Postgraduate Certificate
Instrumentation and Sensors

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Postgraduate Certificate
Instrumentation and Sensors

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

Website: www.techtitute.com/pk/information-technology/postgraduate-certificate/instrumentation-sensors

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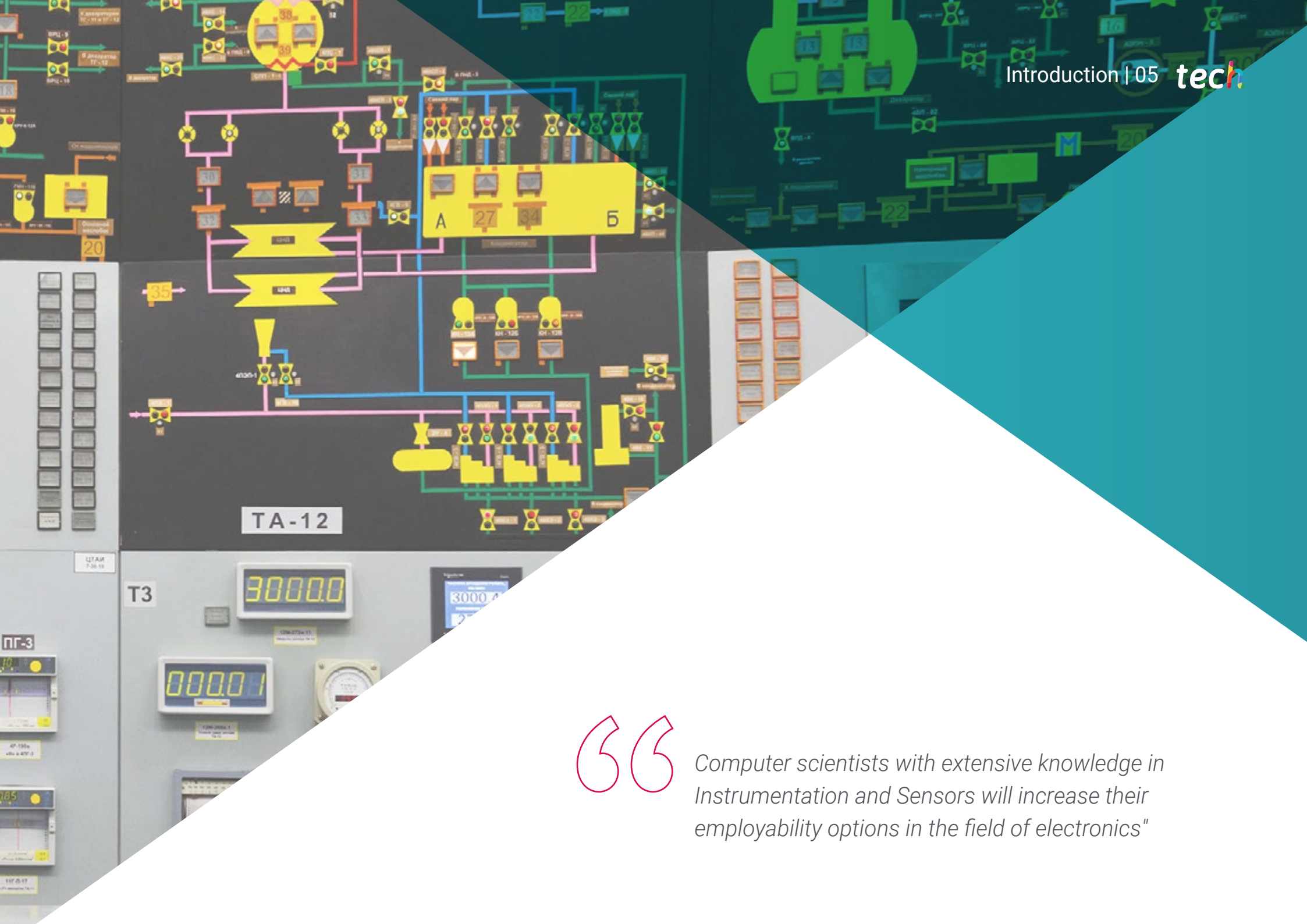
01

Introduction

Sensors and instrumentation are an essential part of electronic systems, since they allow us to transform the variation of physical or chemical quantities into electrical signals that are understood by other devices. This entails a series of specifics that must be understood by computer scientists in order to design and create this type of device. That is why TECH has decided to develop this highly academic program, which will provide students with the necessary training to develop with total confidence in their daily practice.



