Postgraduate Certificate
Machine Learning

tech technological university

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Postgraduate Certificate

Machine Learning

Course Modality: **Online**
Duration: **6 weeks**
Certificate: **TECH Technological University**
Official N° of Hours: **150 h.**
Website: www.techtitute.com/in/information-technology/postgraduate-certificate/machine-learning

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01

Introduction

Artificial intelligence is here to stay. In the coming years, it will play a fundamental role in the entire industrial fabric and will bring about a worldwide revolution. In this program, we will delve into an important part of Artificial Intelligence: machine learning. The objective of this program is to develop the entire data mining process with a focus on the machine learning process.

A comprehensive program for engineering professionals, which will allow them to compete among the most prepared in the sector"

This high-level program discusses the different types of learning that exist (supervised, unsupervised, etc.) and examines the different algorithms used for each type of learning depending on the objective we have in our data mining process (classification, regression, clustering, etc.).

The last units focus on a particular machine learning method; namely, neural networks and their evolution to deep learning and their implementation in real applications.

In view of this situation, this Postgraduate Certificate in Machine Learning is offered as a comprehensive, educational program, including the most cutting-edge technologies demanded in the business world. Therefore, the combination of subjects makes this Postgraduate Certificate a cutting-edge specialization course oriented toward professionals who seek to learn the most up-to-date and ubiquitous technology, or a higher level of knowledge of them.

The main objective is to enable students to apply the knowledge acquired in this course to the real world, in a work environment that reproduces the conditions that may be encountered in the future, in a rigorous and realistic manner.

As it is a 100% online program, students will not have to give up personal or professional obligations. Upon completion of the program, students will have updated their knowledge and will be in possession of an incredibly prestigious qualification that will allow them to advance both personally and professionally.

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

- Practical cases presented by experts in Machine Learning
- The graphic, schematic, and practical contents with which they are created, provide scientific and 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

With the best developed distance learning systems, this Postgraduate Certificate will allow you to learn in a contextual way, learning the practical skills that you need"

Deepen your knowledge in the field of computing and computer structure by including the most advanced aspects of this field of work in your skills"

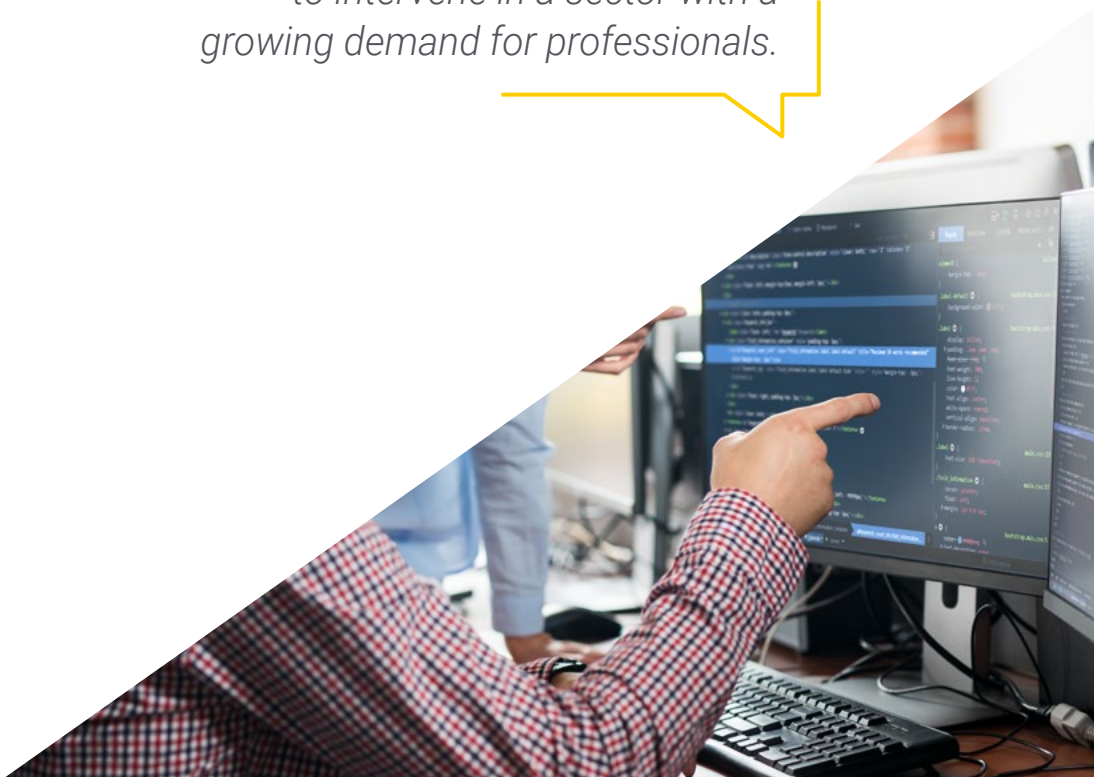
Comprehensive yet focused; this program will provide you with the specific knowledge IT professionals need to compete among the best in the sector.

