Postgraduate Certificate

Neural Networks in Deep Learning

tech global university

tech global university

Postgraduate Certificate

Neural Networks in Deep Learning

- Modality: **online**
- Duration: **6 weeks**
- Certificate: **TECH Global University**
- Credits: **6 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/information-technology/postgraduate-certificate/neural-networks-deep-learning

Index

01 Introduction p. 4

02 Objectives p. 8

03 Course Management p. 12

04 Structure and Content p. 16

05 Methodology p. 20

06 Certificate p. 28

01

Introduction

Neural networks are a type of deep learning algorithm that is inspired by the structure and functioning of the human brain. They are particularly suitable for classification tasks, such as image or speech recognition, and are also used in prediction and data generation. used in prediction and data generation. TECH has designed a program that allows students to maximize their knowledge on aspects such as Deep Learning Types, Architecture Design, Optimizer Selection or Parameter Tuning, among others. All this, thanks to a 100% online modality and with the most dynamic and practical multimedia materials available in the academic market.

Improve your skills on Metric Setting or Loss Function, thanks to the best online university in the world according to Forbes, thanks to TECH"

As Deep Learning becomes more popular and accessible, neural networks have become a powerful tool for solving complex machine learning problems. One of the many advantages of this system is its ability to learn and improve with data.

TECH has designed a Postgraduate Certificate in Neural Networks in Deep Learning with the aim of providing students with the necessary skills and competencies to be able to work as specialists with the highest possible efficiency and quality. In this program, aspects such as Optimizer Selection, Model Training, *Learning Rate* or Weight Adjustment will be addressed.

All this, through a convenient 100% online modality that allows students to organize their schedules and studies, combining them with their other day-to-day work and interests. Moreover, this degree 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 Neural Networks in Deep Learning** 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 neural network in deep learning
- The graphic, schematic and practical contents of the program provide Rehabilitation and practical information on those 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 work
- Content that is accessible from any fixed or portable device with an Internet connection

Become an expert in Deep Learning in only 6 weeks and with total freedom of organization"

Enhance your professional profile in one of the most promising areas of the IT sector thanks to TECH and the most innovative materials"

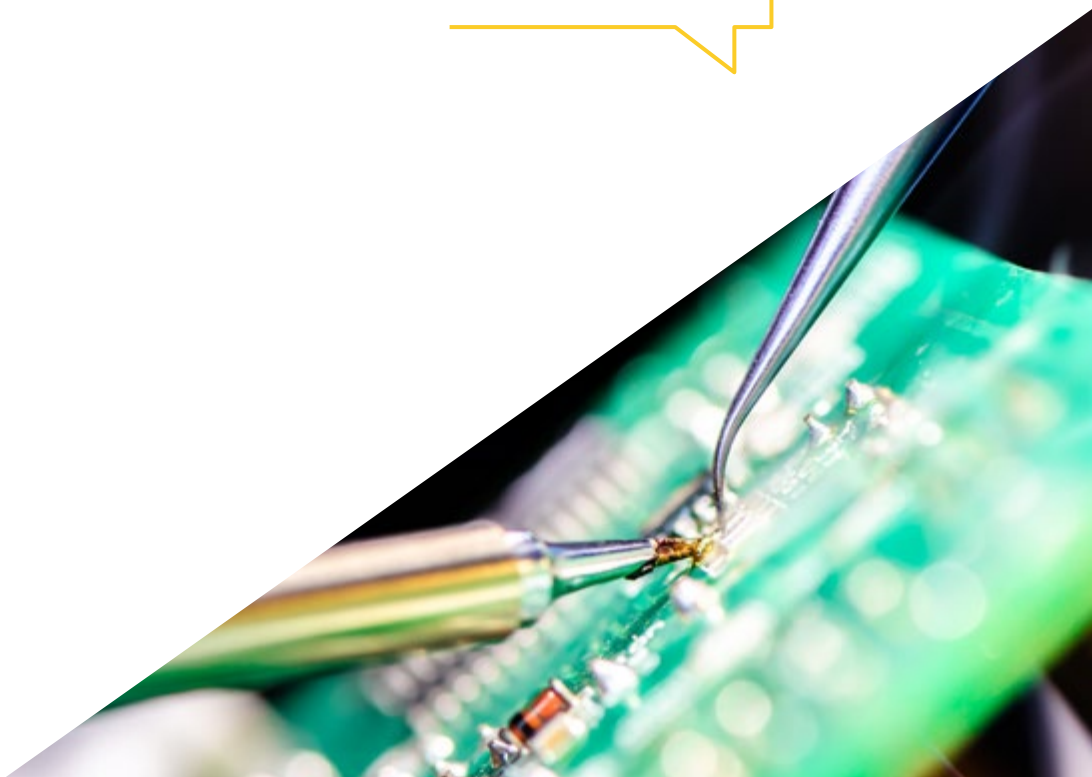
Access all the content on Deep Learning Types from your Tablet, mobile or computer.

