Postgraduate Certificate
Industrial Electronic Communications

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Postgraduate Certificate
Industrial Electronic Communications

- 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/industrial-electronic-communications

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01

Introduction

Industries handle large amounts of data, so it is necessary to have adequate communication networks that favor the exchange of information between different mechanisms. Digital communication has improved these processes, but this also depends on computer engineers achieving the level of qualification required for this job. This TECH academic program offers them the possibility of reaching that level of professionalism that will make them stand out in a really competitive sector, by having a specific syllabus that will provide them with the necessary knowledge.

Specialize in Industrial Electronic Communications and become an expert that all companies want to have on their staff"

The transfer of data between all elements of an industrial production system is the basis of what is known as Industry 4.0. Controllers or PLCs (Power Line Communications) communicate with each other and with distributed digital or analog inputs and outputs, with supervision systems, etc. In turn, downstream, these elements communicate with sensors and other instrumentation elements and, upstream, with management systems, databases and even with services deployed in the cloud.

To handle all this data demand, it is necessary to provide a communication network to meet the needs of each specific case. Sometimes, enormous bandwidths will be required to communicate, in very short times, large amounts of data. At other times, it is necessary to have wireless links for mobile elements or elements that are located at considerable distances. Depending on parameters such as data volume, transmission and response speed, and the scope of application, there are certain types of networks that are more suitable for certain scenarios, so it is necessary for IT professionals working in this field to obtain the necessary qualifications required for their work.

In this sense, TECH has designed this Postgraduate Certificate in Industrial Electronic Communications, with which the student will evaluate the different communications systems, deepening in industrial network standards and fieldbuses, focusing on various communications systems widely used in industrial environments such as: Profibus, WorldFIP or Industrial Ethernet. In order to better understand the requirements of this type of networks, we will first analyze what the most common real-time systems in industrial processes consist of. In addition, some aspects related to the complexity of programming this type of systems will be presented. Finally, the main communication protocols used for the transmission of large volumes of data to higher levels and other cloud services, such as OPC, ICCP, MQTT, among others, will be reviewed.

In addition, this program has the advantage of being 100% online, which 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.

This **Postgraduate Certificate in Industrial Electronic Communications** contains the most complete and up-to-date educational program on the market. The most important features of the program include:

- 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 Industrial Electronic Communications
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Access to content from any fixed or portable device with an Internet connection

This program provides you with a multitude of theoretical and practical resources that will facilitate your learning"

Learn how to create communications networks that can deal with all the data that is handled in the industries and be more competitive in your daily practice"

If you're looking for an academic opportunity to specialize in Industrial Electronic Communications, this is the place for you.

TECH aims to improve the knowledge of students in a comfortable way and that's why it offers them a 100% online methodology.

Its teaching staff includes professionals from the field of IT, who bring to this program the experience of their work, 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. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

02

Objectives

TECH offers IT professionals the opportunity to study this Postgraduate Certificate in Industrial Electronic Communications with the main objective of acquiring the necessary training that will allow them to be successful in a fundamental field within the engineering of electronic systems. Thus, after completing the program, students will have the necessary resources to design, analyze, control and program the most widely used communication networks in the sector.

The completion of this program will allow you to get up to date in a fundamental area such as industrial electronic communication"

General Objectives

- Determine the characteristics of real type systems and recognize the complexity of programming these types of systems
- Analyze the different types of communication networks available
- Evaluate which type of communications network is the most suitable in certain scenarios

Knowing the complexity of real-time systems programming will allow you to be more effective in your daily work"

Specific Objectives

- Establish the basis of real-time systems and their main characteristics in relation to industrial communications
- Examine the need for distributed systems and their programming
- Determine the specific characteristics of industrial communications networks
- Analyze the different solutions for the implementation of a communications network in an industrial environment
- Gain in-depth knowledge of the OSI communications model and the TCP protocol
- Develop the different mechanisms to convert this type of networks into reliable networks
- Address the basic protocols on which the different mechanisms of information transmission in industrial communication networks are based

03

Course Management

For this Postgraduate Certificate in Industrial Electronic Communications, TECH has selected a first class teaching team, with extensive experience both in the sector and in the field of education. People committed to teaching and who understand the importance of offering students the best information on the subject, together with an innovative teaching methodology that favors the learning process. And for that reason, they have gathered together the most relevant topics on industrial communications.

