Professional Master's Degree

Digital Transformation and Industry 4.0

tech technological university

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Professional Master's Degree
Digital Transformation and Industry 4.0

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/in/engineering/professional-master-degree/master-digital-transformation-industry-4-0**

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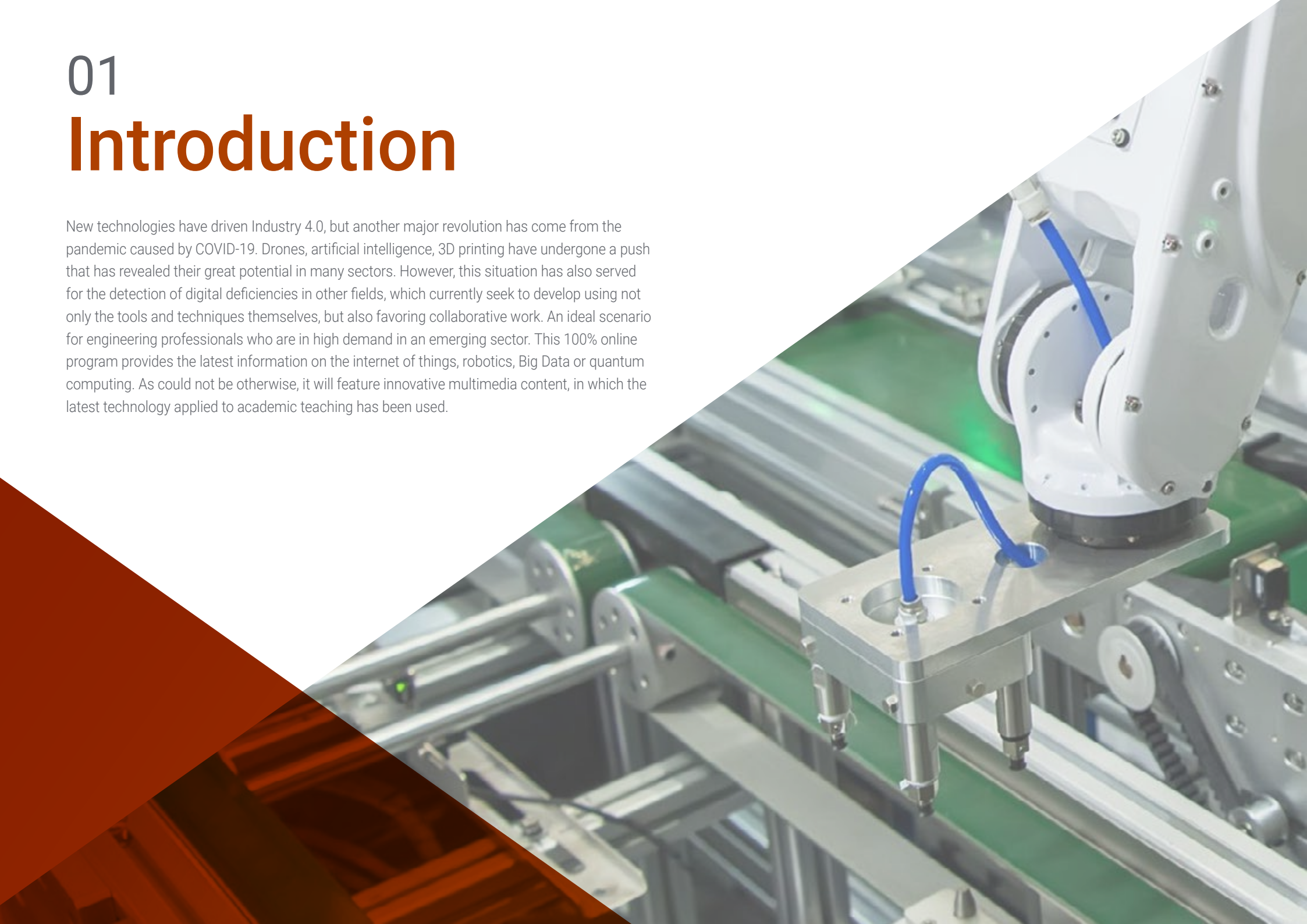
01

Introduction

New technologies have driven Industry 4.0, but another major revolution has come from the pandemic caused by COVID-19. Drones, artificial intelligence, 3D printing have undergone a push that has revealed their great potential in many sectors. However, this situation has also served for the detection of digital deficiencies in other fields, which currently seek to develop using not only the tools and techniques themselves, but also favoring collaborative work. An ideal scenario for engineering professionals who are in high demand in an emerging sector. This 100% online program provides the latest information on the internet of things, robotics, Big Data or quantum computing. As could not be otherwise, it will feature innovative multimedia content, in which the latest technology applied to academic teaching has been used.



Enter a constantly evolving technology sector and get up to date to achieve the best benefits for your digital business. Enroll now"

Today's progress has new technologies as a great ally, a digital transformation present from the educational bases to sectors such as aviation, automobiles, the arms industry, commerce and finance. All of this is geared towards the achievement of a true digital economy, in which the engineering professional plays a leading role thanks to their knowledge.

Change is rapid, accelerated by the pandemic caused by coronavirus, and initiatives from Open Source communities, Startups and public institutions are emerging. The current scenario is completely favorable and forecasts predict a successful future for those who have decided to take this path and face the challenges posed by Industry 4.0. That is why TECH has gathered in this Professional Master's Degree a relevant teaching team in the engineering sector, whose main objective is to offer the most up-to-date knowledge in an area with great potential.

A program with a practical theoretical approach, which provides the graduate with a study in depth on virtual, augmented and mixed reality, industry 4.0 applied to sectors such as tourism, energy, construction or smart factory, or automation systems. The case studies provided by the specialists who teach this degree will provide students with a learning experience that is close to the reality they may encounter in their work performance in different areas.

The professional is also faced with a program that is taught exclusively online, in a convenient and flexible way. All you need is a computer, tablet or cell phone to connect to the virtual campus and access the complete syllabus of this degree. A program, without presence, or classes without fixed schedules, which also gives freedom to view or download the content of this Professional Master's Degree when the student wishes. The engineer is, therefore, facing an excellent opportunity to boost their career in a sector with a wide range of opportunities and also with a university education that is compatible with the most demanding responsibilities.