Delve into the Layer Connection and Network Training from the comfort of your home at any time of the day.

The program's teaching staff includes professionals from sector 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 This will be done with the help of an innovative system of interactive videos made by renowned experts.



02

Objectives

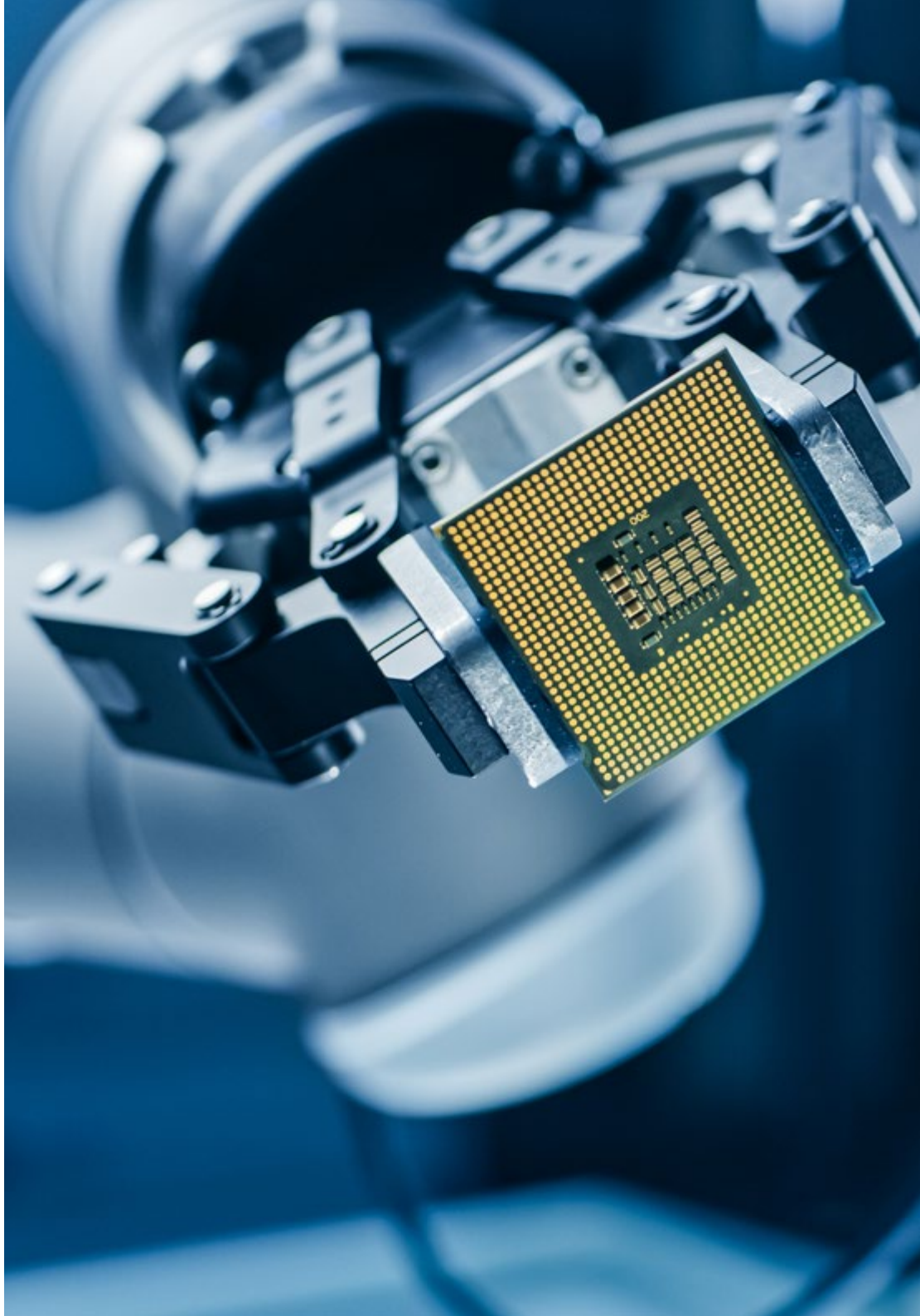
The final objective of this Postgraduate Certificate in Neural Networks in Deep Learning is that the student acquires a precise update of his knowledge in this area. An update that will allow the student to work with the highest possible quality and efficiency.
All this, thanks to TECH and a 100% online modality that gives total freedom of organization and schedules to the student.

