

# Postgraduate Diploma New Technologies



## Postgraduate Diploma New Technologies

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Global University
- » Credits: 18 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/information-technology/postgraduate-diploma/postgraduate-diploma-new-technologies](http://www.techtute.com/us/information-technology/postgraduate-diploma/postgraduate-diploma-new-technologies)

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# 01

# Introduction

Technology, thanks to the advances of recent decades, is managing to emulate and in some cases surpass-human capabilities. Smart cars, smartwatches or voice recognizers would be unimaginable for other generations. Today, however, they are just another element of everyday life. Learning how these technologies are developed, what their basic characteristics are, and above all, what future possibilities they offer, is essential to be part of the next advances.





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*To understand concepts such as Internet of Things, Artificial Intelligence or Big Data it is necessary to put them into practice. At TECH we are committed to accompany you in the development of real use cases"*

The Internet of Things is one of the major technology trends of our century. Multinationals from all sectors are investing heavily in this field. This only highlights the need for qualified profiles, which are currently in short supply. Therefore, in Postgraduate Diploma in New Technologies degree you will learn the characteristics, advantages, challenges and solutions presented by the current IoT paradigm.

In the field of Artificial Intelligence, the most advanced AI systems currently in existence will be presented. The student will also acquire a broad and complex set of skills required in this field. But above all, you will be instructed in the latest AI development techniques to stay ahead of industry developments.

The third axis around which the agenda will revolve is *Big Data*. Graduates will take an in-depth look at the opportunities it offers, the needs it meets, the practical applications it has in the real world and how to maintain data integrity. A section has also been reserved for visualization and analytics, two elements closely related to decision making in a business.

The degree will be taught 100% online and without timetables. It can be accessed from any device with an internet connection. In addition, the entire syllabus will be available from day one. The intention behind this methodology is that the student is the one who establishes his or her own schedule, thus facilitating personal and work conciliation.

This **Postgraduate Diploma in New Technologies** contains the most complete and up to date educational program on the market. The most important features include:

- ◆ The development of case studies presented by experts in new technologies
- ◆ The graphic, schematic, and eminently practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- ◆ Practical exercises where the self-assessment process can be carried out to improve learning
- ◆ Its special emphasis on innovative methodologies
- ◆ 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



*How does Siri work? Is it possible to develop a smart car? These and many other questions are answered by the degree of Postgraduate Diploma in New Technologies"*

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*Working with large databases can be tedious. At TECH, we offer you the right tools to perform data analysis in a comfortable and efficient way”*

*Companies are increasingly demanding profiles capable of working with and interpreting large data banks. At TECH, we show you how.*

*Learn all the keys to the world of robotics thanks to our expert teachers in Artificial Intelligence.*

The program's teaching staff includes professionals from sector who contribute their work 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 immersive training programmed to train 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. This will be done with the help of an innovative system of interactive videos made by renowned experts.



# 02 Objectives

The main objective of the Postgraduate Diploma in New Technologies degree is to define the concepts around which the current technological ecosystem is being built. The graduate student will have worked on real use cases associated with the Internet of Things Defining an architecture and evaluating its suitability based on the IoT solutions offered by the market. In the field of Artificial Intelligence, they will be able to formalize and design automatic reasoning systems, as well as implement machine learning techniques in prediction problems. Finally, in terms of Big Data you will learn to define the different forms of existing storage or to establish the minimum privacy requirements necessary in the access and use of information, among others.







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*TECH will accompany you in the process of developing a real use case in the field of the Internet of Things”*



## General Objectives

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- ◆ Developing a use case associated with IoT
- ◆ Define a high-level architecture of an IoT use case
- ◆ Evaluate the suitability of the use of IoT solutions
- ◆ Demonstrate knowledge of IoT solutions on the market and how they are built
- ◆ Generate specialized knowledge on the application and advanced techniques of intelligent systems and their practical application
- ◆ Formalize and design automatic reasoning systems
- ◆ Implement and apply machine learning techniques in prediction problems
- ◆ Identify the benefits of analyzing and exploiting data for decision-making
- ◆ Analyze the course of the data from its origin to its exploitation
- ◆ Define the different forms of storage in which the information can be stored, taking into account the way in which it will be subsequently exploited
- ◆ Assess the importance of data analytics, as well as the generation of predictive models that provide efficient results
- ◆ Establish the minimum requirements in terms of privacy that are necessary in the area of access to and use of information
- ◆ Identify the different elements that make up the platform architecture and the necessary interaction between them





