Postgraduate Certificate
Autoencoders, GANs, and Diffusion Models in Deep Learning

tech *global university*

![tech global university logo]

Postgraduate Certificate
Autoencoders, GANs, and Diffusion Models 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/informatica/curso-universitario/autoencoders-gans-diffusion-models-deep-learning**

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Introduction

Acquiring new knowledge about Autoencoders, GANs and Diffusion Models is essential for any professional interested in the field of Deep Learning. since these techniques allow the generation of high quality images, videos and texts and the manipulation of data in an effective way. For this reason, TECH has designed a degree that allows the student to increase their knowledge to the maximum aspects such as Efficient Data Representation, the Use of Test Data, Neural Networks Test Data, Deep Neural Networks or the Application of Filters, among others. All this, thanks to a 100% online modality and with the most dynamic and practical multimedia materials in the academic market.

" *Power your knowledge about Autoencoders, Gans, and Diffusion Models in Deep Learning, thanks to the best online university in the world according to Forbes"*

Gaining new knowledge about Autoencoders, GANs and Diffusion Models is essential for any professional interested in the field of Deep Learning. These techniques have applications in a wide range of fields, from the creative industry to research in biology and physics, making them essential tools for any professional wishing to advance in the field.

For this reason, TECH has designed a Postgraduate Certificate in Autoencoders, Gans, and Diffusion Models in Deep Learning with which it seeks to provide students with the necessary skills to be able to perform their work as specialists, with the highest possible efficiency and quality. Thus, throughout this program, aspects such as the Construction of Coding Architectures, Pattern Recognition or the Use of Adversarial Networks will be addressed.

All this, through a convenient 100% online mode that allows students to organize their schedules and their studies, combining them with their other daily work and interests. day to day. In addition, 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 goals quickly and efficiently.

This **Postgraduate Certificate in Autoencoders, GANs, and Diffusion Models in Deep Learning** contains the most complete and updated educational program on the market. Its most outstanding features are:

- The development of case studies presented by experts in Autoencoders, Gans, and Deep Learning Diffusion Models
- The graphic, schematic and practical contents of the program provide Sports 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 Real Data Usage and Image Generation in Deep Learning 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 innovative materials"*

Get in advantage of all the content on Adversarial Networks Patterns and Assessment from your Tablet, mobile or computer.

Delve in the use of the Application for Predicting Results from the comfort of your home and at any time of the day.

The program's teaching staff includes professionals from the sector who contribute their work experience to this training 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.

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Objectives

The final objective of this Postgraduate Certificate in Autoencoders, GANs, and Diffusion Models 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 perform their 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.All this, thanks to TECH and a 100% online modality that gives total freedom of organization and schedules to the student.

"
Delve into all the essentials of Autoencoders, GANs and Diffusion Models in Deep Learning, from the comfort of your your home or work office"

