

# Postgraduate Certificate Introduction to Artificial Intelligence



## Postgraduate Certificate Introduction to Artificial Intelligence

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Global University
- » Credits: 6 ECTS
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/artificial-intelligence/postgraduate-certificate/introduction-artificial-intelligence](http://www.techtute.com/us/artificial-intelligence/postgraduate-certificate/introduction-artificial-intelligence)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Structure and Content

---

*p. 12*

04

Methodology

---

*p. 16*

05

Certificate

---

*p. 24*

# 01

# Introduction

The European Commission stresses that Artificial Intelligence (AI) is completely transforming both people's lives and the business environment. For this reason, it urges professionals to specialize in this technological field with responsibility. In this sense, its systems can be combined with Knowledge Engineering to drive social progress through advances in areas such as medical image analysis, personalization of education or fraud detection. To benefit from its wide range of applications, professionals require in-depth knowledge of Machine Learning and practical skills to handle its innovative tools. For this reason, TECH implements an online program focused on this subject to elevate the specialists' praxis to a higher level.







“

*You will master Genetic Algorithms and you will stand out professionally by offering optimal solutions to complex problems thanks to this Postgraduate Certificate based on Relearning”*

The Artificial Intelligence sector has a myriad of applications in booming industries, such as video games. Intelligent systems have the ability to develop advanced algorithms to design characters with human-like behaviors and abilities. In this context, Game Theory focuses on the strategic behavior and decisions made by different rational agents in interaction situations. In this way, professionals are able to improve the experience of games and develop more rewarding mechanics for users.

Faced with this reality, TECH creates a pioneering program in Introduction to Artificial Intelligence. The curriculum will thoroughly examine the fundamental principles of this branch, such as Supervised Learning or Genetic Algorithms. In this way, students will effectively apply these concepts to their practical projects. Likewise, the syllabus will delve into Neural Networks, a computational model that allows machines to learn and perform complex tasks through the synaptic connections of the human brain. In addition, the program will delve into the use of thesauri, vocabularies and taxonomies to classify knowledge and optimize the processing of Artificial Intelligence systems.

On the other hand, the program is delivered in a 100% online methodology. Therefore, students will be able to embark on their learning process at any time of the day with the benefit of flexible scheduling. The only thing students will need is an electronic device with Internet access to access the virtual platform. Along the same lines, TECH applies the innovative Relearning teaching system in all its programs. Consisting of the progressive reiteration of the most relevant aspects of academic content, this method ensures that students expand their knowledge in a progressive and natural way.

This **Postgraduate Certificate in Introduction to 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 scientific and practical information on the 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 in Artificial Intelligence
- ♦ 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 delve into game theory to model and analyze the strategic interaction between rational agents in a variety of competitive situations"*

“

*Are you looking to specialize in the field of Machine Learning? Achieve it with this university program in only 150 hours"*

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.

*You will have at your disposal the most advanced and effective strategies for tackling problems such as constraint satisfiability.*

*A study plan based on the revolutionary Relearning methodology, which will allow you to consolidate complex concepts with efficiency and dynamism.*





# 02

# Objectives

This university program will provide experts with a comprehensive view of Artificial Intelligence. Upon completion, students will have developed practical skills in the world of programming through the implementation of algorithms and Machine Learning techniques in their projects. Likewise, graduates will incorporate into their daily practice the Monte Carlo statistical technique to simulate the behavior of systems, based on random methods such as sampling. In addition, they will have the most innovative tools to represent knowledge, especially taking into account the Semantic Web.







