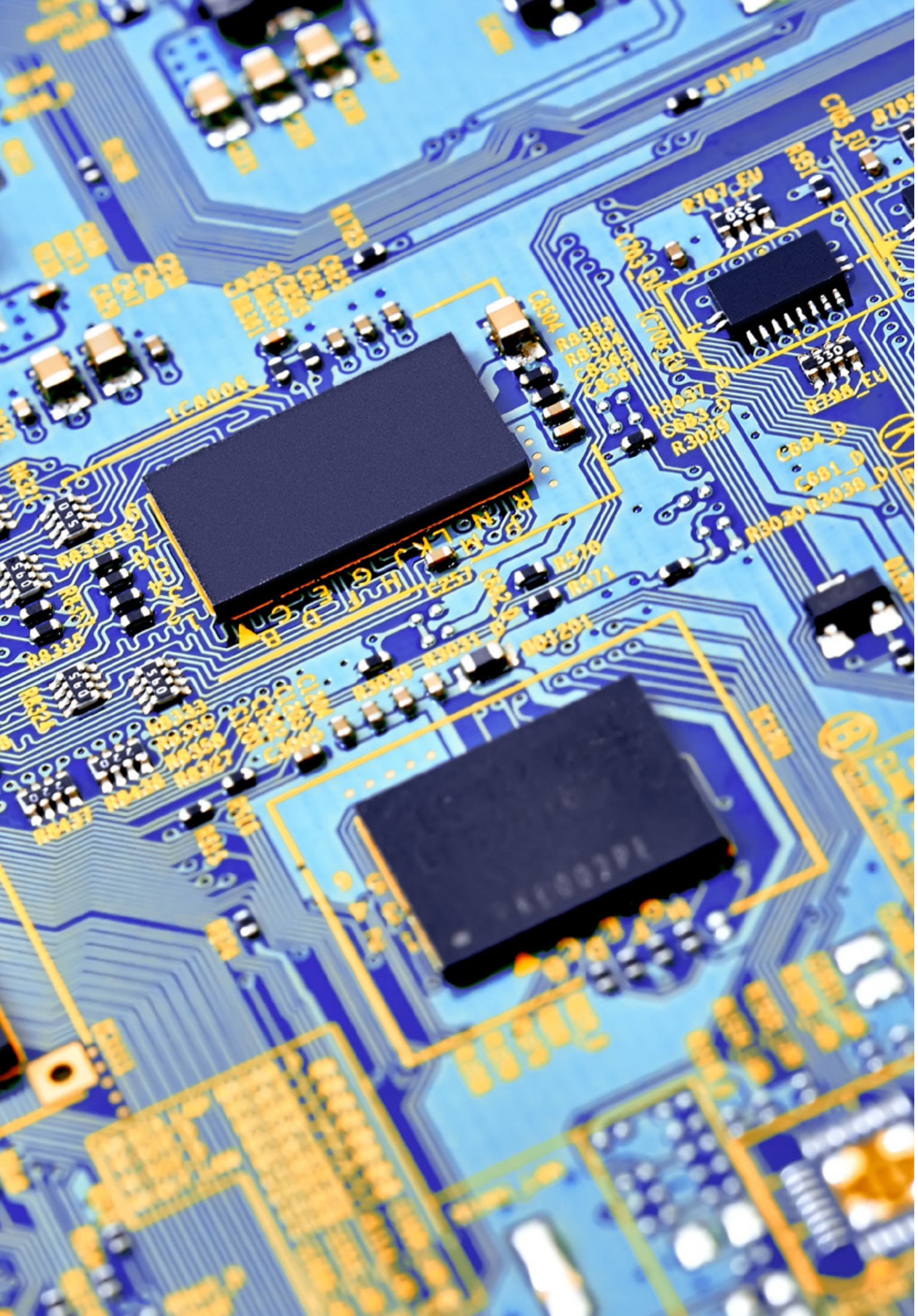
10.4. Marketing Strategies
- 10.4.1. Segmentation
- 10.4.2. Evaluation and Choice of Target Market
- 10.4.3. Differentiation and Positioning

10.5. Marketing Relations in the Industrial sector
- 10.5.1. Creating Relationships
- 10.5.2. From Transactional Marketing to Relationship Marketing
- 10.5.3. Design and Implementation of an Industrial Relational Marketing Strategy

10.6. Value Creation in the Industrial Market
- 10.6.1. Marketing Mix and Offering
- 10.6.2. Advantages of Inbound Marketing in the Industrial Sector
- 10.6.3. Value Proposal in the Industrial Market
- 10.6.4. Industrial Purchasing Process

10.7. Pricing Policies
- 10.7.1. Pricing Policies
- 10.7.2. Objectives of Pricing Policies
- 10.7.3. Strategic Pricing Models





10.8. Communication and Branding in the Industrial Sector
- 10.8.1. *Branding*
- 10.8.2. Building a Brand in the Industrial Market
- 10.8.3. Stages in Communication Development

10.9. Commercial Function and Sales in Industrial Markets
- 10.9.1. Importance of Commercial Management in the Industrial Company
- 10.9.2. Sales Force Strategy
- 10.9.3. Commercial Figure in the Industrial Market
- 10.9.4. Commercial Negotiation

10.10. Distribution in Industrial Environments
- 10.10.1. Nature of Distribution Channels
- 10.10.2. Distribution in the Industrial Sector: Competitive Factor
- 10.10.3. Types of Distribution Channels
- 10.10.4. Choosing the Distribution Channel

TECH Global University will provide you with a unique methodology that will foster the development of key competencies in a field characterized by constant evolution"

