

# Postgraduate Certificate Basic Electronics and Instrumentation





## Postgraduate Certificate Basic Electronics and Instrumentation

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

Website: [www.techtitute.com/us/information-technology/postgraduate-certificate/basic-electronics-instrumentation](http://www.techtitute.com/us/information-technology/postgraduate-certificate/basic-electronics-instrumentation)

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Certificate

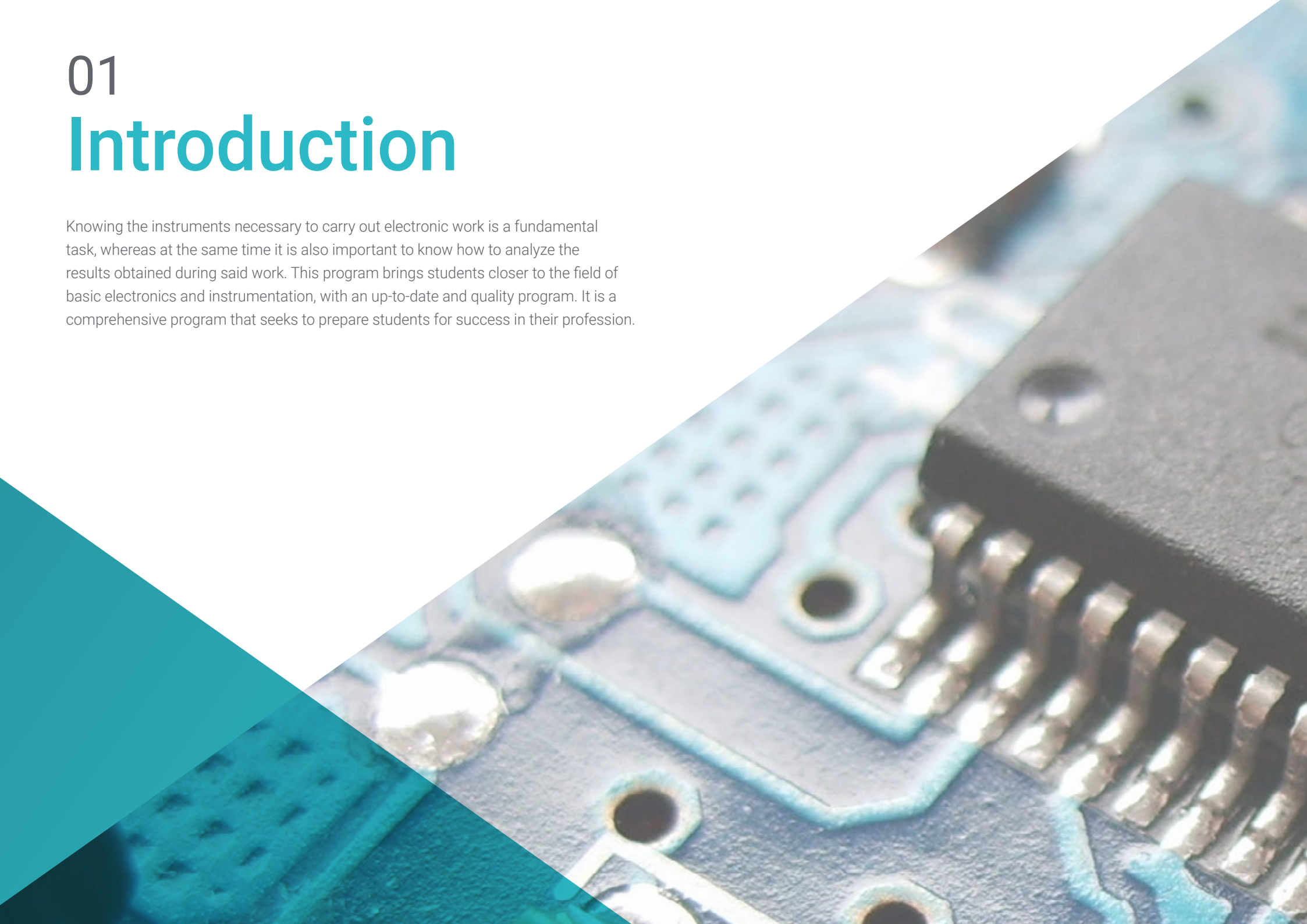
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# 01

# Introduction

Knowing the instruments necessary to carry out electronic work is a fundamental task, whereas at the same time it is also important to know how to analyze the results obtained during said work. This program brings students closer to the field of basic electronics and instrumentation, with an up-to-date and quality program. It is a comprehensive program that seeks to prepare students for success in their profession.