This **Professional Master's Degree in Digital Transformation and Industry 4.0** contains the most complete and up-to-date program on the market. The most important features include:

- The development of case studies presented by experts in Digital Transformation and Industry 4.0.
- The graphic, schematic and practical contents of the book provide technical and practical information on those 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 Advanced Practice Nursing
- 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

Give your profession a boost with this Professional Master's Degree and get the main tools and techniques to succeed in the Industry 4.0 field"

This 100% online Professional Master's Degree will allow you to combine a university education with your professional work. You choose where and when to access"

The completion of this university degree will place engineering professionals at the forefront of the latest developments in Industry 4.0.

Video summaries, detailed videos or specialized readings will allow you to delve into essential technologies in the tourism, agriculture or manufacturing sectors.

The teaching staff includes professionals from the engineering sector, who bring their experience to this 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 learning programmed to train in real situations.

The design of this program focuses on Problem-Based Learning, by means of which the professional must try to solve the different situations of professional practice that arise throughout the Professional Master's Degree. To do this, the professional will be assisted by an innovative interactive video system made by recognized experts in Digital Transformation and Industry 4.0, and with great experience.

02

Objectives

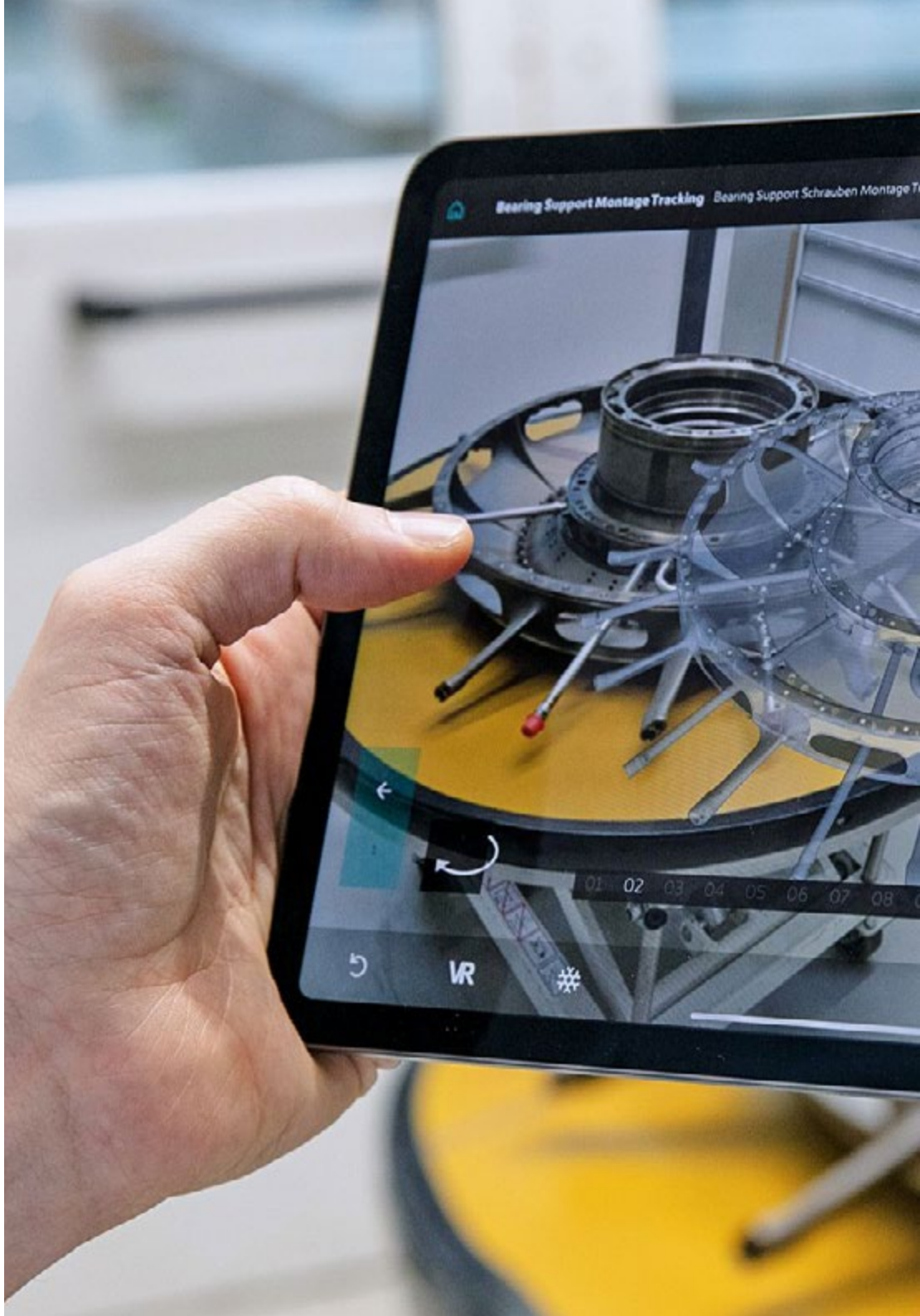
Upon completion of this program, the engineering professional will have acquired a thorough understanding of the profound Digital Transformation that is currently taking place in different sectors. This will be possible thanks to the multimedia material that will enable you to lead the digital change, master the concepts of Virtual Reality or know the existing wearable devices and their application in security systems. These goals will be easier with the support offered by the teachers selected to teach this program.

This program aims to make you the best professional in the industry. For this you have the best methodology and content on digitization in the primary, secondary and tertiary sectors"

General Objectives

- Conduct a comprehensive analysis of the profound transformation and radical paradigm shift being experienced in the current global digitalization process
- Provide in-depth knowledge and the necessary technological tools to face and lead the technological leap and the challenges currently present in companies
- Mastering the digitalization procedures of companies and the automation of their processes to create new fields of wealth in areas such as creativity, innovation and technological efficiency
- Leading Digital Change

TECH helps you achieve professional excellence. Immerse yourself in a degree that will show you the latest developments in robotics, 3D, virtual reality or the internet of things"



Specific Objectives

Module 1. Blockchain and Quantum Computing

- Acquire in-depth knowledge of the fundamentals of Blockchain technology and its value propositions
- Lead the creation of Blockchain-based projects and apply this technology to different business models and the use of tools such as Smart Contracts
- Acquire important knowledge about one of the technologies that will revolutionize our future, such as quantum computing

Module 2. Big Data and Artificial Intelligence

- Deepen the knowledge of the fundamental principles of artificial intelligence
- Master the techniques and tools of this technology (machine learning/deep learning)
- Obtain a practical knowledge of one of the most widespread applications such as Chatbots and virtual assistants
- Acquire knowledge of the different transversal applications that this technology has in all fields