General Objectives

- 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
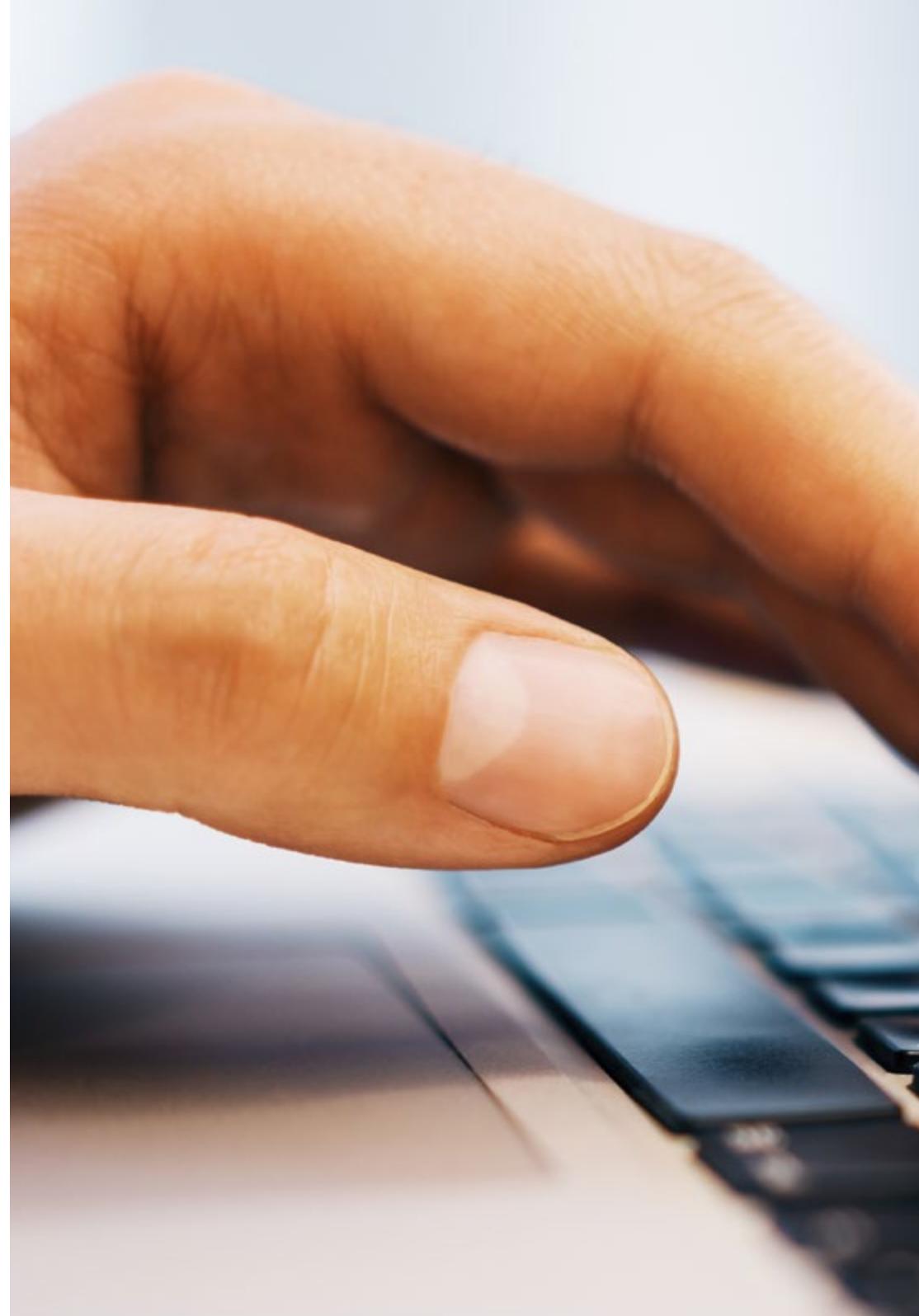
Specific Objectives

◆ Implementing PCA techniques with an incomplete linear autoencoder

◆ Use convolutional and variational autoencoders to improve the performance of autoencoders

◆ Analyze how GANs and diffusion models can generate new and realistic images
new and realistic images

Exceed your highest expectations and achieve the prestigious position you've always wanted, thanks to a unique program"

Course Management

In the quest 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 complete materials. Thus, you will learn from the best the keys to your professional development in a field that adapts to new technologies and the latest market advances.

```
e.keyCode == 13) {
stopImmediatePropagation();
preventDefault();
lf.search();
lf.deactivate();
turn;

/down
e.keyCode == 38 || e.keyCode == 40) {
preventDefault();
stopImmediatePropagation();
 (e.keyCode == 38) { // up
// show previous search query
if (hist.currentIndex == hist.history.
   hist.temporaryQuery = input.val
   // skip previous search if
   if (hist.temporaryQuery
       hist.currentIndex
   }
}
```

" *The most experienced faculty will provide you with the latest advances in Pattern Recognition and Data Distribution Modeling, preparing you to meet 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
- Fund Auditor at Creatividad y Tecnología and PricewaterhouseCoopers
- Lecturer at EAE Business School
- Degree in Economics from the Technological Institute of Santo Domingo INTEC
- Professional Master's Degree in Data Science at Centro Universitario de Tecnología y Arte
- Master MBA in International Relations and Business at CEF (Centro de Estudios Financieros)
- Postgraduate Certificate in Corporate Finance from the Santo Domingo Institute of Technology