Computer scientists with extensive knowledge in Instrumentation and Sensors will increase their employability options in the field of electronics"

One of the most important achievements of mankind took place during the Industrial Revolution. It was in that moment that they realized the importance of having a sequential, strict and automated process as far as possible, in order to produce a product in large quantities at a relatively low cost.

Today, large-scale industry is based on the continuous use of machinery and processes controlled by mechanical and electronic devices. Employment in the industrial sector has reinvented itself and continues to do so, as operators increasingly require a higher technical and multidisciplinary qualification, as they are required to handle and understand up to date technology.

This Postgraduate Certificate in Instrumentation and Sensors at TECH analyzes the different types of sensors and actuators found in industrial processes and specifies the types of control systems in order to understand the intervention of an actuating device depending on a physical or chemical variable to be measured. The distribution of established topics develops, in a coherent and organized manner, the functioning of these devices from two perspectives: the scientific vision of the phenomena involved and the practical applications. In this way, the computer engineer will be able to develop a critical sense when selecting the different elements, according to the process involved in their professional performance.

In short, this is a 100% online Postgraduate Certificate that will allow students to distribute their study time, not being restricted by fixed schedules or having to move to another physical location, being able to access all the contents at any time of the day, balancing their work and personal life with their academic life.

The **Postgraduate Certificate in Instrumentation and Sensors** contains the most complete and up to date program on the market. Its most notable features are:

- Practical cases presented by experts in information technology
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional development
- Practical exercises where self assessment can be used to improve learning
- Special emphasis on innovative methodologies in Instrumentation and Sensors
- 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

Understanding the characteristics of Instrumentation and Sensors in electronic systems will be fundamental in order to be proficient in the creation of this type of device"

A complete academic program that will help you to become a successful computing engineer, specializing in Instrumentation and Sensors"

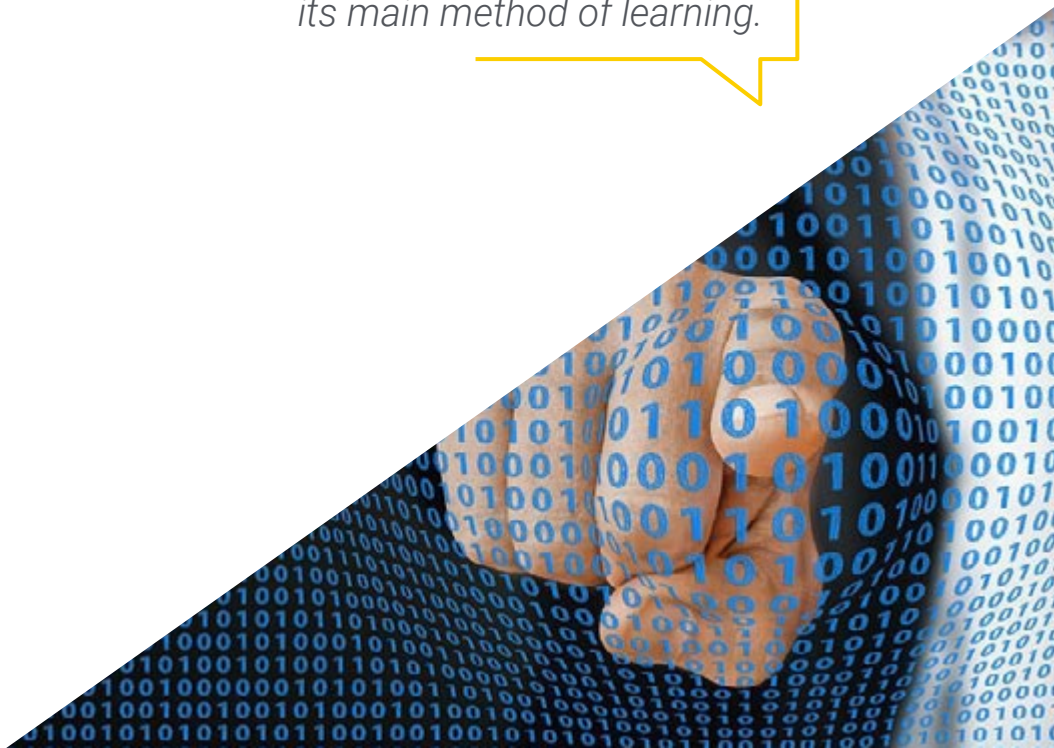
As soon as you enroll in this Postgraduate Diploma, you will have unlimited access to all the teaching resources. All you need is a computer or mobile device with an Internet connection.

