

# Postgraduate Certificate Training of Deep Neural Networks in Deep Learning



## Postgraduate Certificate Training of Deep Neural Networks in Deep Learning

- » 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/training-deep-neural-networks-deep-learning](http://www.techtitute.com/us/information-technology/postgraduate-certificate/training-deep-neural-networks-deep-learning)

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# 01

# Introduction

Training deep neural networks is one of the most important aspects of deep learning. These have multiple layers of interconnected nodes, allowing them to capture more complex data patterns and features than simple neural networks. TECH has designed a program that allows students to maximize their knowledge on aspects such as Gradient Problems, Feature Extraction, Moment Optimizers or Overfitting, among others. All this, thanks to a 100% online modality and with the most dynamic and practical multimedia materials in the educational market.





“

*Improve your skills and acquire new competences on Smoothing Terms or Image Transformations, thanks to the best online university in the world according to Forbes, thanks to TECH"*

The process of training deep neural networks can be costly in terms of time and computational resources. However, it is a powerful tool for solving complex machine learning problems and has proven its effectiveness in fields such as image recognition and text generation.

For this reason, TECH has designed a Postgraduate Certificate in Training of Deep Neural Networks in Deep Learning with which it seeks to provide students with the necessary skills and competencies to be able to perform their work as experts, with the highest possible efficiency and quality. In this way, throughout this program, aspects such as Maximum Entropy Regularization, Deep Learning or Practical Guidelines will be addressed.

All this, through a convenient 100% online modality that allows students to organize their schedules and studies as best suits them, balancing them with their other day-to-day work and interests. In addition, this program has the most complete theoretical and practical materials on the market, which facilitates the student's study process and allows them to achieve their objectives quickly and efficiently.

This **Postgraduate Certificate in Training of Deep Neural Networks in Deep Learning** contains the most complete and up-to-date educational program on the market. The most important features include:

- ◆ The development of practical cases presented by experts in Training of Deep Neural Networks in Deep Learning
- ◆ The graphic, schematic and eminently practical contents of the course provide sportive 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
- ◆ 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



*Become an expert in Deep Neural Networks in only 6 weeks and with total freedom of organization"*

“

*Enhance your professional profile in one of the most promising areas in the field of Computer Science, thanks to TECH and the most complete materials on the market”*

*Delve into Feature Extraction and Assessment Metrics, from the comfort of your home and at any time of the day.*

*Access all Learning Transfer Training content from your tablet, mobile or computer.*

The program's teaching staff includes professionals from the field who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

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

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the academic year. For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.



# 02

# Objectives

The ultimate goal of this Postgraduate Certificate in Training of Deep Neural Networks in Deep Learning is for the student to acquire new skills and competencies in this area. An update that will allow the student to work with the highest possible quality and efficiency. All this, thanks to TECH and a 100% online modality that gives total freedom of organization and schedules to the student.