Module 3. Virtual Reality Augmented and Mixed

- Acquire expert knowledge on the characteristics and fundamentals of virtual reality, augmented reality and mixed reality, as well as their differences
- Use applications of each of these technologies and develop solutions with each of them individually and in an integrated manner, combining them to define immersive experiences

Module 4. 4.0 Industry

- Analyze the origins of the so-called Fourth Industrial Revolution and the Industry 4.0 concept
- In-depth study of the key principles of Industry 4.0, the technologies on which they are based and the potential of all of them in their application to the different productive sectors
- Convert any manufacturing facility into a Smart Factory and be prepared for the challenges that come with it

Module 5. Leading Industry 4.0

- Understand the current virtual era we live in and its leadership capacity, on which will depend the success and survival of the digital transformation processes in which any type of industry is involved
- Develop, from all available data, the (Digital Twin) of the facilities/systems/assets integrated in an IoT network

Module 6. Robotics, Drones and Augmented Workers

- Better understanding of the main automation and control systems, their connectivity, the types of industrial communications and the type of data they exchange
- Convert the production process facilities into a true Smart Factory
- Be able to deal with large amounts of data, define their analysis and derive value from them
- Define continuous monitoring, predictive and prescriptive maintenance models

Module 7. Industry 4.0 Automation Systems

- Conduct an exhaustive analysis of the practical application that emerging technologies are having in the different economic sectors and in the value chain of their main industries
- In-depth knowledge of the primary and secondary economic sectors, as well as the technological impact they are experiencing
- Find out how technologies are revolutionizing the agricultural, livestock, industrial, energy and construction sectors

Module 8. Industry 4.0 Services and Sectorial Solutions I

- Entering the world of robotics and automation
- Choose a robotic platform, prototype and know in detail simulators and robot operating system (ROS)
- Deepen in the applications of artificial intelligence to robotics oriented to predict behaviors and optimize processes
- Study robotics concepts and tools, as well as use cases, real examples and integration with other systems and demonstration
- Analyze the most intelligent robots that will accompany us in the coming years and how humanoid machines will be trained to perform in complex and challenging environments

Module 9. Industry 4.0 Industry Services and Solutions II

- Possess a thorough understanding of the technological impact and how technologies are revolutionizing the tertiary economic sector in the fields of transportation and logistics, health and healthcare (*eHealth* and *smart hospitals*), smart cities, the financial sector (*Fintech*) and mobility solutions.
- Knowing the technological trends of the future

Module 10. The Internet of Things

- Have detailed knowledge of the functioning of IoT and Industry 4.0 and its combinations with other technologies, its current situation, its main devices and uses and how hyperconnectivity gives rise to new business models where all products and systems are connected and in permanent communication
- Deepen the knowledge of an IoT platform and the elements that compose it, the challenges and opportunities to implement IoT platforms in factories and companies, the main business areas related to IoT platforms and the relationship between IoT platforms, robotics and other emerging technologies
- Know the main existing wearable devices, their usefulness, the security systems to be applied in any IoT model and its variant in the industrial world, called IoT

Take the opportunity to learn about the latest advances in this area in order to apply it to your daily practice”

03

Skills

This Professional Master's Degree seeks to provide students with the tools, skills and competencies necessary to successfully develop in Industry 4.0. A process that will be carried out throughout the 1,500 teaching hours of this degree and where students will be able to acquire a deep knowledge about the Blockchainoperation, the great challenges of artificial intelligence or Robotic Process Automatization. All this will allow students to progress with solid and efficient steps in this sector.

Lead any technological project thanks to the tools and techniques shown in this Professional Master's Degree"

General Skills

- Develop an Industry 4.0 oriented strategy
- Have a thorough knowledge of the fundamental elements to successfully carry out a digital transformation process adapted to the new market rules
- Develop an advanced knowledge of the new emerging and exponential technologies that are affecting the vast majority of industrial and business processes in the market
- Adapt to the current market situation governed by automation, robotization and IoT platforms
- Apply the necessary tools to lead technological innovation and digital transformation processes

Improving your skills in the field of digital transformation will allow you to be more competitive. Continue your education and give your career a boost"

Specific Skills

- Securing an existing IoT ecosystem or creating a secure one by deploying intelligent security systems
- Automate production systems with the integration of robots and industrial robotics systems
- Maximize value creation for the customer by applying Lean Manufacturing to the digitalization of our production process
- Know how the Blockchain works and the characteristics of the so-called networks
- Use the main techniques of artificial intelligence such as Machine Learning and deep learning, Neural Networks, and the applicability and use of Natural Language Recognition
- Facing the great challenges related to artificial intelligence, such as providing it with emotions, creativity and personality, even considering how ethical and moral connotations may be affected in its use
- Create useful Chatbots and virtual assistants
- Create virtual worlds and elevate User Experience (UX) enhancement
- Integrating the benefits and main advantages of Industry 4.0
- Learn more about the key factors of the digital transformation of industry and the industrial internet
- Leading the new business models derived from Industry 4.0
- Develop future production models
- Facing the challenges of Industry 4.0 and understanding its effects
- Mastering the essential technologies of Industry 4.0
- Lead manufacturing digitization processes and identify and define digital capabilities in an organization
- Define the architecture behind a Smart Factory
- Reflecting on technological markers in the post-covid era and in the era of absolute virtualization
- Learn more about the current situation in the digital transformation
- Use RPA (Robotic Process Automation) to automate processes in companies, gain efficiency and reduce costs
- Addressing the major challenges facing robotics and automation, such as transparency and ethics
- Know the business strategies derived from Industry 4.0, its value chain and the factors of digitalization of its processes

04

Course Management

Having specialists with extraordinary professional backgrounds in the field of Software Engineering, Development, Robotics or Drones gives graduates of this degree the opportunity to acquire the necessary knowledge to progress in their professional career in Industry 4.0. In addition, the human quality and proximity of the teaching staff will allow students to resolve any doubts that may arise regarding the syllabus throughout the 12-month duration of this program. All this, with the main objective of offering the engineer an education that places them at the forefront of academic teaching.