04

Teaching Objectives

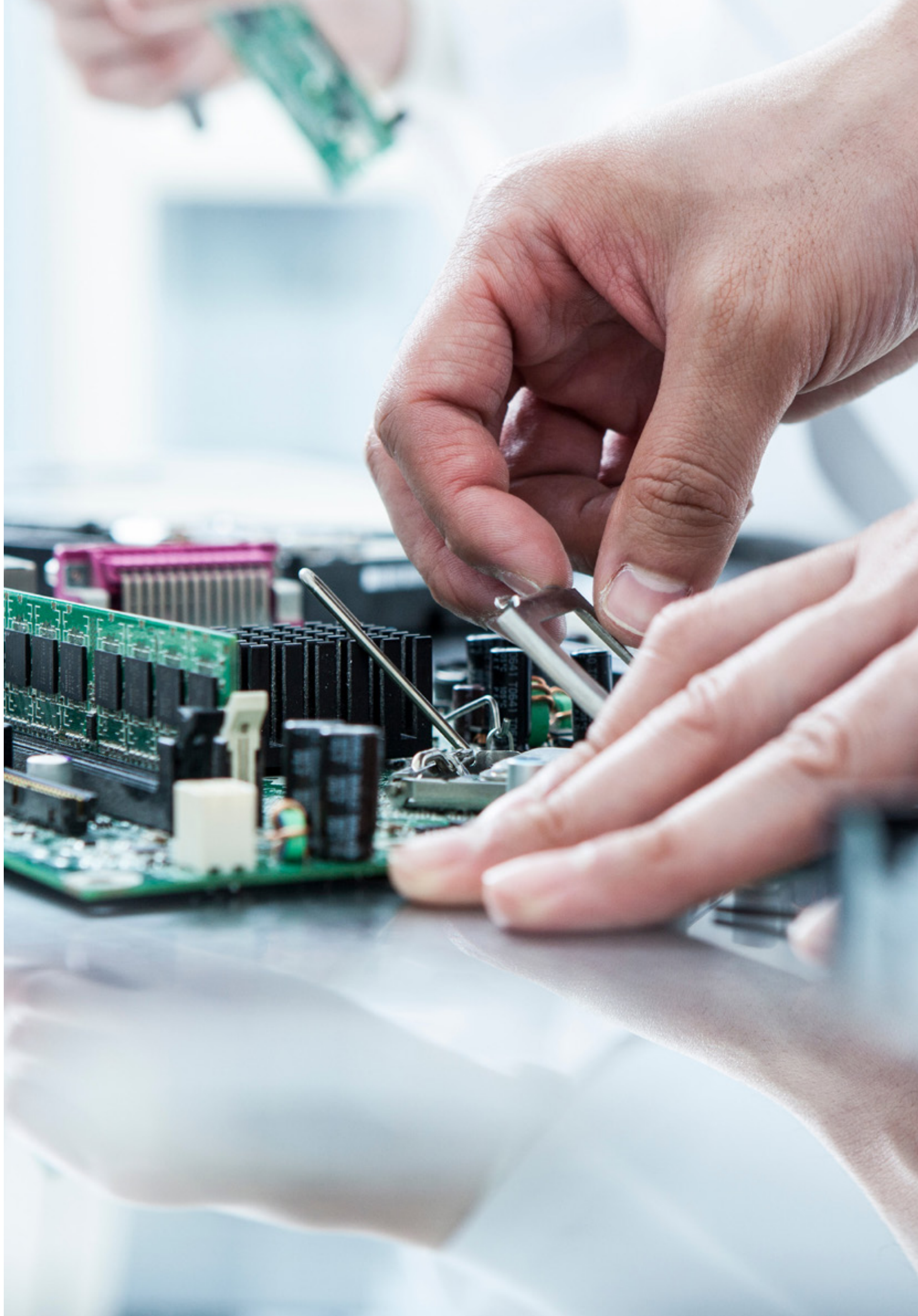
The main goal of this university program is to develop key skills in Electronic Systems Engineering professionals. Throughout an online and practical journey, students will expand their technical knowledge in areas related to the industrial market, electronic communications, and intelligent systems. Thus, they will integrate strategic content on circuit design, digital processing, microelectronics, and Smart Grids, driving dynamic learning supported by simulators, applied exercises, and digital tools. As a result, they will be able to perform effectively in a constantly evolving sector.

You will gain experience in the most advanced digital processing techniques and energy storage optimization"

General Objective

- This university qualification aims to provide professionals with the necessary knowledge in Electronic Systems Engineering. Upon completion of the program, students will confidently apply digital processing techniques, energy storage, and biomedical electronics, integrating intelligent systems and advanced technological solutions. Additionally, they will efficiently manage information and signals, optimizing energy resources and ensuring the functionality of biomedical devices. As such, they will develop the ability to intervene in complex projects within the electronics sector

You will enhance your skills to design and implement electronic devices for medical monitoring and diagnosis"



Specific Objectives

Module 1. Embedded Systems
- Design and implement embedded systems for industrial and commercial applications
- Integrate hardware and software in real-time environments to optimize the performance of electronic devices

Module 2. Electronic Systems Design
- Apply design methodologies for creating advanced electronic circuits
- Analyze and select appropriate electronic components for various industrial applications

Module 3. Microelectronics
- Understand the principles of manufacturing and designing integrated circuits
- Optimize energy consumption in electronic devices using advanced microelectronics techniques

Module 4. Instruments and Sensors
- Design and implement measurement and control systems based on high-precision sensors
- Apply signal processing techniques to improve data acquisition in electronic systems

Module 5. Power Electronic Converters
- Analyze and design electronic converters to optimize energy efficiency in industrial systems
- Implement control and protection strategies in energy conversion systems

Module 6. Digital Processing
- Apply digital signal processing algorithms in communication and control systems
- Design efficient architectures for real-time data processing and analysis

Module 7. Biomedical Electronics
- Develop electronic devices for medical monitoring and diagnosis
- Integrate biomedical sensors into electronic systems for optimizing healthcare

Module 8. Energetic Efficiency, Smart Grid
- Implement technological solutions for optimizing energy consumption in smart grids
- Design control strategies for efficient energy management in electronic systems

Module 9. Industrial Communications
- Develop and integrate communication protocols in industrial automation systems
- Design secure and efficient communication networks for high-demand industrial environments

Module 10. Industrial Marketing
- Apply marketing strategies and market positioning for electronic products
- Develop management and leadership skills in technological projects in the industrial sector

05
Internship

After completing the online phase, the professional will have access to a practical internship at a leading institution, where they will deepen and enrich their knowledge. During this phase, students will be accompanied by a specialized tutor who will guide their performance, facilitating the application of theoretical concepts in real-world environments. This interaction will help consolidate technical skills, understand advanced processes, and link theory with practice, strengthening comprehensive training in Electronic Systems Engineering and ensuring a results-oriented learning experience.

Incorporate the latest trends in the design and implementation of embedded systems into your daily practice to optimize the performance of advanced electronic devices"

The practical phase of this university program consists of an intensive stay at a leading institution in the electronics sector, always under the guidance of a specialized tutor. This experience will allow the professional to learn in a real technological development environment, alongside teams with extensive experience in Systems Engineering. In this way, the professional will apply advanced procedures aimed at the design, integration, and validation of electronic devices.

In this applied proposal, the activities are oriented toward refining the skills necessary to intervene in hardware design projects, digital processing, and energy optimization, which require a high technical level. The internships will be focused on preparing the student for performance within highly competitive technological industries.

In this way, the university program presents a unique opportunity for professionals to consolidate their development in an innovative environment. Additionally, they will have the chance to incorporate electronic solutions into real-world scenarios and fully equipped spaces, allowing them to enhance their competencies in a practical, dynamic, and demanding context.

The practical phase will involve the active participation of the student in carrying out activities and procedures for each area of competence (learning to learn and learning to do), with the support and guidance of instructors and fellow trainees who facilitate teamwork and multidisciplinary integration as transversal competencies for engineering practice (learning to be and learning to relate).

The procedures described below will be the basis of the practical part of the Internship Program, and its realization will be subject to the center's own availability and workload, being the proposed activities the following:

Module	Practical Activity
Design and Implementation of Embedded Systems	Analyze the evolution and characteristics of embedded systems
	Compare different families of microprocessors and their applications
	Describe the internal structure of a microprocessor and its operation
	Examine buses, logic levels, and inputs/outputs in electronic systems
Explore Principles and Applications of Advanced Microelectronics	Analyze the differences between microelectronics and conventional electronics
	Examine properties and behavior of semiconductors
	Design and evaluate circuits with diodes in various configurations
	Interpret characteristics and applications of analog and digital circuits
Use of Instrumentation and Sensors for Measurement and Control Systems	Evaluate the accuracy and reliability of measurements in electronic systems
	Classify instruments based on their functionality and control variables
	Analyze the behavior of regulated systems in open-loop and closed-loop configurations
	Apply accuracy, repeatability, and linearity criteria to optimize instrumentation
Addressing Power Electronics Conversion Systems	Implement energy conversion systems using power electronics for industrial applications
	Analyze the different types of converters and their characteristic parameters in electronic circuits
	Design uncontrolled single-phase AC/DC rectifiers to optimize energy efficiency
	Implement controlled single-phase rectifiers using thyristors for power conversion applications

Civil Liability Insurance

The university's main concern is to guarantee the safety of the interns, other collaborating professionals involved in the internship process at the center. Among the measures dedicated to achieve this is the response to any incident that may occur during the entire teaching-learning process.

