Postgraduate Certificate
Bioinspired Computing

tech global university

Postgraduate Certificate
Bioinspired Computing

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

Website: **www.techtitute.com/us/artificial-intelligence/postgraduate-certificate/bioinspired-computing**

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01
Introduction

In the face of constant technological advances, Bioinspired Computing is emerging as one of the professions with the most promising future on an international scale. This interdisciplinary field focuses on the study and application of principles inspired by nature to solve computational problems, one example being ant colonies. In this way, it helps companies to optimize complex processes such as resource allocation, inventory management or supply chain control. However, this area also presents challenges that must be addressed by professionals to take full advantage of its potential. For this reason, TECH is launching a university and online program with which students will apply bio-inspired concepts to practical problems in fields such as engineering.

This 100% online Postgraduate Certificate will allow you to carry out innovative projects with algorithms, to solve relevant problems such as the planning of logistic routes"

Bioinspired Computing offers a powerful and versatile approach that contributes to generating cutting-edge solutions that have a significant impact on society. For example, its methods are capable of designing renewable energy systems and optimizing industrial processes to reduce the impact on nature. In this way, this technological area contributes to both environmental sustainability and climate change mitigation. In this scenario, more and more companies are looking to integrate experts in this area into their organization. These professionals use intelligent algorithms to help in corporate decision-making, such as strategic planning or financial resource allocation.

In order for specialists to acquire a competitive advantage to stand out from other candidates, TECH has created a Postgraduate Certificate in Bioinspired Computing. With a duration of 150 hours, the curriculum will delve into issues such as the creation of algorithms for social or genetic adaptation. At the same time, the syllabus will provide students with advanced evolutionary strategies to successfully face complex problems with multiple variables and constraints. On the other hand, the teaching materials will emphasize the importance of Neural Networks for devices to learn and adapt from data. In this sense, the program will include both practical examples and use cases in various fields such as medical research, economics or machine vision.

The university program acquires greater dynamism thanks to the multimedia pills and the wide variety of didactic resources offered by TECH (such as specialized readings, infographics or case studies). Similarly, the *Relearning* teaching methodology used by this technological institution will allow professionals to obtain a much more effective update in less time. In this way, their learning process will be totally natural and progressive, so that students will not have to invest long hours in studying.

This **Postgraduate Certificate in Bioinspired Computing** contains the most complete and up-to-date program on the market. The most important features include:

- Development of 100 simulated scenarios presented by experts in Bioinspired Computing Science
- The graphic, schematic and practical contents with which they are conceived provide scientific and practical information on Bioinspired Computing
- News on the latest developments in Bioinspired Computing
- It contains practical exercises where the process of self-evaluation can be carried out to improve learning
- Interactive learning system based on the case method and its application to real practice
- All of this will be complemented by 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

Tackle Genetic Algorithms at the world's best digital university according to Forbes"

Manage Exploration-Exploitation Strategies and maximize the overall performance of systems over time"

You will delve into the Ant Colony technique to solve optimization and search problems in various fields using algorithms.

With the Relearning system, characteristic of TECH, you will have the freedom to plan both your schedules and evaluative chronograms.

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 throughout the program. For this purpose, students will be assisted by an innovative interactive video system created by renowned and experienced experts.

02
Objectives

Under a theoretical-practical approach, this Postgraduate Certificate will provide graduates with the most innovative techniques in Bioinspired Computing. Students will have a resolute and comprehensive approach to solve difficult problems by mimicking the processes observed in nature. In this way, professionals will be equipped with the necessary tools to develop innovative projects in a wide range of fields, ranging from medicine to engineering or robotics. Therefore, they will experience an immediate leap in quality in their careers.

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Through the most efficient pedagogical method, you will expand your knowledge in a rigorous way. And in just 6 weeks with this pioneering program!"