TECH has selected an outstanding teaching team for you to obtain the most up-to-date knowledge and advance in your professional career alongside them"

Management

D. Segovia Escobar, Pablo

- Commercial manager of the Aftermarket and Industry 4.0 area applied to system support at Indra
- Industrial Engineer, Project Management Professional (PMP) por el Program Management Institute
- Master in Business Administration and Management
- Postgraduate in Strategic Management Function
- Sales Manager and Program Manager

Mr. Diezma López, Pedro

- Founder of the technology companies Acuilae (Artificial Intelligence), Ethyka and Zerintia Technologies
- Wearable "Best Initiative" Award in eHealth 2017 and "Best Technological "Solution" 2018 for occupational safety

Professors

Mr. Asenjo Sanz, Álvaro
- Technical Engineer in Computer Systems from the UCM
- Software developer, consulting and IT project management
- Engineer at Kolokium
- Lecturer of the Degree in Computer Science at the Universidad Europea de Madrid
- Trainer in Blockchain

Mr. Castellano Nieto, Francisco
- Responsible for the maintenance of defence equipment in the aeronautical, naval and terrestrial sectors at Indra
- Development engineer in R&D department in the sector of automatic packaging machines for solids, granulates and liquids, packaging machines, palletizers and distribution chains; solutions with technologies from Siemens, Allen-Bradley (Rockwell Automation), Schneider, Omron and Beckhoff
- Industrial Electronic Technical Engineer by the Universidad Pontificia de Comillas I.C.A.I.

Mr. Montes, Armando
- Expert in drones, robots and electronics, and 3D printers
- Creator of several state-of-the-art technological solutions and projects such as Emertech or Smart Vest

Ms. Sánchez López, Cristina
- IT (Software Engineer) for the Accenture Group in large clients such as Banco de Santander, BBVA, Endesa or Barclays Bank
- CEO and founder of Acuilae and ETHYKA
- Master's Degree in Data Science
- Degree in Statistics from the Complutense University Madrid

Mr. González Cano, José Luis
- Industrial Electronics Technician
- Degree in Optics from the Complutense University of Madrid
- He collaborates with companies in the lighting sector in consulting, training, lighting technology projects and implementation of ISO 9001:2015 quality systems (internal auditor)
- Vocational teacher in electronics and automation
- He has directed and taught as a teacher of Vocational Training in electronic systems, telematics (CISCO certified instructor), radio communications, IoT
- Member of the Professional Association of Lighting Designers (Technical Consultant)
- Member of the Spanish Lighting Committee, participating in working groups on LED technology

05

Structure and Content

The syllabus of this Professional Master's Degree has been designed with the objective of offering the most recent information and close to the reality of the market and the new needs in terms of digitalization and automation, crisis management and incorporation of new exponential and emerging technologies. To this end, the students have 10 modules with advanced and dynamic content, based on video summaries, videos in detail or interactive diagrams, which will lead them into the Digital Transformation and Industry 4.0. In addition, the Relearning system will help you progress naturally through the course, reducing even the long hours of study that are so frequent in other teaching methods.

Are you thinking of launching your own Industry 4.0 Startup? This syllabus will show you the most comprehensive and essential content in this field. Enroll now"

Module 1. Blockchain and Quantum Computing

1.1. Aspects of Decentralization
- 1.1.1. Market Size, Growth, Companies and Ecosystem
- 1.1.2. Fundamentals of Blockchain

1.2. Background: Bitcoin, Ethereum, etc.
- 1.2.1. Popularity of Decentralized Systems
- 1.2.2. Evolution of Decentralized Systems

1.3. Blockchain Operation and Examples
- 1.3.1. Types of Blockchain and Protocols
- 1.3.2. Wallets, Mining and More

1.4. Characteristics of Blockchain Networks
- 1.4.1. Functions and Properties of Blockchain Networks
- 1.4.2. Applications: Cryptocurrencies, Reliability, Chain of Custody, etc

1.5. Types of Blockchain
- 1.5.1. Public and Private Blockchains
- 1.5.2. Hard and Soft Forks

1.6. Smart Contracts
- 1.6.1. Intelligent Contracts and Their Potential
- 1.6.2. Smart Contract Applications

1.7. Industry Use Models
- 1.7.1. Blockchain Applications by Industry
- 1.7.2. Blockchain Success Stories by Industry

1.8. Security and Cryptography
- 1.8.1. Objectives of Cryptography
- 1.8.2. Digital Signatures and Hash Functions

1.9. Cryptocurrencies and Uses
- 1.9.1. Types of Cryptocurrencies Bitcoin, HyperLedger, Ethereum, Litecoin, etc.
- 1.9.2. Current and Future Impact of Cryptocurrencies
- 1.9.3. Risks and Regulations

1.10. Quantum Computing
- 1.10.1. Definition and Keys
- 1.10.2. Uses of Quantum Computing

Module 2. Big Data and Artificial Intelligence

2.1. Fundamental Principles of Big Data
- 2.1.1. Big Data
- 2.1.2. Tools to Work With Big Data

2.2. Data Mining and Warehousing
- 2.2.1. Data Mining Cleaning and Standardization
- 2.2.2. Information Extraction, Machine Translation, Sentiment Analysis, etc
- 2.2.3. Types of Data Storage

2.3. Data Intake Applications
- 2.3.1. Principles of Data intake
- 2.3.2. Data Ingestion Technologies to Serve Business Needs

2.4. Viewing Data
- 2.4.1. The Importance of Data Visualization
- 2.4.2. Tools to Carry It Out Tableau, D3, matplotlib (Python), Shiny®

2.5. Machine Learning
- 2.5.1. Understanding Machine Learning
- 2.5.2. Supervised and Unsupervised Learning
- 2.5.3. Types of Algorithms

2.6. Neural Networks (Deep Learning)
- 2.6.1. Neural Network: Parts and Operation
- 2.6.2. Types of Networks CNN, RNN
- 2.6.3. Applications of Neural Networks; Image Recognition and Natural Language Interpretation
- 2.6.4. Generative Text Networks: LSTM

2.7. Natural Language Recognition
- 2.7.1. PLN (Processing Natural Language)
- 2.7.2. Advanced PLN Techniques: Word2vec, Doc2vec

2.8. Chatbots and Virtual Assistants
- 2.8.1. Types of Assistants: Voice and Text Assistants
- 2.8.2. Fundamental Parts of the Development Assistant: Intents, Entities and Dialog flow
- 2.8.3. Integrations: Web, Slack, WhatsApp, Facebook
- 2.8.4. Assistant Development Tools: Dialog Flow, Watson Assistant

2.9. Emotions, Creativity and Personality in IA
- 2.9.1. Understand How to Detect Emotions Using Algorithms
- 2.9.2. Creating a Personality: Language, Expressions and Content