To this end, the university commits to purchasing a civil liability insurance policy to cover any eventuality that may arise during the course of the internship at the center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the Internship Program period. That way professionals will not have to worry in case of having to face an unexpected situation and will be covered until the end of the internship program at the center.

General Conditions of the Internship Program

The general terms and conditions of the internship agreement for the program are as follows:

1. TUTOR: During the Hybrid Master's Degree, students will be assigned with two tutors who will accompany them throughout the process, answering any doubts and questions that may arise. On the one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned an academic tutor whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the student will be accompanied and will be able to discuss any doubts that may arise, both clinical and academic.

2. DURATION: The internship program will have a duration of three continuous weeks, in 8-hour days, five days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

3. ABSENCE: If the students does not show up on the start date of the Hybrid Master's Degree, they will lose the right to it, without the possibility of reimbursement or change of dates. Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination of the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor.

4. CERTIFICATION: Professionals who complete the Hybrid Master's Degree will receive a diploma accrediting their attendance at the institution.

5. EMPLOYMENT RELATIONSHIP: The Hybrid Master's Degree shall not constitute an employment relationship of any kind.

6. PRIOR EDUCATION: Some centers may require a certificate of prior education for the completion of the Hybrid Master's Degree. In these cases, it will be necessary to submit it to the internship department at TECH so that the assignment of the chosen center can be confirmed.

7. DOES NOT INCLUDE: The Hybrid Master's Degree will not include any element not described in the present conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed

However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.

06
Internship Centers

TECH Global University offers students the opportunity to apply their knowledge in prestigious institutions. In this way, a comprehensive experience is ensured, combining acquired theory with real-world environments, allowing professionals to face authentic challenges and develop practical skills in varied contexts. This approach guarantees dynamic and high-quality learning, strengthening preparation to intervene effectively in sector projects and processes, while promoting adaptation to different scenarios and methodologies specific to the industry.

"You will integrate the most advanced knowledge acquired through a theoretical and practical approach into your professional routine"

The student will be able to complete the practical part of this Hybrid Master's Degree at the following centers:

Engineering

SERMICRO SAU

Country	City
Spain	Madrid

Address: C/ Pradillo, 50. 28002, Madrid

ICT Group that provides solutions to help businesses drive their business strategies through technology

Related internship programs:

- Electronic Systems Engineering

SERMICRO Laboratorio

Country	City
Spain	Madrid

Address: C. Franklin, 32, 28906 Getafe, Madrid

ICT Group that provides solutions to help businesses drive their business strategies through technology

Related internship programs:

- Electronic Systems Engineering

Cloen

Country	City
Spain	Valencia

Address: Calle Martin El Humano 28 - 46930 Quart de Poblet, Valencia

A technology company dedicated to the development, manufacturing, and marketing of home products

Related internship programs:

- Electronic Systems Engineering

07

Career Opportunities

This Hybrid Master's Degree equips professionals with the necessary tools to perform effectively in roles related to the design, integration, and management of electronic systems, both in technological industries and research centers. Additionally, it allows for the application of acquired knowledge in real-world work environments, enhancing the ability to lead projects in automation, hardware development, and process optimization. As such, professionals consolidate their experience in various settings, from specialized laboratories to high-innovation electronic companies.

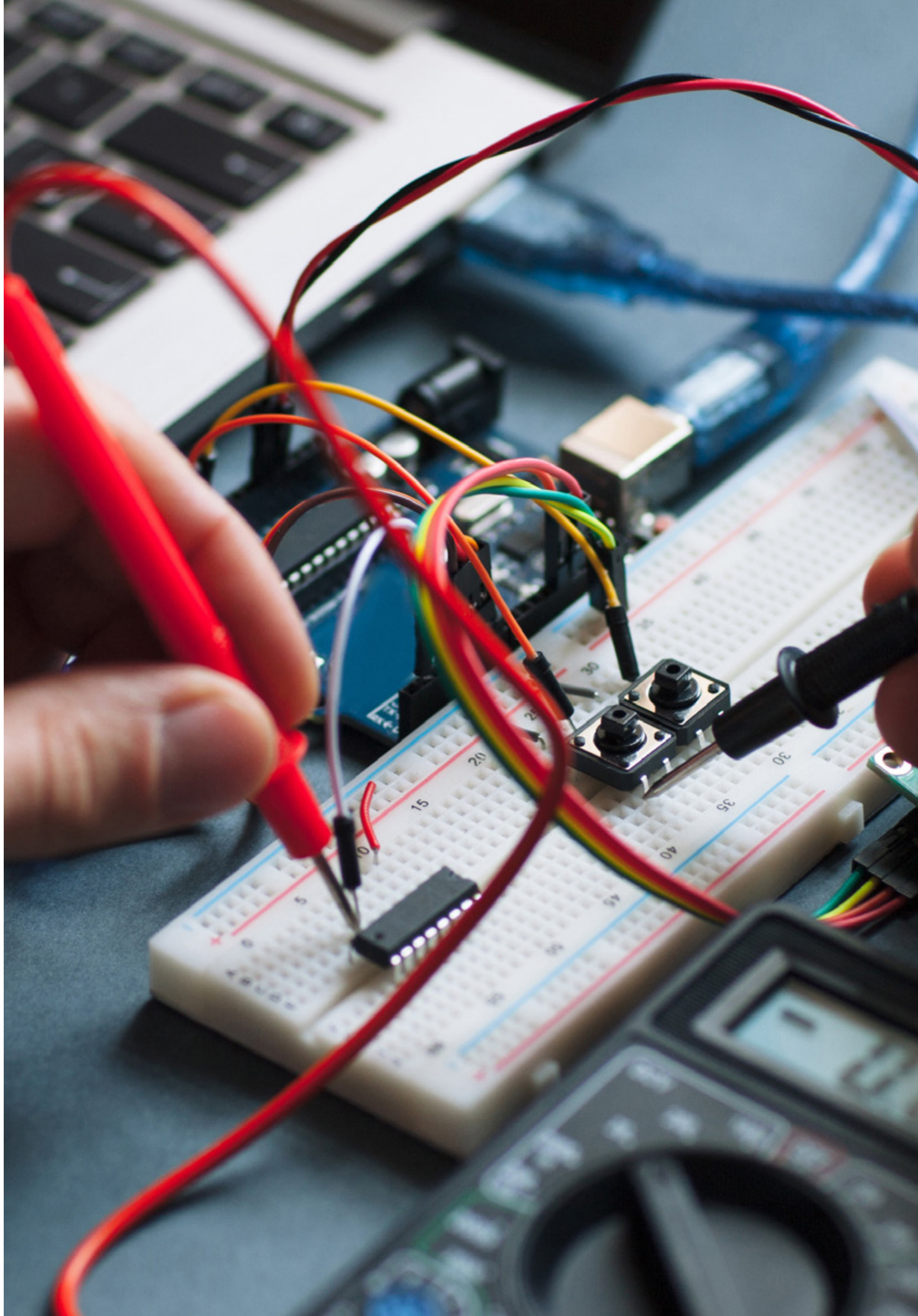
You will complete your internship at an internationally recognized institution, which will allow you to acquire advanced competencies to enhance the excellence of your professional practice"

Graduate Profile

Graduates of this program will have the ability to lead complex automation and industrial control projects, as well as design and implement innovative solutions in digital processing and energy efficiency. They will also integrate advanced knowledge in biomedical electronics and embedded systems, enabling them to optimize devices and protocols in diverse technological environments. With a solid understanding of smart grids and industrial communications, they will manage interconnected systems with precision and security. As a result, they will be prepared to perform effectively in highly competitive sectors, applying solid technical strategies and adapting to market demands.

