Postgraduate Diploma
Neural Networks and Deep Learning Training

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Postgraduate Diploma
Neural Networks and Deep Learning Training

- » Modality: **online**
- » Duration: **6 months**
- » Certificate: **TECH Technological University**
- » Dedication: **16h/week**
- » Schedule: **at your own pace**
- » Exams: **online**

Website: **www.techtitute.com/pk/engineering/postgraduate-diploma/postgraduate-diploma-neural-networks-deep-learning-training**

Index

01

Introduction

Nowadays, *Deep Learning* has become a crucial aspect in modern engineering, and that is why it is essential for professionals in this area to acquire advanced skills in this field. Therefore, this TECH academic program is a response to the growing demand for highly skilled experts in *Deep Learning* in the field of Engineering. For this purpose, the program has been specifically designed to meet these needs and provide engineers with the opportunity to specialize in areas such as Tensorflow and Deep Visual Computer. Thanks to its innovative methodology and 100% online format, students have the possibility to adapt their study pace to their needs and access the theoretical and practical contents from anywhere and at any time.

TECH seeks to project your professional career without neglecting other areas of your life, that's why it offers you a program adapted to you with maximum flexibility”

Research in Neural Networks and Deep Learning Training continues to be a dynamic area that offers a great number of opportunities for those who wish to make significant contributions to the understanding and application of these techniques. Therefore, they have been shown to be particularly effective in processing complex data and performing difficult tasks in a variety of fields, making them an indispensable tool for modern engineering. In addition, deep Neural Networks have a wide range of practical real-world applications, from image and speech recognition to financial analysis and fraud detection.

In the same sense, they have the ability to process large volumes of data efficiently and accurately, which makes them ideal for applications in artificial intelligence and machine learning. Their ability to continuously learn and adapt to new data and situations makes them a very valuable tool for real-time decision making. In short, this is an exciting field that offers multiple opportunities for those who wish to acquire cutting-edge skills and knowledge in modern engineering.

TECH has developed a comprehensive program based on its unique Relearning methodology to facilitate student learning in a progressive and natural way through repetition of fundamental concepts.

The program is presented in an online format so that the professional can focus on learning without having to worry about travel or fixed schedules. In addition, they can access the theoretical and practical content from anywhere and at any time, all you need is a device with Internet connection.

This **Postgraduate Diploma in Neural Networks and Deep Learning Training** 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 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 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

Boost your professional career with a university qualification that will immerse you in the visual architecture of the Deep Computer Vision cortex"

Delve in detail into tracking and tracing techniques and become the professional you have always wanted to be.

Motivational videos, case studies, graphic and schematic contents, discussion forums, etc. Everything you need to take a leap forward in your professional career. Don't wait any longer.