An intensive professional growth program that will allow you to intervene in a sector with a growing demand for professionals.

The program's teaching staff includes professionals from the sector who contribute their work experience to this 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 student will be assisted by an innovative interactive video system created by renowned and experienced experts.



02

Objectives

The objective of this program is to prepare professionals in Machine Learning, with the necessary knowledge and skills to carry out their activity, using the most advanced protocols and techniques of the moment. Through a totally adaptable work approach, this Postgraduate Certificate will progressively lead students to acquire the skills that will propel them to a higher professional level. A unique program designed by professionals with extensive experience in the field.

All the subjects and areas of knowledge have been compiled in a complete and up-to-date syllabus, in order to bring students to the highest theoretical and practical level"

General Objectives

- Examine the data mining process
- Understand types of machine learning
- Analyze appropriate machine learning techniques for each type of problem
- Examine the current paradigms of Artificial Intelligence

In this Postgraduate Certificate, you will be able to balance the efficiency of the most advanced learning methods with the flexibility of a program created to adapt to your possibilities of dedication, without losing quality"

Specific Objectives

- Evaluate the skills acquired in the process of moving from information to knowledge
- Develop the different types of machine learning
- Analyze the metrics and validation methods of different machine learning algorithms
- Compile the different implementations of the various machine learning methods
- Determine the probabilistic reasoning models
- Examine the potential of deep learning
- Demonstrate knowledge of different machine learning algorithms

03

Course Management

In its commitment to offer elite education for all, TECH counts on renowned professionals so students acquire a profound knowledge in Machine Learning. This Postgraduate Certificate has a highly qualified and experienced team in the field, which will offer the best possible resources for students in developing their skills during the program. In this way, students have the guarantees they need to specialize at an international level in a booming sector that will catapult them to professional success.

Succeed with the best and acquire the knowledge and skills you need to get into the Machine Learning industry"

Management

Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO en Corporate Technologies in Corporate Technologies
- CTO in AI Shephers GmbH
- Director of Design and Development at DocPath Document Solutions
- Team Leader in DocPath Document Solutions
- Doctorate in Psychology from the University of Castilla La Mancha
- PhD in Economics, Business and Finance from the Camilo José Cela University
- Master's Degree in Advanced Information Technologies from the University of Castilla la Mancha
- Master MBA+E (Master's Degree in Business Administration and Organisational Engineering) from the University of Castilla La Mancha
- Associate lecturer, teaching undergraduate and master's degrees in Computer Engineering at the University of Castilla la Mancha
- Professor of the Master in Big Data and Data Science at the International University of Valencia
- Professor of the Master's in Industry 4.0 and of the Master's in Industrial Design and Development Member of the SMILe Research Group of the University of Castilla la Mancha