You will drive your career alongside industry leaders and gain key knowledge to stand out in the field of electronic technologies.

- **Critical Thinking:** Evaluate and optimize the design of electronic systems, identifying potential failures and proposing innovative solutions based on rigorous analysis
- **Problem-Solving:** Identify challenges in hardware and software integration, applying effective methodologies to implement efficient and reliable systems
- **Interdisciplinary Teamwork:** Collaborate with professionals from various fields, integrating knowledge of electronics, programming, and control to execute advanced technological projects
- **Technology Project Management:** Plan, organize, and oversee electronic system development projects, ensuring that objectives, deadlines, and quality standards are met



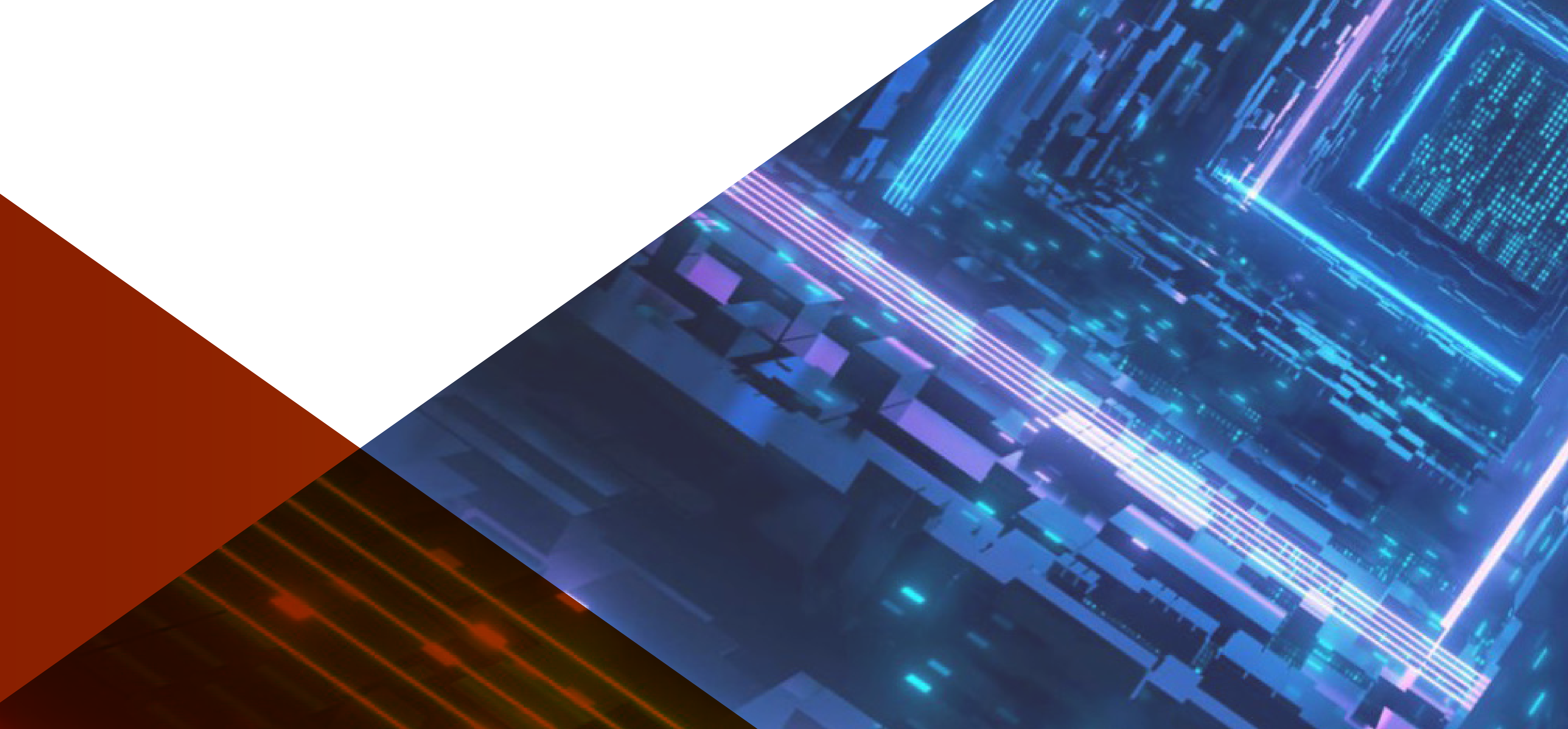
After completing the university program, you will be able to apply your knowledge and skills in the following positions:

1. **Electronic Systems Designer:** Responsible for developing and validating electronic circuits and systems for industrial and commercial applications, ensuring efficiency and reliability.
2. **Automation and Control Engineer:** Supervisor of automatic control systems, integrating hardware and software to optimize production processes.
3. **Power Electronics Coordinator:** Manager of energy conversion and distribution systems using electronic systems, ensuring energy efficiency and device protection.
4. **Digital Signal Processing Analyst:** Dedicated to the development of algorithms and architectures for the analysis and processing of digital signals in communications, audio, and video.
5. **Biomedical Electronics Consultant:** Responsible for implementing and maintaining electronic devices for medical monitoring and diagnosis, integrating sensors and measurement systems.
6. **Industrial Networks and Communications Manager:** Responsible for designing and maintaining secure and efficient communication networks for high-demand industrial environments.
7. **Smart Grids and Energy Efficiency Supervisor:** Supervisor of smart electric energy systems, incorporating technological solutions for efficient consumption management.

At TECH Global University, we enhance your career prospects in a demanding job market with excellence in preparation, applied skills, and professional ethics"

08
Software Licenses Included

TECH is a leading reference in the academic world for combining the latest technology with teaching methodologies to enhance the teaching-learning process. To achieve this, it has established a network of alliances that allows it to access the most advanced software tools used in the professional world.



Upon enrolling, you will receive, completely free of charge, academic credentials for the following professional software applications"

TECH Global University has established a network of professional alliances with the leading providers of software applied to various professional fields. These alliances allow TECH to access hundreds of software applications and licenses, making them available to its students.

The software licenses for academic use will allow students to utilize the most advanced applications in their professional field, enabling them to become familiar with and master these tools without incurring any costs. TECH Global University will manage the licensing process, enabling students to use the software without limitations throughout their studies in the Hybrid Master's Degree in Electronic Systems Engineering, and they will be able to do so entirely free of charge.