2.10. Future of Artificial Intelligence

2.11. Reflections

Module 3. Virtual, Augmented and Mixed Reality

3.1. Market and Tendencies
- 3.1.1. Current Market Situation
- 3.1.2. Reports and Growth by Different Industries

3.2. Differences Between Virtual, Augmented and Mixed Reality
- 3.2.1. Differences Between Immersive Realities
- 3.2.2. Immersive Reality Typology

3.3. Virtual Reality Cases and Uses
- 3.3.1. Origin and Fundamentals of Virtual Reality
- 3.3.2. Cases Applied to Different Sectors and Industries

3.4. Augmented Reality. Cases and Uses
- 3.4.1. Origin and Fundamentals of Augmented Reality
- 3.4.2. Cases Applied to Different Sectors and Industries

3.5. Mixed and Holographic Reality
- 3.5.1. Origin, History and Fundamentals of Mixed and Holographic Reality
- 3.5.2. Cases Applied to Different Sectors and Industries

3.6. 360º Photography and Video
- 3.6.1. Camera Typology
- 3.6.2. Uses of 360 Images
- 3.6.3. Creating a Virtual Space in 360 Degrees

3.7. Virtual World Creation
- 3.7.1. Platforms for the Creation of Virtual Environments
- 3.7.2. Strategies for the Creation of Virtual Environments

3.8. User Experience (UX)
- 3.8.1. Components in the User Experience
- 3.8.2. Tools for the Creation of User Experiences

3.9. Devices and Glasses for Immersive Technologies
- 3.9.1. Device Typology on the Market
- 3.9.2. Glasses and Wearables: Operation, Models and Uses
- 3.9.3. Smart Glasses Applications and Evolution

3.10. Future Immersive Technologies
- 3.10.1. Tendencies and Evolution
- 3.10.2. Challenges and Opportunities

Module 4. 4.0 Industry

4.1. Definition of 4.0 Industry
- 4.1.1. Features

4.2. Benefits of the 4.0 Industry
- 4.2.1. Key Factors
- 4.2.2. Main Advantages

4.3. Industrial Revolutions and Vision of the Future
- 4.3.1. Industrial Revolutions
- 4.3.2. Keys Factors in Each Revolution
- 4.3.3. Technological Principles as a Basis for Possible New Revolutions

4.4. The Digital Transformation of the Industry
- 4.4.1. Characteristics of the Digitization of the Industry
- 4.4.2. Disruptive Technologies
- 4.4.3. Applications in the Industry

4.5. Forth Industrial Revolution Key Principles of Industry 4.0
- 4.5.1. Definitions
- 4.5.2. Key Principles and Applications

4.6. 4.0 Industry and Industrial Internet
- 4.6.1. Origin of IIoT
- 4.6.2. Operation
- 4.6.3. Steps to Follow for its Implementation
- 4.6.4. Benefits

4.7. Smart Factory Principles
- 4.7.1. Smart Factory
- 4.7.2. Elements That Define a Smart Factory
- 4.7.3. Steps to Deploy a Smart Factory

4.8. Status of the 4.0 Industry
- 4.8.1. Status of the 4.0 Industry in Different Sectors
- 4.8.2. Barriers to the Implementation of 4.0 Industry

4.9. Challenges and Risks
- 4.9.1. DAFO Analysis
- 4.9.2. Challenges

4.10. Role of Technological Capabilities and the Human Factor
- 4.10.1. Disruptive Technologies in Industry 4.0
- 4.10.2. The Importance of the Human Factor Key Factor

Module 5. Leading Industry 4.0

5.1. Leadership Abilities
- 5.1.1. Leadership Factors in the Human Factor
- 5.2.2. Leadership and Technology

5.2. Industry 4.0 and the Future of Production
- 5.2.1. Definitions
- 5.2.2. Production Systems
- 5.2.3. Future of Digital Production Systems

5.3. Effects of Industry 4.0
- 5.3.1. Effects and Challenges

5.4. Essential Technologies in Industry 4.0
- 5.4.1. Definition of Technologies
- 5.4.2. Characteristics of Technologies
- 5.4.3. Applications and Impacts

5.5. Digitization of Manufacturing
- 5.2.1. Definitions
- 5.5.2. Benefits of the Digitization of Manufacturing
- 5.5.3. Digital Twins

5.6. Digital Capabilities in an Organization
- 5.6.1. Development Digital Capabilities
- 5.6.2. Understanding the Digital Ecosystem
- 5.6.3. Digital Vision of the Business

5.7. Architecture Behind a Smart Factory
- 5.7.1. Areas and Operations
- 5.7.2. Connectivity and Security
- 5.7.3. Case Uses

5.8. Technology Markers in the Post Covid Era
- 5.8.1. Technological Challenges in the Post Covid Era
- 5.8.2. New Case Uses

5.9. The Era of Absolute Virtualization
- 5.9.1. Virtualisation
- 5.9.2. The New Era of Virtualization
- 5.9.3. Advantages

5.10. Current Situation in Digital Transformation Gartner Hype
- 5.10.1. Gartner Hype
- 5.10.2. Analysis of Technologies and Their Status
- 5.10.3. Data Exploitation

Module 6. Robotics, Drones and Augmented Workers

6.1. Robotics
- 6.1.1. Robotics, Societies and Cinema
- 6.1.2. Components and Parts of Robot

6.2. Robotics and Advanced Automation: Simulators, Cobots
- 6.2.1. Transfer of Learning
- 6.2.2. Cobots and Case Uses

6.3. RPA (Robotic Process Automatization)
- 6.3.1. Understanding RPA and its Functioning
- 6.3.2. RPA Platforms, Projects and Roles

6.4. Robot as a Service (RaaS)
- 6.4.1. Challenges and Opportunities for Implementing Raas Services and Robotics in Enterprises
- 6.4.2. Operation of a Raas system

6.5. Drones and Automated Vehicles
- 6.5.1. Components and Drones Operation
- 6.5.2. Uses, Types and Applications of Drones
- 6.5.3. Evolution of Drones and Autonomous Vehicles

6.6. The Impact of 5G
- 6.6.1. Evolution of Communications and Implications
- 6.6.2. Uses of 5G Technology

6.7. Augmented Workers
- 6.7.1. Human Machine Integration in Industrial Environments
- 6.7.2. Challenges in Worker-Robot Collaboration

6.8. Transparency, Ethics and Traceability
- 6.8.1. Ethical Challenges in Robotics and Artificial Intelligence
- 6.8.2. Monitoring, Transparency and Traceability Methods

