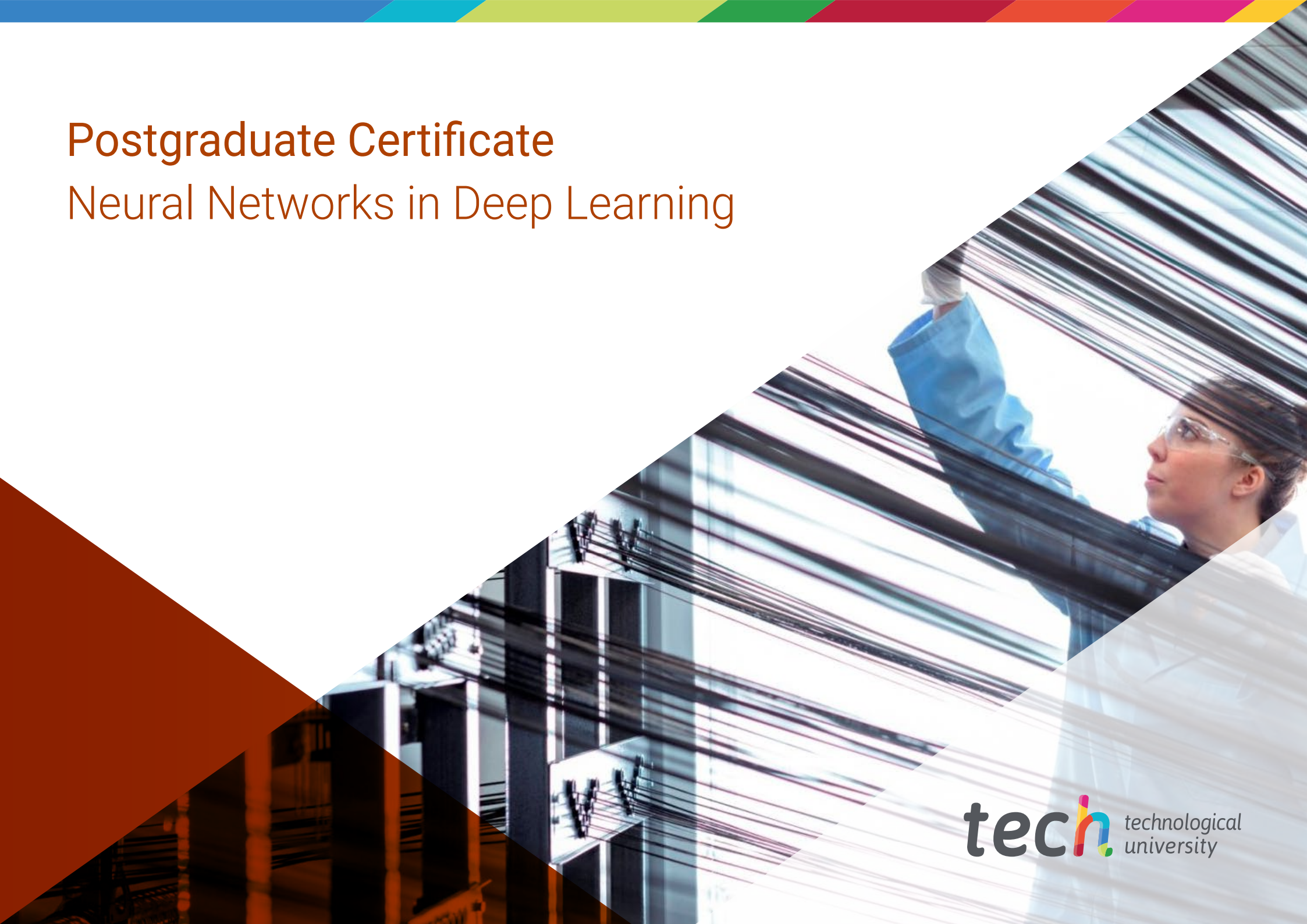
Postgraduate Certificate

Neural Networks in Deep Learning



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Postgraduate Certificate

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/in/engineering/postgraduate-certificate/neural-networks-deep-learning**

