Postgraduate Certificate
Reinforcement Learning

tech *global university*

Postgraduate Certificate
Reinforcement Learning

- » Modality: **online**
- » Duration: **6 weeks**
- » Certificate: **TECH Global University**
- » Credits: **6 ECTS**
- » Schedule: **at your own pace**
- » Exams: **online**

Website: **www.techtitute.com/in/artificial-intelligence/postgraduate-certificate/reinforcement-learning**

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Introduction

Artificial Intelligence continues to evolve by leaps and bounds in many digital sectors. In fact, leading researchers agree that this technological field will soon become the best ally of cybersecurity companies. This is mainly due to the multiple benefits generated byReinforcement Learning, by developing intelligent systems capable of learning autonomously through interaction with their environment. As such, these tools solve a wide range of problems and improve both the efficiency and autonomy of complex systems. Given its growing importance, TECH develops an advanced program aimed at professionals who want to nurture their practice with the most innovative techniques of Reinforcement Learning. In addition, it is taught entirely online.

With this 100% online Postgraduate Certificate, you will develop in your work the most innovative Reinforcement Learning algorithms, solving real-world problems in fields such as process control"

In order to provide high quality goods or services, experts need to have at their fingertips mechanisms to explore their operation and evaluate both their performance and efficiency. In this sense, the creation of OpenAI environments provides an accessible framework for them to develop, test and compare intelligent algorithms. Such platforms facilitate experimentation by providing simulations of real-world scenarios where AI agents can interact and learn. As a result, specialists can train systems such as autonomous vehicles or drones before their market launch.

In this context, TECH is launching a pioneering program in Reinforcement Learning. Through it, students will gain practical skills to develop the most efficient algorithms and apply Neural Network Policies optimally to their projects. The curriculum will delve into issues ranging from reward optimization to action evaluation and gradient optimization. At the same time, the syllabus will delve into Markov Decision Processes in order for the graduates to solve sequential decision making problems under uncertainty frameworks. In addition, the program will include case studies that will enhance the students' skills in aspects such as the construction of Deep Neural Networks for Deep Q-Learning.

The university program will be based on the revolutionary Relearning methodology, of which it is a pioneer. This teaching system consists of the continuous reiteration of the most important concepts, allowing students to consolidate them in an agile and natural way. In this way, it will not be necessary for them to invest long hours of study or resort to arduous traditional techniques such as memorization. Undoubtedly, a unique opportunity to study a program in comfort. All that is required is students to have a device with Internet access to view the content at any time of the day, hosted in the Virtual Campus.

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 the self-assessment process can be carried out 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

Optimize Q-Learning parameters at the world's best digital university according to Forbes"

Looking to delve deeper into Markov Decision Processes? Master this mathematical framework with this university program in only 6 weeks"

You will enrich your practice with the most advanced Reward Learning Algorithms and specialize agents to make optimal decisions in dynamic environments.

With TECH's Relearning system you will have a natural and flexible intellectual growth. Forget about investing long hours of study!"

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 students will be assisted by an innovative interactive video system created by renowned and experienced experts.

Objectives

Thanks to this complete and updated knowledge, graduates will have a broad understanding of Reinforcement Learning. In this sense, they will be able to incorporate cutting-edge procedures such as Markov Decision Processes or Neural Network optimization methods into their daily practice. In addition, they will obtain new skills to get the most out of the OpenAI platforms and to interact with simulations of real-world environments. In this way, professionals will skillfully test and evaluate Artificial Intelligence algorithms in controlled or reproducible situations. Likewise, specialists will propose highly innovative solutions to stand out in booming sectors.