Professors

Mr. Montoro Montarroso, Andrés

- Researcher in the SMILe Group at the University of Castilla-La Mancha
- Data Scientist at Prometeus Global Solutions
- Graduate in Computer Engineering from the University of Castilla La Mancha
- Master's Degree in Data Science and Computer Engineering from the University of Granada
- Guest lecturer in the subject of Knowledge-Based Systems at the Escuela Superior de Informática de Ciudad Real, Giving the Lecture "Advanced Artificial Intelligence Techniques: Search and Analysis of Potential Social Media Radicals"
- Guest lecturer in the subject of Data Mining at the Escuela Superior de Informática de Ciudad Real giving the lecture: "Applications of Natural Language Processing: Fuzzy Logic to the analysis of messages in social networks"
- Speaker at the Seminar on Corruption Prevention in Public Administrations and Artificial Intelligence. Faculty of Law and Social Sciences of Toledo. Conference entitled "Artificial Intelligence Techniques". Speaker at the first International Seminar on Administrative Law and Artificial Intelligence (DAIA). Organised by Centro de Estudios Europeos Luis Ortega Álvarez and Institut de Recerca TransJus. Conference entitled "Sentiment Analysis for the prevention of hate speech on social media"

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Structure and Content

The syllabus has been designed based on educational efficiency, carefully selecting the contents to offer a comprehensive course, which includes all the fields of study that are essential to achieve real knowledge of the subject. Including the latest updates and aspects of the field. Therefore, a curriculum has been established with modules that offer a broad perspective of Machine Learning. From first module, students will see their knowledge expanding, which will enable them to develop professionally, knowing that they can count on the support of a team of experts.

A high-quality Postgraduate Certificate that will allow students to advance quickly and steadily in knowledge acquisition, with the scientific rigor of a global quality teaching"

Module 1. Machine Learning

1.1. Knowledge in Databases
- 1.1.1. Data Pre-Processing
- 1.1.2. Analysis
- 1.1.3. Interpretation and Evaluation of the Results

1.2. Machine Learning:
- 1.2.1. Supervised and Unsupervised Learning
- 1.2.2. Reinforcement Learning
- 1.2.3. Semi-Supervised Learning: Other Learning Models

1.3. Classification
- 1.3.1. Decision Trees and Rule-Based Learning.
- 1.3.2. Support Vector Machines (SVM) and K-Nearest Neighbour (KNN) Algorithms.
- 1.3.3. Metrics for Sorting Algorithms

1.4. Regression
- 1.4.1. Linear and Logistic Regression
- 1.4.2. Non-Linear Regression Models.
- 1.4.3. Time Series Analysis
- 1.4.4. Metrics for Regression Algorithms

1.5. Clustering
- 1.5.1. Hierarchical Grouping
- 1.5.2. Partitional Grouping
- 1.5.3. Metrics for *Clustering* Algorithms

1.6. Association Rules
- 1.6.1. Measures of Interest
- 1.6.2. Rule Extraction Methods
- 1.6.3. Metrics for Association Rule Algorithms

1.7. Multiclassifiers
- 1.7.1. "Bootstrap Aggregation" or "Bagging"
- 1.7.2. "Random "Forests" Algorithm
- 1.7.3. "Boosting" Algorithm

1.8. Probabilistic Reasoning Models
- 1.8.1. Probabilistic Reasoning
- 1.8.2. Bayesian Networks or Belief Networks
- 1.8.3. "Hidden Markov Models"

1.9. Multilayer Perceptron
- 1.9.1. Neural Networks
- 1.9.2. Machine Learning with Neural Networks
- 1.9.3. Gradient Descent, Backpropagation and Activation Functions.
- 1.9.4. Implementation of an Artificial Neural Network

1.10. Deep Learning
- 1.10.1. Deep Neural Networks: Introduction
- 1.10.2. Convolutional Networks
- 1.10.3. Sequence Modelling
- 1.10.4. Tensorflow and Pytorch

A unique, key, and decisive educational experience to boost your professional development"

