

# Postgraduate Certificate Data Processing and Big Data with Python



## Postgraduate Certificate Data Processing and Big Data with Python

- » 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/data-processing-big-data-python](http://www.techtitute.com/us/information-technology/postgraduate-certificate/data-processing-big-data-python)

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# 01

# Introduction

Error and Exception Handling with Python is a fundamental part of programming, allowing developers to handle unexpected situations or errors that may occur during the execution of a program. These tools provide detailed information about the bugs that occur, identifying their typology and the location in the code where they occurred. This makes it easier for computer scientists to correct problems. In view of this, TECH is developing a program that will provide advanced tools for the creation of customized exceptions. In addition, it is taught online so that students can combine their studies with the rest of their activities.



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*You will master the most advanced Integrated Development tools to facilitate code writing with this comprehensive TECH program"*

Organizations are increasingly recognizing the relevance of making informed decisions based on data. In this sense, Data Processing and Big Data with Python is a valuable tool for analyzing data and extracting meaningful information to support strategic decisions. In addition, these tools help institutions to locate inefficiencies in their operations, leading to optimization and resource savings. In tune with this, these resources reveal patterns, trends and relationships that are not obvious to the naked eye. This can drive innovation and discovery in a wide variety of fields, from medicine to scientific research.

Realizing its importance, TECH is launching a pioneering program that will delve into shaping the development environment using Python. The syllabus will delve into Flow Control, taking into account conditional control structures. At the same time, the syllabus will analyze the functions and modularity of this programming language based on parameters, arguments and return values. The program will also provide students with key resources for data analysis, among which IPython tools and Jupyter Notebooks stand out. Likewise, the didactic materials will encourage graduates to make innovative proposals to stand out in an IT industry that offers multiple opportunities.

It should be noted that, for this learning, students will have a 100% online platform and various multimedia resources (such as interactive summaries, case studies, infographics, etc.). In addition to this, TECH's *Relearning* methodology will favor the development of competencies and the mastery of complex concepts in a faster, more efficient and flexible way. All this with a qualification that will not be subject to rigid schedules so that each graduate can choose the time and place where they will focus on this Postgraduate Certificate.

This **Postgraduate Certificate in Data Processing and Big Data with Python** contains the most complete and up-to-date program on the market. The most important features include:

- ♦ The development of practical cases presented by experts in Python Development
- ♦ The graphic, schematic and practical contents of the book provide theoretical 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



*Thanks to the revolutionary Relearning methodology, you will integrate all the knowledge in an optimal way to successfully achieve the results you are looking for"*

“

*You will delve into Jupyter Notebooks to load, clean, explore and analyze data interactively”*

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 apply the most effective testing and debugging strategies to ensure that applications work correctly and are free of bugs.*

*You will achieve your objectives thanks to TECH's didactic tools, including explanatory videos and interactive summaries.*



# 02

# Objectives

Through this course, graduates will effectively handle the most advanced tools for data analysis with Python. In this sense, professionals will use the most relevant libraries and *frameworks* for the processing of this information. In addition, students will develop techniques for flow control and efficient code reuse. Moreover, students will promote best practices in coding and error handling through both testing and debugging strategies.





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*A complete and cutting-edge program that will allow you to advance in a progressive and complete way, from the comfort of your home"*



## General Objectives

- Provide a comprehensive understanding of Python
- Enable advanced data and type handling in Python
- Apply the principles of Object Oriented Programming (OOP) in Python
- Encourage the use of best practices and modern methodologies in software development
- Provide comprehensive education in web and mobile development with Python
- Integrate UI/UX principles in software development
- Teach the configuration and use of data development tools and environments
- Delve into the use of data structures and functions in Python
- Learn advanced data visualization techniques with Matplotlib
- Learn performance optimization and data warehousing strategies





## Specific Objectives

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- ◆ Handle flow control techniques and data handling functions
- ◆ Promote best practices for coding and error handling in Python.

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*Complete this academic itinerary from home or wherever you prefer thanks to its convenient 100% online format”*

# 03

# Course Management

In order to maintain intact the educational quality that characterizes its university programs, TECH has a first class teaching staff. These professionals have an extensive career in the field of Information Technology, where they have offered innovative solutions to prestigious institutions. Aware of the need to update their knowledge, these specialists remain at the technological forefront in their field. In this way, they are characterized by a broad discernment related to Data Processing and Big Data with Python. Students will enjoy a learning experience that will allow them to make a quality leap in their careers.