A unique teaching team, specialized in Industrial Electronic Communications"

Management

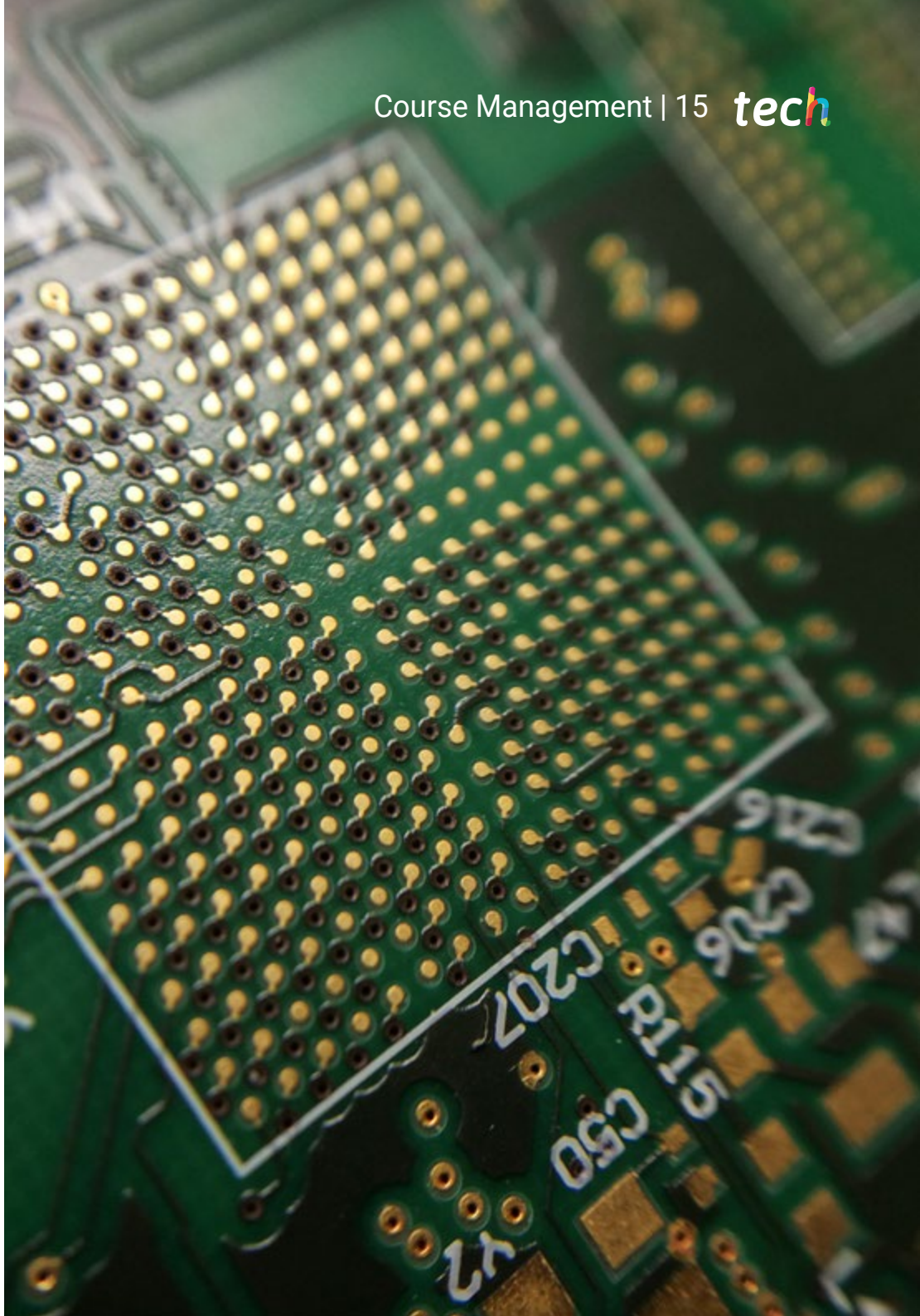
Ms. Casares Andrés, María Gregoria

- 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

Ms. Escandel Varela, Lorena

- Research support technician in the project: "System for the provision and consumption of HD multimedia content in means of collective passenger transport based on LIFI technology for data transmission" At the Carlos III University, Madrid
- Computer Sciences Specialist in Emprestur, Ministry of Toursim, Cuba
- Computer Sciences Specialist in UNE, an electrical company in Cuba