TECH Global University will provide free access to the following software applications:

Ansys

Altair® Flux®

Google Career Launchpad

Google Career Launchpad is a solution for developing digital skills in technology and data analysis. With an estimated value of **5,000 dollars**, it is included **for free** in TECH's university program, providing access to interactive labs and certifications recognized in the industry.

This platform combines technical training with practical cases, using technologies such as BigQuery and Google AI. It offers simulated environments to work with real data, along with a network of experts for personalized guidance.

Key Features:

- **Specialized Courses:** Updated content in cloud computing, machine learning, and data analysis
- **Live Labs:** Hands-on practice with real Google Cloud tools, no additional configuration required
- **Integrated Certifications:** Preparation for official exams with international validity
- **Professional Mentoring:** Sessions with Google experts and technology partners
- **Collaborative Projects:** Challenges based on real-world problems from leading companies

In conclusion, **Google Career Launchpad** connects users with the latest market technologies, facilitating their entry into fields such as artificial intelligence and data science with industry-backed credentials.

Ansys

Ansys is engineering simulation software that models physical phenomena such as fluids, structures, and electromagnetism. With a commercial value of **26,400 euros**, it is offered **free of charge** during the university program at TECH, providing access to cutting-edge technology for industrial design.

This platform excels in its ability to integrate multiphysics analysis into a single environment. It combines scientific precision with automation through APIs, streamlining the iteration of complex prototypes in industries such as aerospace or energy.

Key Features:

- **Integrated multiphysics simulation:** analyze structures, fluids, electromagnetism, and thermals in a single environment
- **Workbench:** a unified platform to manage simulations, automate processes, and customize workflows with Python
- **Discovery:** prototype in real-time with simulations accelerated by GPU
- Automation: create macros and scripts with APIs in Python, C++, and JavaScript
- **High Performance:** solvers optimized for CPU/GPU and cloud scalability on demand

In conclusion, **Ansys** is the ultimate tool to transform ideas into technical solutions, offering power, flexibility, and an unparalleled simulation ecosystem.

Flux

Flux is offered **at no cost** during this university program, as an essential tool for managing information flows and data visualization. It allows for working with dynamic models in collaborative environments, optimizing complex processes from a graphical and interactive perspective.

This platform centralizes the integration of data, logic, and visualization, connecting digital design tools in real-time. Its flexibility allows for the creation of precise computational workflows, adaptable to different disciplines and design or technical analysis projects.

Key Features:

- **Visual Modeling:** Building processes with logically connected nodes
- **Remote Collaboration:** Simultaneous access and editing from different devices
- **Direct Integration with Grasshopper:** Data flow between parametric design systems
- **Intelligent Automation:** Defining rules that control system behavior
- **Interactive Visualization:** Dynamic dashboards to analyze information in real-time

In conclusion, **Flux** represents a high-level tool for coordinating data-driven and visual process-based projects.

09

Study Methodology

TECH is the world's first university to combine the **case study** methodology with **Relearning**, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.

TECH will prepare you to face new challenges in uncertain environments and achieve success in your career"

The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.
The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

At TECH you will NOT have live classes (which you might not be able to attend)"

The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want"

Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.

Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

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.

A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

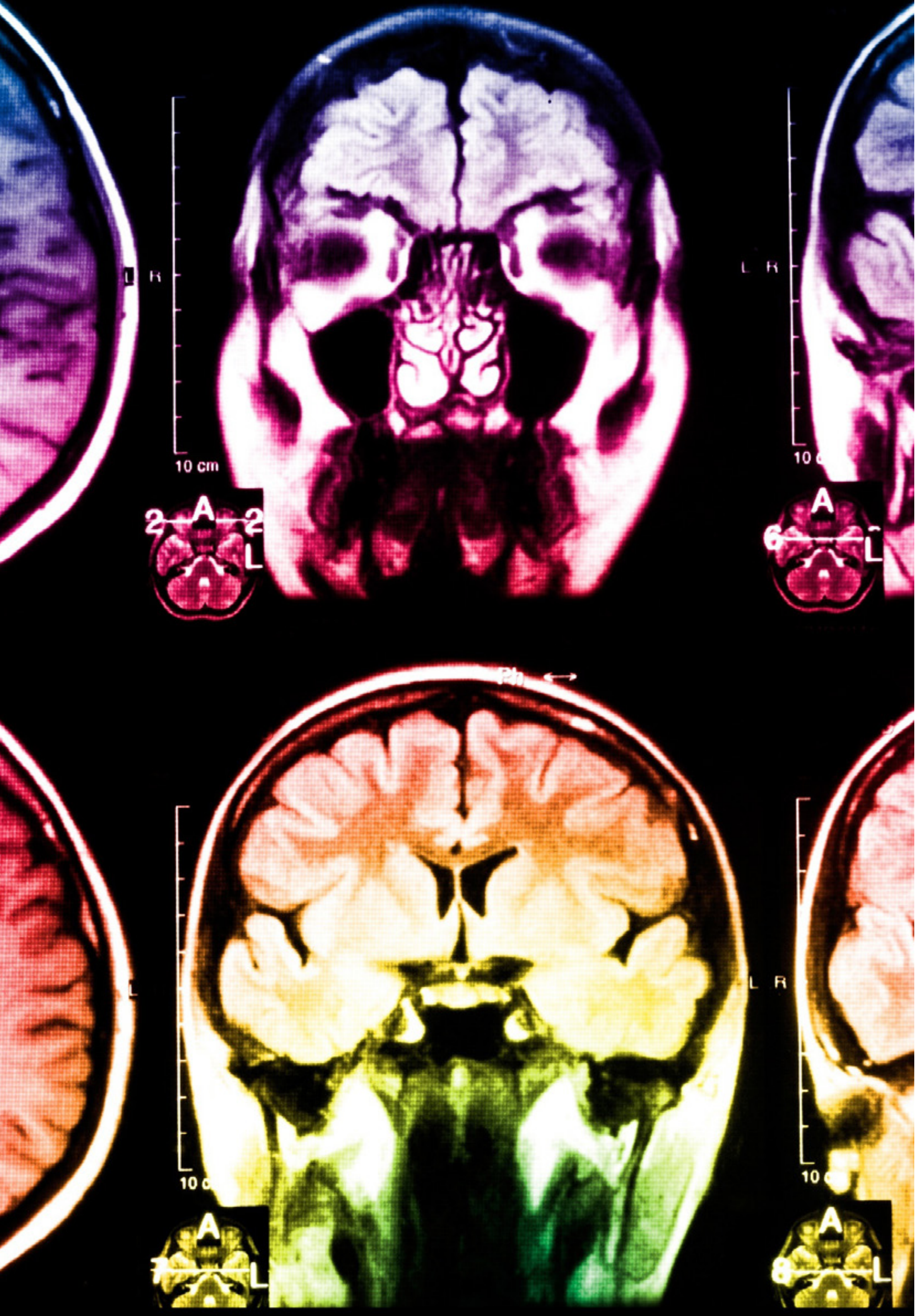
In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.

> *The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule”*

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 assess 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.