## Specific Objectives

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### Module 1. IoT Technologies Architecture

- ◆ Generate specialized knowledge on IoT
- ◆ Defining the criteria for building an IoT solution
- ◆ Develop consultative capabilities in the application of IoT use cases
- ◆ Analyze a basic IoT architecture
- ◆ Determining the operating model of an IoT solution
- ◆ Justify the importance of IoT technology in society and in the coming years
- ◆ Evaluating market solutions and their appropriate for each use case

### Module 2. Artificial Intelligence in Computer and Systems Engineering

- ◆ Generate specialized knowledge on artificial intelligence
- ◆ Identify which type of learning (supervised or unsupervised) is most appropriate for a given problem
- ◆ Identify the characteristics of an intelligent system or agent

### Module 3. *Big Data* in systems engineering and computer science

- ◆ Analyze the different sources of data that can be the sources of information for the process
- ◆ Define the different forms of storage in which the information can be stored, taking into account the way in which it will be subsequently exploited
- ◆ Assess the importance of data analytics, as well as the generation of predictive models that provide efficient results
- ◆ Establish the minimum requirements in terms of privacy that are necessary in the area of access to and use of information
- ◆ Identify the different elements that make up the platform architecture and the necessary interaction between them
- ◆ Develop the differences between the different possibilities of analyzing the information according to the result to be obtained
- ◆ Identify the traceability of the data to analyze its usability in those areas where it is present

03

# Course Management

The teachers of this degree are active professionals in their respective technological fields. Experts on top of new trends so that student learning is maintained at high quality standards. How a house is domotized, what sustainability solutions are offered by the IoT, what is the future of AI or how Big Data is applied to information technologies are some of the questions that will be answered by the faculty of this course.



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*At TECH we have selected teachers who are active in their respective fields so that learning is based on the latest technological trends"*

## Management



### D. Olalla Bonal, Martín

- ♦ Technical sales blockchain specialist en IBM
- ♦ Blockchain Hyperledger and Ethereum Architecture Manager at Blocknitive
- ♦ Director of the Blockchain area at PSS Information Technologies.
- ♦ Director de Información en ePETID - Global Animal Health
- ♦ IT Infrastructure Architect at Bankia - wdoIT (IBM - Bankia Join Venture)
- ♦ Project director and manager at Daynet integral services
- ♦ Director of Technology at Wiron Construcciones Modulares
- ♦ Head of IT Department at Dayfisa
- ♦ Head of IT department at Dell Computer, Majsa and Hippo Viajes
- ♦ Electronics Technician in IPFP Juan de la Cierva



## Professors

### D. Nogales Ávila, Javier

- ◆ Enterprise Cloud and sourcing senior consultant. Quint
- ◆ Cloud and Technology Consultant. Indra
- ◆ Associate Technology Consultant. Accenture
- ◆ Graduate by Jaen University y University of Technology and Economics of Budapest (BME)
- ◆ Degree in Industrial Organization Engineering

### D. Bernal de la Varga, Yeray

- ◆ Big Data Solutions Architect at Orange Bank
- ◆ Big Data Architect at Bankia
- ◆ Big Data Engineer at Hewlett-Packard
- ◆ Adjunct Professor in the Master of Big Data at the University of Deusto
- ◆ Degree in Computer Science from the Polytechnic University of Madrid.
- ◆ Expert in Big Data by U-TAD

### Ms. Gómez-Choco González, Rocío

- ◆ Data Engineer in the IT architecture department at Orange Bank
- ◆ Analytical consultant in the analysis and analytics department of Ernest and Young
- ◆ Graduated in Communications Systems Engineering at Carlos III University
- ◆ Postgraduate in Big Data & Analytics at Carlos III University
- ◆ Master's Degree in Big Data Architecture at Datahack School

# 04

# Structure and Content

Each of the modules that make up this degree are, a priori, independent of each other. However, when it comes to putting them into practice, the many synergies that can be generated when learning is combined will become evident. The topic of the Internet of Things encompasses the more everyday side of technology. Applying the advances to different devices that are part of our daily lives. The resources related to Artificial Intelligence appeal to more complex technologies, unraveling concepts such as machine learning, deep learning, Robotic Process Automation or Natural Language Processing. Finally, in the field of *Big Data*, we will discuss data processing, storage, architecture, analysis and visualization, among other aspects.