TECH is a 21st century university and is committed to online teaching as its main method of learning.

The teaching staff includes professionals from the information technology sector, who bring their experience to this training 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 an immersive training experience designed to train for real life situations.

This program is designed around Problem Based Learning, whereby the student must try to solve the different professional practice situations that arise throughout the program. This will be done with the help of an innovative system of interactive videos made by renowned experts.



02

Objectives

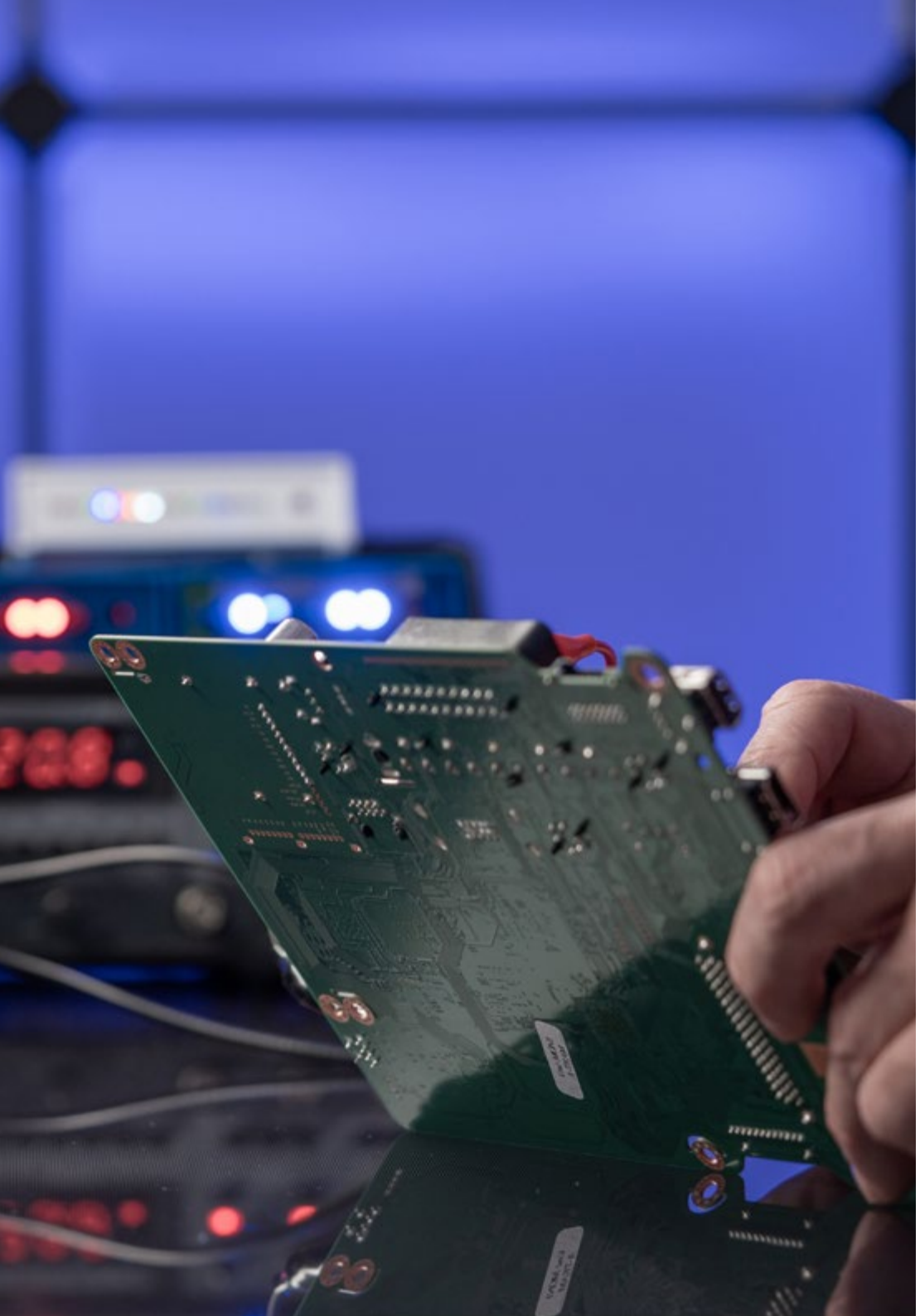
The main objective of this TECH Postgraduate Certificate in Instrumentation and Sensors is to offer computer scientists the necessary superior training to become a true specialist in this area. Thus, at the end of the program, students will be able to design and repair electronic sensors that are indispensable in the daily life of citizens. An objective that will be achieved thanks to a first class theoretical program and the quality of the teaching staff. The perfect combination to improve the qualification of professionals in the sector.