General Objectives

- 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

Specific Objectives

- Introduce the concept of bioinspired computing, as well as to understand the functioning of the different types of social adaptation algorithms and genetic algorithms

- Study of the different models of evolutionary computation, knowing their strategies, programming, algorithms and models based on estimation of distributions

- Understand the operation of evolutionary programming applied to learning problems and multi-objective problems

- Learn the essential concepts related to neural networks and understand the operation of real use cases applied to fields as diverse as medical research, economics and artificial vision

A sophisticated educational experience designed to propel your professional development to the next level"

03
Structure and Content

Designed by experts in Computer and Software Engineering, this university program will provide students with a solid understanding of Bioinspired Computing. The academic itinerary will analyze the main algorithms of social adaptation, so that graduates can model the behavior of autonomous agents interacting in social environments. Likewise, the syllabus will delve into Evolutionary Computation Models (highlighting Genetic Programming or Differential Evolution) to solve complex adaptive problems. The program will also focus on the functionality of Neural Networks, offering practical examples and use cases in areas such as Computer Vision.
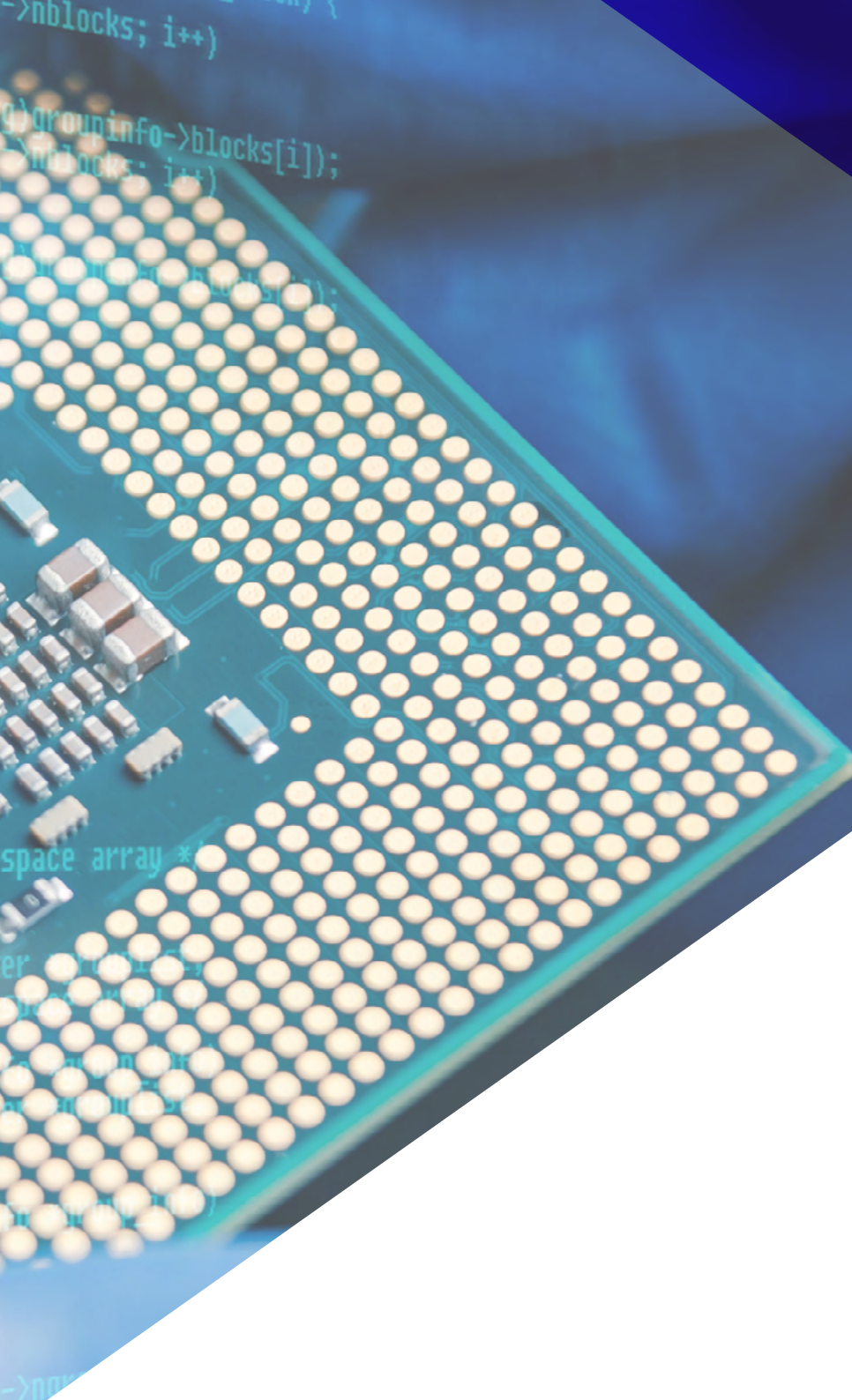
" *A university program that will provide you with technical skills in programming, algorithm analysis and computational modeling"*