- IT and Communications Specialist, Almacenes Universales S.A., Cuba
- Specialist in Radio Communications in Santa Clara air base, Cuba
- Engineering in Telecommunications and Electronis in the Marta Abreu de las Villas Central University, Santa Clara, Cuba
- Master's Degree in Electronic Systems and Its Application at Carlos III University, Madrid: Leganés Campus, Madrid
- PhD student in Electrical, Electronic and Automation Engineering, Department of Electronic Technology. Carlos III University of Madrid: Leganés Campus



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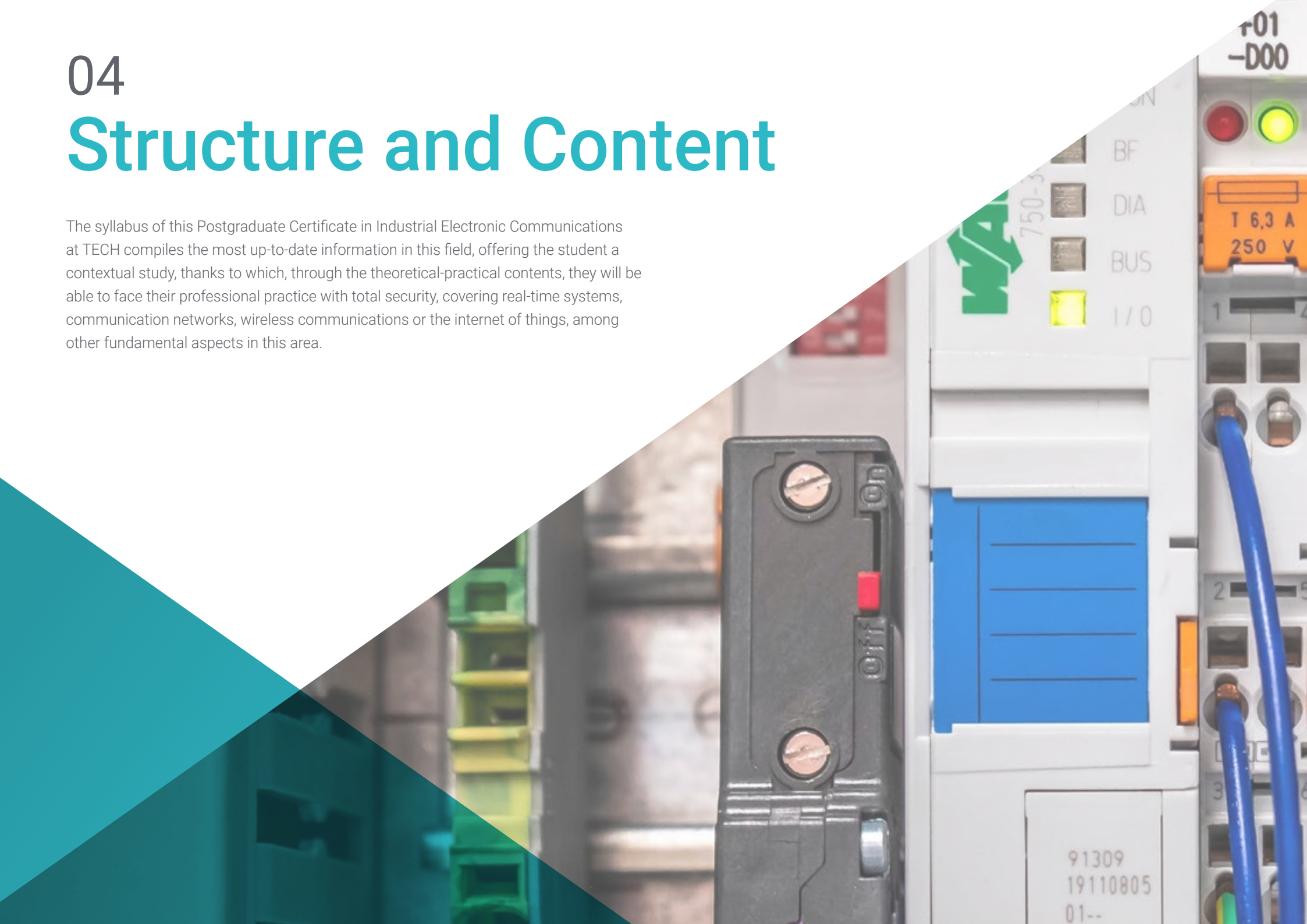
Structure and Content