Specialize in this area of electronic systems and become a world class expert"

General Objectives

- Analyze technical documentation by examining the characteristics of different types of projects in order to determine the data necessary for their development
- Identify standardized symbology and plotting techniques in order to analyze drawings and diagrams of automatic systems and installations
- Identify breakdowns and malfunctions in order to supervise and/or maintain installations and associated equipment
- Identify and apply quality parameters in the work and activities carried out in the learning process, in order to assess the culture of evaluation and quality, and to be able to monitor and improve quality management procedures

By studying this Postgraduate Certificate you will be able to develop the necessary skills to stand out in a highly competitive sector"



Specific Objectives

- Determine measuring and control devices according to their functionality
- Evaluate the different technical characteristics of measurement and control systems
- Develop and propose measurement and regulation systems
- Specify the variables that intervene in a process
- Justify the type of sensor involved in a process according to the physical or chemical parameter to be measured
- Establish appropriate control system performance requirements in accordance with system requirements
- Analyze the operation of typical measurement and control systems in industries

03

Course Management

The teachers of the TECH Postgraduate Certificate in Instruments and Sensors have extensive experience in the sector. Professors who have dedicated a large part of their lives to the field of Electronic Engineering and who bring together all their knowledge in a first class program, aimed at IT professionals. A teaching team that will guide students through the most complete and effective study in this area of electronic systems.

The best professors of the present time in Instrumentation and Sensors will guide you through the study of this Postgraduate Certificate"

Management

Ms. Casares Andrés, María Gregoria

- Associate professor at Carlos III University of Madrid
- Degree in IT from the Polytechnic University of Madrid
- Researcher at Polytechnic University of Madrid
- Researcher at Carlos III University of Madrid
- Evaluator and creator of OCW courses at Carlos III University of Madrid
- Tutor of courses at INTEF (National Agency for Educational Technology and Teacher Development)
- Support Technician at the Ministry of Education Directorate General of Bilingualism and Quality of Education of the Community of Madrid
- Middle and high school teacher specializing in IT
- Associate professor off the Pontificia de Cimillas University
- Teaching Expert in the Community of Madrid
- Analyst / Project Manager at Banco Urquijo Computer Systems
- ERIA Computer Analyst