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
- Master Big Data and Analytics /Project Management (Minor) at EAE Business
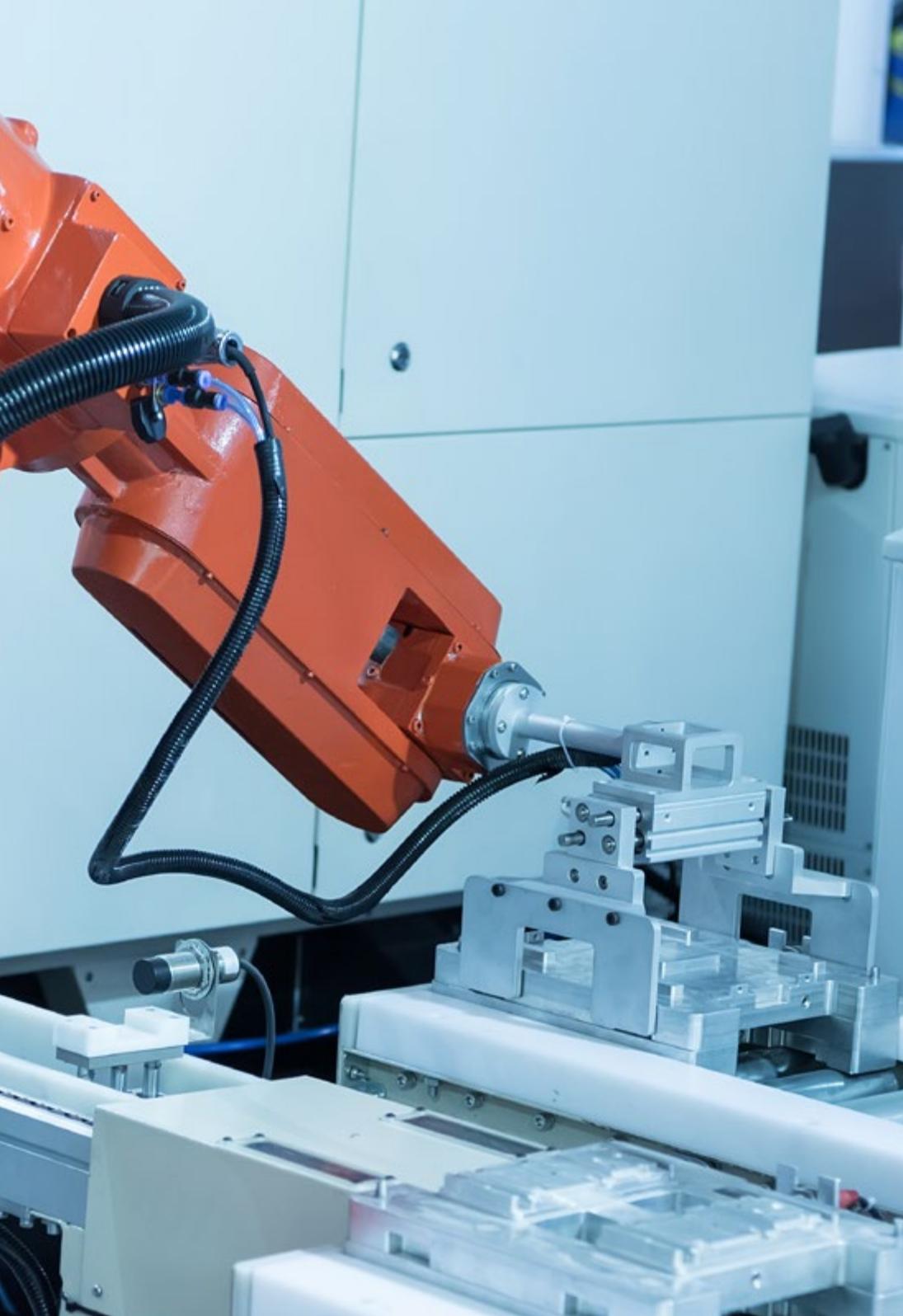
Mr. Villar Valor, Javier

- Director and founding partner Impulsados
- Head of Operations at 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 the company Groupama Seguros
- Responsible for Lean Six Sigma methodology at Honeywell
- Director of Quality and Purchasing at SP & PO
- Lecturer at the European Business School

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Structure and Content

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

Enroll to acquire new knowledge with practical and dynamic materials that are a unique opportunity in the market"