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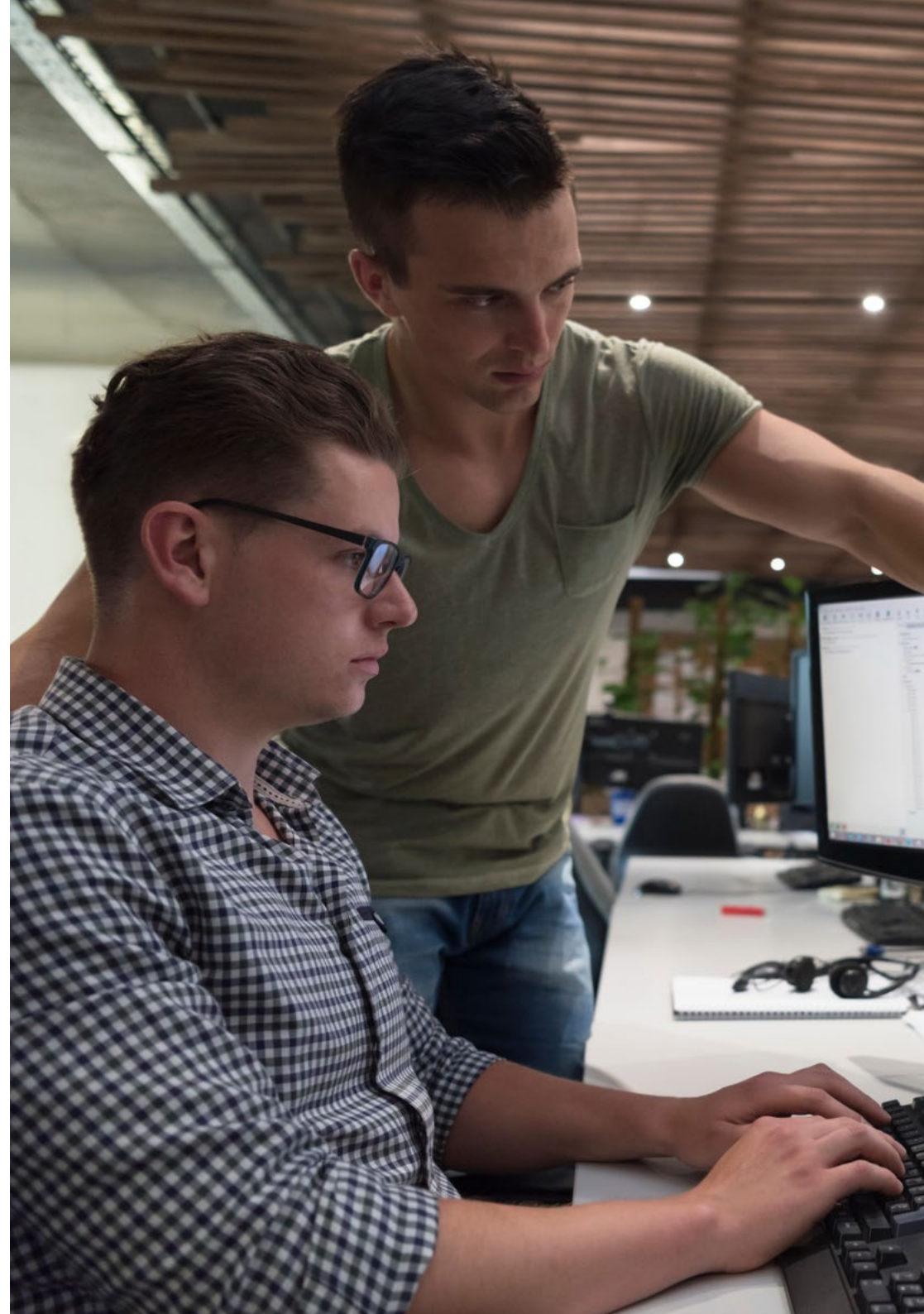
*Delve into all the essential aspects of Training Deep Neural Networks in Deep Learning, without leaving your home and at any time of the day"*



## General Objectives

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- ◆ Fundamentalize the key concepts of mathematical functions and their derivatives
- ◆ Apply these principles to deep learning algorithms to learn automatically
- ◆ Examine the key concepts of Supervised Learning and how they apply to neural network models
- ◆ Analyze the training, evaluation and analysis of neural network models
- ◆ Fundamentals of the key concepts and main applications of deep learning
- ◆ Implement and optimize neural networks with Keras
- ◆ Develop expertise in the training of deep neural networks
- ◆ Analyze the optimization and regularization mechanisms required for deep neural network training





## Specific Objectives

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- ◆ Analyze gradient problems and how they can be avoided
- ◆ Determine how to reuse pre-trained layers to train deep neural networks
- ◆ Establish how to schedule the learning rate to get the best results



*Reach your most demanding goals in a short time and expand your knowledge of Neural Network Training thanks to TECH and its outstanding team of professionals"*

03

# Course Management

In order to provide a degree of the highest quality and usefulness, TECH has selected professionals specialized in Deep Learning as part of this teaching staff, which has been responsible for the design of the most advanced content. As a result, you will learn from the best the keys to your professional development in a field that adapts to new technologies and the latest advances in the market.



“

*The most experienced management and teaching staff will provide you with the latest advances in Model Design or Transfer Learning, preparing you for your professional future in the best possible way”*

## Management



### Mr. Gil Contreras, Armando

- ◆ Lead Big Data Scientist-Big Data at Jhonson Controls
- ◆ Data Scientist-Big Data at Opensistemas
- ◆ Fund Auditor at Creatividad y Tecnología and PricewaterhouseCoopers
- ◆ Professor in EAE Business School
- ◆ Degree in Economics from the Technological Institute of Santo Domingo (INTEC).
- ◆ Master's Degree in Data Science at the University Center of Technology and Art.
- ◆ Master MBA in International Relations and Business at the Center for Financial Studies (CEF).
- ◆ Postgraduate degree in Corporate Finance from the Technological Institute of Santo Domingo.