Module 1. Bioinspired Computing

1.1.   Introduction to Bioinspired Computing
    1.1.1.   Introduction to Bioinspired Computing
1.2.   Social Adaptation Algorithms
    1.2.1.   Bio-Inspired Computation Based on Ant Colonies
    1.2.2.   Variants of Ant Colony Algorithms
    1.2.3.   Particle Cloud Computing
1.3.   Genetic Algorithms
    1.3.1.   General Structure
    1.3.2.   Implementations of the Major Operators
1.4.   Space Exploration-Exploitation Strategies for Genetic Algorithms
    1.4.1.   CHC Algorithm
    1.4.2.   Multimodal Problems
1.5.   Evolutionary Computing Models (I)
    1.5.1.   Evolutionary Strategies
    1.5.2.   Evolutionary Programming
    1.5.3.   Algorithms Based on Differential Evolution
1.6.   Evolutionary Computation Models (II)
    1.6.1.   Evolutionary Models Based on Estimation of Distributions (EDA)
    1.6.2.   Genetic Programming
1.7.   Evolutionary Programming Applied to Learning Problems
    1.7.1.   Rules-Based Learning
    1.7.2.   Evolutionary Methods in Instance Selection Problems
1.8.   Multi-Objective Problems
    1.8.1.   Concept of Dominance
    1.8.2.   Application of Evolutionary Algorithms to Multi-Objective Problems
1.9.   Neural Networks (I)
    1.9.1.   Introduction to Neural Networks
    1.9.2.   Practical Example with Neural Networks
1.10.   Neural Networks (II)
    1.10.1.   Use Cases of Neural Networks in Medical Research
    1.10.2.   Use Cases of Neural Networks in Economics
   1.10.3.   Use Cases of Neural Networks in Computer Vision
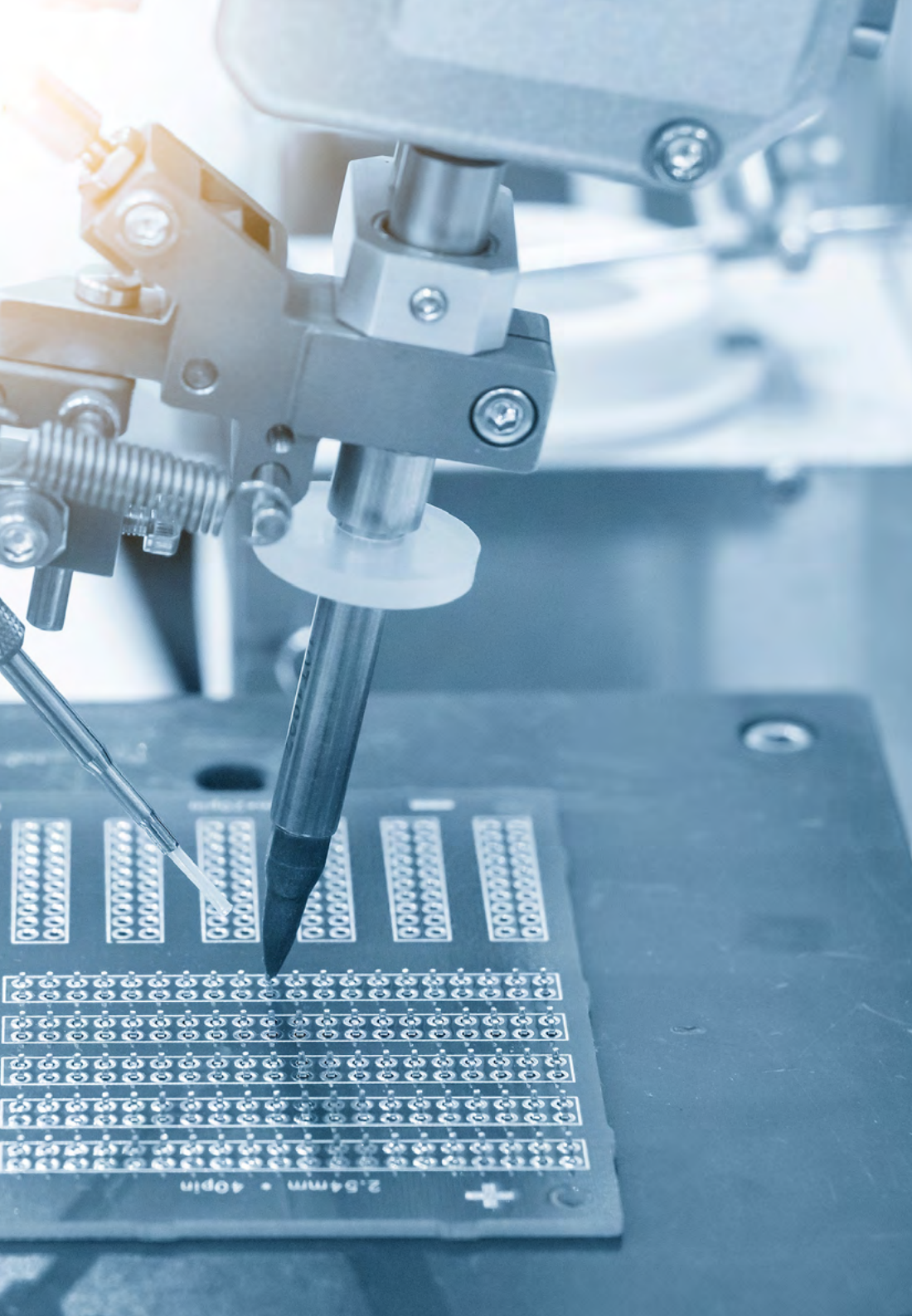
Achieve professional success with this intensive program, designed by professionals with extensive experience in Bioinspired Computing"

