



Postgraduate Diploma
Simulation, Optimization
and Preservation of Spaces
Using Artificial Intelligence

» Modality: online

» Duration: 6 months

» Certificate: TECH Global University

» Accreditation: 18 ECTS

» Schedule: at your own pace

» Exams: online

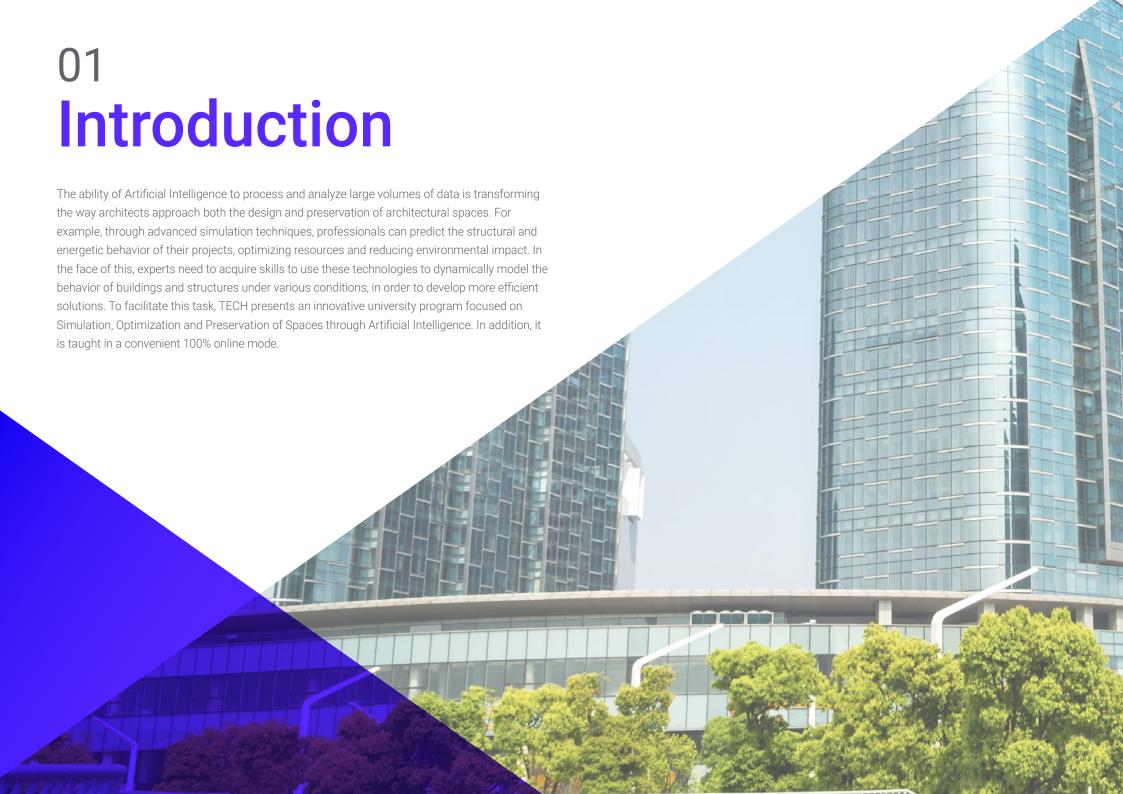
Website: www.techtitute.com/us/artificial-intelligence/postgraduate-diploma/postgraduate-diploma-simulation-optimization-preservation-spaces-using-artificial-intelligence

Index

 $\begin{array}{c|c} 01 & 02 \\ \hline & \\ \hline \\ 03 & 04 & 05 \\ \hline \\ \hline \\ Course Management & Structure and Content \\ \hline \\ \\ \hline \\ p. 12 & p. 16 \\ \hline \end{array}$

06 Certificate

p. 30



tech 06 | Introduction

A new study conducted by the World Economic Forum reveals that the implementation of Artificial Intelligence-based simulation technologies in architecture can reduce the costs associated with the conservation of historic buildings by up to 40% and improve the operational efficiency of urban projects. Therefore, professionals need to skillfully handle these tools both to design and preserve built spaces, as well as to protect built environments in the face of various environmental and human challenges.