6.9. Prototyping, Components and Evolution
- 6.9.1. Prototyping Platforms
- 6.9.2. Phases to Make a Prototype

6.10. Future of Robotics
- 6.10.1. Trends in Robotization
- 6.10.2. New Types of Robots

Module 7. Industry 4.0 Automation Systems

71. Industrial Automation
- 7.1.1. Automization
- 7.1.2. Architecture and Components
- 7.1.3. Safety

7.2. Industrial Robotics
- 7.2.1. Fundamentals of Industrial Robotics
- 7.2.2. Models and Impact on Industrial Processes

7.3. PLC Systems and Industrial Control
- 7.3.1. PLC Evolution and Status
- 7.3.2. Evolution of Programming Languages
- 7.3.3. Computer Integrated Automation CIM

7.4. Sensors and Actuators
- 7.4.1. Classification of Transducers
- 7.4.2. Types of Sensors
- 7.4.3. Standardization of Signals

7.5. Monitor and Manage
- 7.5.1. Types of Actuators
- 7.5.2. Feedback Control Systems

7.6. Industrial Connectivity
- 7.6.1. Standardized Fieldbuses
- 7.6.2. Connectivity

7.7. Proactive / Predictive Maintenance
- 7.7.1. Predictive Maintenance
- 7.7.2. Fault Identification and Analysis
- 7.7.3. Proactive Actions Based on Predictive Maintenance

7.8. Continuous Monitoring and Prescriptive Maintenance
- 7.8.1. Prescriptive Maintenance Concept in Industrial Environments
- 7.8.2. Selection and Exploitation of Data for Self-Diagnostics

7.9. Lean Manufacturing
  7.9.1. Lean Manufacturing
  7.9.2. Benefits Lean Implementation in Industrial Processes
7.10. Industrialized Processes in Industry 4.0. Use Case
  7.10.1. Project Definition
  7.10.2. Technological Selection
  7.10.3. Connectivity
  7.10.4. Data Exploitation

Module 8. Industry 4.0 Services and Sectorial Solutions (I)

8.1. Industry 4.0 and Business Strategies
  8.1.1. Factors of Business Digitalization
  8.1.2. Roadmap for Business Digitalization
8.2. Digitalization of Processes and the Value Chain
  8.2.1. Value Chain
  8.2.2. Key Steps in the Digitization of Processes
8.3. Sector Solutions for the Primary Sector
  8.3.1. The Primary Economic Sector
  8.3.2. Characteristics of Each Subsector
8.4. Digitization of the Primary Sector: Smart Farms
  8.4.1. Main Characteristics
  8.4.2. Keys Factors of Digitization
8.5. Digitization of the Primary Sector: Digital and Intelligent Agriculture
  8.5.1. Main Characteristics
  8.5.2. Keys Factors of Digitization
8.6. Sector Solutions in the Secondary Sector
  8.6.1. The Secondary Economic Sector
  8.6.2. Characteristics of Each Subsector
8.7. Digitization of the Secondary Sector: Smart Factory
  8.7.1. Main Characteristics
  8.7.2. Keys Factors of Digitization
8.8. Digitization of the Secondary Sector: Energy
  8.8.1. Main Characteristics
  8.8.2. Keys Factors of Digitization
8.9. Digitization of the Secondary Sector: Construction
  8.9.1. Main Characteristics
  8.9.2. Keys Factors of Digitization
8.10. Digitization of the Secondary Sector: Mining
  8.10.1. Main Characteristics
  8.10.2. Keys Factors of Digitization

Module 9. Industry 4.0 Industry Services and Solutions (II)

9.1. Tertiary Sector Solutions
  9.1.1. Tertiary Economic Sector
  9.1.2. Characteristics of Each Subsector
9.2. Digitalization of the Tertiary Sector: Transportation
  9.2.1. Main Characteristics
  9.2.2. Keys Factors of Digitization
9.3. Digitization of the Tertiary Sector: eHealth
  9.3.1. Main Characteristics
  9.3.2. Keys Factors of Digitization
9.4. Digitization of the Tertiary Sector: Smart Hospitals
  9.4.1. Main Characteristics
  9.4.2. Keys Factors of Digitization
9.5. Digitization of the Tertiary Sector: Smart Cities
  9.5.1. Main Characteristics
  9.5.2. Keys Factors of Digitization
9.6. Digitalization of the Tertiary Sector: Logistics
  9.6.1. Main Characteristics
  9.6.2. Keys Factors of Digitization

9.7. Digitalization of the Tertiary Sector: Tourism
- 9.7.1. Main Characteristics
- 9.7.2. Keys Factors of Digitization

9.8. Digitization of the Tertiary Sector: Fintech
- 9.8.1. Main Characteristics
- 9.8.2. Keys Factors of Digitization

9.9. Digitalization of the Tertiary Sector: Mobility
- 9.9.1. Main Characteristics
- 9.9.2. Keys Factors of Digitization

9.10. Future Technological Tendencies
- 9.10.1. New Technological Innovations
- 9.10.2. Application Trends

Module 10. Internet of Things (IoT)

10.1. Cyber-Physical Systems (CPS) in the Industry 4.0 Vision
- 10.1.1. Internet of Things (IoT)
- 10.1.2. Components Involved in IoT
- 10.1.3. Cases and Applications of IoT

10.2. Internet of Things and CyberPhysical Systems
- 10.2.1. Computing and Communication Capabilities to Physical Objects
- 10.2.2. Sensors, Data and Elements in Cyber-Physical Systems

10.3. Device Ecosystem
- 10.3.1. Typologies, Examples and Uses
- 10.3.2. Applications of the Different Devices

10.4. IoT Platforms and their Architecture
- 10.4.1. IoT Market Typologies and Platforms
- 10.4.2. Operation of an IoT Platform

10.5. Digital Twins
- 10.5.1. Digital Twin
- 10.5.2. Uses and Applications of the Digital Twin

10.6. Indoor & outdoor Geolocation (Real Time Geospatial)
- 10.6.1. Indoor and Outdoor Geolocation Platforms
- 10.6.2. Implications and Challenges of Geolocation in an IoT Project

10.7. Security Intelligence Systems
- 10.7.1. Typologies and Platforms for Security Systems Implementation
- 10.7.2. Components and Architectures in Intelligent Safety Systems

10.8. IoT and IIoT Platform Security
- 10.8.1. Security Components in an IoT System
- 10.8.2. IoT Security Implementation Strategies

10.9. Wearables at work
- 10.9.1. Types of Wearables in Industrial Environments
- 10.9.2. Lessons Learned and Challenges in Implementing Wearables in the Workplace