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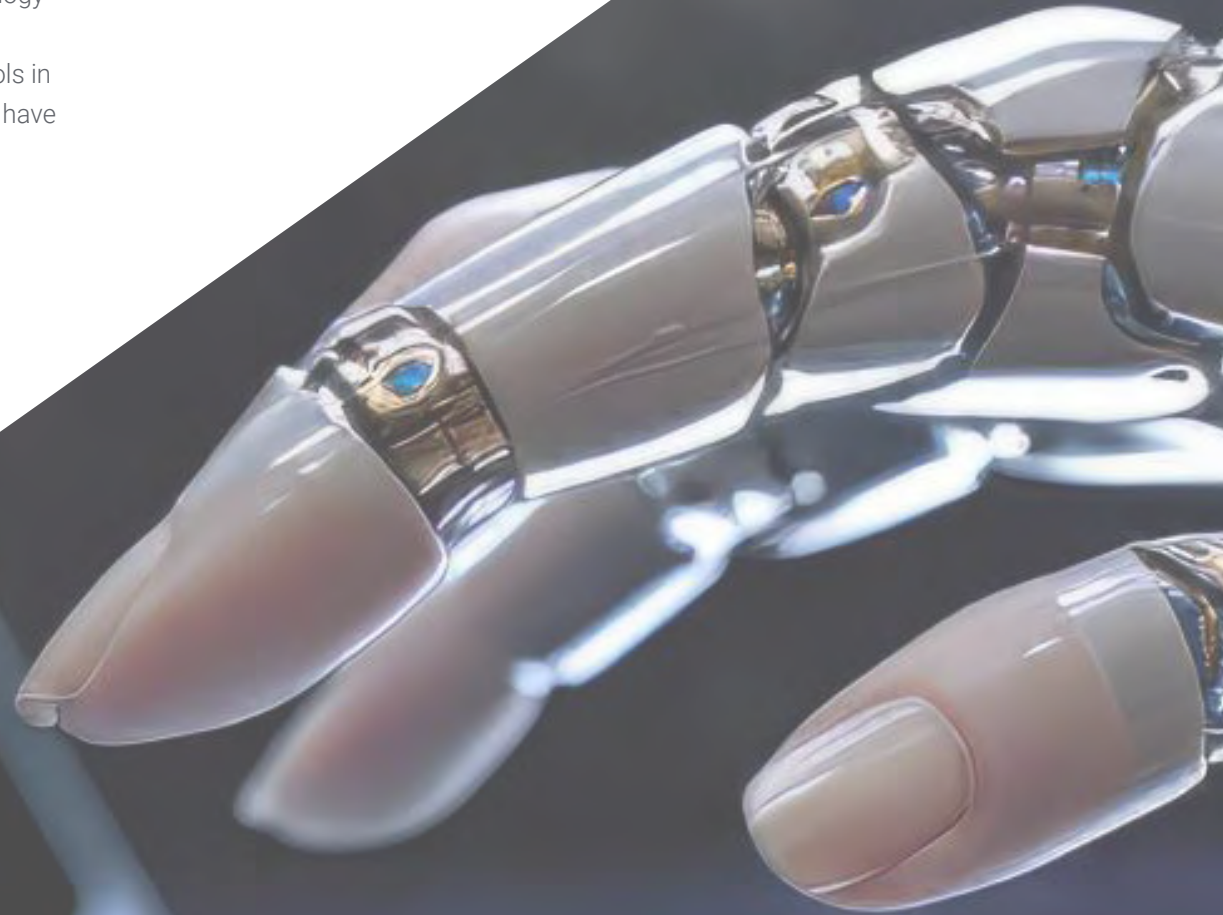
Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