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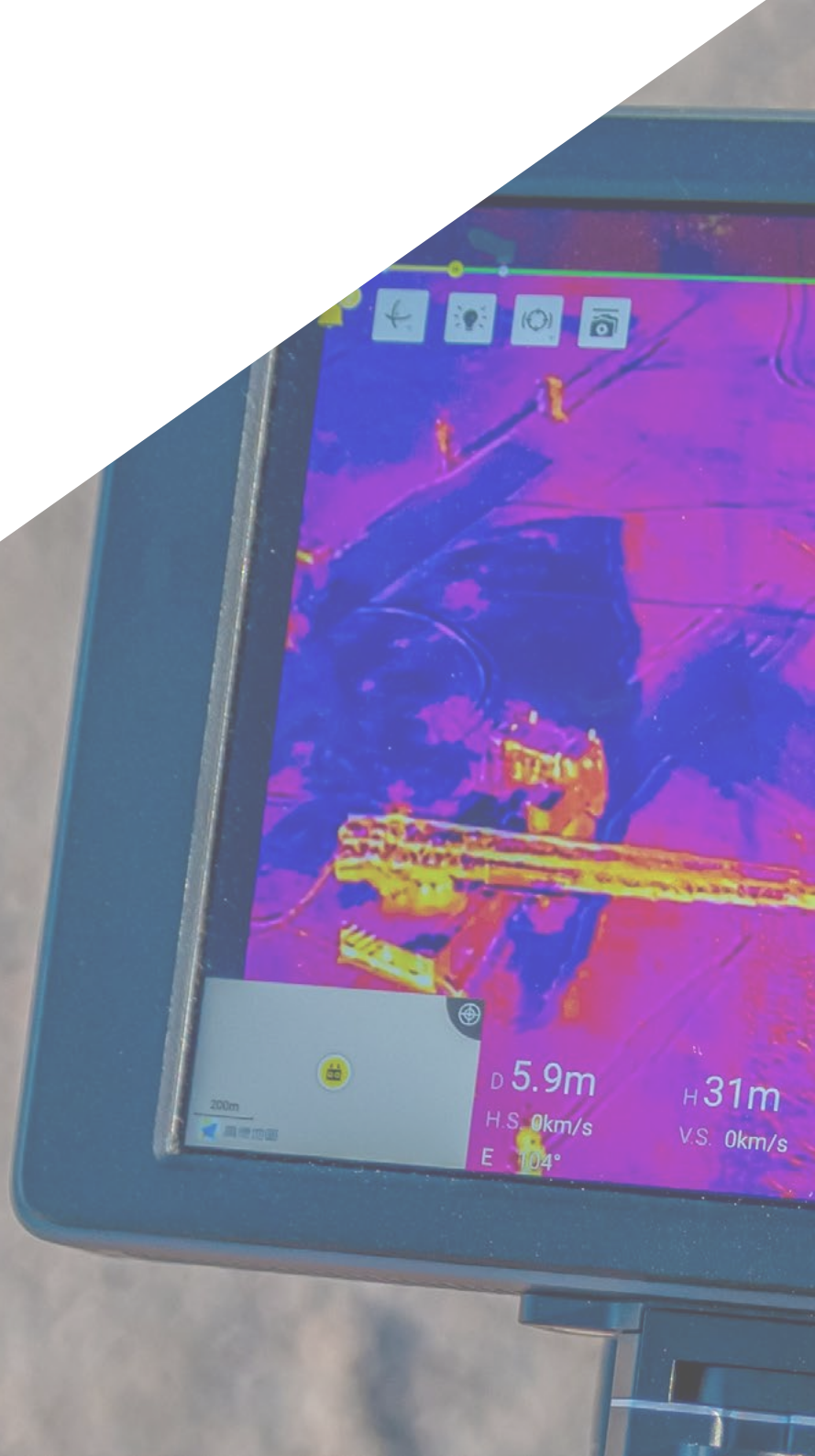
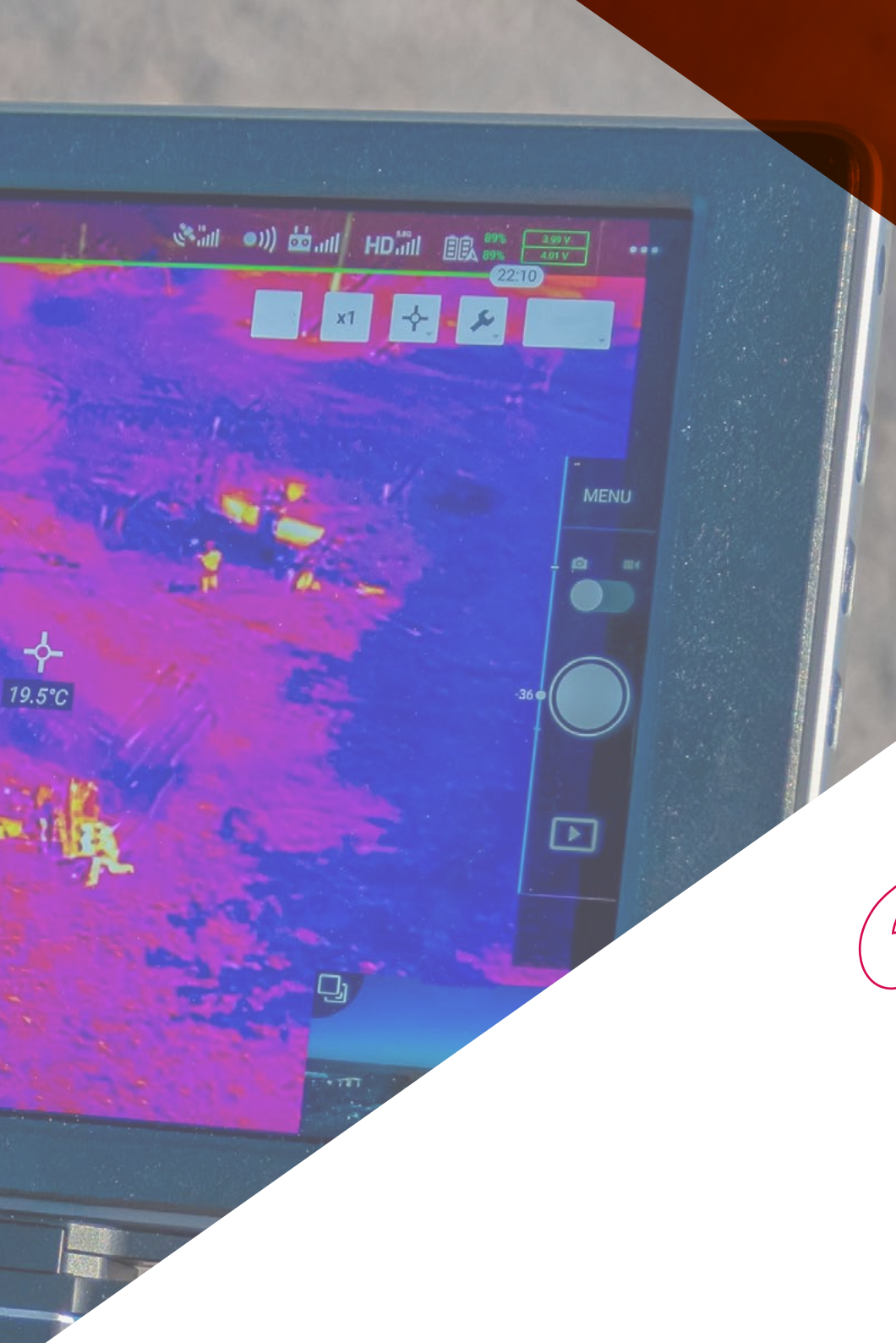
01

