Postgraduate Diploma

Comprehensive Python Programming

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Postgraduate Diploma
Comprehensive Python Programming

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

Website: www.techtitute.com/in/information-technology/postgraduate-diploma/postgraduate-diploma-comprehensive-python-programming

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01

Introduction

Comprehensive Python Programming presents itself as an exceptional option for software development. First of all, Python, with its clear and readable syntax, makes it easy to understand and write code. In addition, the versatility of the language allows a wide range of applications to be addressed, from web development to data analysis and machine learning. In turn, Comprehensive Programming stands out for fostering modularity and code reuse, promoting a more efficient and maintainable development. By using integrated libraries and frameworks, developers can take advantage of pre-existing solutions to accelerate the software creation process. This is why TECH has developed this comprehensive 100% online program, based on the innovative Relearning methodology.

Do you want to become an expert in Comprehensive Python Programming? You will combine the elegance of the language with the power of modularity, facilitating the development of robust and efficient applications"

Comprehensive Python Programming stands out as the preferred choice for developers and companies. First of all, Python is known for its clear and readable syntax, which facilitates code comprehension. In addition, its versatility allows the efficient integration of different programming paradigms, such as Object Oriented Programming, providing a holistic and adaptable approach. Comprehensive Programming also stands out for its modular approach, facilitating the reuse of code and the maintainability of projects in the long term. The combination of both aspects results in a powerful and accessible tool.

In this context, TECH has developed this Postgraduate Diploma in Comprehensive Python Programming, which covers an extensive syllabus aimed at providing computer scientists with a comprehensive understanding of the language and to develop advanced programming skills. In this way, the creation and execution of programs in Python will be addressed, as well as the use of integrated development tools (IDEs) for the execution of scripts.

Likewise, the course will delve into the comprehensive development of Python applications, so that the professional specializes in the design and advanced modeling of applications, effective testing and debugging, code optimization, deployment and maintenance of applications. In addition, aspects of application architecture and the handling of dependencies, security and authentication will be addressed.

Likewise, the syllabus will focus on the use of essential libraries, flow control techniques and specific functions for data processing. Graduates will learn about best practices for coding, style, conventions, documentation, testing and debugging in the context of data analysis. Finally, online resources and Python communities will be discussed, facilitating access to a wide range of resources.

Therefore, TECH will offer students a flexible and 100% online certification, based on the revolutionary Relearningmethodology, which focuses on the repetition of fundamental concepts to strengthen the assimilation of content.

This **Postgraduate Diploma in Comprehensive Python Programming** 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 Comprehensive Python Programming
- 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

Take advantage of all the benefits of Comprehensive Python Programming, which simplifies the development process and offers unparalleled flexibility and power to meet the changing demands of the digital world"

You'll apply SOLID principles and modular design, along with the use of UML and diagrams in application design and modeling, all through an extensive library of the most innovative multimedia resources"

You will delve into the management of object references, collection data, logical and arithmetic operations, and key concepts such as input/output, functions, strings and error handling.

Thanks to this 100% online Postgraduate Diploma, you will be equipped with the necessary tools to face real challenges in the world of software development and data analysis using Python.

The program's teaching staff includes professionals from the field who contribute their work experience to this educational 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.