Module 1. Autoencoders, Gans, and Diffusion Models

1.1.   Representation of efficient Data
    1.1.1.   Dimensionality Reduction
    1.1.2.   Deep Learning
    1.1.3.   Compact representations

1.2.   PCA realization with an incomplete linear automatic encoder
    1.2.1.   Training process
    1.2.2.   Implementation in Python
    1.2.3.   Use of test data

1.3.   Stacked automatic encoders
    1.3.1.   Deep Neural Networks
    1.3.2.   Construction of coding architectures
    1.3.3.   Use of regularization

1.4.   Convolutional autoencoders
    1.4.1.   Design of convolutional models
    1.4.2.   Convolutional model training
    1.4.3.   Results Evaluation

1.5.   Automatic encoder denoising
    1.5.1.   Application of filters
    1.5.2.   Design of coding models
    1.5.3.   Use of regularization techniques

1.6.   Sparse automatic encoders
    1.6.1.   Increasing coding efficiency
    1.6.2.   Minimizing the number of parameters
    1.6.3.   Using regularization techniques

1.7.   Variational automatic encoders
    1.7.1.   Use of variational optimization
    1.7.2.   Unsupervised deep learning
    1.7.3.   Deep latent representations

Thanks to TECH's pedagogical methodology, you will be able to acquire new knowledge in a complete way and in a short period of time"

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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.

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:
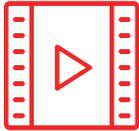
Study Material

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%
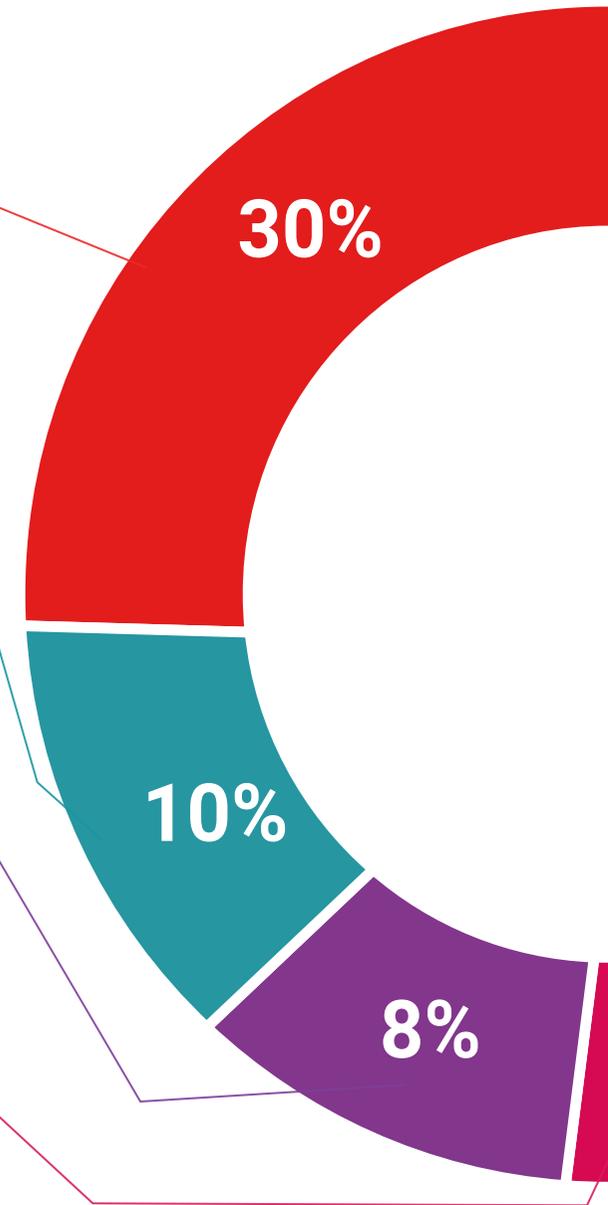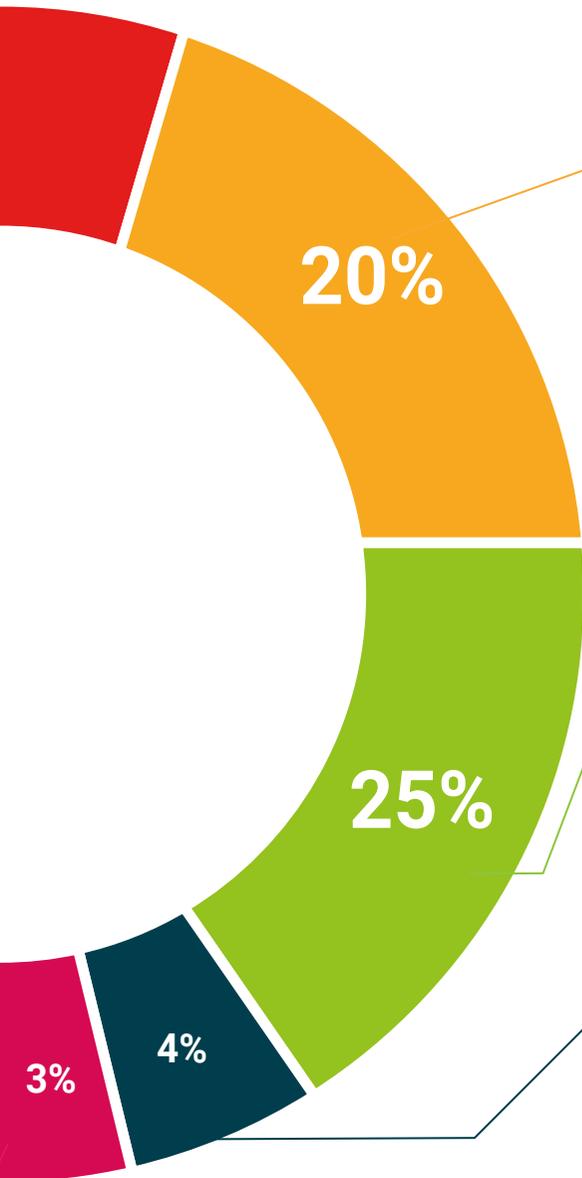
Case Studies