Achieve the objectives of this title and master Network Design and Optimizer Selection"

General Objectives

- Understand the key concepts of mathematical functions and their derivatives
- Apply these principles to deep learning algorithms for automatic learning
- 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
- Understand the key concepts and the main applications of deep learning
- Implement and optimizing neural networks with Keras
- Develop expertise in deep neural network training
- Analyze the optimization and regularization mechanisms necessary for the training of deep networks

Delve into all the essentials of Neural Networks in Deep Learning, from the comfort of your home or work office"



Specific Objectives

- Develop the chain rule for calculating derivatives of nested functions
- Analyze how to create new functions from existing functions and how to calculate their derivatives
- Examine the concept of Backward Pass and how the derivatives of vector functions are applied to automatic learning
- Learn about how to use TensorFlow to build custom models
- Understand how to load and process data using TensorFlow tools
- Establish the key concepts of NLP natural language processing with RNNs and attention mechanisms. and attention mechanisms
- Explore the functionality of Hugging Face's transformer libraries and other natural language processing tools for application to vision problems
- Learn to build and train autoencoder models, GANs and diffusion models
- Understand how autoencoders can be used to efficiently encode data

03

Course Management

In order to provide a degree of the highest quality and usefulness, TECH has selected professionals specialized in Neural Networks in Deep Learning as part of this teaching staff, which has been responsible for the design of the most advanced content. In this way, 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 faculty will teach you the latest advances in Deep Learning, preparing you to face the current challenges in this area"

Management

Mr. Gil Contreras, Armando

- *Lead Big Data Scientist-Big Data* at Jhonson Controls
- *Data Scientist-Big Data* at Opensistemas
- Creativity and Technology Fund Auditor and PricewaterhouseCoopers
- Professor in EAE Business School
- Creativity and Technology Fund Auditor and PricewaterhouseCoopers
- Master in Data Science at the Centro Universitario de Tecnología y Arte
- Master MBA in International Relations and Business at the Center for Financial Studies CEF
- Postgraduate in Corporate Finance at the Instituto Tecnológico de Santo Domingo

Professors

Mr Delgado Panadero, Ángel

- ML Engenieer at Paradigma Digital
- Computer Vision Engineer at NTT Disruption
- Data Scientist at Singular People
- Data Analys at Parclick
- Professor in Master at Big data and Analitycs at EAE Business School
- Degree in Physical from the University of Salamanca

Mata, Dionis

- *Data Engineer* at Wide Agency Sodexo
- *Data Consultant* atTokiota 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
- Chief Operating Officer of Summa Insurance Brokers
- Responsible for identifying opportunities for improvement at Liberty Seguros
- Director of Transformation and Professional Excellence at Johnson Controls Iberia
- Responsible for the organization of Groupama Insurance Company
- Lean Six Sigma Methodology Manager 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 didactic resources of this curriculum 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 state-of-the-art knowledge to create practical and completely up-to-date content. All this, based on the most efficient pedagogical methodology, TECH *Relearning*.