The university methodology top-rated by its students

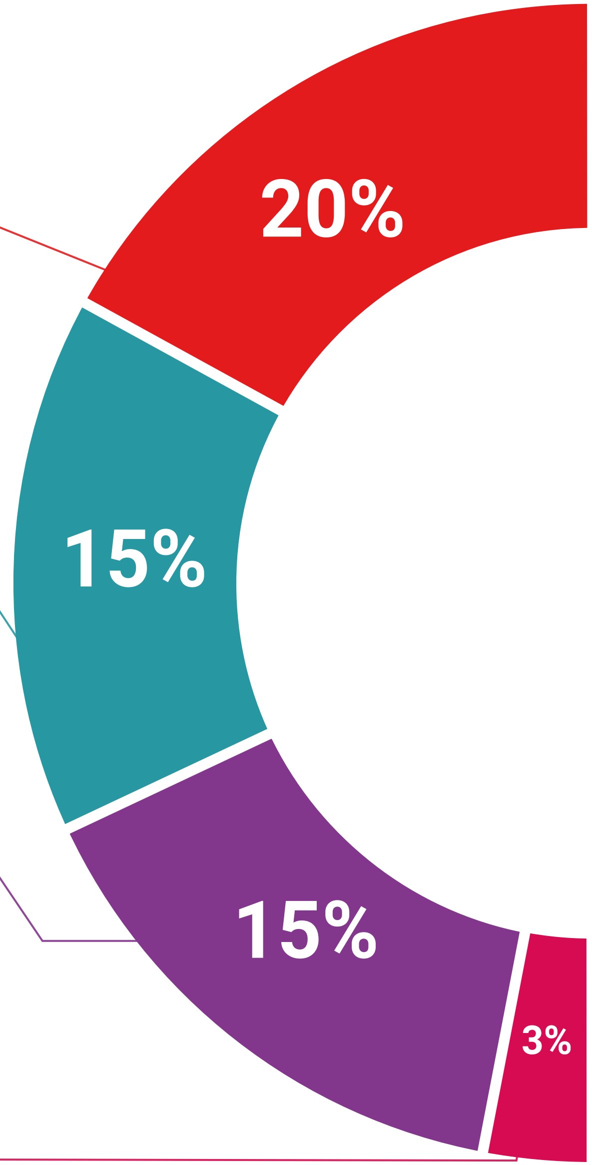
The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the teaching quality, the quality of the materials, the structure of the program and its objectives is excellent. Not surprisingly, the institution became the top-rated university by its students according to the global score index, obtaining a 4.9 out of 5.

Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.

You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.

As such, the best educational materials, thoroughly prepared, will be available in this program:



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.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.

Practicing Skills and Abilities

You 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 within the framework of the globalization we live in.

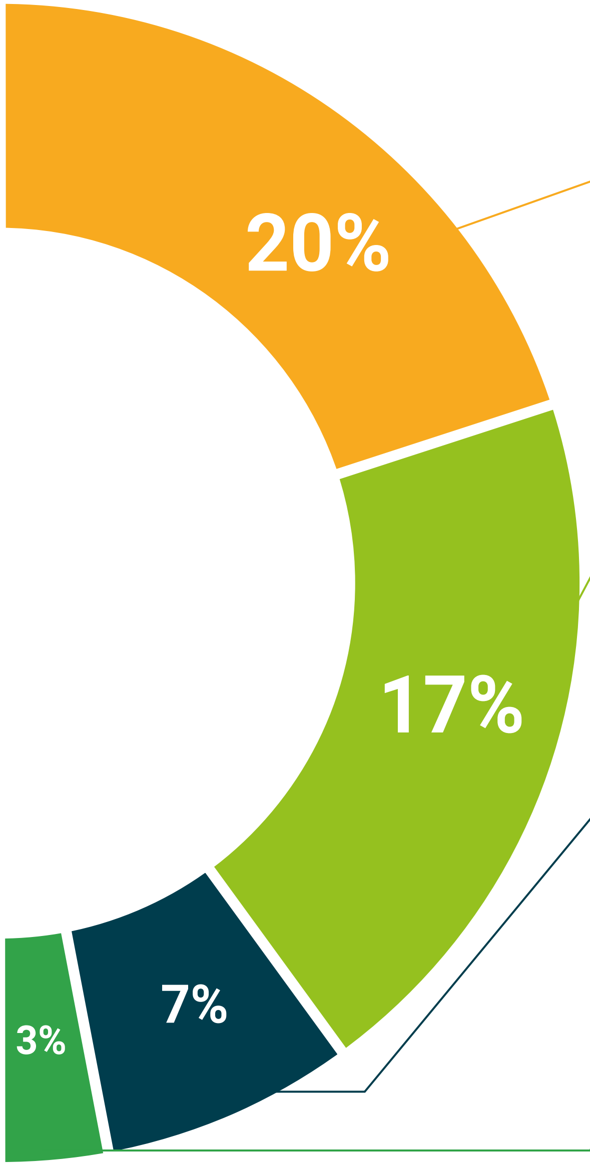
Interactive Summaries

We present 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, international guides... In our virtual library you will have access to everything you need to complete your education.



Case Studies

Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.

Testing & Retesting

We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.

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 for 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.

10
Teaching Staff

The faculty team at TECH Global University for this university program combines a solid academic background with experience in the Electronic Systems Engineering sector. In fact, they have been involved in projects integrating electronic systems, covering areas such as microelectronics, digital processing, industrial communications, and energy efficiency. They have also developed technological innovations in industrial settings and contributed to significant research on contemporary electronic applications. As a result, students will have access to up-to-date knowledge applicable to real-world scenarios, ensuring learning aligned with the current demands of the sector and the most relevant trends in electronic technology.

The faculty, specialized in engineering, has designed additional hours of content to allow you to expand each section of the syllabus in a personalized manner"

Management

Ms. Casares Andrés, María Gregoria

- Teaching Expert in Computer Science and Electronics
- Head of Service in the General Directorate of Bilingualism and Quality of Education of the Community of Madrid
- Lecturer at intermediate and advanced courses related to Computer Science
- Lecturer in university studies related to Computer and Electronic Engineering
- Computer Analyst at Banco Urquijo
- Computer Analyst at ERIA
- Degree in Computer Science from the Polytechnic University of Madrid
- Research Sufficiency in Computer Engineering at the Polytechnic University of Madrid
- Research Proficiency at the Carlos III University of Madrid

Faculty

Mr. Torralbo Vecino, Manuel

- *PCB Design Engineer* at *Alten Spain*
- Electronic Engineer at Capgemini
- Prototype Engineer at Ontech Security
- Electronic Engineer at UCAnFly
- Collaborative Lecturer in university engineering studies
- Graduate in Electronic Engineering from the University of Cádiz
- Master's Degree in Electronic Systems for Intelligent Environments from the University of Málaga
- IPMA Level D Certification as a Project Manager

Dr. Fernández Muñoz, Javier

- Systems Engineer specializing in software and operating system development
- Systems Engineer
- PhD in Computer Engineering from Carlos III University of Madrid
- Bachelor's Degree in Computer Science from the Polytechnic University of Madrid
- Associate Professor in programs related to Computer Science and Engineering