02

Objectives

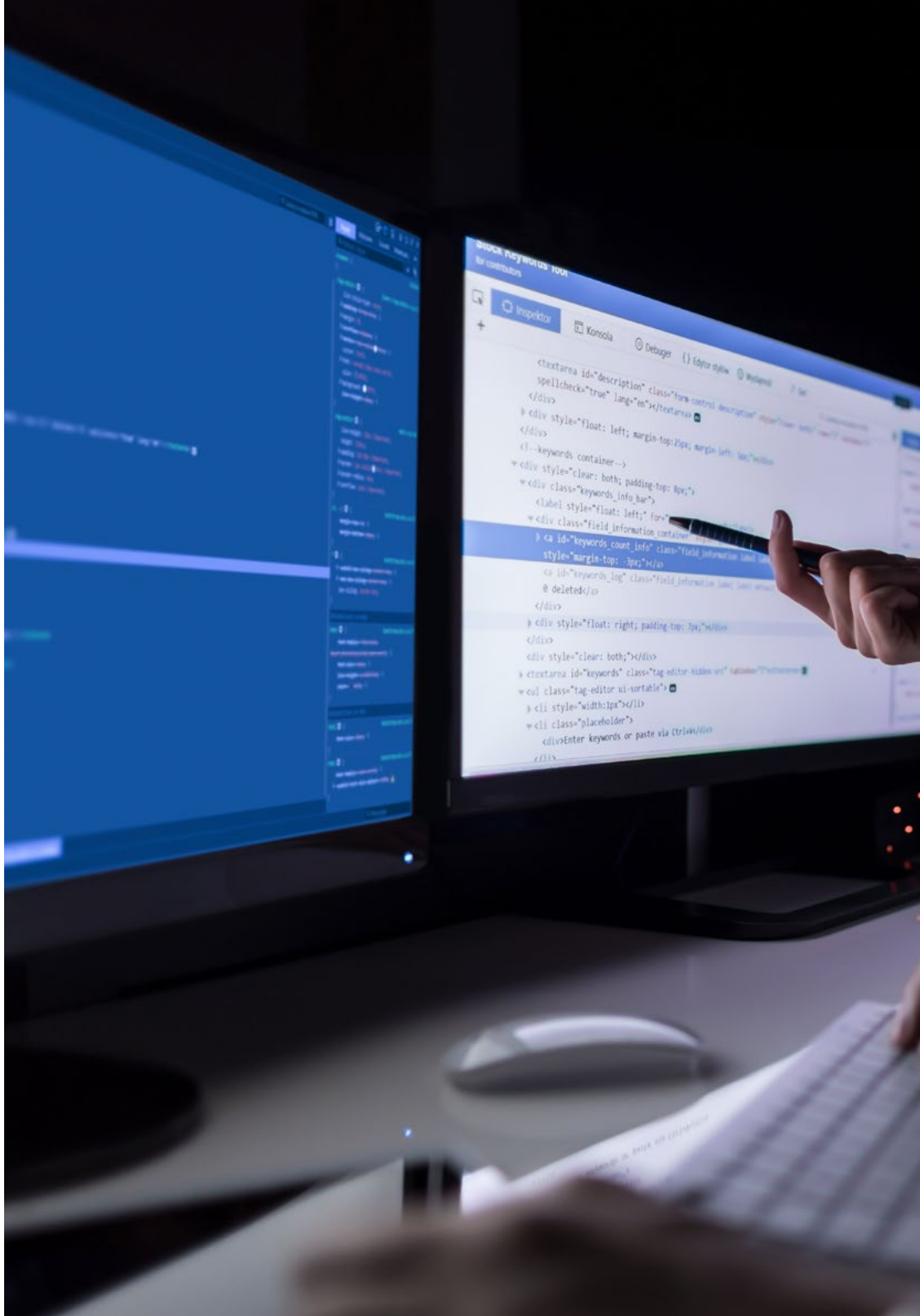
The Postgraduate Diploma aims to train highly qualified and versatile programming professionals. Therefore, it will seek to equip graduates with solid knowledge in the creation and execution of Python programs, as well as advanced data management. By highlighting the importance of best practices and modern methodologies in software development, the syllabus will enable computer scientists to master the syntax of the language, as well as the design and maintenance of applications in an efficient and effective manner. In addition, it will encourage specialization in advanced application design, effective testing and *debugging*.

You will not only acquire theoretical knowledge, but also cultivate practical skills essential to face real challenges in the world of software development using Python. Enroll now!"