The most comprehensive and up-to-date view of Network Training can be found in this syllabus"

Module 1. Neural networks, the basis of *Deep Learning*

1.1. Deep Learning
- 1.1.1. Types of Learning Foundations
- 1.1.2. Applications of Foundations Learning
- 1.1.3. Advantages and Disadvantages of Foundations Learning

1.2. Surgery
- 1.2.1. Sum
- 1.2.2. Product
- 1.2.3. Transfer

1.3. Layers
- 1.3.1. Input layer
- 1.3.2. Hidden layer
- 1.3.3. Output layer

1.4. Layer Bonding and Operations
- 1.4.1. Architecture Design
- 1.4.2. Connection between layers
- 1.4.3. Forward propagation

1.5. Construction of the first neural network
- 1.5.1. Network Design
- 1.5.2. Establish weights
- 1.5.3. Training the Networks

1.6. Trainer and Optimizer
- 1.6.1. Optimizer Selection
- 1.6.2. Establishment of a loss function
- 1.6.3. Establishment of a metric

1.7. Application of Neural Network Principles
- 1.7.1. Activation Functions
- 1.7.2. Backward propagation
- 1.7.3. Parameter Estimation

1.8. From biological to artificial neurons
- 1.8.1. Functioning of a biological neuron
- 1.8.2. Transfer of knowledge to artificial neurons
- 1.8.3. Establish relationships between the two

1.9. Implementation of MLP (Multilayer Perceptron) with Keras
- 1.9.1. Definition of the Structure of Networks
- 1.9.2. Model compilation
- 1.9.3. Model Training

1.10. *Fine tuning* Hyperparameters of Neural Networks
- 1.10.1. Selection of the activation function
- 1.10.2. Setting *learning rate*
- 1.10.3. Weight adjustment

180 hours separate you from becoming the expert in Neural Networks demanded by the schools of this sport"

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

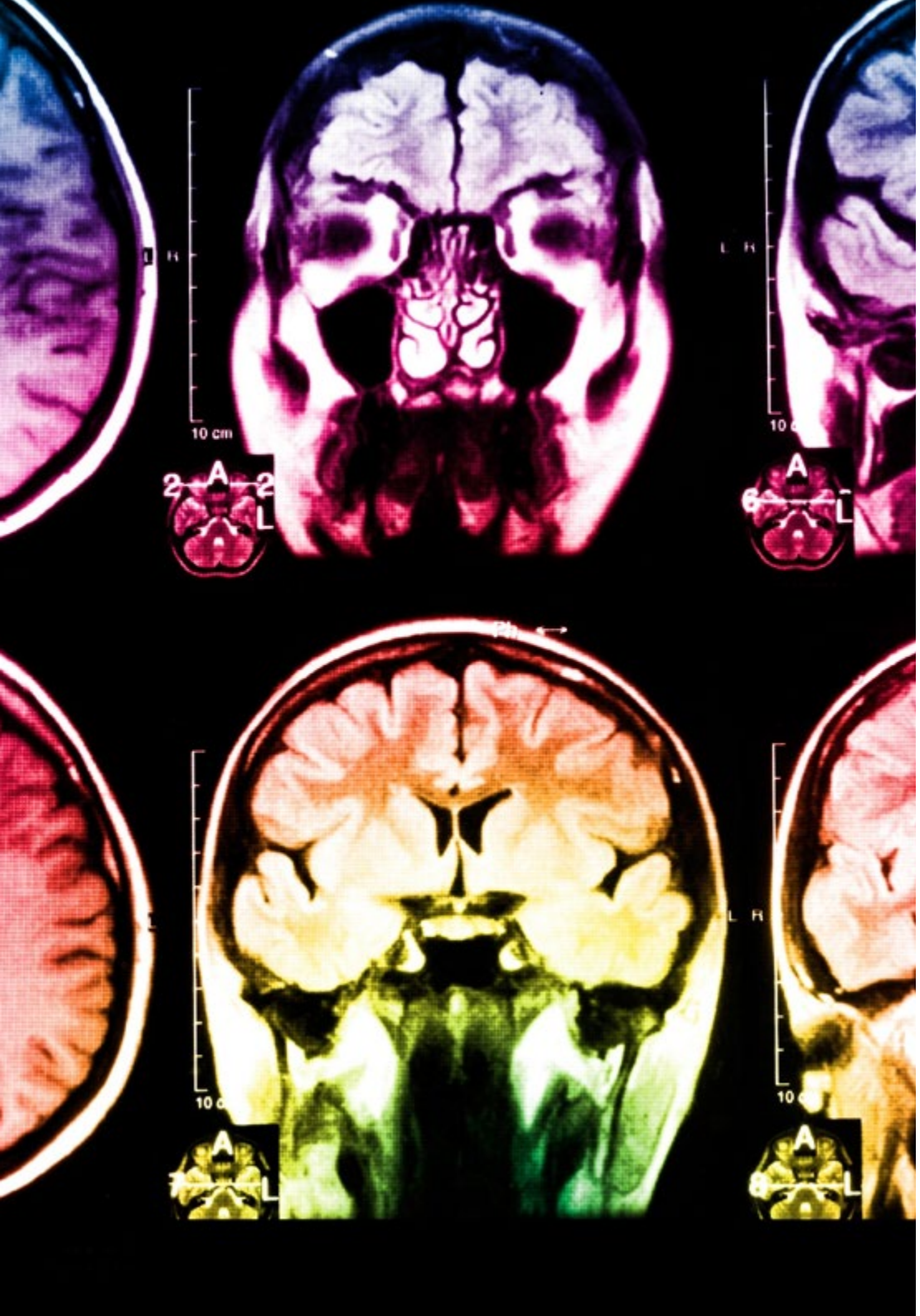
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