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.

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.

05
Certificate

The Postgraduate Certificate in Bioinspired Computing 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 Bioinspired Computing** endorsed by **TECH Global University**, the world's largest online university.
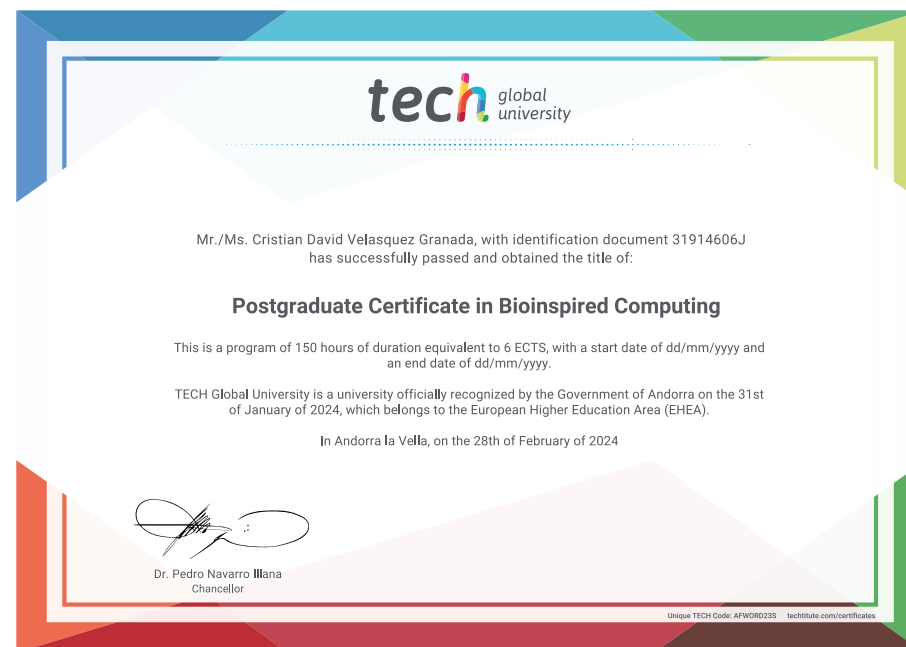
TECH Global University is an official European University publicly recognized by the Government of Andorra (*official bulletin*). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training 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 Bioinspired Computing**

ECTS: **6**

Official Nº of Hours: **150 hours**.

*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.

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Mr./Ms. Cristian David Velasquez Granada, with identification document 31914606J has successfully passed and obtained the title of:

Postgraduate Certificate in Bioinspired Computing

This is a program of 150 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
Chancellor

Unique TECH Code: AFWORD23S   techtitute.com/certificates

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