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

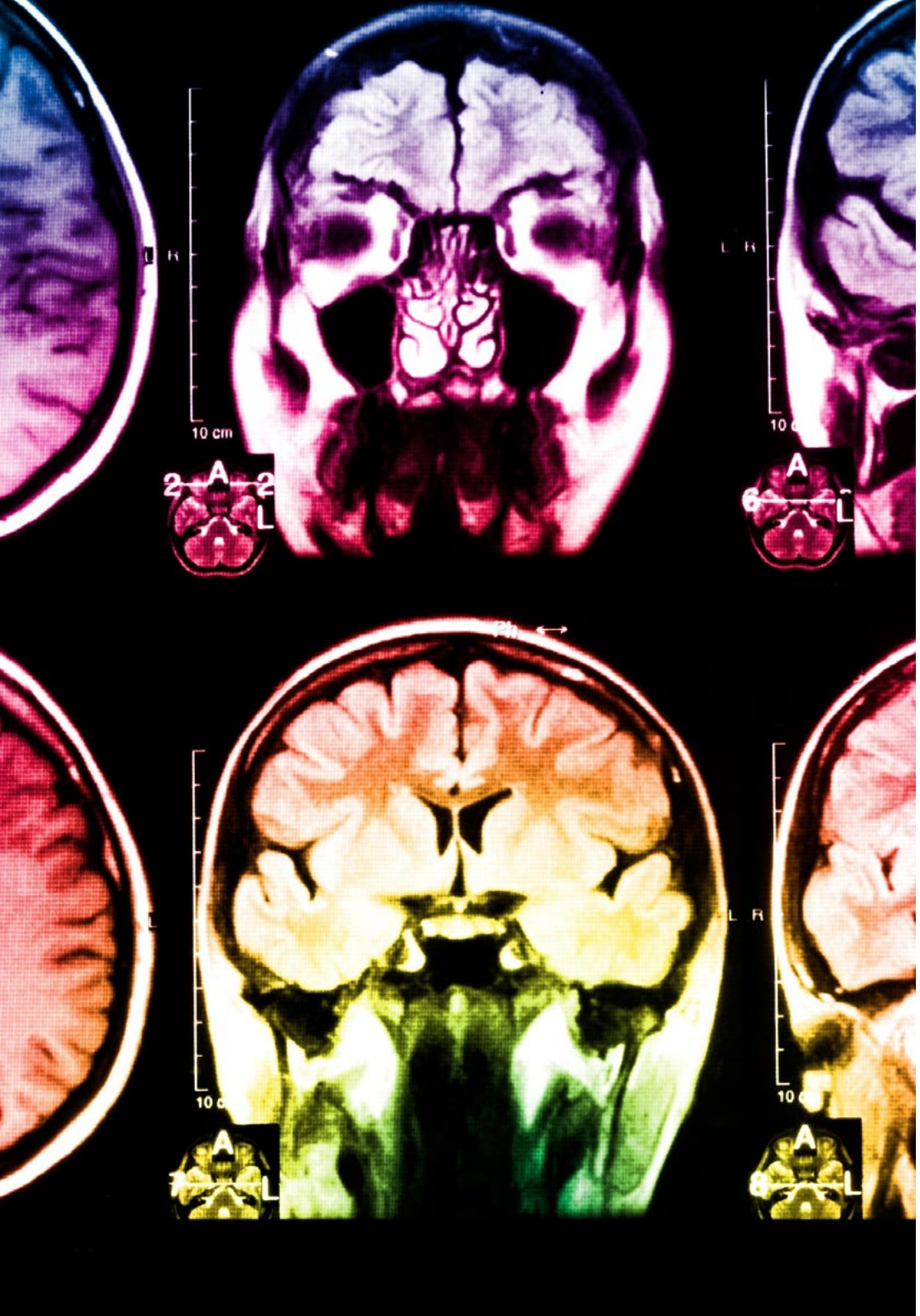
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

