

# Postgraduate Certificate Reinforcement Learning



## Postgraduate Certificate Reinforcement Learning

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Technological University
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/information-technology/postgraduate-certificate/reinforcement-learning](http://www.techtute.com/us/information-technology/postgraduate-certificate/reinforcement-learning)

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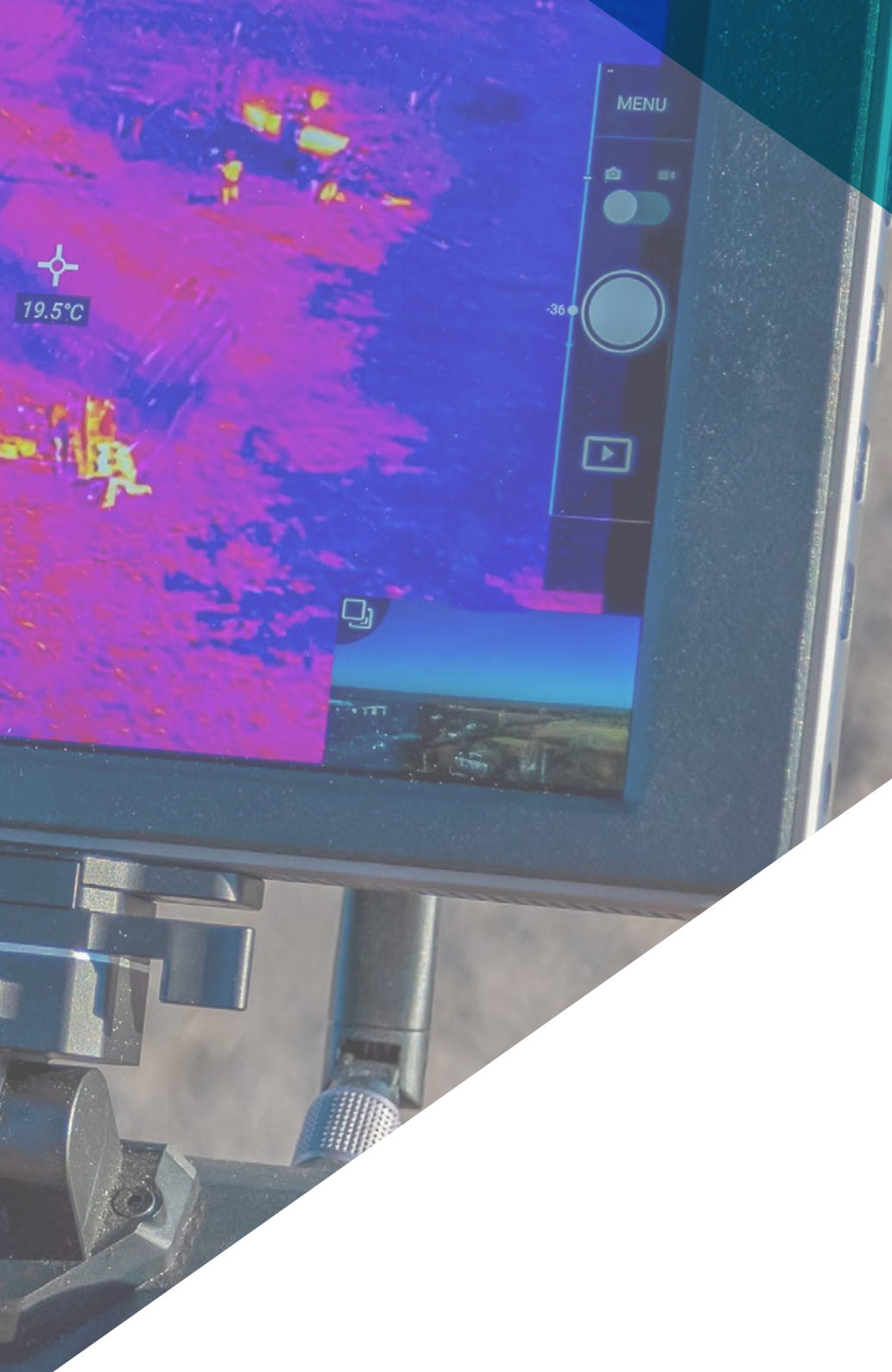
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# 01

# Introduction

Reinforcement Learning is a branch of Artificial Intelligence that aims to teach a machine to learn on its own from experience and feedback received. Training in Reinforcement Learning, therefore, is of great importance for those interested in computer science, artificial intelligence and its applications. For this reason, TECH has designed a degree that allows students to maximize their knowledge on aspects such as Reward Optimization and Policy Search, Reward Optimization Algorithms or Deep Learning Policies, among others. All this, thanks to a 100% online modality and with the most dynamic and practical multimedia materials in the academic market.