The syllabus of this Postgraduate Certificate in Industrial Electronic Communications at TECH compiles the most up-to-date information in this field, offering the student a contextual study, thanks to which, through the theoretical-practical contents, they will be able to face their professional practice with total security, covering real-time systems, communication networks, wireless communications or the internet of things, among other fundamental aspects in this area.



A very complete program that synthesizes the fundamental aspects of industrial communications, allowing you to acquire a higher qualification in a short time"

Module 1. Industrial Communications

1.1. Real Time Systems
- 1.1.1. Classification
- 1.1.2. Programming
- 1.1.3. Planning

1.2. Communication Networks
- 1.2.1. Transmission of medium
- 1.2.2. Basic Configurations
- 1.2.3. CIM Pyramid
- 1.2.4. Classification
- 1.2.5. OSI Model
- 1.2.6. TCP/IP Model

1.3. Fieldbuses
- 1.3.1. Classification
- 1.3.2. Distributed, Centralized Systems
- 1.3.3. Distributed Control Systems

1.4. BUS
- 1.4.1. Physical Level
- 1.4.2. Link Level
- 1.4.3. Error Control
- 1.4.4. Components

1.5. CAN or CANopen
- 1.5.1. Physical Level
- 1.5.2. Link Level
- 1.5.3. Error Control
- 1.5.4. Devicenet
- 1.5.5. Controlnet

1.6. Profibus
- 1.6.1. Physical Level
- 1.6.2. Link Level
- 1.6.3. Application Level
- 1.6.4. Communication Models
- 1.6.5. System Operation
- 1.6.6. Profinet

1.7. Modbus
- 1.7.1. Physical Environment
- 1.7.2. Access to the Environment
- 1.7.3. Transmission Series Modes
- 1.7.4. Protocol
- 1.7.5. Modbus TCP

1.8. Industrial Ethernet
- 1.8.1. Profinet
- 1.8.2. Modbus TCP
- 1.8.3. Ethernet/IP
- 1.8.4. EtherCAT

1.9. Wireless Communication
- 1.9.1. Networks 802.11 (Wifi)
- 1.9.3. Networks 802.15.1 (BlueTooth)
- 1.9.3. Networks 802.15.4 (ZigBee)
- 1.9.4. WirelessHART
- 1.9.5. WiMAX
- 1.9.6. Networks Based on Cell Phones
- 1.9.7. Satellite Communications

1.10. IoT in Industrial Environments
- 1.10.1. The Internet of Things
- 1.10.2. IoT Device Characteristics
- 1.10.3. Application of IoT in Industrial Environments
- 1.10.4. Security Requirements
- 1.10.5. Communication Protocols: MQTT and CoAP

A program designed to improve your qualification in the field of idustrial communications"