In this scenario, TECH is launching a pioneering program in Simulation, Optimization and Preservation of Spaces through Artificial Intelligence. Designed by recognized experts in this field, the academic itinerary will delve into aspects ranging from the most sophisticated techniques to optimize the energy efficiency of infrastructures or bioclimatic design strategies to the use of sustainable materials. The curriculum will also delve into the use of AnyLogic to model the dynamics of space use in urban and architectural environments. In addition, the program will include a disruptive module to delve into the future perspectives on emerging technologies of Artificial Intelligence. Thanks to this, graduates will obtain advanced competencies to handle Artificial Intelligence tools to improve the efficiency of architectural projects and maximize their sustainability considerably.

Moreover, the program's methodology is based on TECH's Relearning method, which guarantees the exhaustive assimilation of complex concepts. It is worth noting that the only thing architects need to access this Virtual Campus is a device with Internet access, where they will find a variety of multimedia resources (such as explanatory videos, interactive summaries or specialized readings). Undoubtedly, an immersive experience that will allow experts to experience a significant leap in quality in their careers.

This Postgraduate Diploma in Simulation, Optimization and Preservation of Spaces Using Artificial Intelligence contains the most complete and up-to-date program on the market. The most important features include:

- Development of practical cases presented by experts in Artificial Intelligence
- 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



You will expand your knowledge by analyzing real cases and solving complex situations in simulated learning environments"



Are you looking to use stateof-the-art architectural simulation software to anticipate the performance of structures under different scenarios? Achieve it with this program in just 6 months"

The program's teaching staff includes professionals from the sector who contribute their work experience to this specializing 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 course. For this purpose, students will be assisted by an innovative interactive video system created by renowned experts in the field of educational coaching with extensive experience.

You will delve into the latest trends in heritage preservation and restoration of historic spaces.

You will learn at your own pace and without time constraints thanks to the revolutionary Relearning system that TECH puts at your disposal.





tech 10 | Objectives



General Objectives

- Understand the theoretical foundations of Artificial Intelligence
- Study the different types of data and understand the data lifecycle
- Evaluate the crucial role of data in the development and implementation of Al solutions
- Delve into algorithms and complexity to solve specific problems
- Explore the theoretical basis of neural networks for Deep Learning development
- Explore bio-inspired computing and its relevance in the development of intelligent systems
- Manage advanced Artificial Intelligence tools to optimize architectural processes such as parametric design
- Apply Generative Modeling techniques to maximize efficiency in infrastructure planning and improve the energy performance of buildings



You will have access to a variety of audiovisual support materials such as explanatory videos, interactive summaries and specialized readings"





Specific Objectives

Module 1. Space Optimization and Energy Efficiency with AI

- Implement bioclimatic design strategies and Al-assisted technologies to improve the energy efficiency of architectural initiatives
- Acquire skills in the use of simulation tools to improve energy efficiency in urban planning and architecture

