Postgraduate Certificate
Design and Development of Intelligent Systems in Data Science

tech technological university

Postgraduate Certificate
Design and Development of Intelligent Systems in Data Science

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

Website: **www.techtitute.com/us/information-technology/postgraduate-certificate/design-development-intelligent-systems-data-science**

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01
Introduction

An intelligent system is capable of automatically solving complex and multidisciplinary problems, supporting the decisions of a group of experts in different areas. Consequently, there are programs to support telemedicine or intelligent systems to process and analyze data. For this reason, computer engineers must be able to program models that adapt to company needs, so they must also have specialized knowledge in the field.

"Developing and perfecting intelligent systems is essential to automate in-company information analysis"

This Postgraduate Certificate will develop student analytical skills in order to move from unstructured data models to automating the data mining process. To this end, a distinction will be made between the different learning techniques used in developing intelligent systems, such as machine learning, classification and regression algorithms.

As the program progresses, the theory of neural networks, a computational system composed of a large number of simple and interconnected elements that help to process information by means of their dynamic state, will be studied in depth. The result will be a computational model evolved to adapt to the needs of current computer engineering.

The entire program is comprised of a series of case studies that will help computer engineers who are looking to advance their careers and challenge themselves to achieve excellence.

This **Postgraduate Certificate in Design and Development of Intelligent Systems in Data Science** contains the most complete and up-to-date academic program on the market. The most important features include:

- Practical cases studies are presented by experts in Engineering in data analysis
- The graphic, schematic, and eminently practical contents with which they are created, provide scientific and 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

Find an innovative solution to a company's problems by automating tedious processes"

"*Gain specialized knowledge about different machine learning techniques to automate tasks*"

Learn about the different algorithms that help form neural models in intelligent systems.

This program is available in an online format, which facilitates student training.

The program's teaching staff includes professionals from the sector who contribute their work experience to this training 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 training programmed to train 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 student will be assisted by an innovative interactive video system created by renowned and experienced experts.

02
Objectives

The knowledge provided on this program will help computer engineers to become familiar with the different techniques used in automatic learning, as well as the different types that exist, namely supervised and reinforced, among others. Students will thus consolidate themselves as agents of change willing to offer new proposals for the benefit of all.

A well-developed algorithm can determine the success of intelligent systems in Data Science"

General Objectives

- Analyze the benefits of applying data analytic techniques in every company department
- Develop the basis for understanding the needs and applications of each department
- Generate specialized knowledge to select the right tool
- Propose techniques and objectives in order to be as productive as possible according to the department

Designing a program that processes big data can help reduce the burden on business analysts"
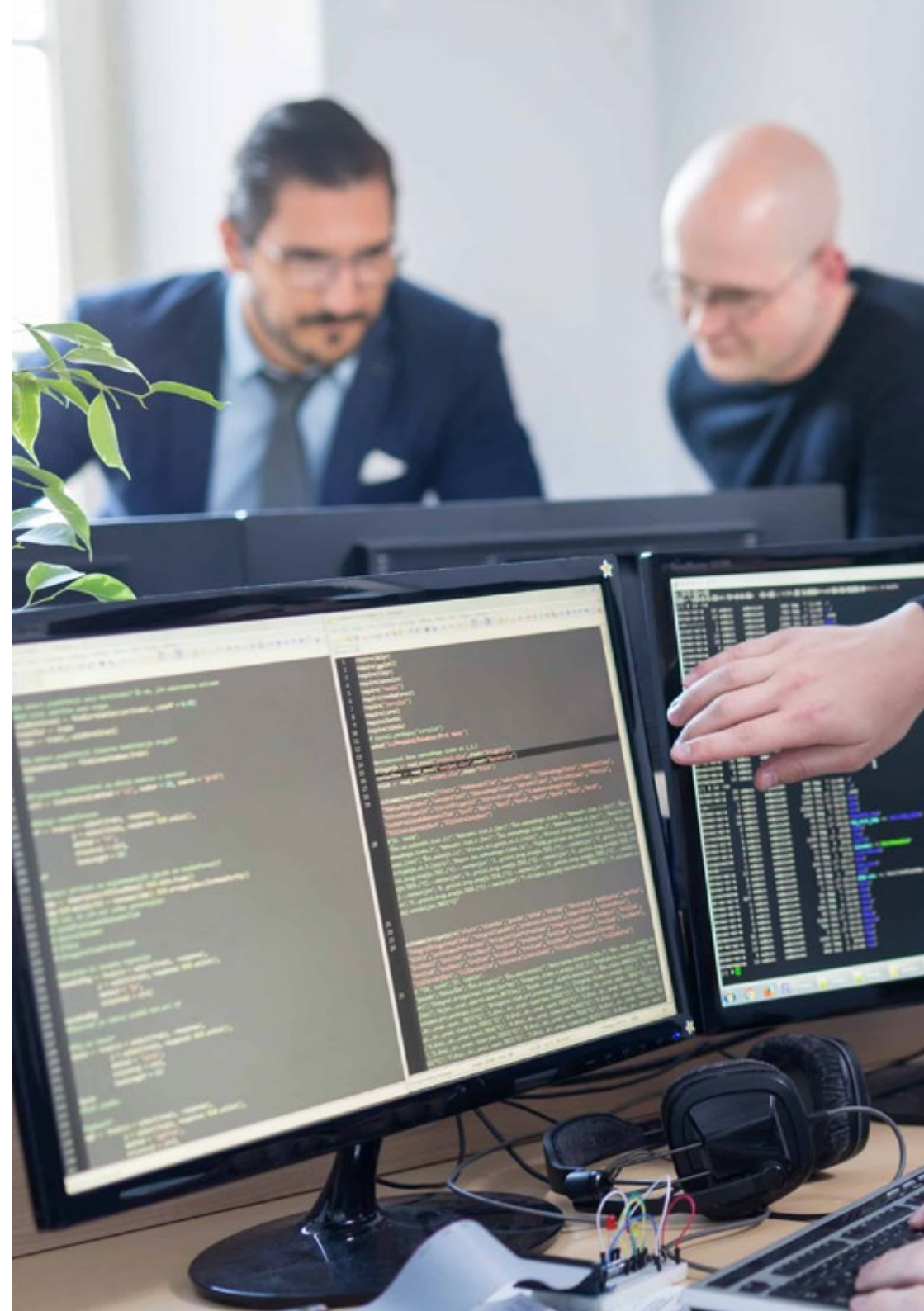
Specific Objectives