"You will develop practical skills to apply the theoretical concepts learned to real-world problems in a variety of fields, such as robotics or video games"

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
- Implement and optimize neural networks with Keras
- Develop expertise in the training of deep neural networks

Specific Objectives

- Use gradients to optimize an agents 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
- Analyze the optimization and regularization mechanisms required for Neural deep neural network training

Case studies and explanatory videos will bring you productively closer to the creation of OpenAI environments"

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Course Management

Loyal to its commitment to provide educational excellence, TECH has brought together a prestigious teaching team for this Postgraduate Certificate. These professionals are characterized by being specialized in Artificial Intelligence, in addition to having an extensive career where they have excelled in the field of Reinforcement Learning. In this way, they have developed teaching materials that stand out for bringing together the most innovative techniques that have emerged in this area. In this way, students will enjoy an enriching and immersive educational experience with the guidance of these renowned experts.

The teaching team of this program will bring you up to date with the latest advances in Neural Network Policies, so that you can overcome the challenges during its implementation"

Management

Mr. Gil Contreras, Armando

- *Lead Big Data Scientist* at Johnson Controls
- *Data Scientist-Big Data* at Opensistemas S.A
- Fund Auditor at Creatividad and Tecnología (CYTSA)
- Public Sector Auditor at PricewaterhouseCoopers Auditors
- Master's Degree in *Data Science* from the Centro Universitario de Tecnología y Arte
- MBA in International Relations and Business from the Centro de Estudios Financieros (CEF)
- Bachelor's Degree in Economics from Instituto Tecnológico de Santo Domingo

Professors

Ms. Delgado Feliz, Benedit

- Administrative Assistant and Electronic Surveillance Operator for the National Drug Control Directorate (DNCD)
- Customer Service at Cáceres y Equipos
- Claims and Customer Service at Express Parcel Services (EPS)
- Microsoft Office Specialist at the National School of Informatics (Escuela Nacional de Informática)
- Social Communicator from the Catholic University of Santo Domingo

Ms. Gil de León, María

- Co-Director of Marketing and Secretary at RAÍZ Magazine
- Copy Editor at Gauge Magazine
- Stork Magazine reader from Emerson College
- B.A. in Writing, Literature and Publishing from Emerson College

Mr. Matos Rodríguez, Dionis
- Data Engineer at Wide Agency Sodexo
- Data Consultant at Tokiota
- Data Engineer at Devoteam
- BI Developer at Ibermática
- Applications Engineer at Johnson Controls
- Database Developer at Suncapital España
- Senior Web Developer at Deadlock Solutions
- QA Analyst at Metaconxept
- Master's Degree in Big Data & Analytics by EAE Business School
- Master's Degree in Systems Analysis and Design
- Bachelor's Degree in Computer Engineering from APEC University

Mr. Villar Valor, Javier
- Director and Founding Partner of Impulsa2
- Chief Operations Officer (COO) at Summa Insurance Brokers
- Director of Transformation and Operational Excellence at Johnson Controls
- Master in Professional Coaching
- Executive MBA from Emlyon Business School, France
- Master's Degree in Quality Management from EOI, Spain
- Computer Engineering from the Universidad Acción Pro-Education and Culture (UNAPEC)

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Structure and Content

This program will provide students with a comprehensive view of Reinforcement Learning in order to enrich their projects. To achieve this, the curriculum will analyze key concepts such as reward optimization or policy search. Throughout the program, students will acquire practical skills for both the optimal creation of OpenAI environments and the construction of Deep Neural Networks for Deep Q-Learning. This will provide graduates with the necessary resources to address Reinforcement Learning problems, specifically in environments with high complexity or dimensionality, such as video games.

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"*A university program designed by experts in Machine Learning that will ensure a quality leap in your professional career*"

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 ofQ-LearningParameters

Reach your maximum efficiency in the field of Reinforcement Learning thanks to the most innovative pedagogical resources offered by TECH. Enroll now!"