" *Distribute the course load according to your personal needs and combine the university program with professional work"*
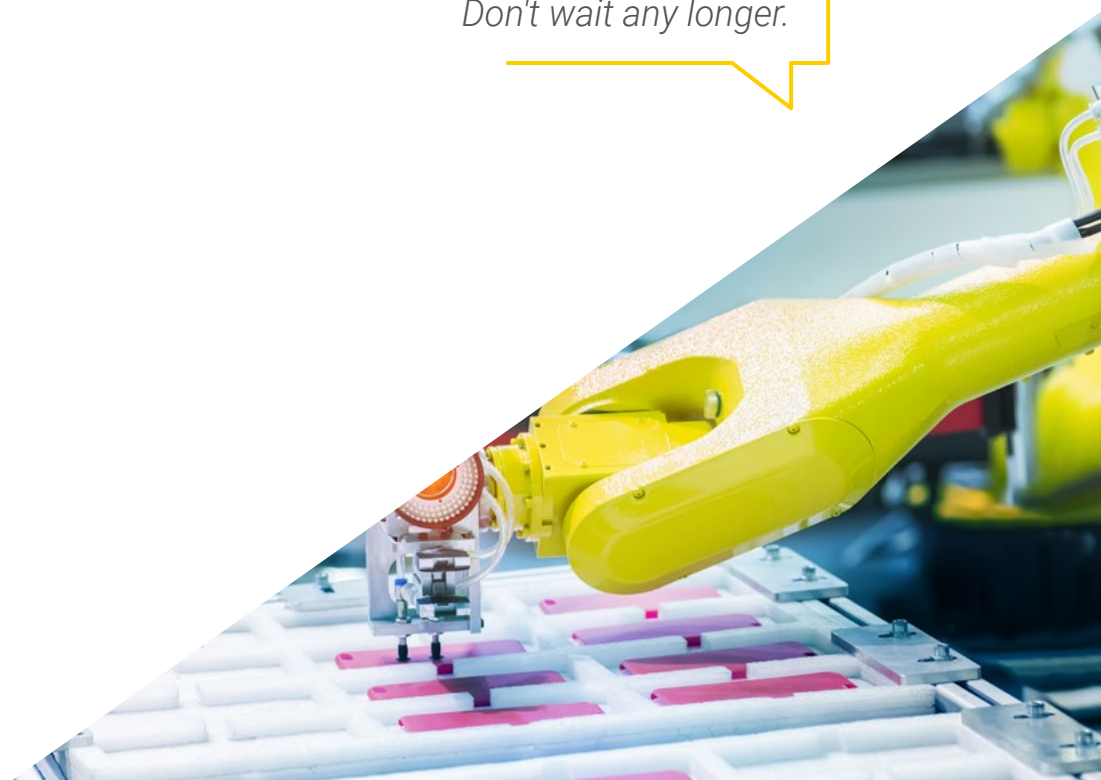
The program's teaching staff includes professionals in the sector who contribute their work experience to this educational as well as renowned specialists from leading societies and prestigious universities.

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 student, by acquiring knowledge through the program, will obtain a global and up-to-date vision in the fundamental aspects of Neural Networks and Deep Learning Training, allowing them to achieve the established objectives. In this way, the student will develop comprehensive skills in an essential, versatile and constantly growing field of engineering, which will lead them to achieve excellence in a booming sector. In order to ensure student satisfaction, TECH has defined general and specific objectives that will serve as guide the student towards success.

Develop your full potential and achieve your professional goals through the in-depth mastery of Adam and RMSprop optimizers that you will develop with this program"

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

You will achieve your goals thanks to the efficient tools you will acquire in this TECH Postgraduate Diploma"

Specific Objectives

Module 1. Deep Neural Network Training
- Analyze the 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 obtain the best results

Module 2. Model Customization and Training with TensorFlow
- Determine how to use the TensorFlow API to define custom functions and graphs
- Lay the foundations for using the tf.data API to load and pre-process data efficiently
- Discuss the TensorFlow Datasets project and how it can be used to facilitate access to preprocessed datasets

Module 3. Deep Computer Vision with Convolutional Neural Networks
- Explore and understand how convolutional and clustering layers work for Visual Cortex architecture
- Develop CNN architectures with Keras
- Use pre-trained Keras models for object classification, localization, detection and tracking, as well as semantic segmentation

03

Course Management

TECH has designed this Postgraduate Diploma focused on Neural Networks and Deep Learning Training, aimed at Engineering professionals. This program has a highly specialized teaching team with experience in the discipline, which guarantees quality teaching. Students enrolled in this program will be able to update and take advantage of the experience and practice of the teaching team to face the current challenges in the field of Deep Learning.