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*Improve your skills on Markov Decision Processes or Q-Learning Parameter Optimization, thanks to TECH, the world's largest digital university”*

Reinforcement Learning is considered one of the most promising fields of artificial intelligence for the future. The ability to learn on its own from a machine is increasingly important in a world where the volume of data is constantly increasing and the speed of decision making is crucial.

For this reason, TECH has designed a Postgraduate Certificate in Reinforcement Learning with which it seeks to provide students with the necessary skills and competencies to be able to perform their work as specialists, with the highest possible quality in their jobs. Thus, throughout this program, aspects such as Markov Decision Process Models, Reinforcement Learning Algorithms, Policy Gradients or the OpenAI Gym Environment will be addressed.

All this, through a convenient 100% online mode that allows students to organize their schedules and studies, combining them with their other interests. In addition, this degree has the most complete theoretical and practical materials on the market, which facilitates the student's study process and allows him/her to reach their most demanding objectives.

This **Postgraduate Certificate in Reinforcement Learning** 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 Reinforcement learning
- ◆ 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 Reinforcement Learning in only 6 weeks and with total freedom of organization”*

“

*Improve your professional profile to the maximum and achieve success in one of the most promising areas in the IT field, thanks to TECH”*

The program's teaching staff includes professionals from sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

Its multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide an immersive education programmed to learn in real situations.

The design of this program focuses on Problem-Based Learning, by means of which the professional must try to solve the different professional practice situations that are presented throughout the academic course. This will be done with the help of an innovative system of interactive videos made by renowned experts.

*Delve into Deep Learning Policies and Reward Learning Algorithms from the comfort of your home at any time of the day.*

*Access all the content on Evaluating a Reinforcement Learning Algorithm from your Tablet, mobile or computer.*



# 02 Objectives

The final objective of this Postgraduate Certificate in Reinforcement Learning is that the student acquires an optimal update of their knowledge in this area. An update that will allow the student to perform their work with the highest possible Efficacy. 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.







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*Enroll now and delve into all the essentials of Reinforcement Learning, from the comfort of 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

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- ◆ Use gradients to optimize an agent's policy
- ◆ Evaluate the use of neural networks to improve the accuracy of an agent when making decisions
- ◆ Implement different boosting algorithms to improve the performance of an agent

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*Exceed your highest expectations, thanks to a unique program with the most comprehensive theoretical and practical materials in the academic market”*

03

# Course Management

To offer 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 advanced content. 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.



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*A prestigious teaching staff will teach you the latest advances in Reinforcement Learning, preparing you to face 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 Impulsa2
- ◆ 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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*A unique, key, and decisive educational experience to boost your professional development”*

# 04

# Structure and Content

The didactic resources of this syllabus 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 updated contents. All this, based on the most efficient teaching methodology in the market, TECH's Relearning.