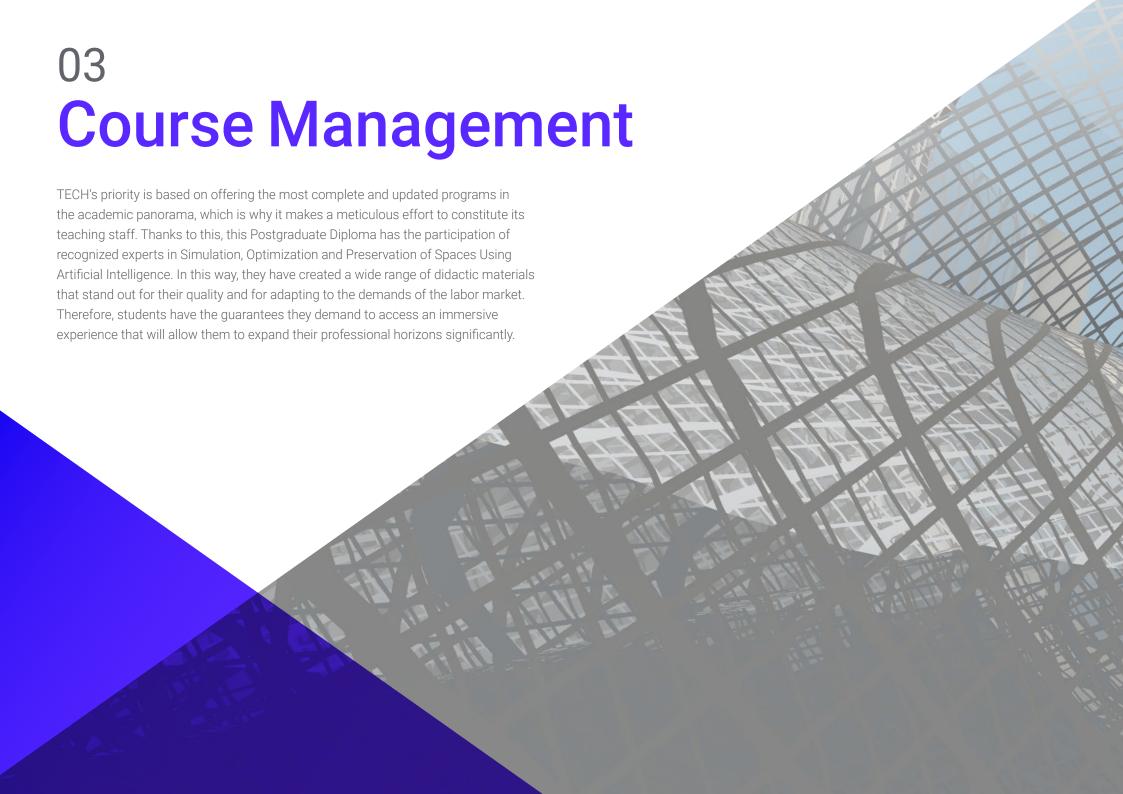
Module 2. Simulation and Predictive Modeling with Al

- Employ programs such as TensorFlow, MATLAB or ANSYS to perform simulations that anticipate structural and environmental behavior in architectural projects
- Implement predictive modeling techniques to optimize urban planning and space management, using AI to improve accuracy and efficiency in strategic decision making

Module 3. Heritage Preservation and Restoration with AI

- Master the use of photogrammetry and laser scanning for both documentation and conservation of architectural heritage
- Develop skills to manage cultural heritage preservation projects, considering the ethical implications and responsible use of Al







tech 14 | Course Management

Management



Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO at Korporate Technologies
- CTO at AI Shepherds GmbH
- Consultant and Strategic Business Advisor at Alliance Medical
- Director of Design and Development at DocPath
- PhD in Psychology from the University of Castilla La Mancha
- PhD in Economics, Business and Finance from the Camilo José Cela University
- PhD in Psychology from University of Castilla La Mancha
- Master's Degree in Executive MBA from the Isabel I University
- Master's Degree in Sales and Marketing Management, Isabel I University
- Expert Master's Degree in Big Data by Hadoop Training
- Master's Degree in Advanced Information Technologies from the University of Castilla La Mancha
- Member of: SMILE Research Group





Professors

Mr. Peralta Vide, Javier

- Technological Coordinator and Content Developer at Aranzadi Laley Formación
- Collaborator at CanalCreativo
- Collaborator at Dentsu
- Collaborator at Ai2
- Collaborator at BoaMistura
- Freelance Architect at Editorial Nivola, Biogen Technologies, Releaf, etc.
- Specialization by Revit Architecture Metropa School
- Graduate in Architecture and Urbanism from the University of Alcalá



Take the opportunity to learn about the latest advances in this field in order to apply it to your daily practice"

Structure and Content

This university program has been designed by recognized experts in Simulation, Optimization and Preservation of Spaces Using Artificial Intelligence. The curriculum will delve into issues such as the application of SketchUp to obtain detailed energy analysis, sustainable materials assisted with Cityzenit or intelligent energy management with Google DeepMind's Energy. In addition, the syllabus will provide graduates with the most advanced simulation techniques with MATLAB, which will allow them to model the energy consumption of a building under different climatic conditions. In addition, the didactic materials will analyze how Artificial Intelligence can be used to prevent the deterioration of historic structures.