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*A professional growth process that will provide you with the skills of a true Artificial Intelligence expert. You will compete with the best in the industry!"*



## General Objectives

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- Prepare scientifically and technologically, as well as to develop the professional practice of Intelligent Systems, with a transversal and versatile approach adapted to the new technologies and innovations in this field
- Specialize students in the use of cutting-edge tools and techniques in the field of Artificial Intelligence and intelligent systems, including the mastery of relevant programming languages
- Develop problem solving and critical thinking skills, to evaluate different approaches in the design and implementation of Intelligent Systems
- Stimulate creativity and innovation in both the design and development of Intelligent Systems, promoting new ideas and approaches to address challenges in the field of Artificial Intelligence



*6 weeks of stimulating learning  
that will take you to the next level  
in Knowledge Engineering"*







## Specific Objectives

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- Lay the foundations of artificial intelligence and knowledge engineering, making a brief tour through the history of artificial intelligence up to the present day
- Understand the essential concepts of search in artificial intelligence, both informed and uninformed search
- Understand how artificial intelligence works in games
- Learn the fundamental concepts of neural networks and the use of genetic algorithms
- Acquire the appropriate mechanisms to represent knowledge, especially taking into account the semantic web
- Understand the functioning of expert systems and decision support systems



# 03

## Structure and Content

This Postgraduate Certificate will provide students with a solid foundation in the fundamental concepts, techniques and applications of Artificial Intelligence. To this end, the academic itinerary will cover from the search stage to the different types of algorithms. At the same time, the syllabus will provide students with advanced approaches, among which Planning as Heuristic Search stands out. In this way, professionals will find efficient solutions to programming problems in complex or dynamic environments. The academic contents will also offer guidelines for knowledge representation in the Semantic Web, to improve data interoperability.



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*This program gives you the opportunity to update your knowledge in a real scenario, with the maximum scientific rigor of an institution at the forefront of technology as TECH"*



## Module 1. Artificial Intelligence and Knowledge Engineering

- 1.1. Introduction to Artificial Intelligence and Knowledge Engineering
  - 1.1.1. Brief History of Artificial Intelligence
  - 1.1.2. Artificial Intelligence Today
  - 1.1.3. Knowledge Engineering
- 1.2. Searching
  - 1.2.1. Common Search Concepts
  - 1.2.2. Uninformed Search
  - 1.2.3. Informed Search
- 1.3. Boolean Satisfiability, Constraint Satisfiability and Automatic Planning
  - 1.3.1. Boolean Satisfiability
  - 1.3.2. Constraint Satisfiability Problems
  - 1.3.3. Automatic Planning and PDDL
  - 1.3.4. Planning as Heuristic Search
  - 1.3.5. Planning with SAT
- 1.4. Artificial Intelligence in Games
  - 1.4.1. Game Theory
  - 1.4.2. Minimax and Alpha-Beta Pruning
  - 1.4.3. Simulation: Monte Carlo
- 1.5. Supervised and Unsupervised Learning
  - 1.5.1. Introduction to Machine Learning
  - 1.5.2. Classification
  - 1.5.3. Regression
  - 1.5.4. Validation of Results
  - 1.5.5. Clustering
- 1.6. Neural Networks
  - 1.6.1. Biological Fundamentals
  - 1.6.2. Computational Models
  - 1.6.3. Supervised and Unsupervised Neuron Networks
  - 1.6.4. Simple Perceptron
  - 1.6.5. Multilayer Perceptron







- 1.7. Genetic Algorithms
  - 1.7.1. History
  - 1.7.2. Biological Fundamentals
  - 1.7.3. Problem Coding
  - 1.7.4. Generation of the Initial Population
  - 1.7.5. Main Algorithm and Genetic Operators
  - 1.7.6. Evaluation of Individuals: Fitness
- 1.8. Thesauri, Vocabularies, Taxonomies
  - 1.8.1. Vocabulary
  - 1.8.2. Taxonomy
  - 1.8.3. Thesauri
  - 1.8.4. Ontologies
- 1.9. Knowledge Representation Semantic Web
  - 1.9.1. Semantic Web
  - 1.9.2. Specifications: RDF, RDFS and OWL
  - 1.9.3. Inference/ Reasoning
  - 1.9.4. Linked Data
- 1.10. Expert systems and DSS
  - 1.10.1. Expert Systems
  - 1.10.2. Decision Support Systems