Professors

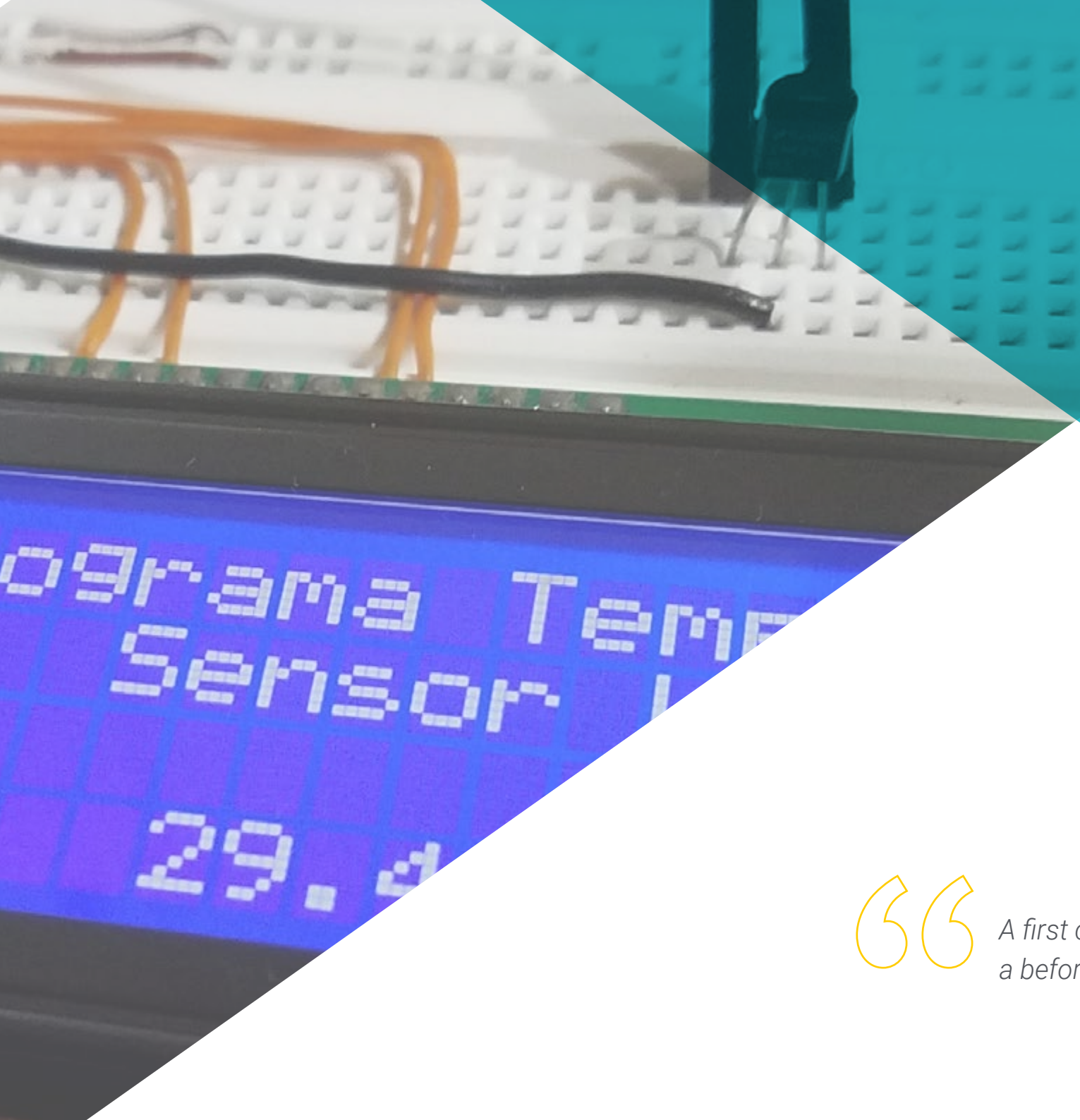
Mr. Jara Ivars, Luis

- Industrial Engineer- Sliding Ingenieros SL
- High School Teacher of Electrotechnical and Automatic Systems, Community of Madrid
- Secondary School Teacher Electronic Equipment Community of Madrid
- Physics and Chemistry High School Teacher
- Degree in Physical Sciences, Spanish Open University (UNED). Industrial Engineering, Spanish Open University (UNED)
- Master's Degree in Astronomy and Astrophysics from the International University of Valencia
- Master's Degree in Occupational Risk Prevention , UNED, 2011
- Master's Degree in University Teacher Training

04

Structure and Content

The structure of the content has been designed thinking of the academic needs of computer scientists in the field of electronic instrumentation and sensors In this way, students will be able to carry out a self guided study through the most innovative concepts of the moment, which will be fundamental for their professional growth. A program that includes the most complete syllabus together with multiple practical cases that will help the student to better understand the theoretical aspects.



A first class program that will mark a before and after in your training"

Module 1. Instrumentation and Sensors

1.1. Measurement
- 1.1.1. Measurement and Control Characteristics
  - 1.1.1.1. Accuracy
  - 1.1.1.2. Reliability
  - 1.1.1.3. Repeatability
  - 1.1.1.4. Reproducability
  - 1.1.1.5. Derivatives
  - 1.1.1.6. Linearity
  - 1.1.1.7. Hysteresis
  - 1.1.1.8. Resolution
  - 1.1.1.9. Scope
  - 1.1.1.10. Errors
- 1.1.2. Instrumentation Classification
  - 1.1.2.1. According to its Functionality
  - 1.1.2.2. According to the Control Variable