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.
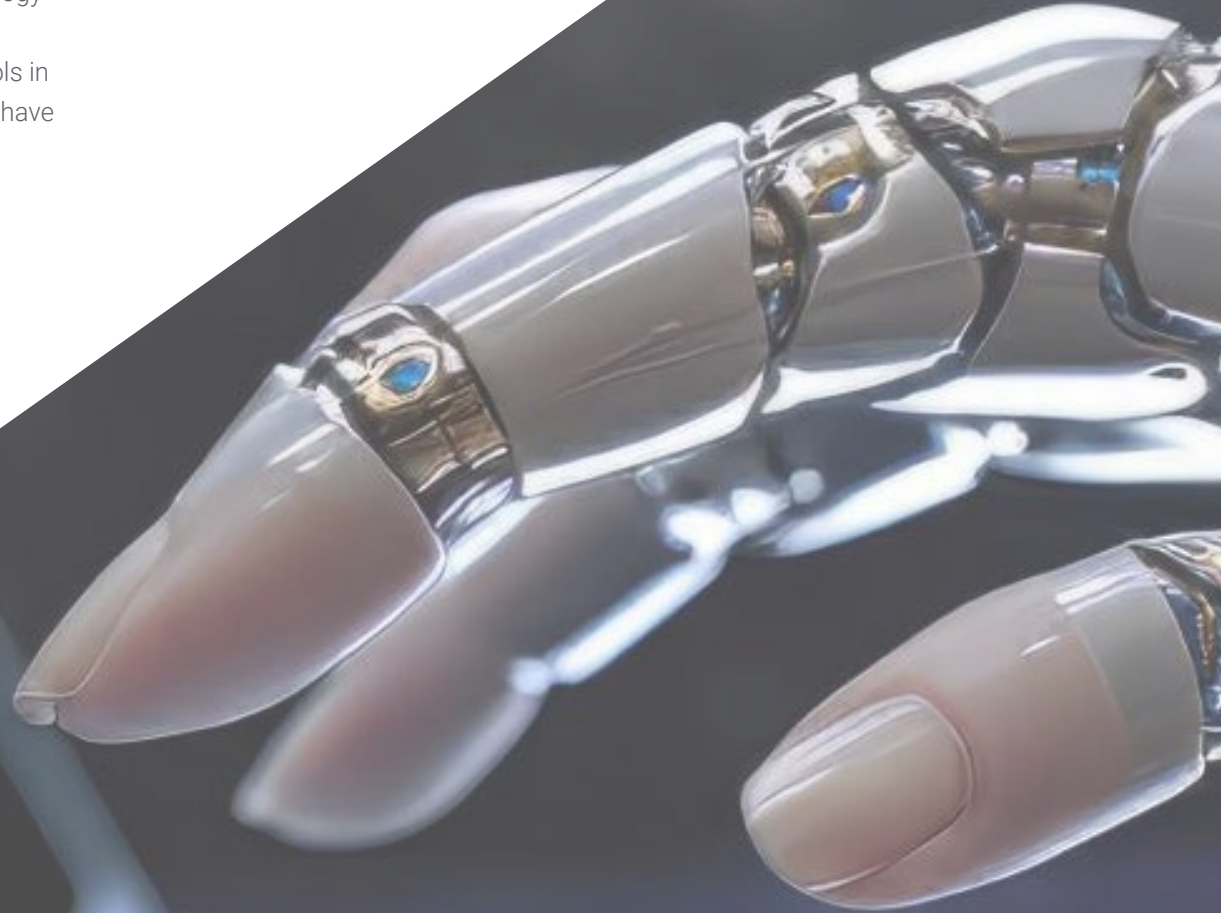
Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

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.

01 learning from evidence

02 relearning from evidence

03 testing

04 learning from an expert

05 neurocognitive context dependent learning

06 Von-Restorff effect

07 case based learning through storytelling

08 competencies testing (retesting)

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically. This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.

This program offers the best educational material, prepared with professionals in mind:

Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.

Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

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

Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.

Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.

30%

10%

8%

20%

25%

4%

3%

Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.

Interactive Summaries

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.

06

Certificate

The Postgraduate 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 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 Reinforcement 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 Reinforcement Learning**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**

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

Postgraduate Certificate in Reinforcement 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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