tech 18 | Structure and Content

Module 1. Space Optimization and Energy Efficiency with Al

- 1.1. Optimizing Spaces with Autodesk Revit and Al
 - 1.1.1. Using Autodesk Revit and Al for Spatial Optimization and Energy Efficiency
 - 1.1.2. Advanced Techniques for Improving Energy Efficiency in Architectural Designs
 - 1.1.3. Case Studies of Successful Projects Combining Autodesk Revit with Al
- 1.2. Analysis of Energy Efficiency Metrics and Data with SketchUp and Trimble
 - 1.2.1. Applying SketchUp and Trimble Tools for Detailed Energy Analysis
 - 1.2.2. Developing Energy Efficiency Metrics Using Al
 - 1.2.3. Strategies for Setting Energy Efficiency Goals for Architectural Projects
- 1.3. Bioclimatic Design and Al-Optimized Solar Orientation
 - 1.3.1. Al-Assisted Bioclimatic Design Strategies for Maximizing Energy Efficiency
 - 1.3.2. Examples of Buildings Using Al-Guided Design to Optimize Thermal Comfort
 - 1.3.3. Practical Applications of AI in Solar Orientation and Passive Design
- 1.4. Al-Assisted Sustainable Materials and Technologies with Cityzenit
 - 1.4.1. Innovation in Sustainable Materials Supported by Al Analysis
 - 1.4.2. Using AI to Develop and Apply Recycled and Low-Environmental-Impact Materials
 - 1.4.3. Study of Projects Using Renewable Energy Systems Integrated with Al
- 1.5. Urban Planning and Energy Efficiency with WattPredictor and Al
 - 1.5.1. Al Strategies for Energy Efficiency in Urban Design
 - 1.5.2. Implementing WattPredictor to Optimize Energy Use in Public Spaces
 - 1.5.3. Successful Cases of Cities Using AI to Improve Urban Sustainability
- 1.6. Intelligent Energy Management with Google DeepMind's Energy
 - 1.6.1. Applications of DeepMind Technologies for Energy Management
 - 1.6.2. Implementing AI for Energy Consumption Optimization
 - 1.6.3. Assessment of Cases Where AI Has Transformed Energy Management in Communities and Buildings
- 1.7. Al-Assisted Energy Efficiency Certifications and Regulations
 - 1.7.1. Using AI to Ensure Compliance with Energy Efficiency Standards (LEED, BREEAM)
 - 1.7.2. Al Tools for Energy Audit and Certification of Projects
 - 1.7.3. Impact of Regulations on Al-Supported Sustainable Architecture



Structure and Content | 19 tech

- 1.8. Life Cycle Assessment and Environmental Footprint with Enernoc
 - 1.8.1. Al Integration for Life Cycle Analysis of Building Materials
 - 1.8.2. Using Enernoc to Assess Carbon Footprint and Sustainability
 - 1.8.3. Model Projects Using AI for Advanced Environmental Assessments
- 1.9. Energy Efficiency Education and Awareness with Verdigris
 - 1.9.1. Role of Al in Energy Efficiency Education and Awareness
 - 1.9.2. Using Verdigris to Teach Sustainable Practices to Architects and Designers
 - 1.9.3. Initiatives and Educational Programs Using AI to Promote a Cultural Change Toward Sustainability
- 1.10. Future of Space Optimization and Energy Efficiency with ENBALA
 - 1.10.1. Exploration of Future Challenges and the Evolution of Energy Efficiency Technologies
 - 1.10.2. Emerging Trends in Al for Spatial and Energy Optimization
 - 1.10.3. Perspectives on How AI Will Continue to Transform Architecture and Urban Design

Module 2. Simulation and Predictive Modeling with Al

- 2.1. Advanced Simulation Techniques with MATLAB in Architecture
 - 2.1.1. Using MATLAB for Advanced Architectural Simulations
 - 2.1.2. Integrating Predictive Modeling and Big Data Analytics
 - 2.1.3. Case Studies Where MATLAB Has Been Fundamental in Architectural Simulation
- 2.2. Advanced Structural Analysis with ANSYS
 - 2.2.1. Implementing ANSYS for Advanced Structural Simulations in Architectural Projects
 - 2.2.2. Integrating Predictive Models to Evaluate Structural Safety and Durability
 - 2.2.3. Projects Highlighting the Use of Structural Simulations in High Performance Architecture
- 2.3. Modeling Space Use and Human Dynamics with AnyLogic
 - 2.3.1. Using AnyLogic to Model the Dynamics of Space Use and Human Mobility
 - 2.3.2. Applying AI to Predict and Improve the Efficiency of Space Use in Urban and Architectural Environments
 - 2.3.3. Case Studies Showing How Simulation Influences Urban and Architectural Planning