Introduction

Neural Networks in Deep Learning are at the epicenter of the technological revolution in Engineering, allowing the processing of large amounts of data and the resolution of complex problems. Aware of this growing need, TECH has developed a comprehensive program for engineers to specialize in this discipline. The program has been designed to address the theoretical and practical aspects of Neural Networks, allowing students to acquire advanced skills in areas such as image processing, speech recognition and robotics. In addition, its 100% online format offers students the possibility of adapting their study pace to their needs, allowing them to access the theoretical-practical contents from anywhere and at any time.





You will have at your disposal a Virtual Campus available 24 hours a day, without adapting to fixed schedules or imposed schedules that do not suit you"

Neural Networks in Deep Learning are an essential tool for data processing and complex problem solving in Engineering. Their ability to learn and adapt to different situations makes them ideal for tasks such as pattern recognition, data classification and real-time decision making. In addition, their use in fields such as computer vision and natural language processing has led to important advances in technology, such as facial recognition and machine translation.

Given this reality, this TECH academic program is designed as a response to the growing demand for highly qualified professionals in this area. This program has been specifically designed to provide solid training in the use of Neural Networks in Deep Learning, with a focus on their practical application in different fields of Engineering. Students will have the opportunity to learn state-of-the-art tools such as Tensorflow and Keras, and will acquire the necessary skills to design, implement and optimize Neural Network models to solve real-world problems.

For this reason, this complete program designed by TECH is based on the Relearning methodology to facilitate the student's learning through the progressive and natural repetition of the fundamental concepts. In this way, the graduate will acquire the necessary skills by adjusting the study to their life style. In addition, the online format will allow the professional to access the theoretical-practical contents anywhere and at any time, without the need to travel or adjust to a fixed schedule. Moreover, you will be able to access the theoretical and practical contents at any time and place, as long as you have a device with an Internet connection.

This **Postgraduate Certificate in Neural Networks in Deep Learning** contains the most complete and up-to-date program on the market. Its most outstanding features are:

- The development of case studies presented by experts in Deep Learning
- The graphic, schematic, and practical contents with which they are created, provide 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
- Content that is accessible from any fixed or portable device with an Internet connection

TECH seeks to project your professional career without neglecting other areas of your life, that's why it offers you a flexible and adaptable teaching to your needs”

You will be able to download all the content to any electronic device from the Virtual Campus and consult it whenever you need it, even without an Internet connection"

You will get a comprehensive learning with the latest methodology applied to academic teachings, the TECH Relearning.

Boost your professional career with a university qualification in which you will immerse yourself in the transfer of knowledge to artificial neurons.

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.

Its multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide an immersive education programmed to learn 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 professional practice situations that are presented throughout the academic course. For this purpose, the student will be assisted by an innovative interactive video system created by renowned experts.

02

Objectives

The program will allow the graduate to acquire up-to-date knowledge and a global vision of the key aspects of Neural Networks in Deep Learning, which will allow them to achieve the proposed objectives. In this way, the student will develop comprehensive skills in an essential, versatile and constantly growing area of engineering, which will lead them to achieve excellence in a booming sector. To ensure student satisfaction, TECH has established general and specific objectives that will guide the student towards success.

You will be able to achieve your most ambitious goals with the skills and abilities you will develop after completing this Postgraduate Certificate"

General Objectives

- Lay the foundation for 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
- Lay the foundation for the key concepts and main applications of deep learning
- Implement and optimizes neural networks with Keras
- Develop expertise in the training of deep neural networks
- Analyze the optimization and regularization mechanisms necessary for deep network training

Specific Objectives

- Analyze the architecture of neural networks and their principles of operation
- Determine how neural networks can be applied to a variety of problems
- Establish how to optimize the performance of deep learning models by tuning hyperparameters

You will achieve your objectives thanks to mastering the hyperparameters of Fine tuning of neural networks”

03

Course Management

This TECH Postgraduate Certificate is designed so that Engineering professionals can be up-to-date in Neural Networks in Deep Learning. This academic program has a highly specialized teaching team with extensive experience in the discipline, which guarantees quality teaching. Students who enroll in this program will be able take advantage of the experience and practice of the teaching team to face the current challenges in the field of Deep Learning.