Succeed with the guidance of the best and acquire the knowledge and skills you need to embark on Neural Networks and Deep Learning Training"

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 engineer will be able to achieve advanced and efficient learning thanks to the Relearning method, which is based on the constant reiteration of key concepts throughout the academic course. In this way, it will not be necessary to invest large amounts of time in studying, since the method allows a quick and effective assimilation of the subject matter. Therefore, the engineer will be able to delve into a complete and exhaustive subject matter on the transfer of learning training or to delve into the use of graphics for the models training.
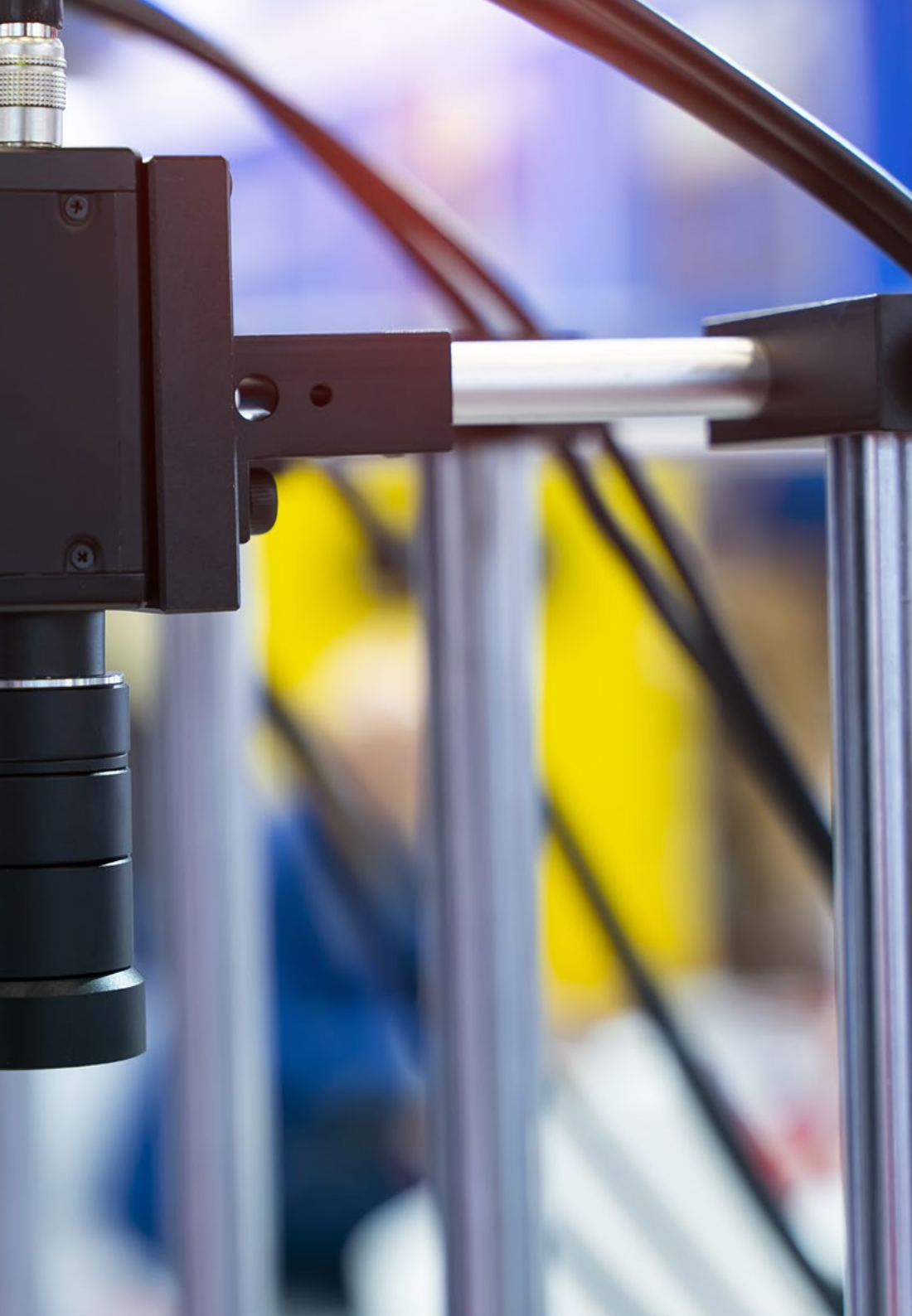
Expert curriculum and quality content are the key to your learning success"