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*Smartbuilding and smart cities have become a reality. This degree offers you the keys you need to participate in its development"*

## Module 1. IoT Technologies Architecture

- 1.1. The Art of the Internet of Things (IoT)
  - 1.1.1. Internet of Things IoT
  - 1.1.2. IoT Technologies
  - 1.1.3. Internet of Things. Advanced Concepts
- 1.2. IoT Solution Architecture
  - 1.2.1. IoT Solutions Architecture
  - 1.2.2. Design of an IoT Architecture
  - 1.2.3. Operation and Data Management of an IoT Solution
- 1.3. IoT and other Technology Trends
  - 1.3.1. *Cloud Computing*
  - 1.3.2. *Machine/Deep Learning*
  - 1.3.3. Artificial Intelligence
- 1.4. IoT Solution Platforms
  - 1.4.1. Development Platforms
  - 1.4.2. IoT Solutions
  - 1.4.3. IoT Solutions Platforms. Advanced Concepts
- 1.5. *Smart Things*
  - 1.5.1. *Smart Buildings*
  - 1.5.2. *Smart Cities*
  - 1.5.3. Intelligent Networks
- 1.6. Sustainability and IoT
  - 1.6.1. Sustainability and Emerging Technologies
  - 1.6.2. Sustainability in IoT
  - 1.6.3. Sustainable IoT use Cases
- 1.7. IoT. Use Cases
  - 1.7.1. Cases of use in the Healthcare Sector
  - 1.7.2. Use Cases in Industrial Environments
  - 1.7.3. Use Cases in the Logistics Sector
  - 1.7.4. Cases of use in the Agriculture and Livestock Sector
  - 1.7.5. Other use Cases

- 1.8. IoT Business Ecosystem
  - 1.8.1. Solution Providers
  - 1.8.2. IoT Consumers
  - 1.8.3. IoT Ecosystem
- 1.9. The Role of the IoT Engineer
  - 1.9.1. IoT Engineer Role. Skills
  - 1.9.2. The Role of the IoT Specialist in Companies
  - 1.9.3. Recognized Certifications in the Market
- 1.10. IoT Challenges
  - 1.10.1. IoT Adoption Targets
  - 1.10.2. Main Barriers to Adoption
  - 1.10.3. IoT Applications Future of IoT

## Module 2. Artificial Intelligence in Systems Engineering and Computer Science

- 2.1. Artificial Intelligence
  - 2.1.1. Intelligence in Systems Engineering
  - 2.1.2. Artificial Intelligence
  - 2.1.3. Artificial Intelligence Advanced Concepts
- 2.2. Importance of Data
  - 2.2.1. Data Ingestion
  - 2.2.2. Analysis and Profiling
  - 2.2.3. Data Refinement
- 2.3. Machine Learning in Artificial Intelligence
  - 2.3.1. *Machine Learning*
  - 2.3.2. Supervised Learning
  - 2.3.3. Unsupervised Learning
- 2.4. *Machine Learning* in Artificial Intelligence
  - 2.4.1. *Deep Learning vs. Machine Learning*
  - 2.4.2. Neural Networks.
- 2.5. Robotic Process Automation (RPA) in Artificial Intelligence
  - 2.5.1. RPA in Artificial Intelligence
  - 2.5.2. Process Automation. Good Practices