*If you are looking for quality education that will help you specialize in one of the fields with the most professional prospects, this is your best option”*

Advances in telecommunications are happening all the time, as this is one of the fastest evolving areas. It is therefore necessary to have IT experts who can adapt to these changes and have first-hand knowledge of the new tools and techniques that are emerging in this field.

This Postgraduate Certificate in Basic Electronics and Instrumentation addresses the complete range of topics involved in this field. Its study has a clear advantage over other programs that focus on specific blocks, which prevents students from knowing the interrelation with other areas included in the multidisciplinary field of telecommunications. In addition, the teaching team of this educational program has made a careful selection of each of the topics of this program to offer students the most comprehensive study opportunity possible and always linked to current events.

This program will provide students with the keys to master the basic concepts of linear systems, electrical circuit theory, electronic circuits, the physical principles of semiconductors and electronic devices. Specifically, students will be taught to use the necessary instrumentation in the field of electronics.

This program is aimed at those interested in achieving a higher level of knowledge in Basic Electronics and Instrumentation. The main objective is for students to specialize their knowledge in simulated work environments and conditions in a rigorous and realistic manner so they can later apply it in the real world.

Additionally, as it is a 100% online program, the student is not constrained by fixed timetables or the need to move to another physical location, but can access the contents at any time of the day, balancing their professional or personal life with their academic life.

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

- ◆ The development of practical cases presented by Basic Electronics and Instrumentation 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 self-assessment can be used to improve learning
- ◆ Its special emphasis on innovative methodologies in Electronics Therapy and Basic Instrumentation
- ◆ 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



*Do not miss the opportunity to take this Postgraduate Certificate in Basic Electronics and Instrumentation with us. It's the perfect opportunity to advance your career"*

“

*This Postgraduate Certificate is the best investment you can make when choosing a refresher program to expand your existing knowledge of Basic Electronics and Instrumentation”*

The teaching staff includes professionals from the field of design, who bring their experience to this specialization program, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive education programmed to learn in real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the academic year. To do so, professionals will be assisted by an innovative interactive video system created by renowned Basic Electronics and Instrumentation experts.

*This Postgraduate Certificate has the best didactic material, which will allow you a contextual study that will facilitate your learning.*

*This 100% online Postgraduate Certificate will allow you to combine your studies with your professional work.*



# 02 Objectives

The Postgraduate Certificate in Basic Electronics and Instrumentation is designed to facilitate the performance of the professionals in this field to enable them to master the main developments in this area.







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*Our goal is to make you the best professional in your sector. And for this we have the best methodology and content"*