Module 1. Deep Neural Network Training

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 Pretrained 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 Scheduling
- 1.4.1. Automatic Learning Rate Control
- 1.4.2. Learning Cycles
- 1.4.3. Smoothing Terms

1.5. Over-Adjustment
- 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 Assessment Metrics and 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

Module 2. Model Customization and Training with TensorFlow

2.5. Data Loading and Pre-processing with TensorFlow

    2.5.1. Loading Data Sets with TensorFlow

    2.5.2. Data Pre-processing with TensorFlow

    2.5.3. Using TensorFlow Tools for Data Manipulation

2.6. The tf.data API

    2.6.1. Using the tf.data API for Data Processing

    2.6.2. Construction of Data Flows with tf.data

    2.6.3. Using the tf.data API for Models Training

2.7. The TFRecord Format

    2.7.1. Using the TFRecord API for Data Serialization

    2.7.2. Loading TFRecord Files with TensorFlow

    2.7.3. Using TFRecord Files for Models Training

2.8. Keras Pre-processing Layers

    2.8.1. Using the Keras Pre-processing API

    2.8.2. Construction of Pre-processing Pipelined with Keras

    2.8.3. Using the Keras Pre-processing API for Models Training

2.9. The TensorFlow Datasets Project

    2.9.1. Using TensorFlow Datasets for Data Loading

    2.9.2. Data Pre-processing with TensorFlow Datasets

    2.9.3. Using TensorFlow Datasets for Models Training

2.10. Construction of a Deep Learning Application with TensorFlow. Practical Application

    2.10.1. Construction of a Deep Learning Application with TensorFlow

    2.10.2. Model Training with TensorFlow

    2.10.3. Use of the Application for Results Forecasting

Module 3. Deep Computer Vision with Convolutional Neural Networks

3.1. Visual Cortex Architecture

    3.1.1. Functions of the Visual Cortex

    3.1.2. Computational Vision Theory

    3.1.3. Image Processing Models

3.2. Convolutional Layers

    3.2.1. Reuse of Weights in Convolution

    3.2.2. 2D Convolution

    3.2.3. Activation Functions