General Objectives

- Provide a comprehensive understanding of Python
- Develop practical programming skills
- Encourage the use of best practices and modern methodologies in software development
- Become proficient in comprehensive Python application development
- Teach the configuration and use of data development tools and environments
- Develop skills in data management and analysis with Python

With a special emphasis on versatility, innovation and practical application, this Postgraduate Diploma presents itself as a fundamental catalyst for success in the Python programming industry"



Specific Objectives

Module 1. Python Programming

- Enable the configuration and effective use of the Python development environment
- Understand advanced programming concepts
- Get qualified in advanced data handling in Python

Module 2. Application Development in Python

- Specialize in the design and advanced modeling of applications
- Learn how to optimize, deploy and maintain applications
- Control testing and Debugging

Module 3. Data Processing and Big Data with Python

- Handle flow control techniques and data handling functions
- Promote best practices for coding and error handling in Python
- Use essential Python data libraries

03

Course Management

Teachers stand out as passionate and highly qualified experts, committed to the success and holistic development of each student. With a combination of practical experience and theoretical knowledge, these professionals are fluent in the Python language and possess a deep understanding of current trends and demands in software development. Their pedagogical approach will be characterized by inspiration, motivation and active learning, cultivating a dynamic environment. These mentors will guide graduates in the application of concepts in practical projects, encouraging the development of critical skills and the resolution of real problems.

The faculty, on the cutting edge of technology and programming, will effectively prepare you to excel in the competitive world of software development with Python"

Management

Mr. 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 Metaconxept
- 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

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 Emlyon 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

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. 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

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

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 Postgraduate Diploma has been developed to provide professionals with a complete immersion in the field of Comprehensive Python Programming. From program creation to advanced data management, the syllabus will cover all the crucial aspects to forge highly competent developers. As such, the content will not only delve into the clear and readable syntax of Python, but will also delve into advanced concepts such as object reference management, modular design and common architectural patterns.

From data analysis, to advanced project implementation, this syllabus will equip you with the essential skills to succeed in the dynamic programming landscape"

Module 1. Python Programming

1.1. Creation and Execution of Python Programs
- 1.1.1. Configuration of the Development Environment
- 1.1.2. Execution of Python Scripts
- 1.1.3. Integrated Development Tools (IDEs)

1.2. Data in Python
- 1.2.1. Primitive Types (int, float, str)
- 1.2.2. Conversion and Casting of Data Types in Python
- 1.2.3. Immutability and Data Storage in Python

1.3. References to Objects in Python
- 1.3.1. References in Memory
- 1.3.2. Identity vs. Equality
- 1.3.3. Reference Management and Garbage Collection

1.4. Collection Data in Python
- 1.4.1. Common Lists and Operations
- 1.4.2. Tuples and their Immutability
- 1.4.3. Dictionaries and Data Access

1.5. Logical Operations in Python
- 1.5.1. Boolean Operators
- 1.5.2. Conditional Expressions
- 1.5.3. Short-Circuit Evaluation

1.6. Arithmetic Operators in Python
- 1.6.1. Arithmetic Operations in Python
- 1.6.2. Division Operators
- 1.6.3. Precedence and Associativity

1.7. Input/output in Python
- 1.7.1. Reading Data from Standard Input
- 1.7.2. Writing Data to Standard Output
- 1.7.3. File Handling

1.8. Creating and Calling Python Functions
- 1.8.1. Function Syntax
- 1.8.2. Parameters and Arguments
- 1.8.3. Return Values and Anonymous Functions

1.9. Using Strings in Python
- 1.9.1. Manipulating and Formatting Strings
- 1.9.2. Common Strings Methods
- 1.9.3. Interpolation and F-strings

1.10. Error and Exception Handling in Python
- 1.10.1. Common Types of Exceptions
- 1.10.2. Try-except Blocks
- 1.10.3. Creating Custom Exceptions

Module 2. Application Development in Python

2.1. Python Application Architecture
- 2.1.1. Software Design
- 2.1.2. Common Architectural Patterns
- 2.1.3. Requirements and Needs Assessment

2.2. Design and Modeling of Python Applications
- 2.2.1. Use of UML and Diagrams
- 2.2.2. Modeling Data and Information Flow
- 2.2.3. SOLID Principles and Modular Design

2.3. Dependency and Library Management in Python
- 2.3.1. Package Management with Pip
- 2.3.2. Use of Virtual Environments
- 2.3.3. Resolving Dependency Conflicts

2.4. Design Patterns in Python Development
- 2.4.1. Creative, Structural and Behavioral Patterns
- 2.4.2. Practical Application of Patterns
- 2.4.3. Refactoring and Patterns