- ◆ Analyze the step from information to knowledge
- ◆ Develop the different types of machine learning
- ◆ Examine metrics and scores to quantify model quality
- ◆ Implement the various machine learning algorithms
- ◆ Identify probabilistic reasoning models
- ◆ Lay the foundations for deep learning
- ◆ Demonstrate the skills acquired to understand the various machine learning algorithms

Course Management

The Postgraduate Certificate in Design and Development of Intelligent Systems in Data Science brings together a select group of professionals with multiple years of experience in data analysis in the field of business. Students are thus guaranteed that the knowledge imparted comes from professionals capable of answering any questions they may have while providing them with real cases to better exemplify the contents on the program.

With this teaching team you will be sure to learn everything you need to know about the development and design of intelligent systems"

Management

Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO at Korporate Technologies
- CTO in AI Shephers GmbH
- Doctorate in Psychology from the University of CastillaLa
- PhD in Economics, Business and Finance from the Camilo José Cela University. Outstanding Award in her PhD
- PhD in Psychology, University of CastillaLa Mancha
- Master's Degree in Advanced Information Technologies from the University of Castilla la Mancha
- Master MBA+E (Master's Degree in Business Administration and Organisational Engineering) from the University of Castilla la Mancha.
- Associate lecturer, teaching undergraduate and master's degrees in Computer Engineering at the University of Castilla la Mancha.
- Professor of the Master in Big Data and Data Science at the International University of Valencia.
- Lecturer of the Master's Degree in Industry 4.0 and the Master's Degree in Industrial Design and Product Development.
- Member of the SMILe Research Group of the University of Castilla la Mancha.

Professors

Mr. Montoro Montarroso, Andrés

 ◆ Researcher in the SMILe Group at the University of Castilla-La Mancha.

 ◆ Data Scientist at Prometeus Global Solutions

 ◆ Graduate in Computer Engineering from the University of Castilla-La Mancha.

 ◆ Master's Degree in Data Science and Computer Engineering from the University of Granada

 ◆ Guest lecturer in the subject of Knowledge-Based Systems at the Escuela Superior de Informática de Ciudad Real, Giving the Lecture "Advanced Artificial Intelligence Techniques: Search and Analysis of Potential Social Media Radicals".

 ◆ Guest lecturer in the subject of Data Mining at the Escuela Superior de Informática de Ciudad Real giving the lecture: "Applications of Natural Language Processing: Fuzzy Logic to the analysis of messages in social networks"

 ◆ Speaker at the Seminar on Corruption Prevention in Public Administrations and Artificial Intelligence. Faculty of Law and Social Sciences of Toledo. Conference entitled "Artificial Intelligence Techniques" Speaker at the first International Seminar on Administrative Law and Artificial Intelligence (DAIA). Organised by Centro de Estudios Europeos Luis Ortega Álvarez and Institut de Recerca TransJus Conference entitled "Sentiment Analysis for the prevention of hate speech on social media"

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Structure and Content

It is essential for computer engineers to have the most updated knowledge of the Design and Development of New Intelligent Data Science Systems and, for that purpose, this Postgraduate Certificate has been designed to provide all the relevant information on this topic, such as becoming familiar with the different types of learning, algorithms and mining processes. Thus will the objectives of the program to train professional, integral and prestigious engineers be fulfilled.