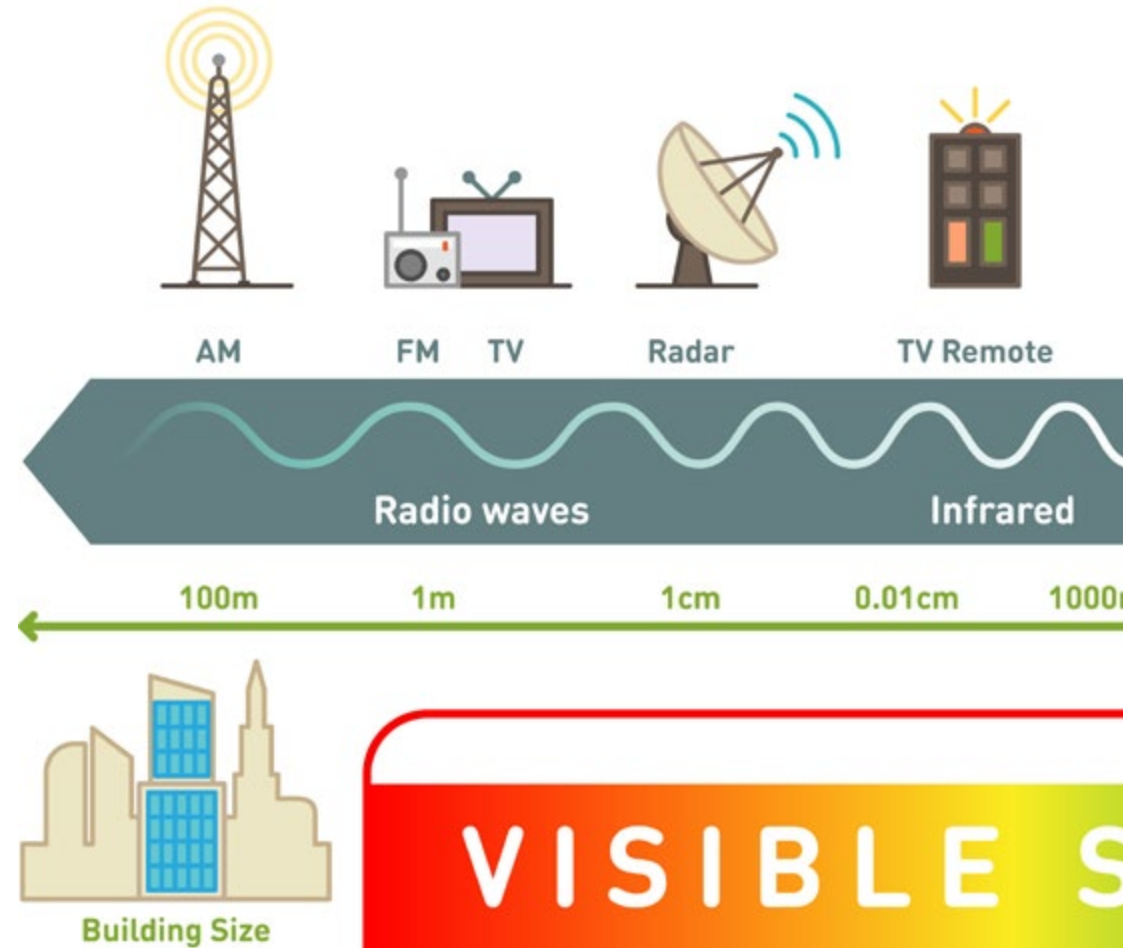
### General Objective

- ◆ Prepare students to be able to develop their work with total security and quality in the field of telecommunications, and Basic Instrumentation