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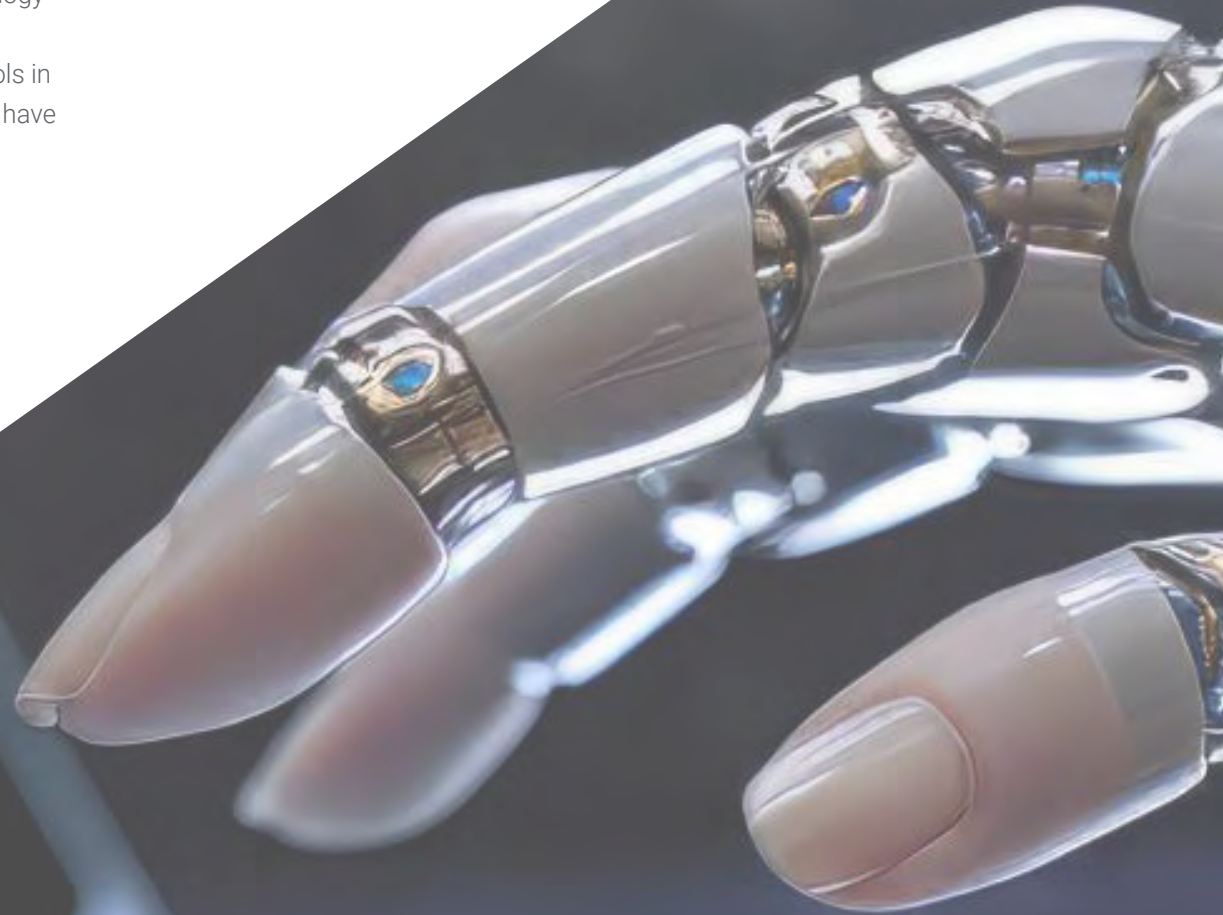
*With this university program,  
you will customize your learning  
process according to your needs,  
circumstances and schedule.  
Enroll now!”*

# 04

# 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.





05

# Certificate

The Postgraduate Certificate in Introduction to Artificial Intelligence guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.



The image features two black graduation caps (mortarboards) against a bright blue sky with light, wispy clouds. The caps are positioned diagonally, with one in the foreground and another slightly behind it. The background is split into a white lower-left section and a blue upper-right section by a diagonal line.

“

*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 Introduction to 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** 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 Introduction to Artificial Intelligence**

ECTS: **6**

Official N° of Hours: **150 h.**





future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

**tech** global  
university

personalized service innovation

knowledge present training

development language

virtual classroom

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# Postgraduate Certificate

## Introduction to Artificial Intelligence