With this TECH program, you will delve into the implementation of MLP with Keras from the best experts in Deep Learning"

Management

Mr. Gil Contreras, Armando

- Lead Big Data Scientist-Big Data at Jhonson Controls
- *Data Scientist-Big Data* at Opensistemas
- Fund Auditor at Creativity and Technology and PricewaterhouseCoopers
- Professor at EAE Business School
- Degree in Economics from the Instituto Tecnológico de Santo Domingo INTEC
- Master's Degree in Data Science at Centro Universitario de Tecnología y Arte
- Master MBA in International Relations and Business at Centro de Estudios Financieros CEF
- Postgraduate Degree 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 Analyst at Parclick
- Tutor at Master 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
- Máster Big Data and Analytics /Project Management(Minor) at EAE Business School

Mr. Villar Valor, Javier

- Director and Founder Partner Impulsa2
- Chief Operating Officer of Summa Insurance Brokers
- Responsible for identifying improvement opportunities at Liberty Seguros
- Director of Transformation and Professional Excellence at 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 current syllabus has been designed considering the pedagogical methodology that characterizes TECH, known as Relearning. Pioneers in its use, this learning technique guarantees that the professional has a more natural and effective academic experience by reiterating the most important concepts in Neural Networks in Deep Learning throughout the program. This not only leads to a better assimilation of the syllabus, but also to a significant reduction in the number of hours of study required to complete the Postgraduate Certificate.

A syllabus that will provide you with the skills necessary to set up a metric or loss function in trainer and optimizer"

Module 1. Neural Networks, the Basis of Deep Learning

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

1.2. Operations
- 1.2.1. Addition
- 1.2.2. Product
- 1.2.3. Transfer

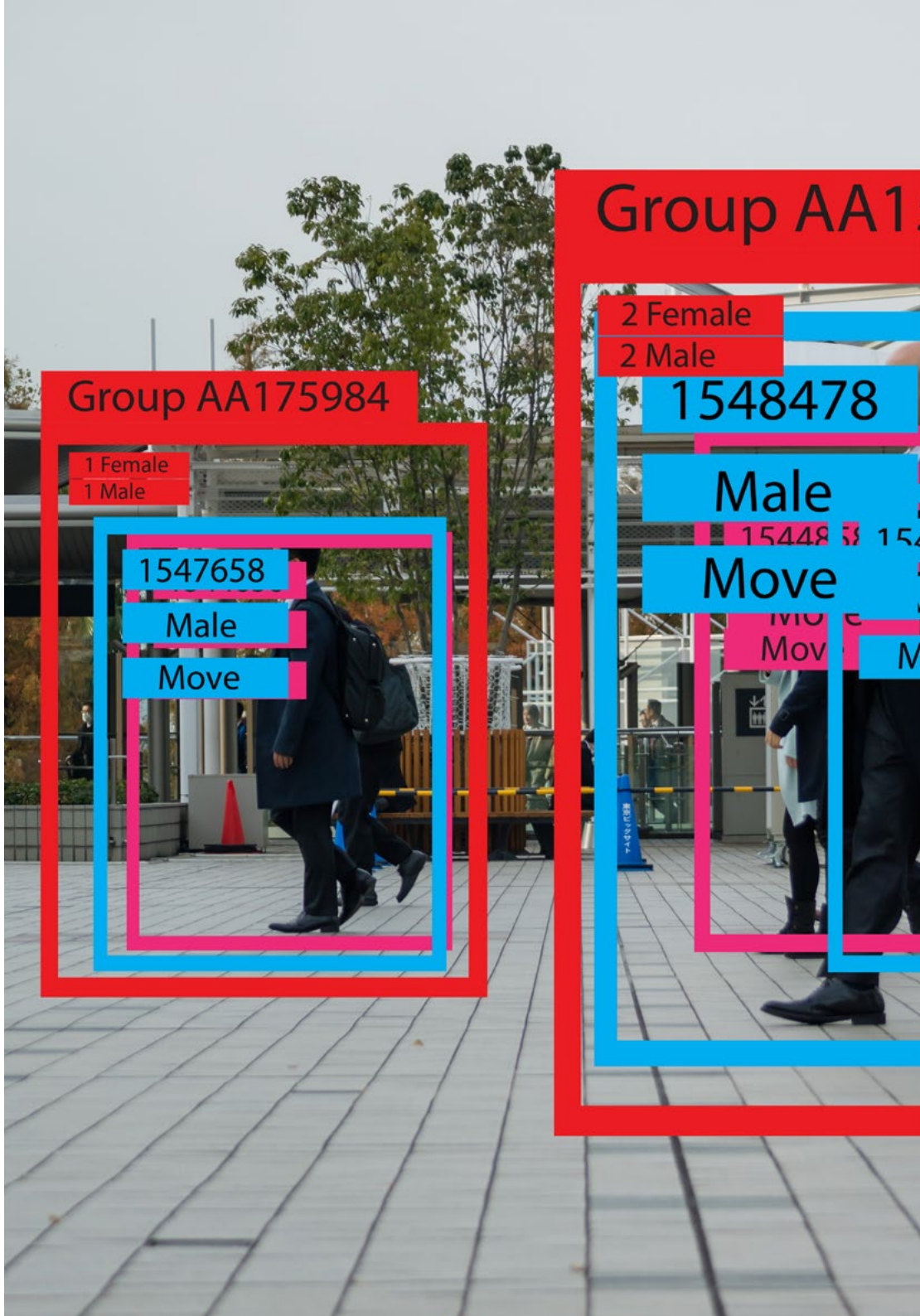
1.3. Layers
- 1.3.1. Input layer
- 1.3.2. Hidden layer
- 1.3.3. Output layer