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*The diversity of talents and knowledge of the teaching staff will generate a dynamic learning environment. Train with the best!”*

## Management



### Dr. Matos Rodríguez, Dionis

- ♦ *Data Engineer* at Wide Agency Sadexo
- ♦ *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 Metaconcept
- ♦ Professional Master's Degree in Big Data & Analytics by the EAE Business School
- ♦ Professional Master's Degree in Systems Analysis and Design
- ♦ Bachelor's Degree in Computer Engineering from APEC University

## 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 Contreras, Milagros

- ♦ *Content Creator* at MPCTech LLC
- ♦ Project Manager
- ♦ *Freelance IT Writer*
- ♦ MBA from the Complutense University of Madrid
- ♦ Degree/Graduate in Business Administration from the Technological Institute of Santo Domingo

**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
- ♦ Professional Masters Degree in *Professional Coaching*
- ♦ Executive MBA from Emylon Business School, France
- ♦ Professional Master's Degree in Quality Management from EOI, Spain
- ♦ Computer Engineering from the University Action Pro-Education and Culture (UNAPEC)

**Mr Gil Contreras, Armando**

- ♦ Lead *Big Data Scientist* at Jhonson Controls
- ♦ *Data Scientist-Big Data* at Opensistemas S.A
- ♦ Fund Auditor at Creatividad y Tecnología S.A. (CYTSA)
- ♦ Public Sector Auditor at PricewaterhouseCoopers Auditores
- ♦ Professional Master's Degree in *Data Science* at University Center of Technology and Art
- ♦ Professional Máster Degree MBA in International Relations and Business from the Center for Financial Studies (CEF)
- ♦ Bachelor's Degree in Economics from the Technological Institute of Santo Domingo

**Mr. Delgado Panadero, Ángel**

- ♦ *ML Engenieer* at Paradigma Digital
- ♦ *Computer Vision Engineer* at NTT Disruption
- ♦ *Data Scientist* at Singular People
- ♦ *Data Analyst* at Parclick
- ♦ Specialist in *Data Engineering* on GPC
- ♦ Specialist in *Deep Learning*
- ♦ Degree in Physics at the University of Salamanca



*Take the opportunity to learn about the latest advances in this field in order to apply it to your daily practice"*

# 04

# Structure and Content

This program will provide graduates with advanced competencies in data management and analysis with Python. The program will cover everything from the use of this programming language in analysis science to the configuration of the development environment for virtual environments. Likewise, the syllabus will delve into aspects such as operators, tuples and list comprehensions. The didactic contents will also provide resources for data analysis, among which IPython and Jupyter Notebooks stand out. Students will acquire the necessary skills and knowledge to work efficiently with information in Python to face real challenges in the world of *Big Data*.



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*A Postgraduate Certificate that will raise your professional horizons so that you can compete among the best in the IT sector"*

## Module 1. Data Processing and *Big Data* with Python

- 1.1. Using Python on Data
  - 1.1.1. Python in Data Science and Analysis
  - 1.1.2. Essential Libraries for Data
  - 1.1.3. Applications and Examples
- 1.2. Setting Up the Python Development Environment
  - 1.2.1. Python Installation and Tools
  - 1.2.2. Configuration of Virtual Environments
  - 1.2.3. Integrated Development Tools (IDE)
- 1.3. Variables, Data Types and Operators in Python
  - 1.3.1. Variables and Primitive Data Types
  - 1.3.2. Data Structures
  - 1.3.3. Arithmetic and Logical Operators
- 1.4. Flow Control: Conditionals and Loops
  - 1.4.1. Conditional Control Structures (*if, else, elif*)
  - 1.4.2. Loops (*for, while*) and Flow Control
  - 1.4.3. List Comprehensions and Generator Expressions
- 1.5. Functions and Modularity with Python
  - 1.5.1. Use of Functions
  - 1.5.2. Parameters, Arguments and Return Values
  - 1.5.3. Modularity and Code Reuse
- 1.6. Error and Exception Handling with Python
  - 1.6.1. Errors and Exceptions
  - 1.6.2. Exception Handling with *Try-Except*
  - 1.6.3. Creating Custom Exceptions
- 1.7. IPython Tool
  - 1.7.1. IPython Tool
  - 1.7.2. Using IPython for Data Analysis
  - 1.7.3. Differences with the Standard Python Interpreter





- 1.8. *Jupyter Notebooks*
  - 1.8.1. *Jupyter Notebooks*
  - 1.8.2. Use of Notebooks for Data Analysis
  - 1.8.3. Publication of *Jupyter* Notebooks
- 1.9. Python Coding Best Practices
  - 1.9.1. Style and Conventions (WBS 8)
  - 1.9.2. Documentation and Comments
  - 1.9.3. Testing and Debugging Strategies
- 1.10. Python Resources and Communities
  - 1.10.1. Online Resources and Documentation
  - 1.10.2. Communities and Forums
  - 1.10.3. Learning and Updating in Python

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*A university program without fixed schedules and with a syllabus available from day one. Set your own learning pace!”*

# 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.



A close-up photograph of a person's hands typing on a laptop keyboard. The image is partially obscured by a teal diagonal overlay that covers the top right and bottom right portions of the page. The lighting is soft, highlighting the texture of the skin and the keys.

“

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

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 Data Processing and Big Data with Python 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 Data Processing and Big Data with Python** contains the most complete and up-to-date scientific 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 in Data Processing and Big Data with Python**

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  
development languages  
virtual classroom



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