- 2.5.3. Process Automation. Continuing Improvement
- 2.6. *Natural Language Processing (NLP) in Artificial Intelligence*
  - 2.6.1. NLP in Artificial Intelligence
  - 2.6.2. NPL Applied to *Software*
  - 2.6.3. NLP. Application
- 2.7. Image Recognition in Artificial Intelligence
  - 2.7.1. Models
  - 2.7.2. Algorithms
  - 2.7.3. Applications
- 2.8. Neural Networks in Artificial Intelligence
  - 2.8.1. Models
  - 2.8.2. Learning Algorithms
  - 2.8.3. Applications Neural Networks in Artificial Intelligence
- 2.9. Artificial Intelligence (AI) Model Life Cycle
  - 2.9.1. Development of the Artificial Intelligence Model
  - 2.9.2. Training
  - 2.9.3. Putting into Production
- 2.10. New Application of Artificial Intelligence
  - 2.10.1. Ethics in IA systems
  - 2.10.2. Bias Detection
  - 2.10.3. New Artificial Intelligence Applications

### Module 3. *Big Data* in Systems Engineering and Computer Science

- 3.1. *Big Data* Applied to IT
  - 3.1.1. *Big Data* Applied to IT
  - 3.1.2. *Big Data*. Opportunities
  - 3.1.3. *Big Data*. Application
- 3.2. Information and Data
  - 3.2.1. Information Sources
  - 3.2.2. Quality
  - 3.2.3. Transformation
- 3.3. Processing *Big Data*.
  - 3.3.1. *Big Data* Processing. *Hadoop*

- 3.3.2. *Big Data* Processing *Spark*
- 3.3.3. Streaming Processing
- 3.4. Data Storage.
  - 3.4.1. Data Storage. Databases
  - 3.4.2. Data Storage. Cloud
  - 3.4.3. Data Storage. Information Use
- 3.5. Architecture *Big Data*.
  - 3.5.1. *Big Data* Architecture. *Data Lake*
  - 3.5.2. *Big Data* Architecture. Process Monitoring
  - 3.5.3. *Big Data* Architecture. *Cloud Computing*
- 3.6. Data Analysis
  - 3.6.1. Data Analysis. Predictive Modeling
  - 3.6.2. Data Analysis. *Machine Learning*
  - 3.6.3. Data Analysis. *Deep Learning*
- 3.7. Data Visualization
  - 3.7.1. Types
  - 3.7.2. Visualization Tools
  - 3.7.3. *Reporting* Tools
- 3.8. Information Use
  - 3.8.1. *Business Intelligence*
  - 3.8.2. *Business Analytics*
  - 3.8.3. *Data Science*
- 3.9. Privacy and Data Protection
  - 3.9.1. Sensitive Data
  - 3.9.2. Consent
  - 3.9.3. Anonymization
- 3.10. Data Governance
  - 3.10.1. Data Governance
  - 3.10.2. *Data Lineage*
  - 3.10.3. Data Catalog

# 05 Methodology

This training program offers 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"*

## At TECH we use the Case Method

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

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



*We are the first online university to combine Harvard Business School case studies with a 100% online learning system based on repetition.*



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

### **A learning method that is different and innovative.**

This intensive Information Technology program at TECH Global University prepares you to face all the challenges in this field, both nationally and internationally. We are committed to promoting your personal and professional growth, the best way to strive for success, that is why at TECH Global University you will use Harvard case studies, with which we have a strategic agreement that allows us, to offer you material from the best university in the world.

**“** *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

Our university is the first in the world to combine Harvard University case studies with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

We enhance Harvard case studies 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 university 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 competencies and skills in each thematic area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization we live in.



### 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

They will complete a selection of the best case studies in the field used at Harvard. Cases that are presented, analyzed, and supervised by the best senior management 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 multimedia content presentation training Exclusive system 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 your goals.



06

# Certificate

The Postgraduate Diploma in New Technologies guarantees, in addition to the most rigorous and up to date training, access to a Postgraduate Diploma issued by TECH Global University.





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*Successfully complete this training program  
and receive your university certificate  
without travel or laborious paperwork”*

This program will allow you to obtain your **Postgraduate Diploma in New Technologies** endorsed by **TECH Global University**, the world's largest online university.

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

This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Diploma in New Technologies**

Modality: **online**

Duration: **6 months**

Accreditation: **18 ECTS**





## Postgraduate Diploma New Technologies

- » Modality: **online**
- » Duration: **6 months**
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- » Credits: **18 ECTS**
- » Schedule: **at your own pace**
- » Exams: **online**

# Postgraduate Diploma New Technologies