## Professors

### Mr. Delgado Panadero, Ángel

- ◆ ML Engenieer at Paradigma Digital
- ◆ Computer Vision Engineer at NTT Disruption
- ◆ Data Scientist at Singular People
- ◆ Data Analyst at Parclick
- ◆ Tutor in the Master's Degree in Big Data and Analytics at EAE Business School
- ◆ Degree in Physics at the University of Salamanca



#### **Mr. Matos, Dionis**

- ◆ Data Engineer at Wide Agency Sodexo
- ◆ Data Consultant at Tokiota Site
- ◆ Data Engineer at Devoteam Testa Home
- ◆ Business Intelligence Developer at Ibermatica Daimler
- ◆ Master's Degree in Big Data and Analytics /Project Management(Minor) at EAE Business School

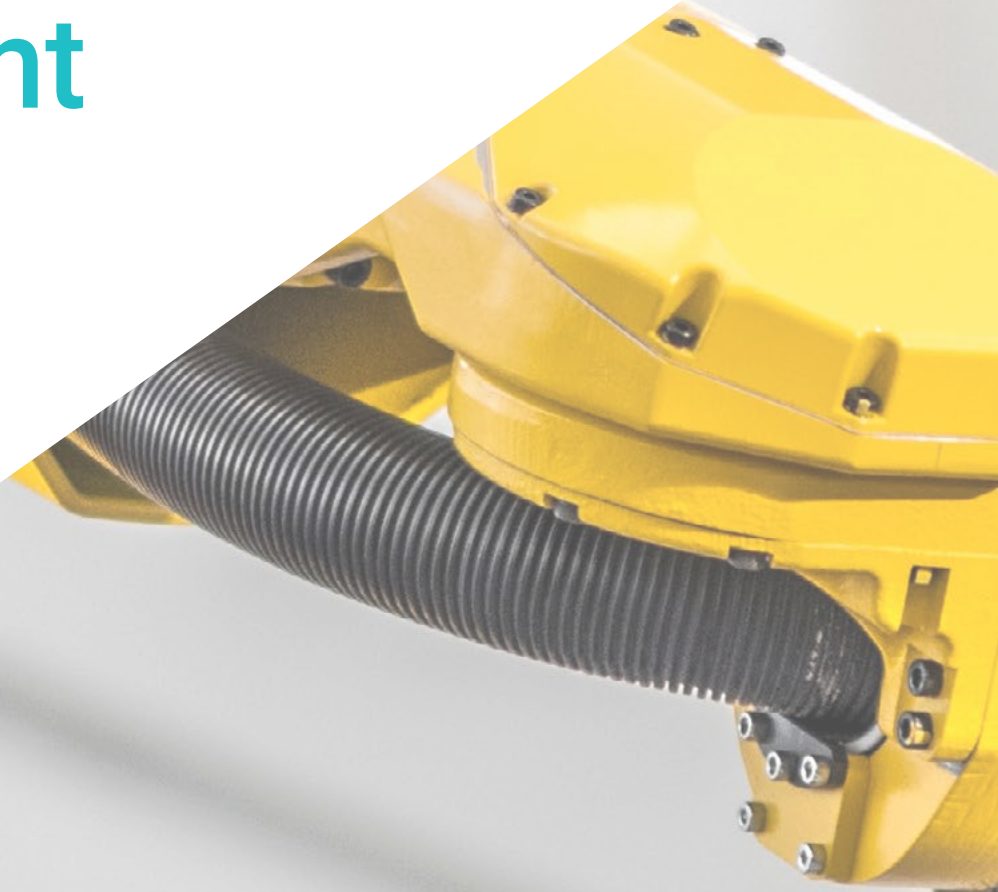
#### **Mr. Villar Valor, Javier**

- ◆ Director and founding partner Impulsa2
- ◆ Head of Operations at Summa Insurance Brokers
- ◆ Responsible for identifying opportunities for improvement at Liberty Seguros
- ◆ Director of Transformation and Professional Excellence in Johnson Controls Iberia
- ◆ Responsible for the organization of the company Groupama Seguros
- ◆ Responsible for Lean Six Sigma methodology at Honeywell
- ◆ Director of Quality and Purchasing at SP & PO
- ◆ Professor at the European Business School

# 04

# Structure and Content

The structure and all the teaching resources of this syllabus have been designed by the renowned professionals that make up TECH's team of experts in the area of Deep Learning. These specialists have used their extensive experience and their most advanced knowledge to create practical and completely innovative contents. All this, based on the most efficient pedagogical methodology, TECH's Relearning.