- 2.4. Predictive Modeling with TensorFlow in Urban Planning
 - 2.4.1. Implementing TensorFlow for Modeling Urban Dynamics and Structural Behavior
 - 2.4.2. Using AI to Predict Future Outcomes in City Design
 - 2.4.3. Examples of How Predictive Modeling Influences Urban Planning and Design
- 2.5. Predictive Modeling and Generative Design with GenerativeComponents
 - 2.5.1. Using GenerativeComponents to Merge Predictive Modeling and Generative Design
 - 2.5.2. Applying Machine Learning Algorithms to Create Innovative and Efficient Designs
 - 2.5.3. Examples of Architectural Projects that Have Optimized Their Design Using These Advanced Technologies
- 2.6. Simulation of Environmental Impact and Sustainability with COMSOL
 - 2.6.1. Applying COMSOL for Environmental Simulations in Large-Scale Projects
 - 2.6.2. Using AI to Analyze and Improve the Environmental Impact of Buildings
 - 2.6.3. Projects that Show How Simulation Contributes to Sustainability
- 2.7. Simulation of Environmental Performance with COMSOL
 - 2.7.1. Applying COMSOL Multiphysics for Environmental and Thermal Performance Simulations
 - 2.7.2. Using AI to Optimize Design Based on Daylighting and Acoustics Simulations
 - 2.7.3. Examples of Successful Implementations That Have Improved Sustainability and Comfort
- 2.8. Innovation in Simulation and Predictive Modeling
 - Exploration of Emerging Technologies and Their Impact on Simulation and Modeling
 - 2.8.2. Discussion of How Al Is Changing Simulation Capabilities in Architecture
 - 2.8.3. Evaluation of Future Tools and Their Potential Applications in Architectural Design
- 2.9. Simulation of Construction Processes with CityEngine
 - 2.9.1. Applying CityEngine to Simulate Construction Sequences and Optimize On-Site Workflows
 - 2.9.2. Al Integration for Modeling Construction Logistics and Coordinating Activities in Real-Time
 - 2.9.3. Case Studies Showing Improved Construction Efficiency and Safety through Advanced Simulations

tech 20 | Structure and Content

- 2.10. Challenges and Future of Simulation and Predictive Modeling
 - 2.10.1. Assessment of Current Challenges in Simulation and Predictive Modeling in Architecture
 - 2.10.2. Emerging Trends and the Future of These Technologies in Architectural Practice
 - 2.10.3. Discussion on the Impact of Continued Innovation in Simulation and Predictive Modeling in Architecture and Construction

Module 3. Heritage Preservation and Restoration with Al

- 3.1. Al Technologies in Heritage Restoration with Photogrammetry
 - 3.1.1. Using Photogrammetry and AI for Accurate Heritage Documentation and Restoration
 - 3.1.2. Practical Applications in the Restoration of Historic Buildings
 - 3.1.3. Outstanding Projects Combining Advanced Techniques and Respect for Authenticity
- 3.2. Predictive Analysis for Conservation with Laser Scanning
 - 3.2.1. Implementing Laser Scanning and Predictive Analytics in Heritage Conservation
 - 3.2.2. Using AI to Detect and Prevent Deterioration in Historic Structures
 - 3.2.3. Examples of How These Technologies Have Improved Accuracy and Efficiency in Conservation
- 3.3. Cultural Heritage Management with Virtual Reconstruction
 - 3.3.1. Applying Al-Assisted Virtual Reconstruction Techniques
 - 3.3.2. Strategies for Digital Heritage Management and Preservation
 - 3.3.3. Success Stories in the Use of Virtual Re-Enactment for Education and Preservation
- 3.4. Preventive Conservation and Al-Assisted Maintenance
 - 3.4.1. Using Al Technologies to Develop Strategies for Preventive Conservation and Maintenance of Historic Buildings
 - 3.4.2. Implementing Al-Based Monitoring Systems for Early Detection of Structural Problems
 - 3.4.3. Examples of How AI Contributes to the Long-Term Conservation of Cultural Heritage