1.4. Layer Union and Operations
- 1.4.1. Design of Architectures
- 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. Weights Establishment
- 1.5.3. Network Training

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 the Neural Network Principles
- 1.7.1. Activation Functions
- 1.7.2. Backward Propagation
- 1.7.3. Parameter Adjustment



1.8. From Biological to Artificial Neurons
- 1.8.1. Functioning of a Biological Neuron
- 1.8.2. Knowledge Transfer to Artificial Neurons
- 1.8.3. Establishing Relations between Both

1.9. Implementation of MLP (Multilayer Perceptron) with Keras
- 1.9.1. Definition of the Network Structure
- 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. Learning Rate Establishment
- 1.10.3. Weight Adjustment

A comprehensive program designed by experts for you to acquire in-depth knowledge in Neural Networks in Deep Learning"

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 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

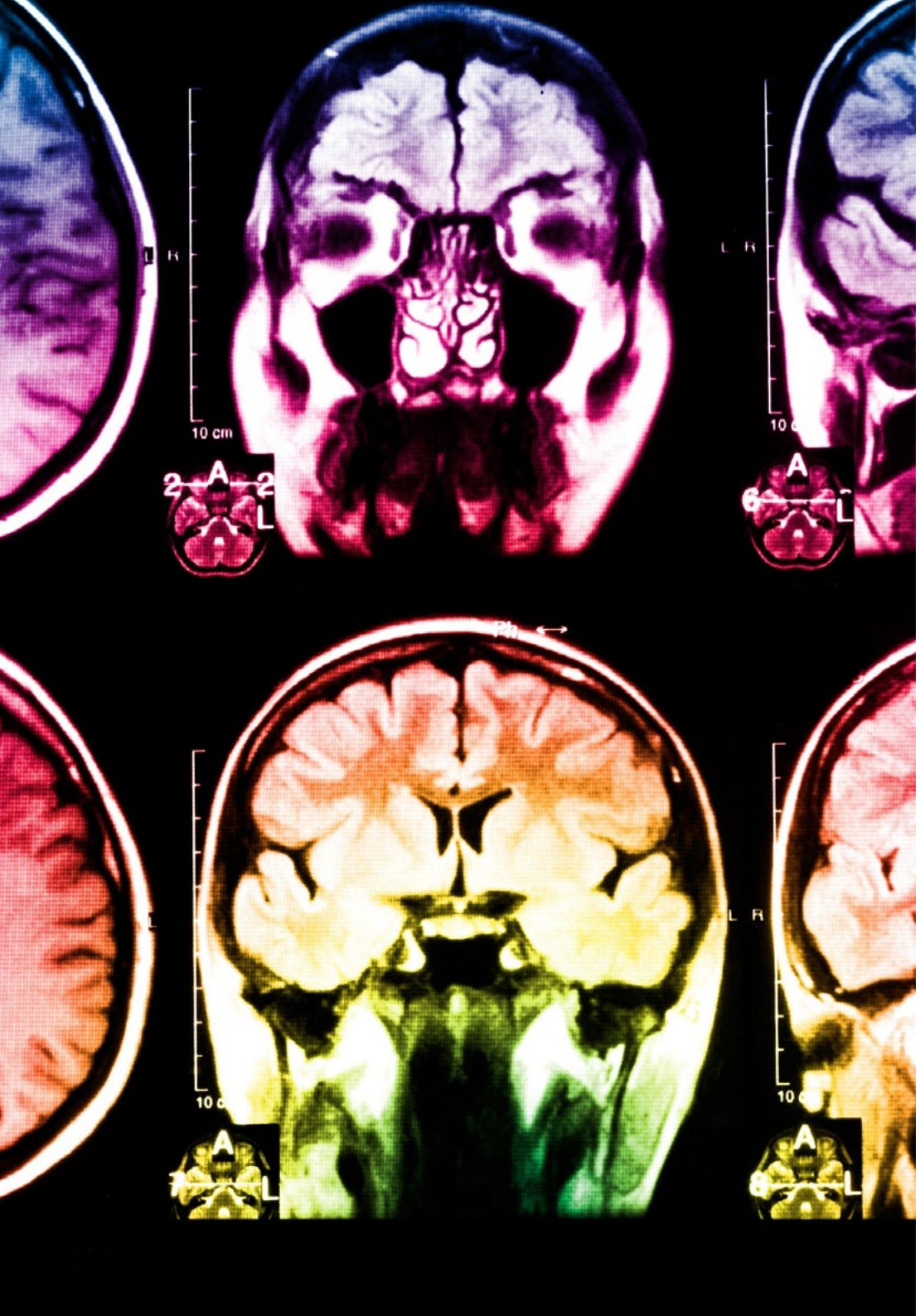
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

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 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.

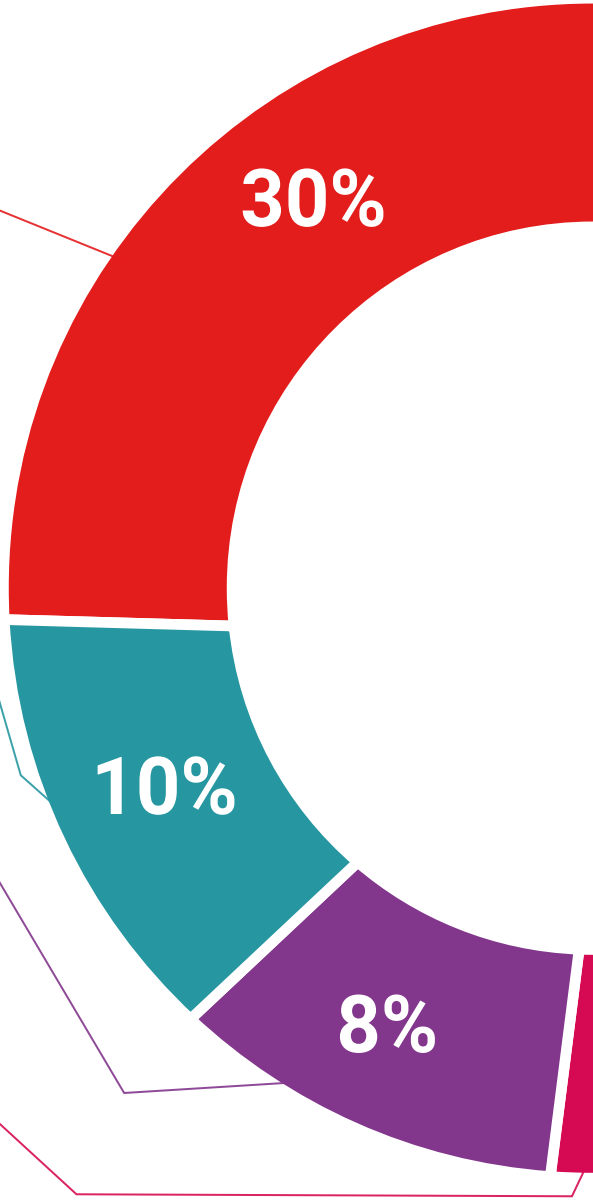
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