Dr. García Vellisca, Mariano Alberto

- Senior Research Officer in Neural Engineering United Kingdom
- Collaborator in the Discovery Research-CTB Program at the Polytechnic University of Madrid
- Senior Research Officer in the Brain-Computer Interface and Neural Engineering (BCI-NE) research group at the University of Essex UK
- Research Officer at the Biomedical Technology Center of the Polytechnic University of Madrid
- Electronics Engineer in GPS Technology SA
- Electronics Engineer at Relequick SA
- Professor of Vocational Training and Moratalaz Secondary School
- PhD in Biomedical Engineering from the Polytechnic University of Madrid
- Electronics Engineer from the Complutense University of Madrid
- Master’s Degree in Biomedical Engineering from the Polytechnic University of Madrid
- Internal Auditor of Quality Management Systems according to ISO 9001 Bureau Veritas, Spain

Mr. De la Rosa Prada, Marcos

- Telecommunications Engineer and Technology Consultant
- Technology Consultant in Santander
- New Technologies Agent in Badajoz
- Telecommunications Engineer from the University of Extremadura
- Scrum Foundation Expert Certificate by EuropeanScrum.org
- Certificate in Pedagogical Aptitude, University of Extremadura

Mr. Ruiz Díez, Carlos

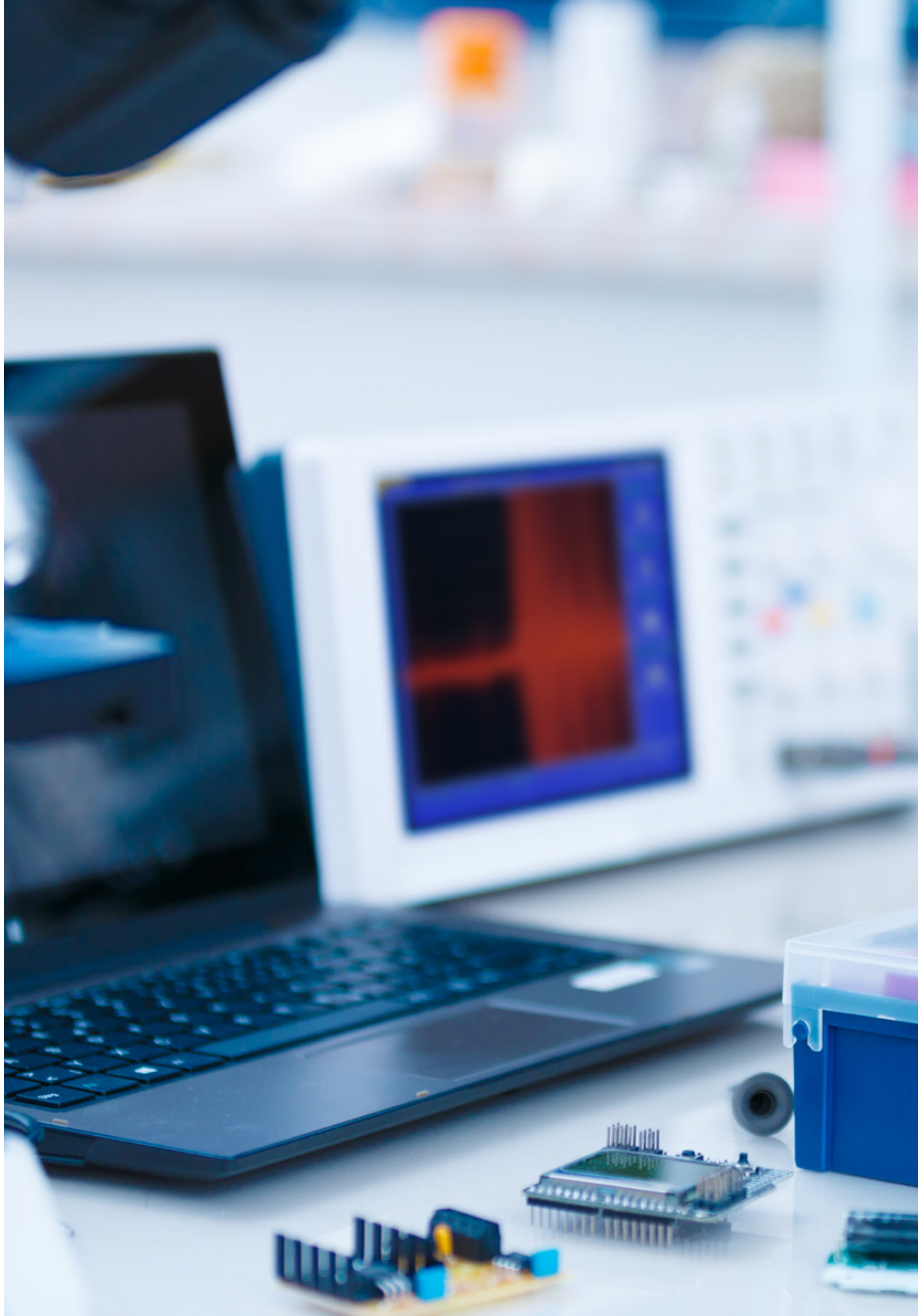
- Specialist in Biological and Environmental Engineering
- Researcher at the National Microelectronics Center of the CSIC
- Director of Competitive Engineering Training at ISC
- Volunteer trainer at Caritas Employment Classroom
- Research intern in the Composting Research Group of the Department of Chemical, Biological and Environmental Engineering of the UAB
- Founder and product developer at NoTime Ecobrand, a fashion and recycling brand
- Development cooperation project manager for the NGO Future Child Africa in Zimbabwe
- Director of the Innovation Department and Founding Member of the Aerodynamic Department team of ICAI Speed Club: Racing Motorcycle Racing Team, Pontificia University de Comillas
- Graduate in Industrial Technologies Engineering from the Pontifical University of 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 Open University (UNED)