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

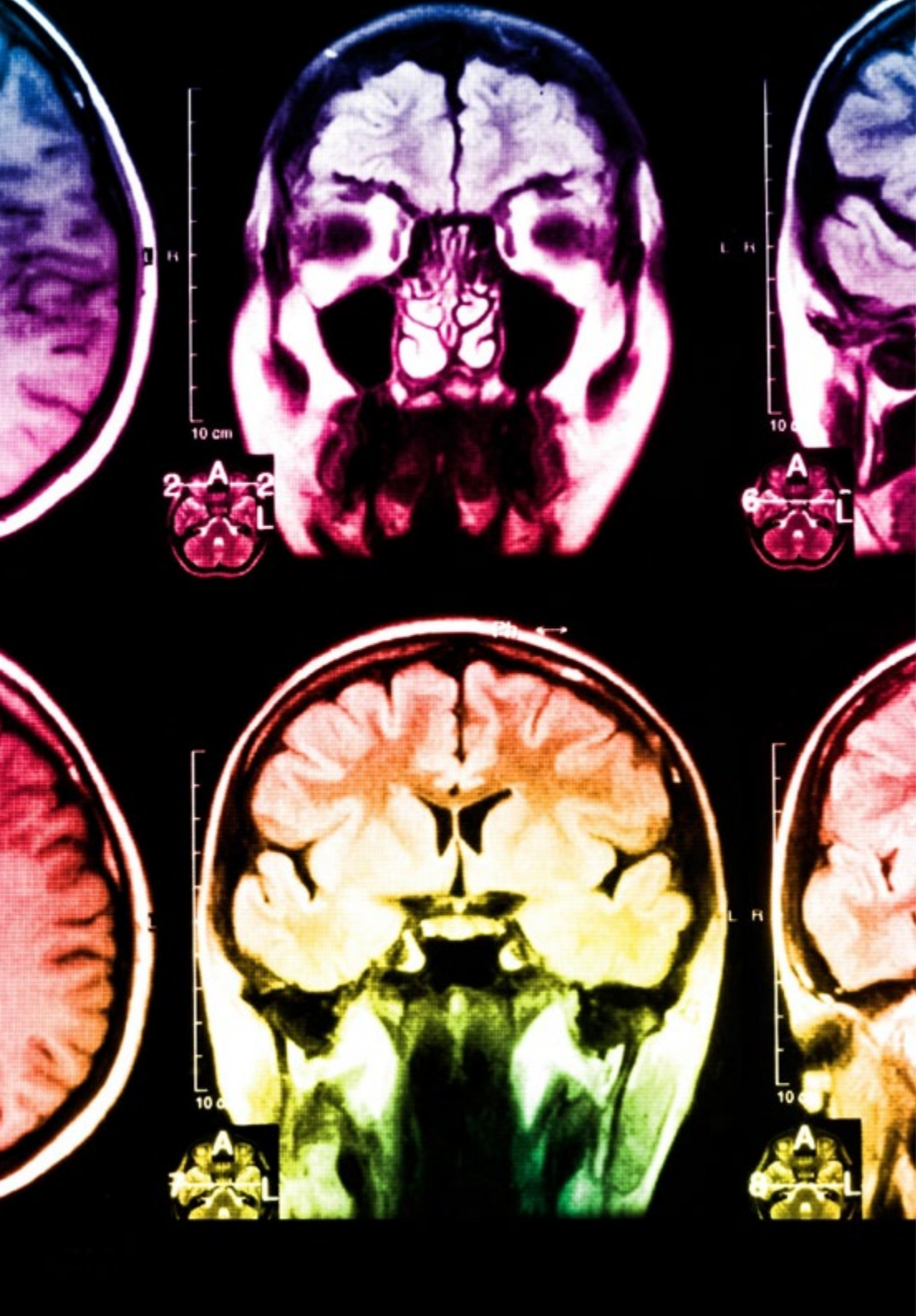
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