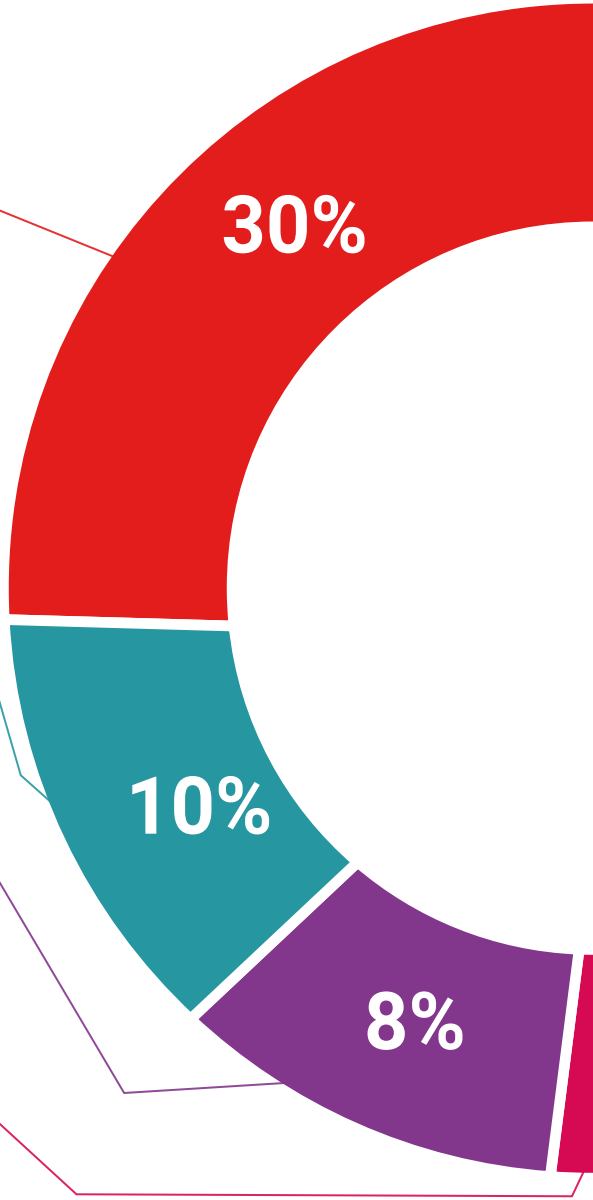
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

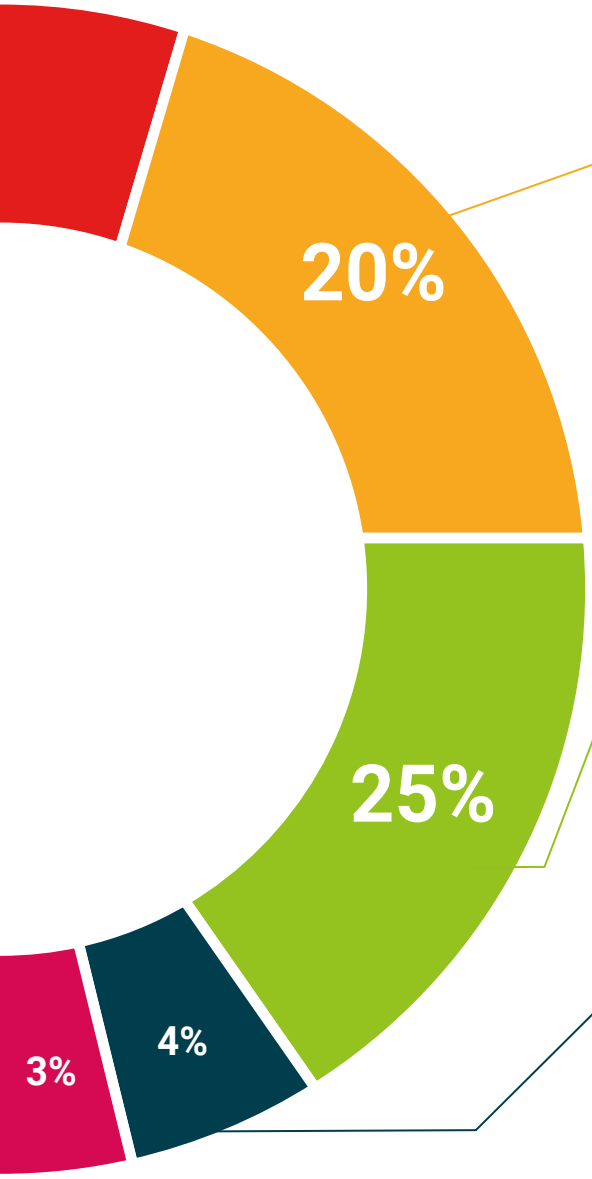
Practising Skills and Abilities

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

This Postgraduate Certificate in Machine 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 Machine Learning** contains the most complete and up-to-date scientific 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 Machine Learning**

Official Nº of Hours: **150 h.**


tech technological university

Awards the following

CERTIFICATE

to

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

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Machine 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

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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Certificate: **TECH Technological University**

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