> "It's time to take your career a step further and develop a program that suits the company's big data"

Module 1. Design and Development of Intelligent Systems

1.1.   Data Pre-Processing

    1.1.1.   Data Pre-Processing

    1.1.2.   Data Transformation

    1.1.3.   Data Mining

1.2.   Machine Learning

    1.2.1.   Supervised and Unsupervised Learning

    1.2.2.   Reinforcement Learning

    1.2.3.   Other Learning Paradigms

1.3.   Classification Algorithms

    1.3.1.   Inductive Machine Learning

    1.3.2.   SVM and KNN

    1.3.3.   Metrics and Scores for Ranking

1.4.   Regression Algorithms

    1.4.1.   Lineal Regression, Logistical Regressiona and Non-Lineal Models

    1.4.2.   Time Series

    1.4.3.   Metrics and Scores for Regression

1.5.   Clustering Algorithms

    1.5.1.   Hierarchical Clustering Techniques

    1.5.2.   Partitional Clustering Techniques

    1.5.3.   Metrics and Scores for *Clustering*

1.6.   Association Rules Techniques

    1.6.1.   Methods for Rule Extraction

    1.6.2.   Metrics and Scores for Association Rule Algorithms

1.7.   Advanced Classification Techniques. Multiclassifiers

    1.7.1.   Bagging Algorithms

    1.7.2.   Random "*Forests Sorter*"

    1.7.3.   "Boosting" for Decision Trees

Discover all the possible applications and the great impact Intelligent Systems can have on a company"

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.

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.

The student will learn to solve complex situations in real business environments through collaborative activities and real cases.

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%

tech

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 Design and Development of Intelligent Systems in Data Science guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.

Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"
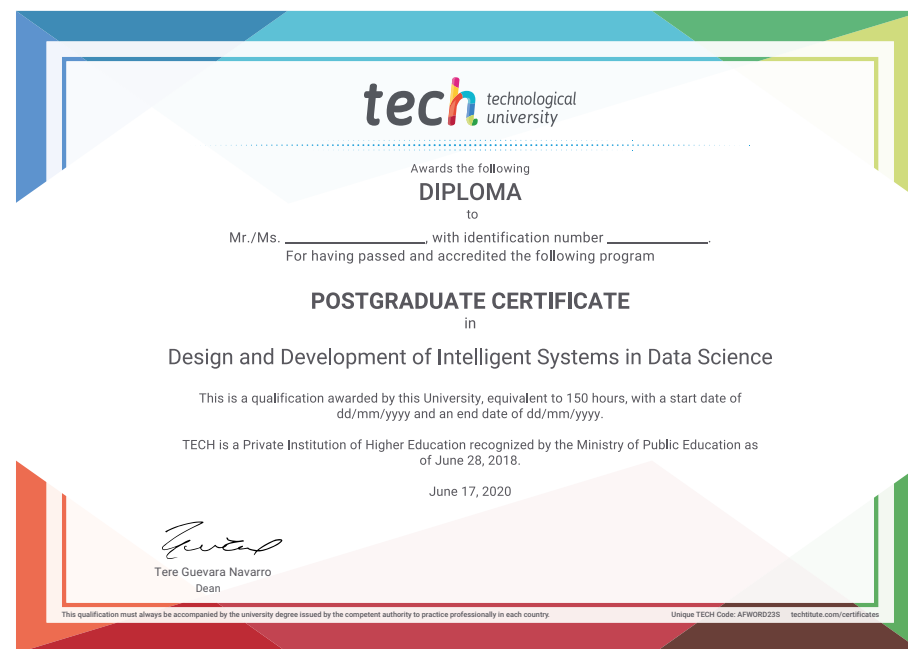
This **Postgraduate Certificate in Design and Development of Intelligent Systems in Data Science** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University** by 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 job markets, competitive professional career evaluation committees.

Title: **Postgraduate Certificate in Design and Development of Intelligent Systems in Data Science**

Official N° of Hours: **150 h.**

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Awards the following
DIPLOMA
to
Mr./Ms. _____, with identification number _____.
For having passed and accredited the following program

POSTGRADUATE CERTIFICATE
in

Design and Development of Intelligent Systems in Data Science

This is a qualification awarded by this University, equivalent to 150 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.   Unique TECH Code: AFWORD235   techtitute.com/certificates

*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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