1.2. Regulation
- 1.2.1. Regulated Systems
  - 1.2.1.1. Open Loop Operation
  - 1.2.1.2. Closed Loop Operation
- 1.2.2. Types of Industrial Processes
  - 1.2.2.1. Continuous Processes
  - 1.2.2.2. Discrete Processes

1.3. Flow Sensors
- 1.3.1. Flow Rate
- 1.3.2. Units Used for Flow Measurement
- 1.3.3. Types of Flow Sensors
  - 1.3.3.1. Flow Measurement by Volume
  - 1.3.3.2. Flow Measurement by Mass

1.4. Pressure Sensors
- 1.4.1. Pressure
- 1.4.2. Units Used for Pressure Measurement
- 1.4.3. Types of Pressure Sensors
  - 1.4.3.1. Pressure Measurement Through Mechanical Elements
  - 1.4.3.2. Pressure Measurement Through Electro-Mechanical Elements
  - 1.4.3.3. Pressure Measurement Through Electronic Elements

1.5. Temperature Sensors
- 1.5.1. Temperature
- 1.5.2. Units Used for Temperature Measurement
- 1.5.3. Types of Temperature Sensors
  - 1.5.3.1. Bimetallic Thermometer
  - 1.5.3.2. Glass Thermometer
  - 1.5.3.3. Resistance Thermometer
  - 1.5.3.4. Thermistors
  - 1.5.3.5. Thermocouples
  - 1.5.3.6. Radiation Pyrometers

1.6. Level Sensors
- 1.6.1. Level of Liquids and Solids
- 1.6.2. Units Used for Temperature Measurement
- 1.6.3. Types of Level Sensors
  - 1.6.3.1. Liquid Level Gauges
  - 1.6.3.2. Solids Level Gauges

1.7. Sensors for Other Physical and Chemical Variables
- 1.7.1. Sensors for Other Physical Variables
  - 1.7.1.1. Weight Sensors
  - 1.7.1.2. Velocity Sensors
  - 1.7.1.3. Density Sensors
  - 1.7.1.4. Humidity Sensors
  - 1.7.1.5. Flame Sensors
  - 1.7.1.6. Solar Radiation Sensors
- 1.7.2. Sensors for Other Chemical Variables
  - 1.7.2.1. Conductivity Sensors
  - 1.7.2.2. pH Sensors
  - 1.7.2.3. Gas Concentration Sensors

1.8. Actuators
- 1.8.1. Actuators
- 1.8.2. Motors
- 1.8.3. Servo Valves

1.9. Automatic Control
- 1.9.1. Automatic Regulation
- 1.9.2. Types of Regulators
  - 1.9.2.1. Two Step Controller
  - 1.9.2.2. Proportional Controller
  - 1.9.2.3. Differential Controller
  - 1.9.2.4. Proportional-Differential Controller
  - 1.9.2.5. Integral Controller
  - 1.9.2.6. Proportional-Integral Controller
  - 1.9.2.7. Proportional-Integral-Differential Controller
  - 1.9.2.8. Digital Electronic Controller

1.10. Applications of Control in the Industry
- 1.10.1. Selection Criteria for Control Systems
- 1.10.2. Examples of Industrial Control Types
  - 1.10.2.1. Ovens
  - 1.10.2.2. Dryers
  - 1.10.2.3. Combustion Control
  - 1.10.2.4. Level Control
  - 1.10.2.5. Heat Exchangers
  - 1.10.2.6. Central Nuclear Reactor

Access the most complete information on Instrumentation and Sensors"