2.5. Testing and Debugging in Python Applications
- 2.5.1. Testing Strategies (Unitary, Integration)
- 2.5.2. Use of Testing Frameworks
- 2.5.3. Debugging Techniques and Tools

2.6. Security and Authentication in Python
- 2.6.1. Application Security
- 2.6.2. Implementation of Authentication and Authorization
- 2.6.3. Vulnerability Prevention

2.7. Optimization and Performance of Python Applications
- 2.7.1. Performance Analysis
- 2.7.2. Code Optimization Techniques
- 2.7.3. Efficient Resource and Data Management

2.8. Deployment and Distribution of Python Applications
- 2.8.1. Deployment Strategies
- 2.8.2. Use of Containers and Orchestrators
- 2.8.3. Distribution and Continuous Updates

2.9. Maintenance and Updating in Python
- 2.9.1. Software Lifecycle Management
- 2.9.2. Maintenance and Refactoring Strategies
- 2.9.3. System Upgrade and Migration

2.10. Documentation and Technical Support in Python
- 2.10.1. Creating Effective Documentation
- 2.10.2. Documentation Tools
- 2.10.3. Strategies for Supporting and Communicating with Users

Module 3. Data Processing and *Big Data* with Python

3.1. Using Python on Data
- 3.1.1. Python in Data Science and Analysis
- 3.1.2. Essential Libraries for Data
- 3.1.3. Applications and Examples

3.2. Setting Up the Python Development Environment
- 3.2.1. Python Installation and Tools
- 3.2.2. Configuration of Virtual Environments
- 3.2.3. Integrated Development Tools (IDE)

3.3. Variables, Data Types and Operators in Python
- 3.3.1. Variables and Primitive Data Types
- 3.3.2. Data Structures
- 3.3.3. Arithmetic and Logical Operators

3.4. Flow Control: Conditionals and Loops
- 3.4.1. Conditional Control Structures (if, else, elif)
- 3.4.2. Loops (for, while) and Flow Control
- 3.4.3. List Comprehensions and Generator Expressions

3.5. Functions and Modularity with Python
- 3.5.1. Use of Functions
- 3.5.2. Parameters, Arguments and Return Values
- 3.5.3. Modularity and Code Reuse