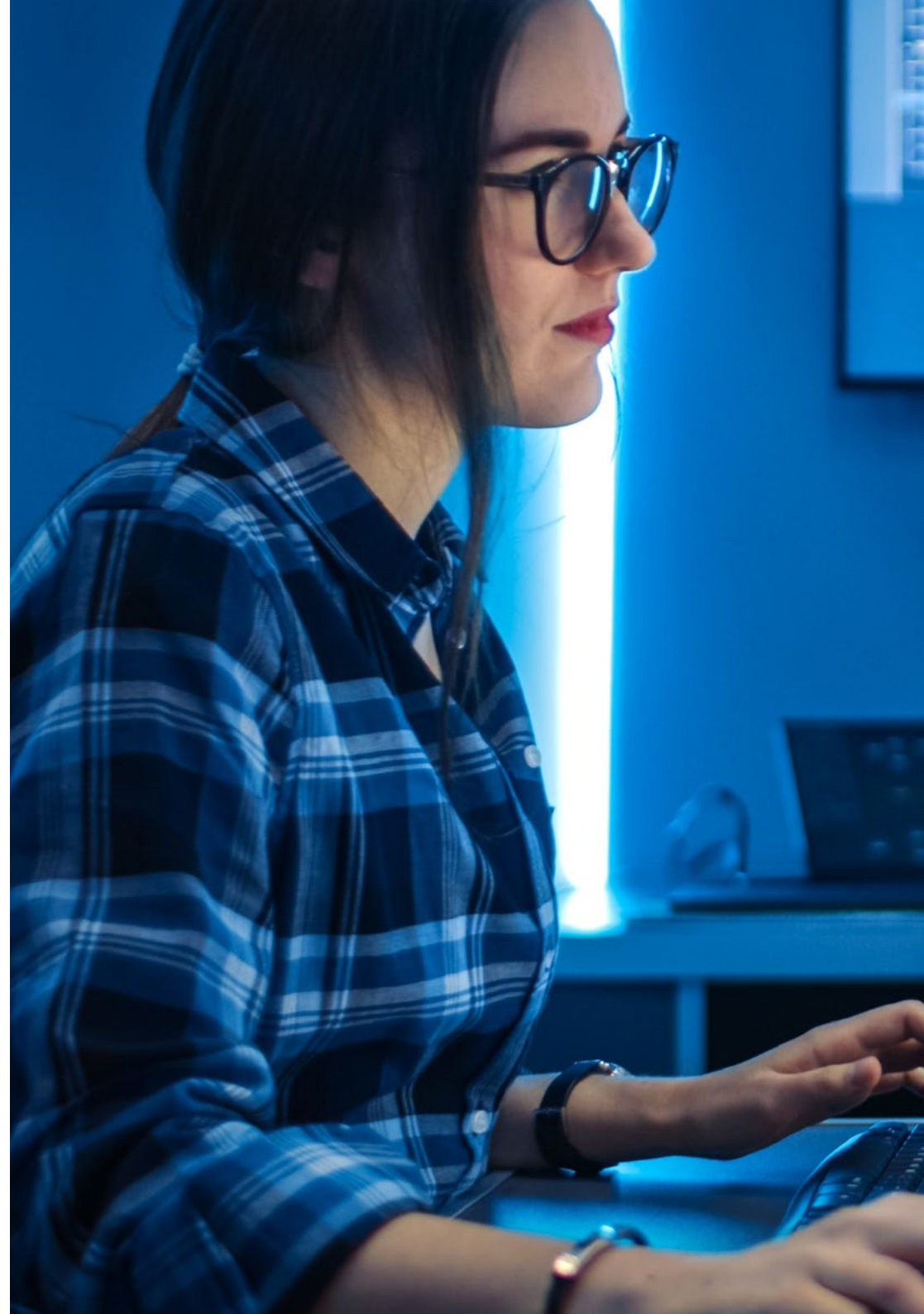


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*The most specialized and complete vision of the academic market can be found in this TECH syllabus”*

## Module 1. Reinforcement Learning

- 1.1. Optimization of rewards and policy search
  - 1.1.1. Reward optimization algorithms
  - 1.1.2. Policy search processes
  - 1.1.3. Reinforcement learning for reward optimization
- 1.2. OpenAI
  - 1.2.1. OpenAI Gym environment
  - 1.2.2. Creation of OpenAI environments
  - 1.2.3. Reinforcement Learning Algorithms in OpenAI
- 1.3. Neural network policies
  - 1.3.1. Convolutional neural networks for policy search
  - 1.3.2. Deep learning policies
  - 1.3.3. Extending neural network policies
- 1.4. Stock evaluation: the credit allocation problem
  - 1.4.1. Risk analysis for credit allocation
  - 1.4.2. Estimating the profitability of loans
  - 1.4.3. Credit evaluation models based on neural networks
- 1.5. Policy Gradients
  - 1.5.1. Reinforcement learning with policy gradients
  - 1.5.2. Optimization of policy gradients
  - 1.5.3. Policy gradient algorithms
- 1.6. Markov decision processes
  - 1.6.1. Optimization of Markov decision processes
  - 1.6.2. Reinforcement learning for Markov decision processes
  - 1.6.3. Models of Markov decision processes
- 1.7. Temporal difference learning and Q-Learning
  - 1.7.1. Application of temporal differences in learning
  - 1.7.2. Application of Q-Learning in learning
  - 1.7.3. Optimization of Q-Learning parameters



- 1.8. Implementation of Deep Q-Learning and Deep Q-Learning variants
  - 1.8.1. Construction of deep neural networks for Deep Q-Learning
  - 1.8.2. Implementation of Deep Q-Learning
  - 1.8.3. Variations of Deep Q-Learning
- 1.9. Reinforcement Learning Algorithms
  - 1.9.1. Reinforcement Learning Algorithms
  - 1.9.2. Reward Learning Algorithms
  - 1.9.3. Punishment learning algorithms
- 1.10. Design of a Reinforcement Learning Environment. Practical Application
  - 1.10.1. Design of a reinforcement learning environment
  - 1.10.2. Implementation of a reinforcement learning algorithm
  - 1.10.3. Evaluation of a reinforcement learning algorithm

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*Thanks to the most efficient pedagogical methodology, you will be able to acquire new knowledge in a precise way and in only 150 hours”*

# 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.

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*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

The Postgraduate Certificate in Reinforcement Learning guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University





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

This **Postgraduate Certificate in Reinforcement Learning** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University** via tracked delivery\*.

The diploma 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 Reinforcement Learning**

Official N° of Hours: **150 h**



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

future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
online training  
development language  
classroom



## Postgraduate Certificate Reinforcement Learning

- » Modality: online
- » Duration: 6 Weeks
- » Certificate: TECH Technological University
- » Schedule: at your own pace
- » Exams: online

# Postgraduate Certificate Reinforcement Learning