3.3. Grouping Layers and Implementation of Grouping Layers with Keras

    3.3.1. Pooling and Striding

    3.3.2. Flattening

    3.3.3. Pooling Types

3.4. CNN Architecture

    3.4.1. VGG Architecture

    3.4.2. AlexNet Architecture

    3.4.3. ResNet Architecture

3.5. Implementation of a ResNet-34 CNN using Keras

    3.5.1. Weight Initialization

    3.5.2. Input Layer Definition

    3.5.3. Definition of the Output

3.6. Use of Pre-trained Keras Models

    3.6.1. Characteristics of Pre-trained Models

    3.6.2. Uses of Pre-trained Models

    3.6.3. Advantages of Pre-trained Models

A program designed to make you an expert in Neural Networks and Deep Learning Training"
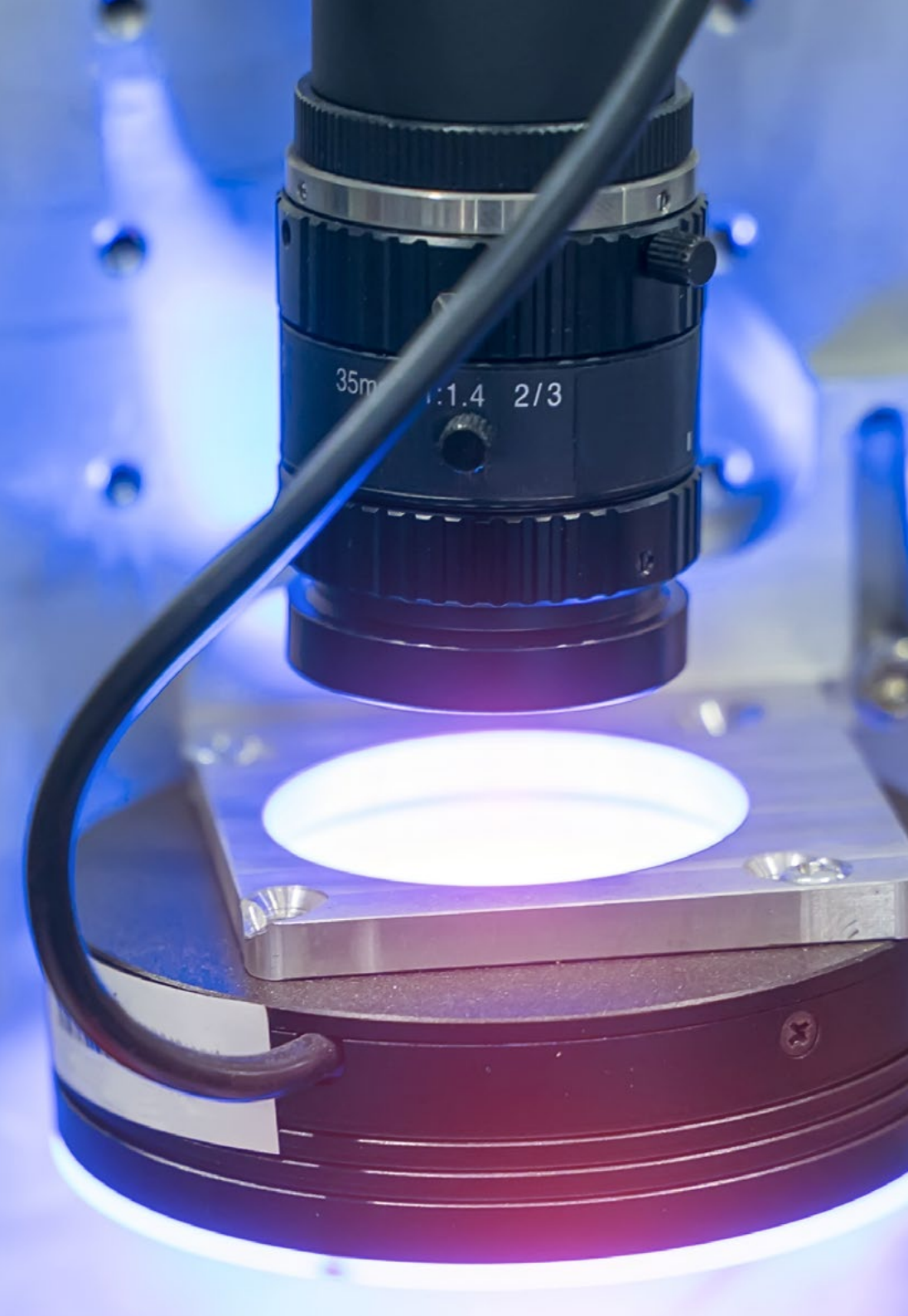
05
Methodology

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.

01 learning from evidence

02 relearning from evidence

03 testing

04 learning from an expert

05 neurocognitive context dependent learning

06 Von-Restorff effect

07 case based learning through storytelling

08 competencies testing (retesting)

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.

30%

10%

8%

20%

25%

4%

3%

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 Diploma in Neural Networks and Deep Learning Training guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma 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 Diploma in Neural Networks and Deep Learning Training** 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 Diploma** issued by TECH Technological University via tracked delivery*

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

Title: **Postgraduate Diploma in Neural Networks and Deep Learning Training**

Official Nº of Hours: **450 h.**

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Awards the following
CERTIFICATE
to

Mr./Ms. _____, with identification number _____.
For having passed and accredited the following program

POSTGRADUATE DIPLOMA
in
Neural Networks and Deep Learning Training

This is a qualification awarded by this University, equivalent to 450 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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