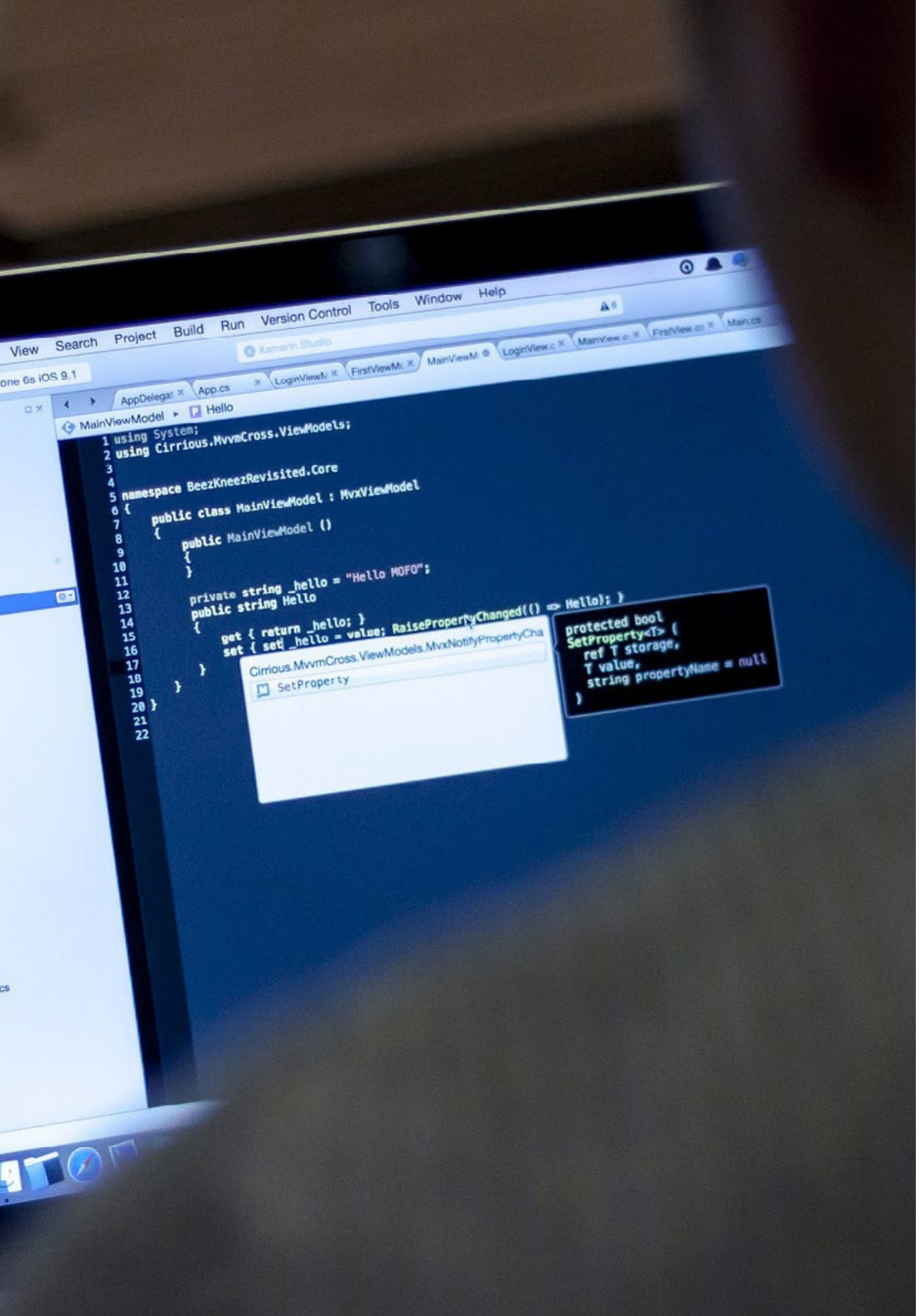
3.6. Error and Exception Handling with Python
- 3.6.1. Errors and Exceptions
- 3.6.2. Exception Handling with Try-Except
- 3.6.3. Creating Custom Exceptions

3.7. IPython Tool
- 3.7.1. IPython Tool
- 3.7.2. Using IPython for Data Analysis
- 3.7.3. Differences with the Standard Python Interpreter

3.8. Jupyter Notebooks
- 3.8.1. Jupyter Notebooks
- 3.8.2. Use of Notebooks for Data Analysis
- 3.8.3. Publication of Jupyter Notebooks

3.9. Python Coding Best Practices
- 3.9.1. Style and Conventions (WBS 8)
- 3.9.2. Documentation and Comments
- 3.9.3. Testing and Debugging Strategies

3.10. Python Resources and Communities
- 3.10.1. Online Resources and Documentation
- 3.10.2. Communities and Forums
- 3.10.3. Learning and Updating in Python



With a focus on best practices and modern methodologies, the program will push you to cultivate skills to effectively design, optimize and maintain applications"