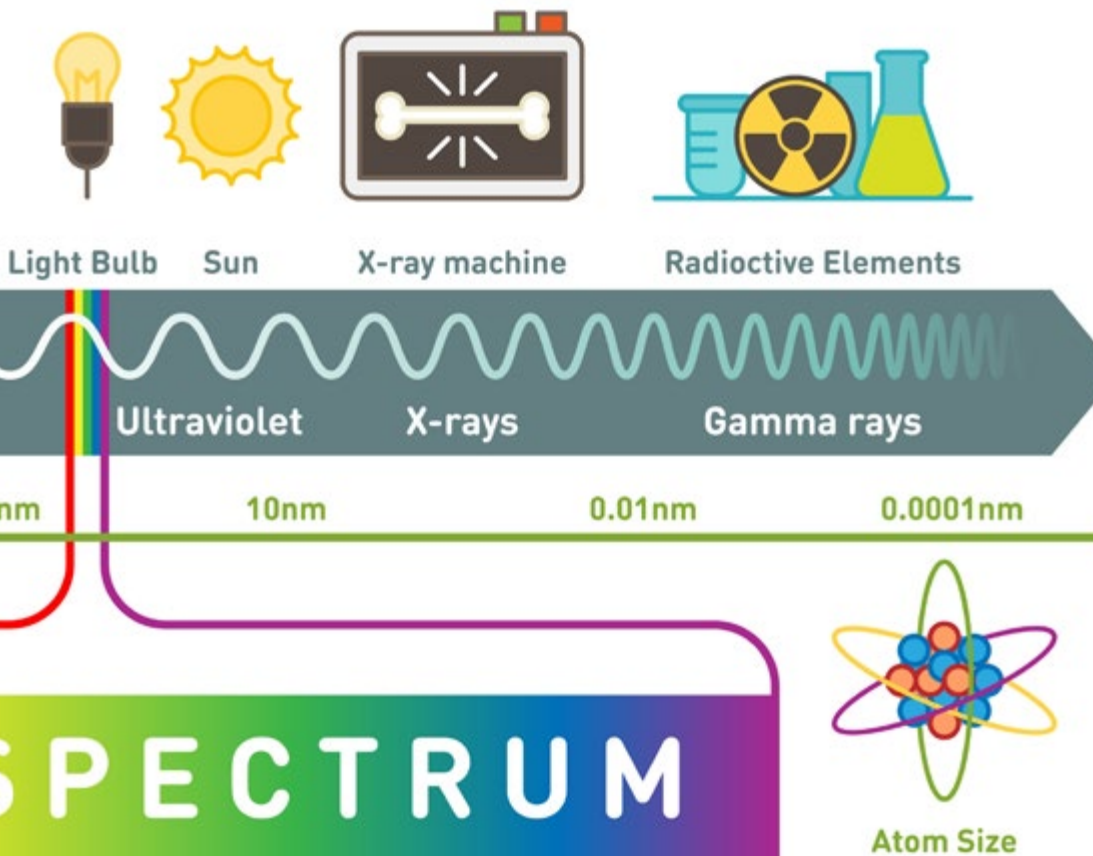


*Get trained at the one of the world's leading private online universities"*

# Electromagnetic



# etic Spectrum



## Specific Objectives

- ◆ Learn about the operation and limitations of basic electronic workstation instruments
- ◆ Know and implement the basic techniques for measuring electrical parameters of signals, and evaluate the associated errors and their possible correction techniques
- ◆ Master the basic characteristics and behavior of the most common passive components and be able to select them for a given application
- ◆ Understand the basic characteristics of linear amplifiers
- ◆ Know, design and implement the basic circuits using operational amplifiers considered ideal
- ◆ Understand the operation of capacitively coupled multi-stage feedback-free amplifiers and be able to design them
- ◆ Analyze and know how to apply the basic techniques and configurations in analog-integrated circuits

03

# Structure and Content

The structure of the contents has been designed by the best professionals in the from the engineering sector, with extensive experience and recognized prestige in the profession.



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*We have the most complete and up-to-date educational program on the market. We strive for excellence and for you to achieve it too"*

## Module 1. Basic Electronics and Instrumentation

- 1.1. Basic Instrumentation
  - 1.1.1. Introduction. Signals and Their Parameters
  - 1.1.2. Basic Electrical Quantities and their Measurement
  - 1.1.3. Oscilloscopes
  - 1.1.4. Digital Multimeter
  - 1.1.5. Function Generator
  - 1.1.6. Laboratory Power Supply
- 1.2. Electronic Components in the Laboratory
  - 1.2.1. Main Types, Tolerance and Serial Concepts
  - 1.2.2. Thermal Behavior and Power Dissipation. Maximum Voltage and Current
  - 1.2.3. Concepts of Coefficients of Variation, Drift and Non-Linearity
  - 1.2.4. Most Common Main Type Specific Parameters Catalog Selection and Limitations
- 1.3. The Junction Diode, Circuits with Diodes, Diodes for Special Applications
  - 1.3.1. Introduction and Operation
  - 1.3.2. Diode Circuits
  - 1.3.3. Special Application Diodes
  - 1.3.4. Zener Diode
- 1.4. The Bipolar Junction Transistor (BJT) and FET/MOSFET
  - 1.4.1. Transistor Fundamentals
  - 1.4.2. Polarization and Transistor Stabilization
  - 1.4.3. Transistor Circuits and Applications
  - 1.4.4. Single-Stage Amplifiers
  - 1.4.5. Amplifier Types, Voltage, Current
  - 1.4.6. Alternating Models
- 1.5. Basic Amplifier Concepts. Ideal Operational Amplifier Circuits
  - 1.5.1. Types of Amplifiers. Voltage, Current, Transimpedance and Transconductance
  - 1.5.2. Characteristic Parameters: Input and Output Impedances, Forward and Inverse Transfer Functions
  - 1.5.3. Vision as Quadripoles and Parameters
  - 1.5.4. Amplifier Association: Cascade, Series-Series, Series-Parallel, Parallel-Series and Parallel, Parallel
  - 1.5.5. Operational Amplifier Concept. General Characteristics. Use as a Comparator and as an Amplifier
  - 1.5.6. Inverting and Non-Inverting Amplifier Circuits. Precision Trackers and Rectifiers. Voltage Current Control
  - 1.5.7. Elements for Instrumentation and Operational Calculation: Adders, Subtractors, Differential Amplifiers, Integrators and Differentiators
  - 1.5.8. Stability and Feedback: Astables and Triggers
- 1.6. Single-Stage Amplifiers and Multistage Amplifiers
  - 1.6.1. General Concepts of Device Polarization
  - 1.6.2. Basic Polarization Circuits and Techniques. Implementation for Bipolar and Field Effect Transistors. Stability, Drift and Sensitivity
  - 1.6.3. Basic Small-Signal Amplification Configurations: Common Emitter-Source, Base-Gate, Collector-Drainer. Properties and Variants
  - 1.6.4. Performance Against Large Signal Excursions and Dynamic Range
  - 1.6.5. Basic Analog Switches and their Properties
  - 1.6.5. Frequency Effects in Single-Stage Configurations: Case of Medium Frequencies and their Limits
  - 1.6.6. Multi-Stage Amplification with R-C and Direct Coupling. Amplification, Frequency Range, Polarization and Dynamic Range Considerations
- 1.7. Basic Configurations in Analog Integrated Circuits
  - 1.7.1. Differential Input Configurations. Bartlett's Theorem. Polarization, Parameters and Measurements
  - 1.7.2. Polarization Functional Blocks: Current Mirrors and their Modifications. Active Loads and Level Changers
  - 1.7.3. Standard Input Configurations and their Properties: Single Transistor, Darlington Pairs and their Modifications, Cascode
  - 1.7.4. Output Configurations