10.10. Implementing an API to Interact with a Platform
- 10.10.1. Types of APIs Involved in an IoT Platform
- 10.10.2. API Market
- 10.10.3. Strategies and Systems to Implement API Integrations

You are looking at an online program that will allow you to get into the ecosystem of IoT devices and platforms"

06

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 is the most widely used learning system in the best faculties in the world. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

Relearning Methodology

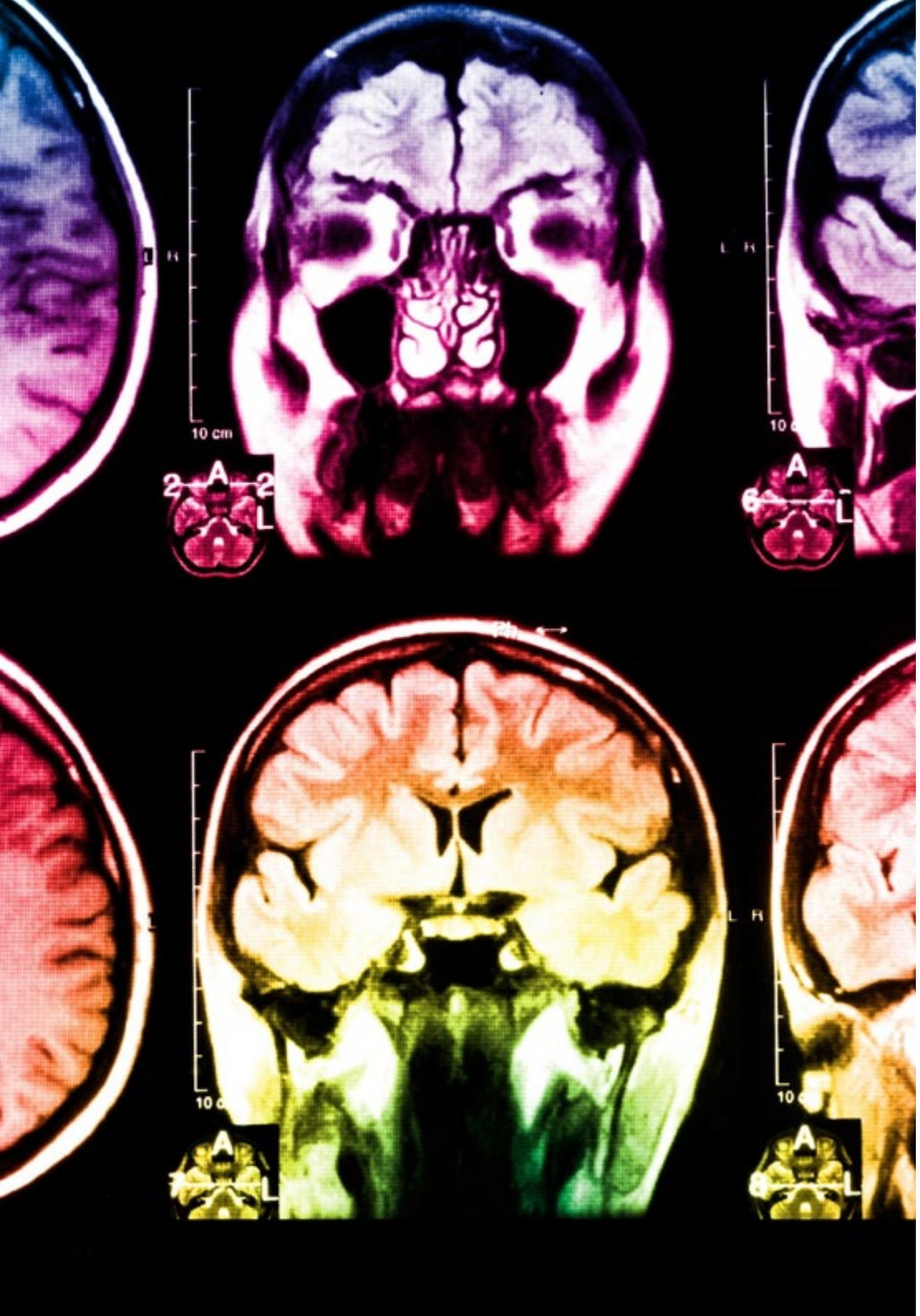
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

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

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

At TECH, you will learn using a cutting-edge methodology designed to 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 relearn). 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 elearning, 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.

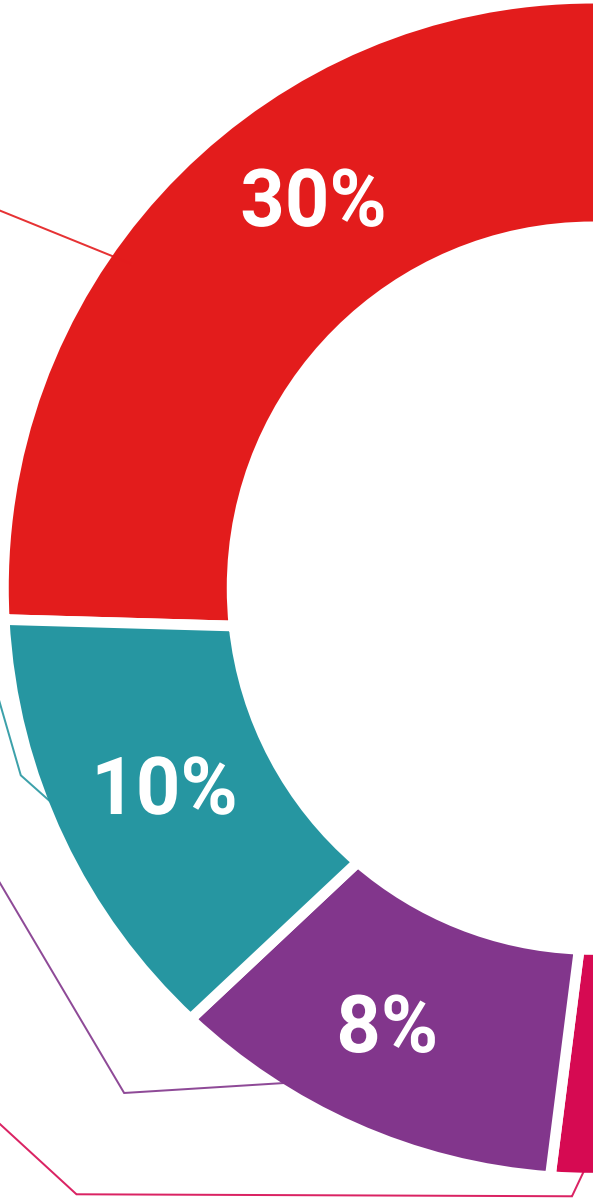
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