- 3.5. Digital Documentation and BIM in Heritage Preservation
 - 3.5.1. Applying Advanced Digital Documentation Techniques, including BIM and Augmented Reality, Assisted by AI
 - 3.5.2. Using BIM Models for Efficient Heritage Management and Restoration
 - 3.5.3. Case Studies on the Integration of Digital Documentation in Restoration Projects
- 3.6. Al-Assisted Preservation Policies and Management
 - 3.6.1. Using Al-Based Tools for Management and Policy Making in Heritage Preservation
 - 3.6.2. Strategies for Integrating AI into Conservation-Related Decision-Making
 - 3.6.3. Discussion of How Al Can Improve Collaboration Among Institutions for Heritage Preservation
- 3.7. Ethics and Responsibility in Al Restoration and Preservation
 - 3.7.1. Ethical Considerations in the Application of Al in Heritage Restoration
 - 3.7.2. Debate on the Balance between Technological Innovation and Respect for Historical Authenticity
 - 3.7.3. Examples of How AI Can Be Used Responsibly in Heritage Restoration
- 3.8. Innovation and the Future of Heritage Preservation with Al
 - 3.8.1. Perspectives on Emerging AI Technologies and Their Application in Heritage Preservation
 - 3.8.2. Assessing the Potential of Al to Transform Restoration and Conservation
 - 3.8.3. Discussion on the Future of Heritage Preservation in an Era of Rapid Technological Innovation
- 3.9. Cultural Heritage Education and Awareness with GIS
 - 3.9.1. Importance of Public Education and Awareness in Cultural Heritage Preservation with GIS
 - 3.9.2. Using Geographical Information Systems (GIS) to Promote the Valuation and Knowledge of Cultural Heritage
 - 3.9.3. Successful Education and Outreach Initiatives Using Technology to Teach about Cultural Heritage
- 3.10. Challenges and the Future of Heritage Preservation and Restoration
 - 3.10.1. Identification of Current Challenges in Cultural Heritage Preservation
 - 3.10.2. Role of Technological Innovation and AI in Future Conservation and Restoration Practices
 - 3.10.3. Perspectives on How Technology Will Transform Heritage Preservation in the Coming Decades





A university program designed based on the latest trends in Simulation, Optimization and Preservation of Spaces Using Artificial Intelligence to guarantee you a successful learning experience. Enroll now!"







tech 24 | Methodology

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.



Methodology | 27 tech

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.



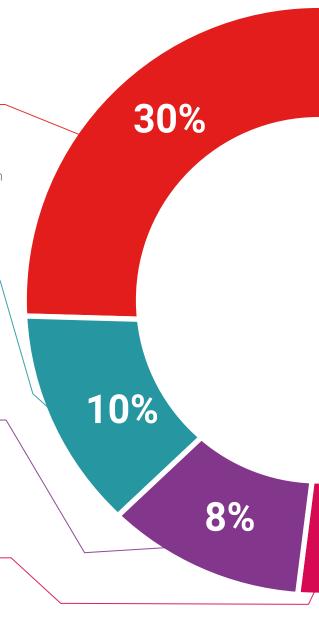
Practising Skills and Abilities

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.



25%

20%





tech 32 | Certificate

This private qualification will allow you to obtain a **Postgraduate Diploma in Simulation**, **Optimization and Preservation of Spaces Using Artificial Intelligence** 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** private qualification, 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 Diploma in Simulation, Optimization and Preservation of Spaces Using Artificial Intelligence

Modality: online

Duration: 6 months

Accreditation: 18 ECTS



Postgraduate Diploma in Simulation, Optimization and Preservation of Spaces Using Artificial Intelligence

This is a private qualification of 540 hours of duration equivalent to 18 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



^{*}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.

health confidence people
leducation information tutors
guarantee accreditation teaching
institutions technology learning



Postgraduate Diploma
Simulation, Optimization
and Preservation of Spaces
Using Artificial Intelligence

- » Modality: Online
- » Duration: 6 months.
- » Certificate: TECH Global University
- » Accreditation: 18 ECTS
- » Schedule: at your own pace
- » Exams: online