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

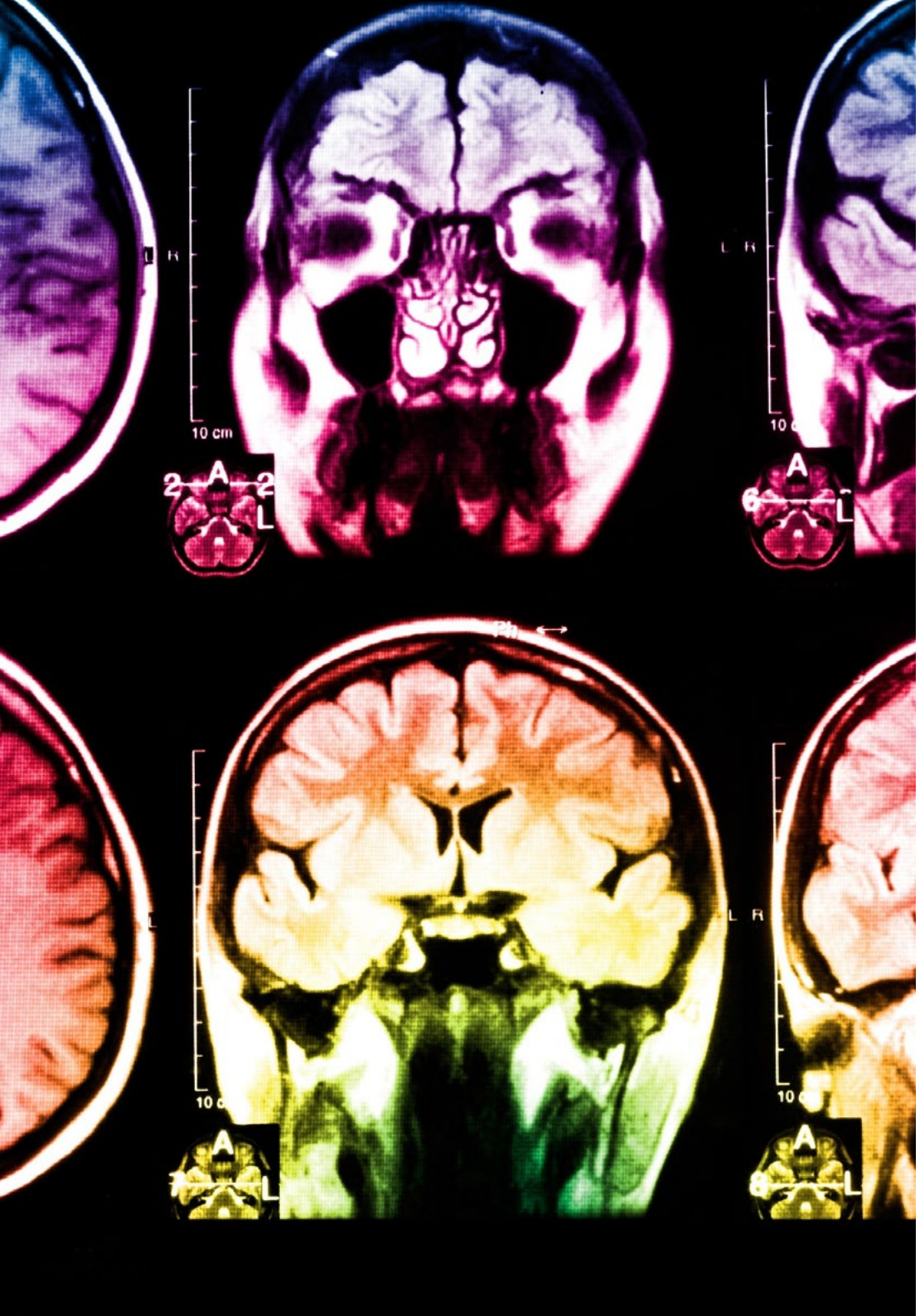
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.



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.

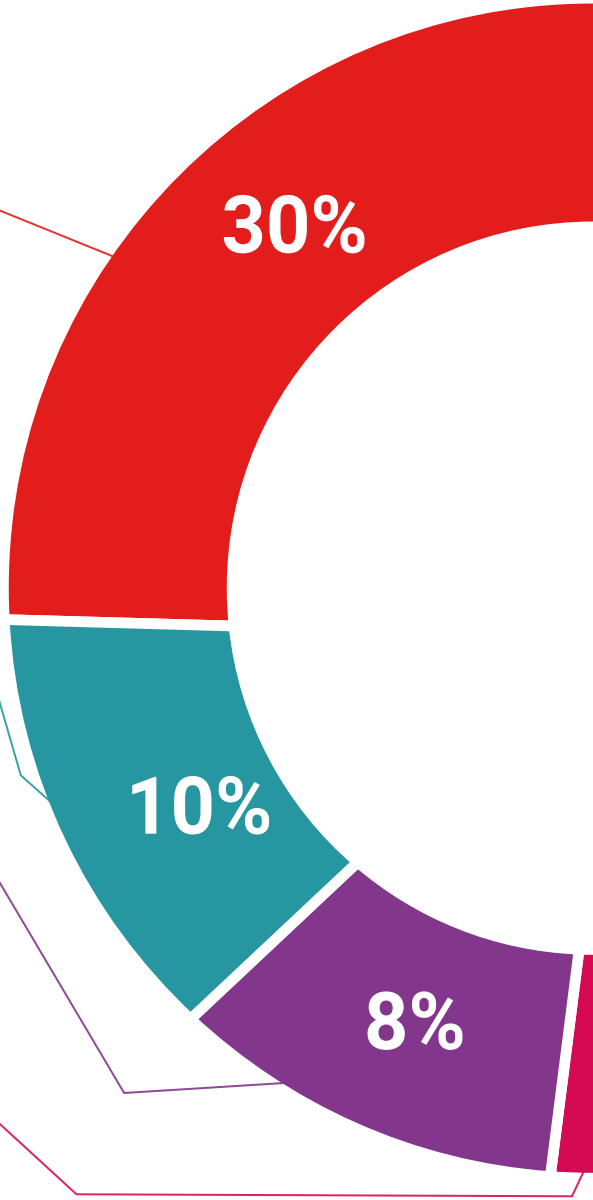
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