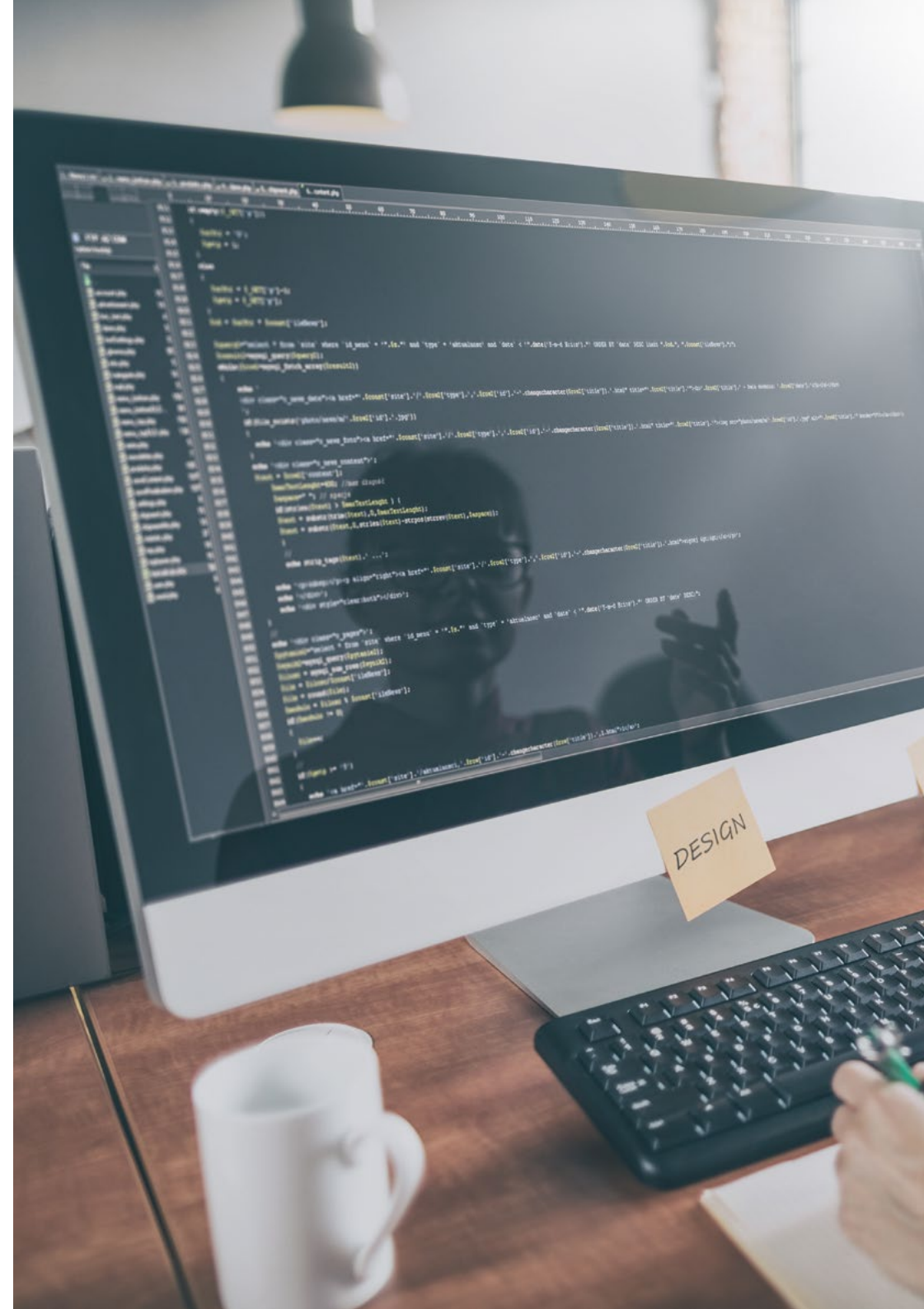


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*Reach your full potential in the field of Computer Science thanks to the most complete pedagogical and practical materials on the educational market”*