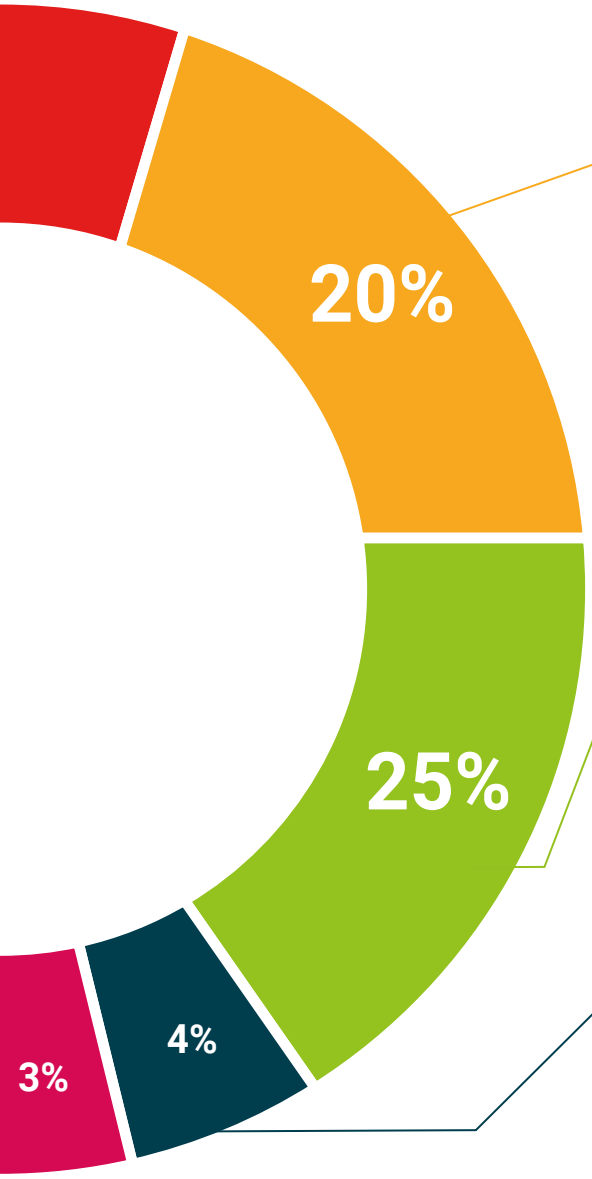
Practising Skills and Abilities

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 Technological University.

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

This **Postgraduate Certificate in 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 certificate 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 Neural Networks in Deep Learning**

Official Nº of Hours: **150 h.**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Awards the following

CERTIFICATE

to

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

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Neural Networks in Deep Learning

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

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

June 17, 2020

Tere Guevara Navarro

Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.

Unique TECH Code: AFWORD23S techtitute.com/certificates

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

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