05

Methodology

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

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

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

Case Study to contextualize all content

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

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

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

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

A learning method that is different and innovative

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

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

The case method 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

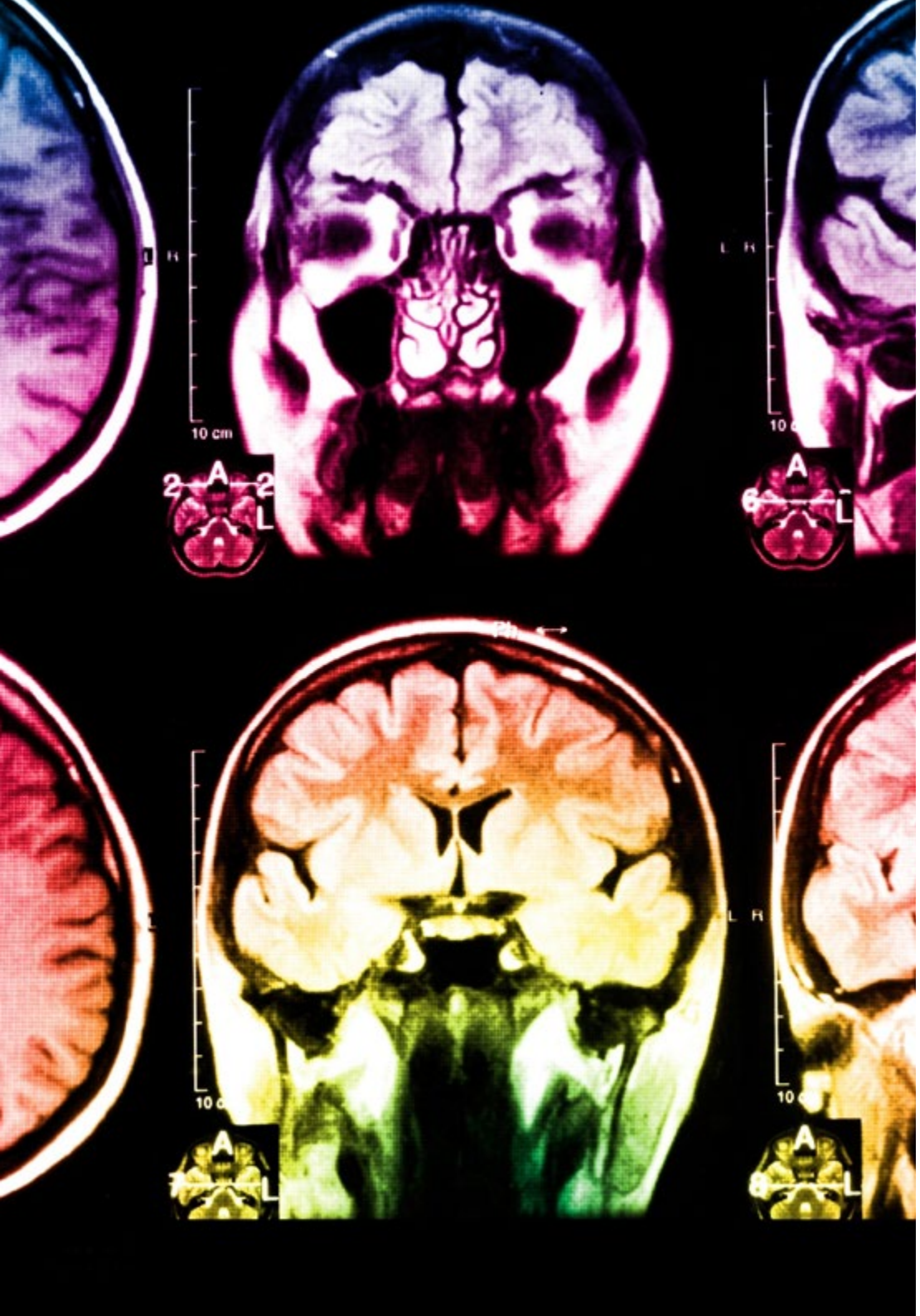
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