## Module 1. Training of Deep Neural Networks

- 1.1. Gradient Problems
  - 1.1.1. Gradient Optimization Techniques
  - 1.1.2. Stochastic Gradients
  - 1.1.3. Weight Initialization Techniques
- 1.2. Reuse of Pre-Trained Layers
  - 1.2.1. Learning Transfer Training
  - 1.2.2. Feature Extraction
  - 1.2.3. Deep Learning
- 1.3. Optimizers
  - 1.3.1. Stochastic Gradient Descent Optimizers
  - 1.3.2. Adam and RMSprop Optimizers
  - 1.3.3. Moment Optimizers
- 1.4. Learning Rate Programming
  - 1.4.1. Automatic Learning Rate Control
  - 1.4.2. Learning Cycles
  - 1.4.3. Smoothing Terms
- 1.5. Overfitting
  - 1.5.1. Cross Validation
  - 1.5.2. Regularization
  - 1.5.3. Evaluation Metrics
- 1.6. Practical Guidelines
  - 1.6.1. Model Design
  - 1.6.2. Selection of Metrics and Evaluation Parameters
  - 1.6.3. Hypothesis Testing
- 1.7. Transfer Learning
  - 1.7.1. Learning Transfer Training
  - 1.7.2. Feature Extraction
  - 1.7.3. Deep Learning



- 1.8. Data Augmentation
  - 1.8.1. Image Transformations
  - 1.8.2. Synthetic Data Generation
  - 1.8.3. Text Transformation
- 1.9. Practical Application of Transfer Learning
  - 1.9.1. Learning Transfer Training
  - 1.9.2. Feature Extraction
  - 1.9.3. Deep Learning
- 1.10. Regularization
  - 1.10.1. L1 and L2
  - 1.10.2. Regularization by Maximum Entropy
  - 1.10.3. Dropout

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*Thanks to the most efficient teaching methodology, you will be able to acquire new knowledge in a precise way and in only 150 hours”*



# 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.



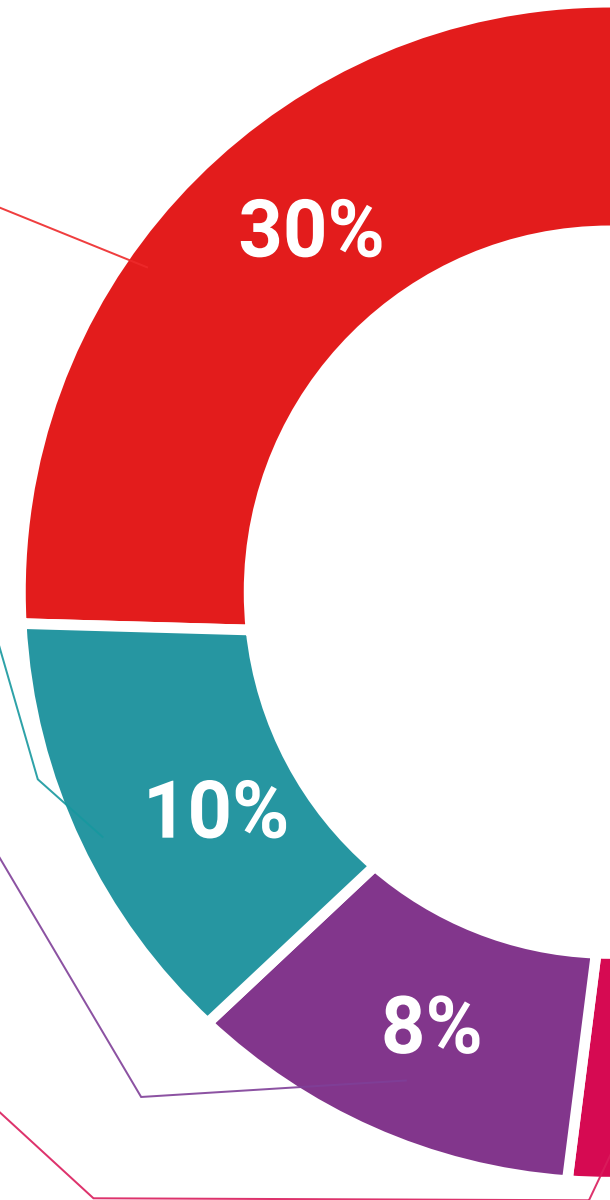
### Practising Skills and Abilities

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 Training of Deep Neural Networks in Deep Learning guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.





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

This **Postgraduate Certificate in Training of Deep Neural Networks in Deep Learning** contains the most complete and up-to-date program on the market.

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

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

Title: **Postgraduate Certificate in Training of Deep Neural Networks in Deep Learning**  
Official N° of Hours: **150 h.**



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

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



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