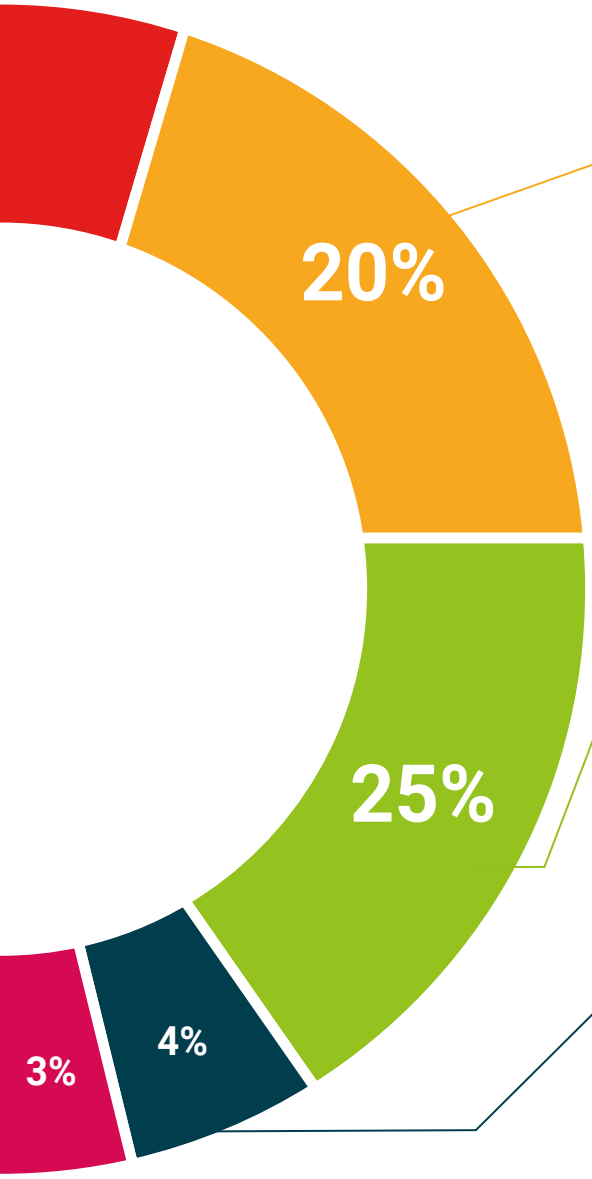
Practising Skills and Abilities

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 Diploma in Comprehensive Python Programming guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma 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 Diploma in Comprehensive Python Programming** contains the most complete and up-to-date educational program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Diploma** issued by **TECH Technological University** via tracked delivery*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in Comprehensive Python Programming**

Official Nº of Hours: **450 h.**


tech technological university

Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having passed and accredited the following program

POSTGRADUATE DIPLOMA

in

Comprehensive Python Programming

This is a qualification awarded by this University, equivalent to 450 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

Unique TECH Code: AFWORD23S techtitute.com/certificates

*Apostille Convention. In the event that the student wishes to have their paper certificate issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

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Postgraduate Diploma
Comprehensive Python Programming

- Modality: **online**
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- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Postgraduate Diploma

Comprehensive Python Programming

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