- 1.8. Active Filters
  - 1.8.1. General Aspects
  - 1.8.2. Operational Filter Design
  - 1.8.3. Low Pass Filters
  - 1.8.4. High Pass Filters
  - 1.8.5. Band Pass and Band Filters
  - 1.8.6. Other Types of Active Filters
- 1.9. Analog-to-Digital Converters (A/D)
  - 1.9.1. Introduction and Functionalities
  - 1.9.2. Instrumental Systems
  - 1.9.3. Types of Converters
  - 1.9.4. Converter Characteristics
  - 1.9.5. Data Processing
- 1.10. Sensors
  - 1.10.1. Primary Sensors
  - 1.10.2. Resistive Sensors
  - 1.10.3. Capacitive Sensors
  - 1.10.4. Inductive and Electromagnetic Sensors
  - 1.10.5. Digital Sensors
  - 1.10.6. Signal-Generating Sensors
  - 1.10.7. Other Types of Sensors



*This program will allow you to advance  
in your career comfortably"*

# 04

# Methodology

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

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





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

## Case Study to contextualize all content

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

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



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



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

### A learning method that is different and innovative

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

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

The case method has been the most widely used learning system among the world's leading Information Technology schools for as long as they have existed. 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 course, students 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 different teaching elements in each lesson.

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

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

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

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



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

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

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

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

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



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



### Study Material

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

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



### Classes

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

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



### Practising Skills and Abilities

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



### Additional Reading

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





#### Case Studies

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



#### Interactive Summaries

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

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



#### Testing & Retesting

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



# 05 Certificate

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





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

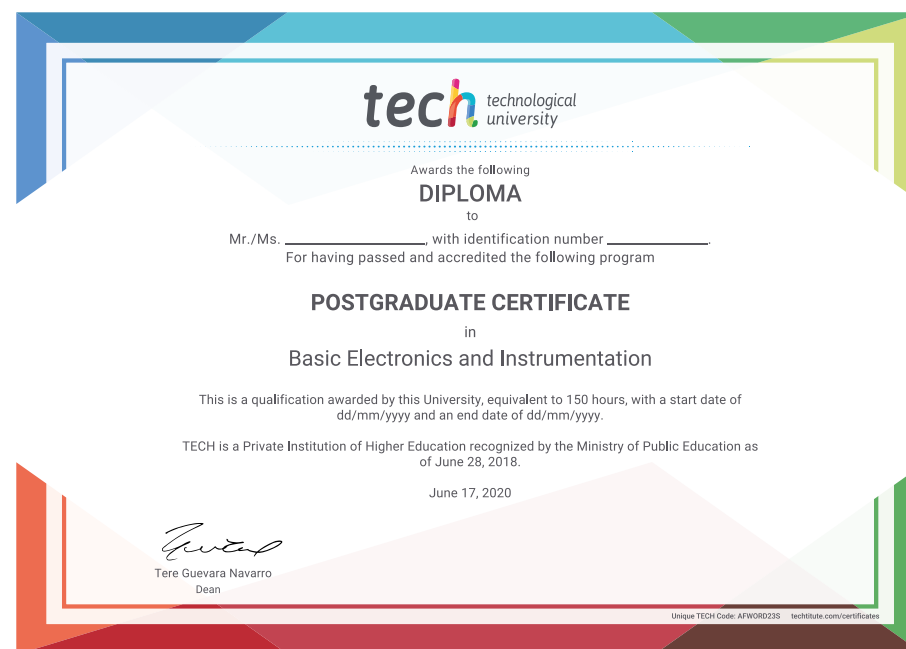
This **Postgraduate Certificate in Basic Electronics and Instrumentation** contains the most complete and up-to-date program on the market.

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 from career from evaluation committees.

Title: **Postgraduate Certificate in Basic Electronics and Instrumentation**

Official N° of Hours: **150 h.**



\*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.

future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
online training  
development language  
classroom



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