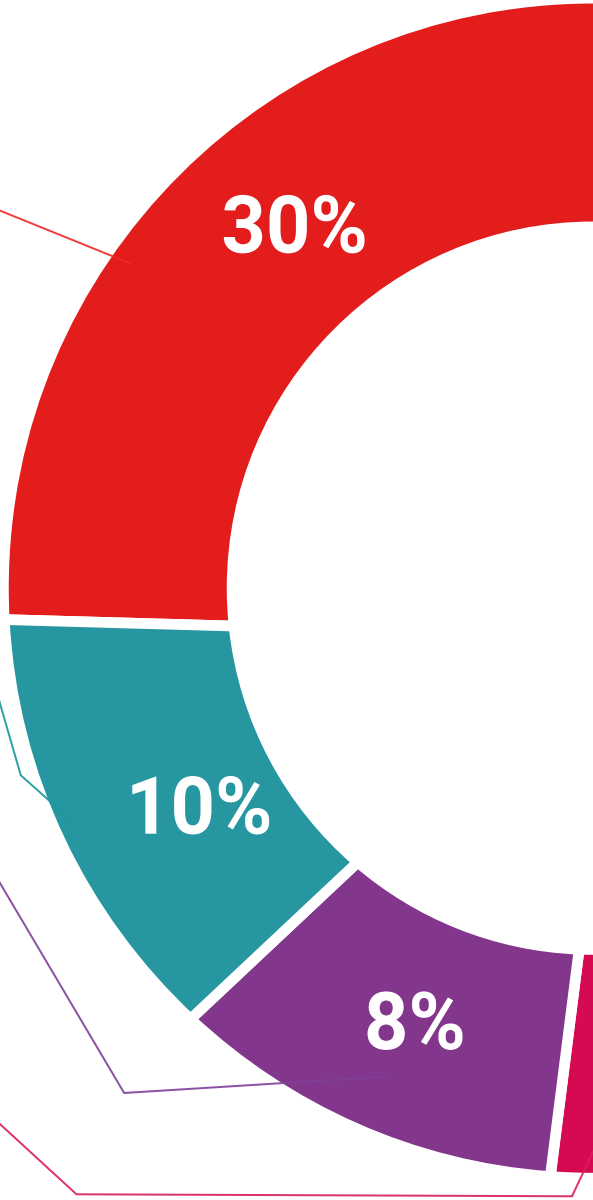
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