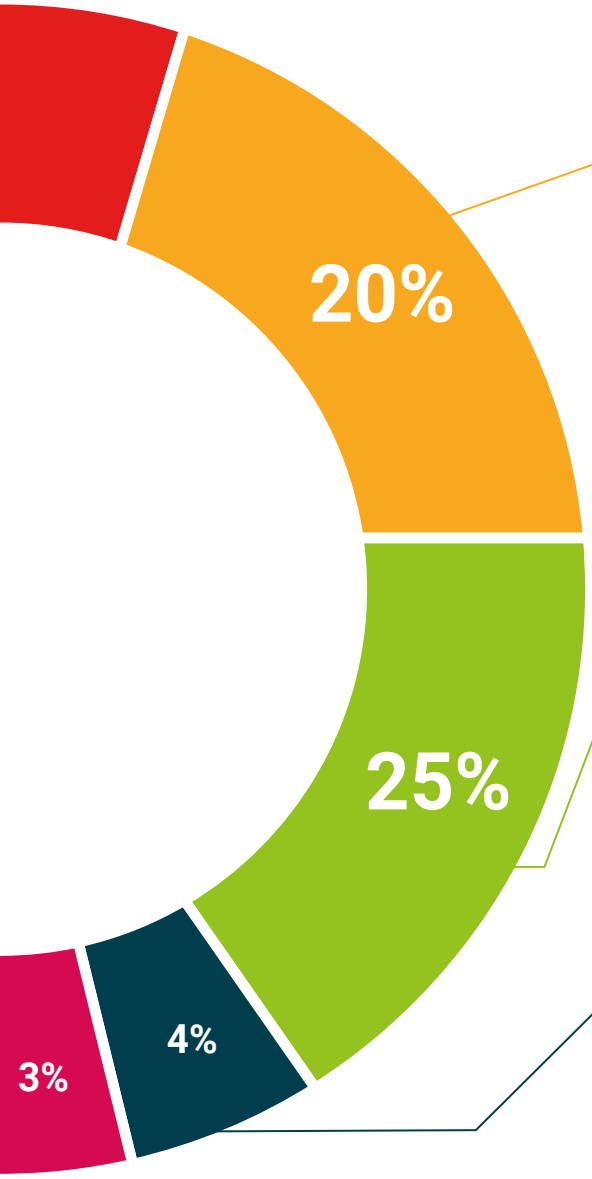
Practising Skills and Abilities

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.

07

Certificate

The Professional Master's Degree in Digital Transformation and Industry 4.0 guarantees you, in addition to the most rigorous and updated training, access to a Professional Master's Degree issued by TECH Technological University.

Successfully complete this program and receive your university degree without travel or laborious paperwork”

This **Professional Master's Degree in Digital Transformation and Industry 4.0** ccontains the most complete and updated program on the market.

After the student has passed the evaluations, they will receive their corresponding **Professional Master's Degree** issued by **TECH Technological University** via tracked delivery*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Professional Master's Degree, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Master's Degree in Digital Transformation and Industry 4.0**

Official Nº of hours: **1,500 h.**


tech technological university

Awards the following

CERTIFICATE

to

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

For having successfully passed and accredited the following program

PROFESSIONAL MASTER'S DEGREE

in

Digital Transformation and Industry 4.0

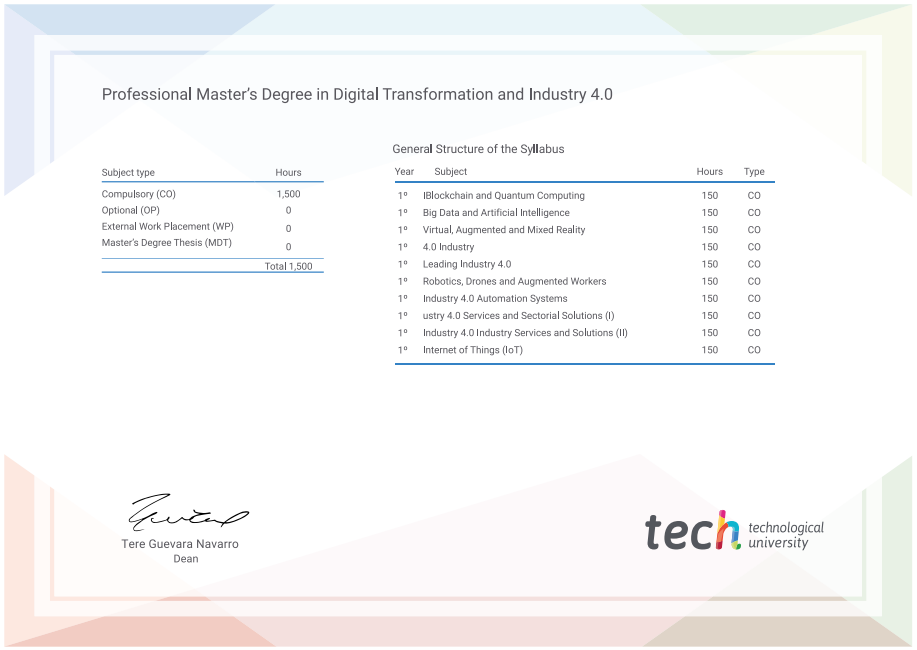
This is a qualification awarded by this University, equivalent to 1,500 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

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


Professional Master's Degree in Digital Transformation and Industry 4.0

Subject type	Hours
Compulsory (CO)	1,500
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
	Total 1,500

General Structure of the Syllabus

Year	Subject	Hours	Type
1º	IBlockchain and Quantum Computing	150	CO
1º	Big Data and Artificial Intelligence	150	CO
1º	Virtual, Augmented and Mixed Reality	150	CO
1º	4.0 Industry	150	CO
1º	Leading Industry 4.0	150	CO
1º	Robotics, Drones and Augmented Workers	150	CO
1º	Industry 4.0 Automation Systems	150	CO
1º	ustry 4.0 Services and Sectorial Solutions (I)	150	CO
1º	Industry 4.0 Industry Services and Solutions (II)	150	CO
1º	Internet of Things (IoT)	150	CO

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Dean

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*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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Professional Master's Degree

Digital Transformation and Industry 4.0

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Professional Master's Degree

Digital Transformation and Industry 4.0

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