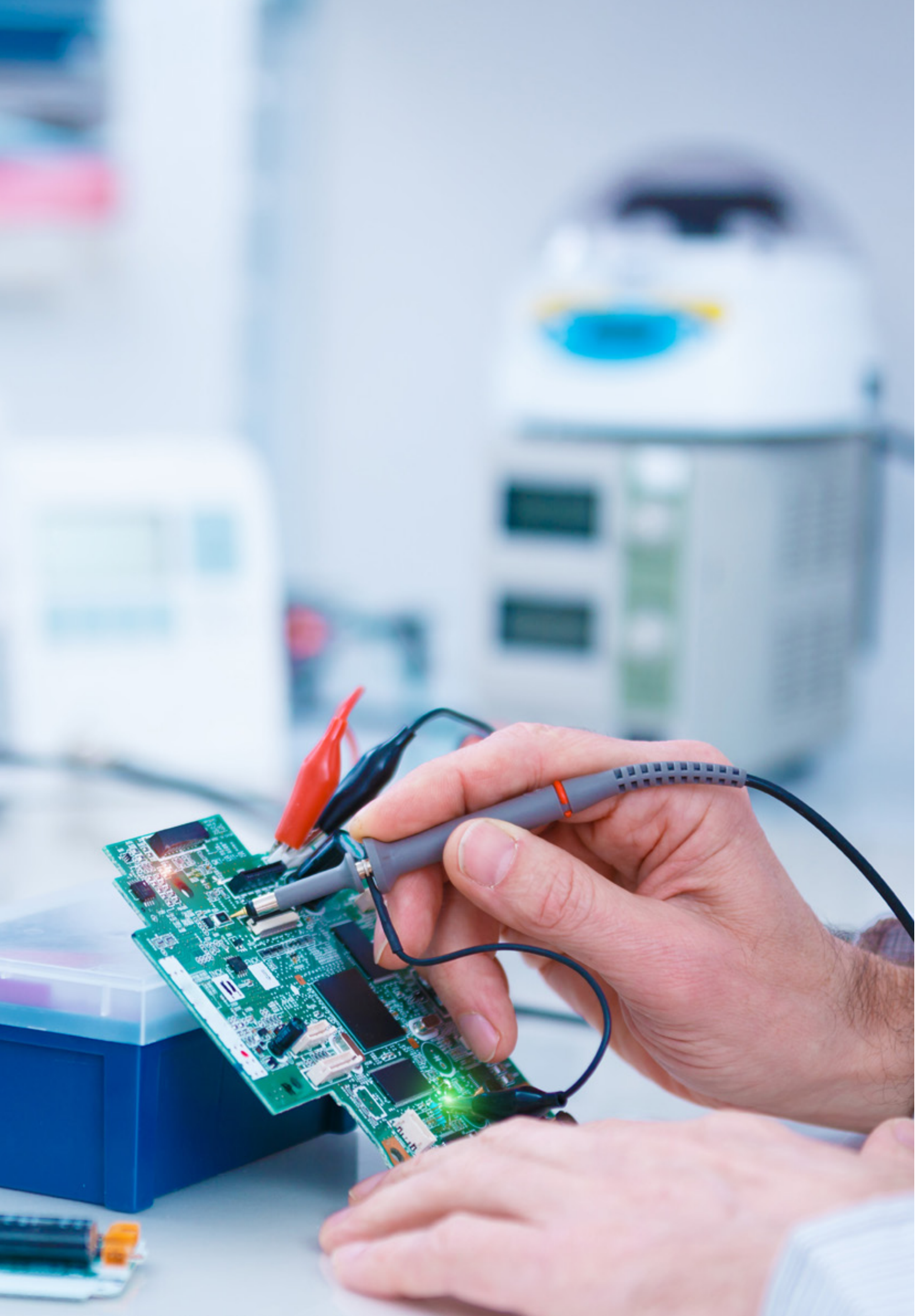
Ms. Sánchez Fernández, Elena

- Biomedical Engineer Specialized in Electronic Systems
- Field Service Engineer at BD Medical
- Degree in Biomedical Engineering from the Carlos III University of Madrid
- Master's Degree in Electronic Systems Engineering from the Polytechnic University of Madrid (UPM)
- Scholar in the Microelectronics Department at UPM
- Scholar in the Microelectronics Department at Complutense University of Madrid
- Scholar in the Movement Analysis Laboratory EUF-ONCE | ONCE-UAM, Madrid

Mr. Jara Ivars, Luis

- Industrial Engineer at Sliding Ingenieros S.L
- High School Teacher in Electrotechnical and Automatic Systems in the Community of Madrid
- High School Teacher in Electronic Equipment Community of Madrid
- High School Teacher in Physics and Chemistry
- Master's Degree in Astronomy and Astrophysics from the International University of Valencia
- Master's Degree in Occupational Risk Prevention by UNED
- Master's Degree in Teacher Training
- Degree in Physical Sciences from UNED
- Industrial Engineer by UNED





Ms. Millán Varela, Lorena

- Electronic Engineer specialized in Data Transmission
- Research Support Technician at Carlos III University of Madrid
- Specialist in Computer Sciences at Emprestur, Ministry of Tourism, Cuba
- Specialist in Computer Sciences at UNE, Electric Company, Cuba
- Specialist in Computing and Communications at Almacenes Universales S.A., Cuba
- Radiocommunications Specialist at Santa Clara Air Base, Cuba
- Master's Degree in Electronic Systems and Applications from Carlos III University of Madrid
- Telecommunications and Electronics Engineering from Marta Abreu Central University of Las Villas, Santa Clara, Cuba

"Boost your career path with holistic teaching, allowing you to advance both theoretically and practically"

11

Certificate

Hybrid Master's Degree in Electronic Systems Engineering guarantees students, in addition to the most rigorous and up-to-date education, access to a diploma for the Hybrid Master's Degree issued by TECH Global University.

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

This private qualification will allow you to obtain a diploma for the **Hybrid Master's Degree in Electronic Systems Engineering endorsed by TECH Global University**, the world's largest online university.

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

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

TECH is a member of the **American Society for Engineering Education (ASEE)**, a society composed of leading international figures in engineering. This distinction strengthens its leadership in academic and technological development in engineering.

Accreditation/Membership

ASEE

Title: **Hybrid Master's Degree in Electronic Systems Engineering**

Modality: **Hybrid (Online + Internship)**

Duration: **12 months**

Credits: **60 + 4 ECTS**

tech global university

Mr./Ms. ________________, with identification document ____________
has successfully passed and obtained the title of:

Hybrid Master's Degree in Electronic Systems Engineering

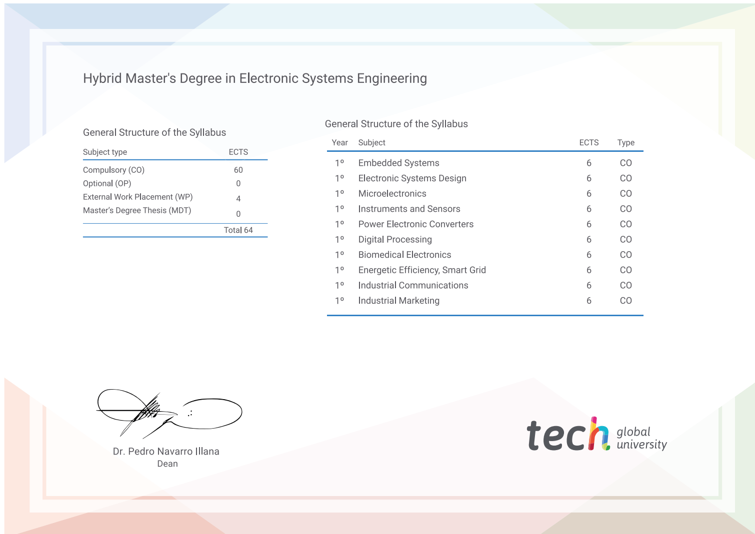
This is a private qualification of 1,920 hours of duration equivalent to 64 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
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



Hybrid Master's Degree in Electronic Systems Engineering

General Structure of the Syllabus

Subject type	ECTS
Compulsory (CO)	60
Optional (OP)	0
External Work Placement (WP)	4
Master's Degree Thesis (MDT)	0
	Total 64

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	Embedded Systems	6	CO
1º	Electronic Systems Design	6	CO
1º	Microelectronics	6	CO
1º	Instruments and Sensors	6	CO
1º	Power Electronic Converters	6	CO
1º	Digital Processing	6	CO
1º	Biomedical Electronics	6	CO
1º	Energetic Efficiency, Smart Grid	6	CO
1º	Industrial Communications	6	CO
1º	Industrial Marketing	6	CO

Dr. Pedro Navarro Illana
Dean

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

Hybrid Master's Degree
Electronic Systems Engineering

Modality: **Hybrid (Online + Internship)**

Duration: **12 months**

Certificate: **TECH Global University**

Credits: **60 + 4 ECTS**

Hybrid Master's Degree
Electronic Systems Engineering

Accreditation/Membership

ASEE American Society for Engineering Education

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