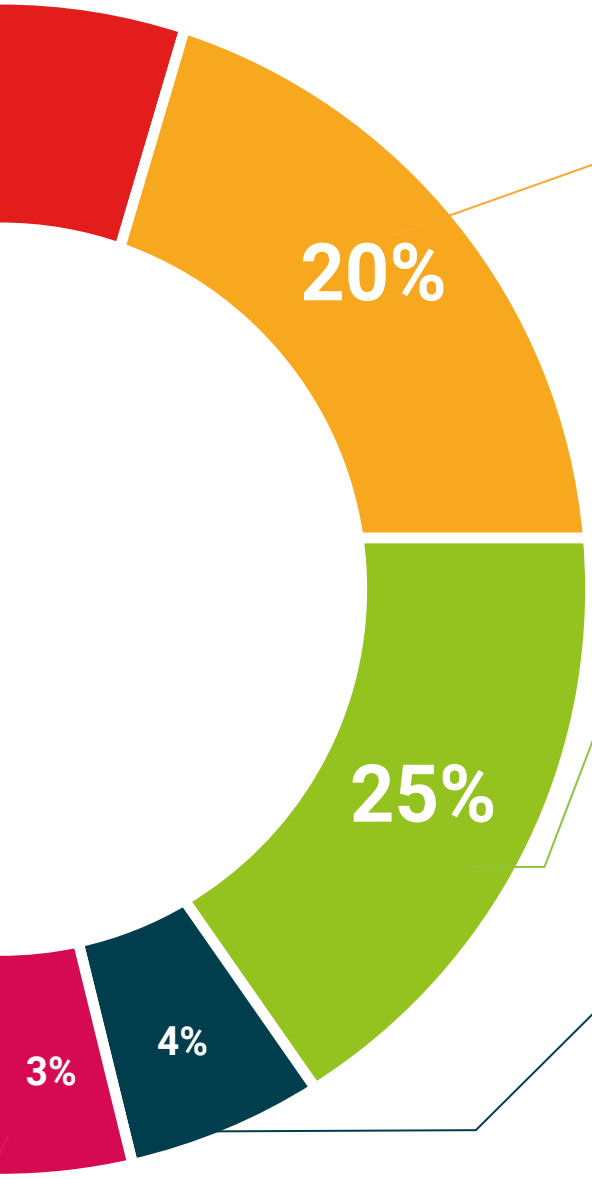
Practising Skills and Abilities

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 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 Global University.

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

This program will allow you to obtain your **Postgraduate Certificate in Neural Networks in Deep Learning** 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.

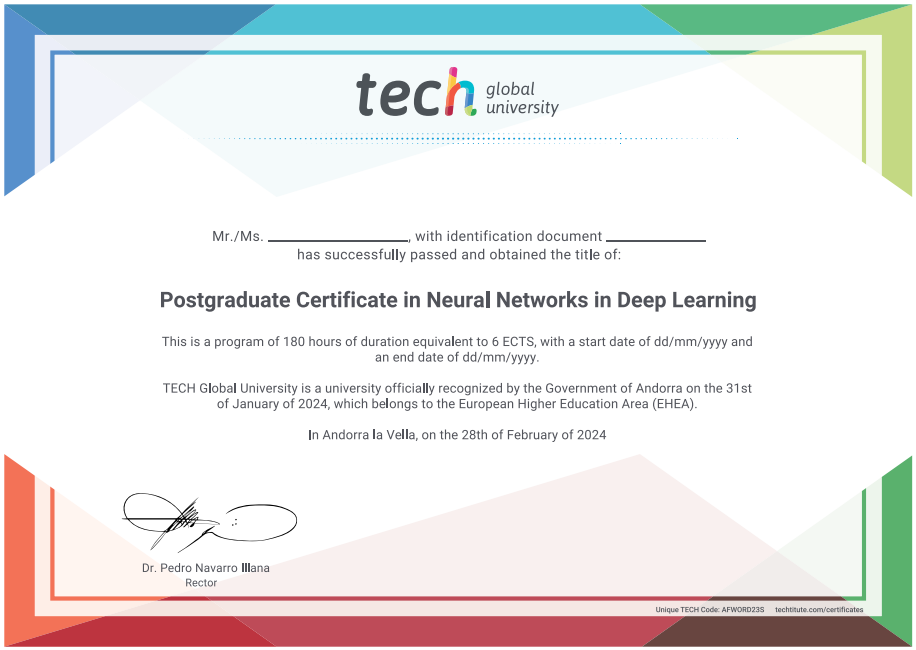
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Neural Networks in Deep Learning**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**


tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Postgraduate Certificate in Neural Networks in Deep Learning

This is a program of 180 hours of duration equivalent to 6 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

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 Global University will make the necessary arrangements to obtain it, at an additional cost.

tech global university

Postgraduate Certificate

Neural Networks in Deep Learning

- Modality: **online**
- Duration: **6 weeks**
- Certificate: **TECH Global University**
- Credits: **6 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Postgraduate Certificate

Neural Networks in Deep Learning

tech global university