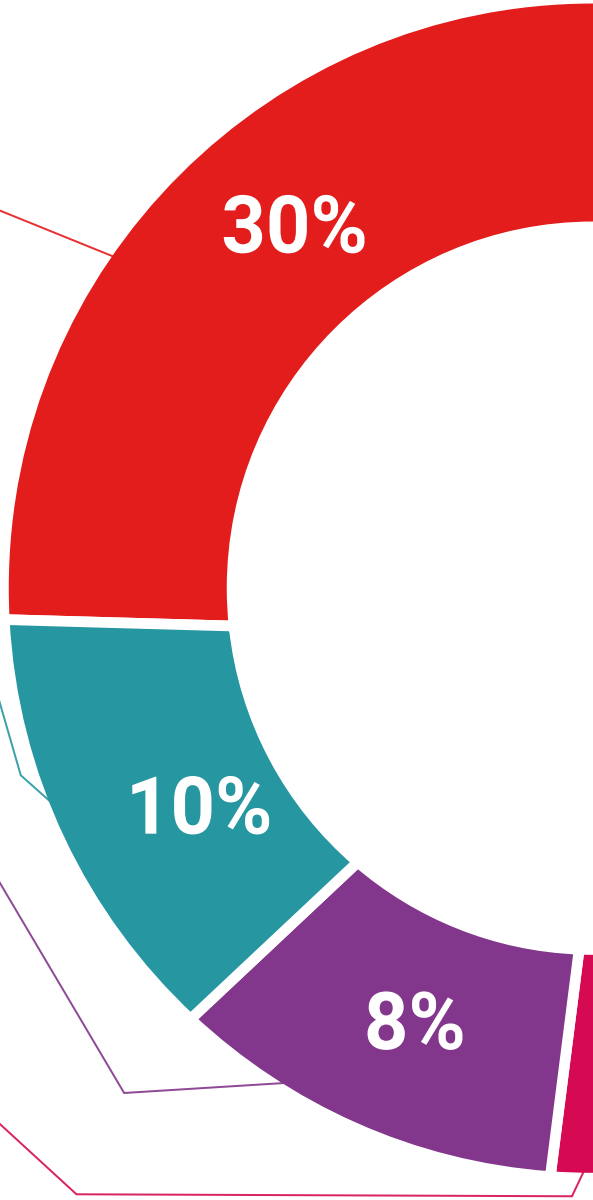
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

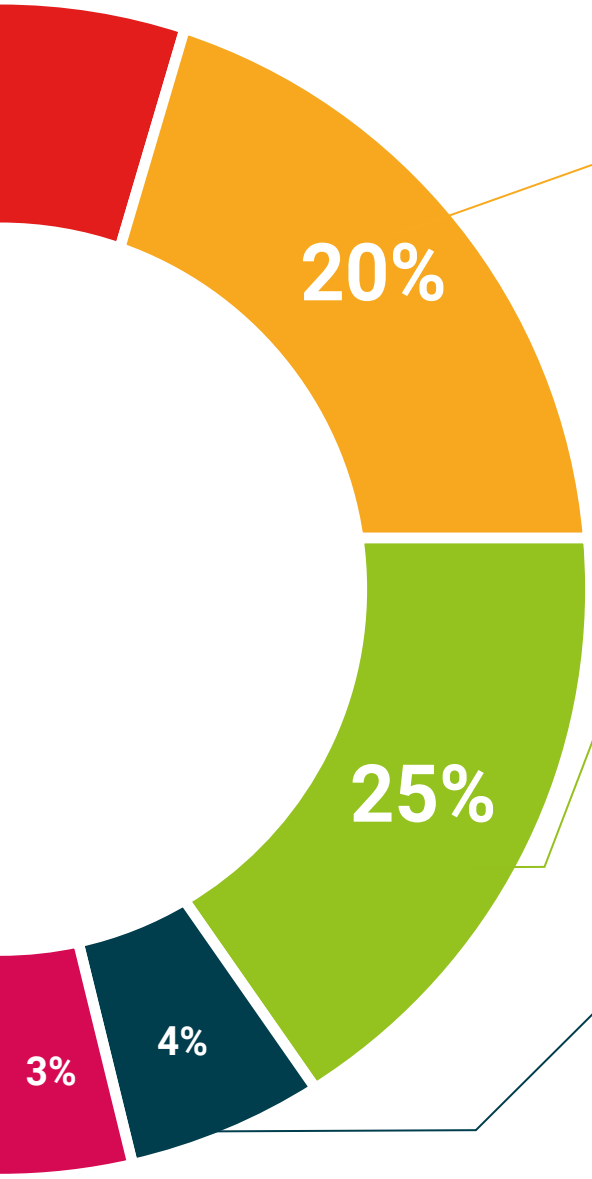
Practising Skills and Abilities

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.

06

Certificate

The Postgraduate Certificate in Instrumentation and Sensors guarantees students, in addition to the most rigorous and up to date training, access to a Postgraduate Certificate issued by TECH Technological University.

By successfully completing this program, you will receive your TECH qualification without the need for complicated paperwork"

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

Title: **Postgraduate Certificate in Instrumentation and Sensors**

Official Nº of hours: **150 h.**


tech technological university

Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Instrumentation and Sensors

This is a qualification awarded by this University, equivalent to 150 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

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

June 17, 2020

Tere Guevara Navarro

Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates

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

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Postgraduate Certificate
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