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.

Certificate

The Postgraduate Certificate in Autoencoders, GANs, and Diffusion Models in Deep Learning guarantees students, in addition to the most rigorous and up-to-date education, access to a 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 Autoencoders, GANs, and Diffusion Models 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.
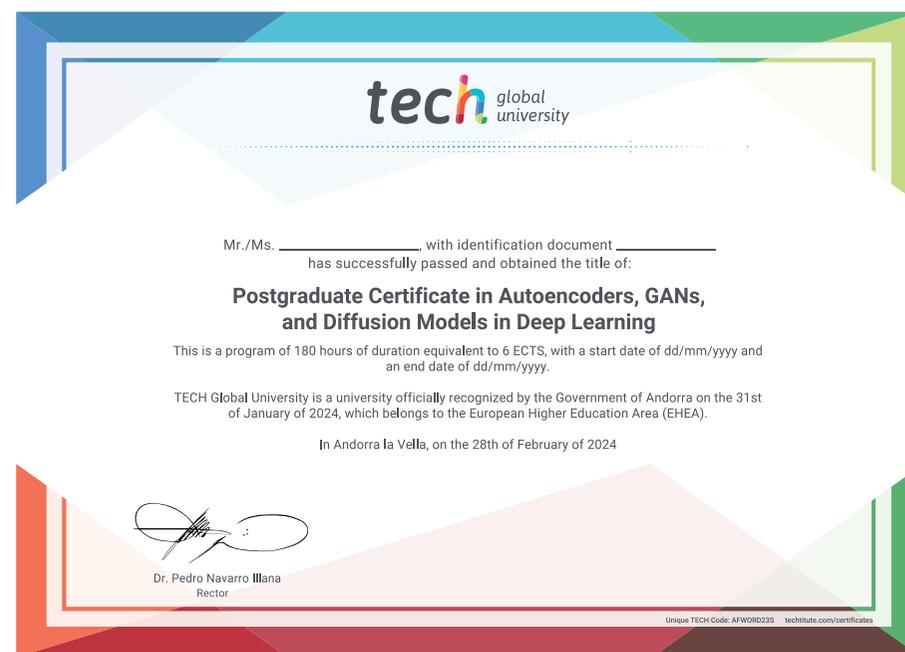
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Autoencoders, GANs, and Diffusion Models in Deep Learning**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**

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tech global university

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

Postgraduate Certificate in Autoencoders, GANs, and Diffusion Models 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

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*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.

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