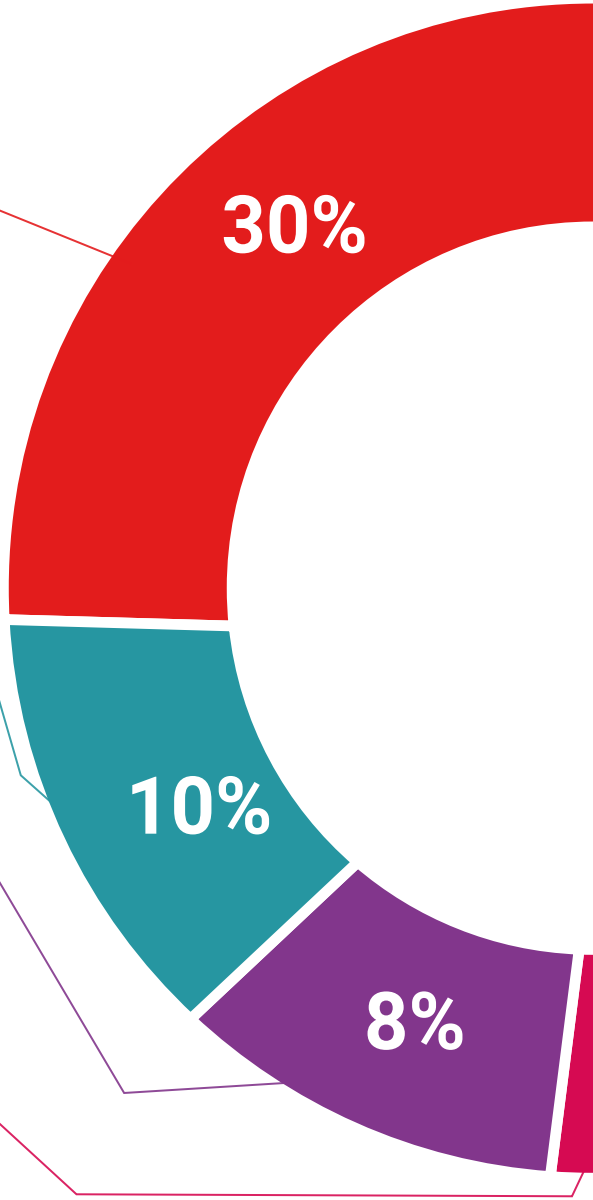
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

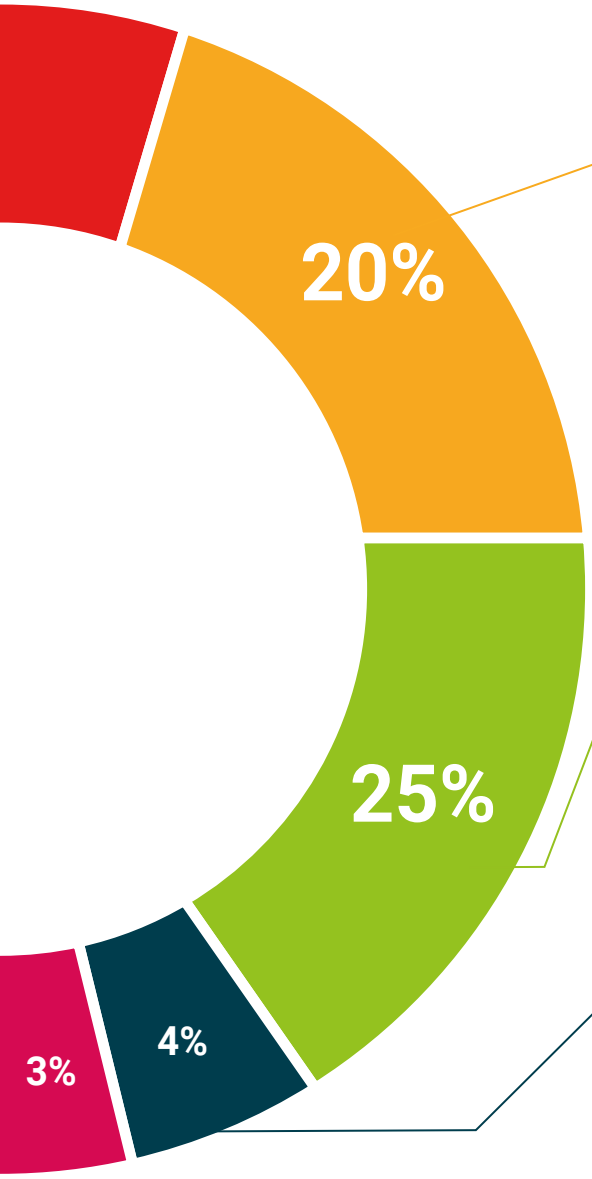
Practising Skills and Abilities

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 Industrial Electronic Communications guarantees, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.

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

This **Postgraduate Certificate in Industrial Electronic Communications** contains the most complete and up-to-date educational program on the market.

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

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

Title: **Postgraduate Certificate in Industrial Electronic Communications**

Official Nº of hours: **150 h.**


tech technological university

Awards the following

DIPLOMA

to

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

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Industrial Electronic Communications

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

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

June 17, 2020

Tere Guevara Navarro

Dean

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

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

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