

# Postgraduate Certificate

## API Creation and Architecture with Flask from Scratch



## Postgraduate Certificate API Creation and Architecture with Flask from Scratch

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Global University
- » Accreditation: 6 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/information-technology/postgraduate-certificate/api-creation-architecture-flask-scratch](http://www.techtute.com/us/information-technology/postgraduate-certificate/api-creation-architecture-flask-scratch)

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# 01

# Introduction to the Program

The creation of APIs and the design of efficient web architectures are fundamental pillars in the development of modern applications. For this reason, Flask, a Python microframework widely recognized for its flexibility and simplicity, has established itself as a key tool for these objectives. According to a report by JetBrains, Python continues to be one of the most widely used languages in global software projects, with Flask leading the way as one of the preferred options for building light and agile APIs. Taking into account these innovations in the current technology industry, TECH has designed this Postgraduate Certificate that will cover everything related to developing innovative software projects. Using a 100% online methodology, specialists will boost their career and make a difference in the global market.



“

*Become an expert in creating scalable web architectures with Flask. This online Postgraduate Certificate will guide you step by step in designing the modern solutions that companies need. Enroll and take the leap into the future of development!*

In a world where integration between applications is key, APIs stand out as a set of essential rules and protocols that allow different systems, applications or software to communicate with each other efficiently. In fact, with Flask it is possible to design efficient and customized RESTful APIs to meet the specific needs of any project.

In this sense, mastering this tool will open the door to the construction of scalable systems that optimize the user experience and respond to current technological demands. For this reason, TECH has designed this Postgraduate Certificate in API Creation and Architecture with Flask from Scratch, which will provide up-to-date knowledge and practical tools that will enable any project to be tackled successfully. Using a comprehensive and multidisciplinary approach, the program will cover topics such as the creation of RESTful APIs, the configuration of development environments, database management using SQLAlchemy and deployment on cloud servers, among others. In addition, key security and optimization concepts will be emphasized to guarantee application performance.

By acquiring this knowledge, graduates will be prepared to take on professional challenges in an increasingly competitive global market. Thanks to this program, they will not only acquire technical skills, but also a comprehensive vision that will position them as leaders in the creation of innovative digital infrastructures. In this way, they will be able to access roles such as back-end developers, software architects or technology consultants, significantly increasing their employability and professional projection.

Furthermore, the program will be delivered 100% online, allowing students to organize their studies according to their schedules and responsibilities. In turn, the Relearning methodology, based on the reiteration of key concepts, will promote the assimilation of content in a dynamic and effective way. In this way, TECH will offer an accessible, flexible educational experience that is perfectly adapted to the demands of today's world.

This **Postgraduate Certificate in API Creation and Architecture with Flask from Scratch** contains the most complete and up-to-date educational program on the market. Its most notable features are:

- ♦ The development of case studies presented by experts in programming
- ♦ Graphic, schematic, and practical contents which provide scientific and practical information on the disciplines that are essential for professional practice
- ♦ Practical exercises where the process of self-assessment can be used to improve learning
- ♦ Special emphasis on innovative methodologies in API Creation and Architecture with Flask from Scratch
- ♦ 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



*Discover a 100% online methodology designed to enhance your skills and stand out in the competitive world of web development. Enroll at TECH today and make a difference!"*

“

*You will learn how to develop APIs and web architectures from scratch with a practical syllabus designed by experts. With TECH's online methodology, your professional growth is just a click away. Get started now!”*

Its teaching staff includes professionals from the field of medicine, who bring to this program the experience of their work, 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 an immersive learning experience designed to prepare for real-life situations.

This program is designed around Problem-Based Learning, whereby the student must try to solve the different professional practice situations that arise throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced experts.

*Master Flask and build robust APIs with the support of leading professors in the industry. With this online Postgraduate Certificate, you will have access to up-to-date and practical content that will transform your career.*

*Only TECH will provide you with a complete program that covers the fundamentals and implementation of advanced APIs. Enroll now and take your projects to the next level!*



02

# Why Study at TECH?

TECH is the world's largest online university. With an impressive catalog of more than 14,000 university programs available in 11 languages, it is positioned as a leader in employability, with a 99% job placement rate. In addition, it relies on an enormous faculty of more than 6,000 professors of the highest international renown.



“

*Study at the world's largest online university and guarantee your professional success. The future starts at TECH”*

**The world's best online university, according to FORBES**

The prestigious Forbes magazine, specialized in business and finance, has highlighted TECH as "the best online university in the world" This is what they have recently stated in an article in their digital edition in which they echo the success story of this institution, "thanks to the academic offer it provides, the selection of its teaching staff, and an innovative learning method oriented to form the professionals of the future".

**Forbes**  
The best online university in the world

The most complete  
**syllabus**

**The most complete syllabuses on the university scene**

TECH offers the most complete syllabuses on the university scene, with programs that cover fundamental concepts and, at the same time, the main scientific advances in their specific scientific areas. In addition, these programs are continuously updated to guarantee students the academic vanguard and the most demanded professional skills and the most in-demand professional competencies. In this way, the university's qualifications provide its graduates with a significant advantage to propel their careers to success.

**The best top international faculty**

TECH's faculty is made up of more than 6,000 professors of the highest international prestige. Professors, researchers and top executives of multinational companies, including Isaiah Covington, performance coach of the Boston Celtics; Magda Romanska, principal investigator at Harvard MetaLAB; Ignacio Wistumba, chairman of the department of translational molecular pathology at MD Anderson Cancer Center; and D.W. Pine, creative director of TIME magazine, among others.

**TOP**  
international faculty

**The world's largest online university**

TECH is the world's largest online university. We are the largest educational institution, with the best and widest digital educational catalog, one hundred percent online and covering most areas of knowledge. We offer the largest selection of our own degrees and accredited online undergraduate and postgraduate degrees. In total, more than 14,000 university programs, in ten different languages, making us the largest educational institution in the world.

**World's No.1**  
The World's largest online university

**The most effective methodology**

**A unique learning method**

TECH is the first university to use Relearning in all its programs. This is the best online learning methodology, accredited with international teaching quality certifications, provided by prestigious educational agencies. In addition, this innovative academic model is complemented by the "Case Method", thereby configuring a unique online teaching strategy. Innovative teaching resources are also implemented, including detailed videos, infographics and interactive summaries.

**The official online university of the NBA**

TECH is the official online university of the NBA. Thanks to our agreement with the biggest league in basketball, we offer our students exclusive university programs, as well as a wide variety of educational resources focused on the business of the league and other areas of the sports industry. Each program is made up of a uniquely designed syllabus and features exceptional guest hosts: professionals with a distinguished sports background who will offer their expertise on the most relevant topics.

**Leaders in employability**

TECH has become the leading university in employability. Ninety-nine percent of its students obtain jobs in the academic field they have studied within one year of completing any of the university's programs. A similar number achieve immediate career enhancement. All this thanks to a study methodology that bases its effectiveness on the acquisition of practical skills, which are absolutely necessary for professional development.



**Google Premier Partner**

The American technology giant has awarded TECH the Google Premier Partner badge. This award, which is only available to 3% of the world's companies, highlights the efficient, flexible and tailored experience that this university provides to students. The recognition not only accredits the maximum rigor, performance and investment in TECH's digital infrastructures, but also places this university as one of the world's leading technology companies.



**The top-rated university by its students**

Students have positioned TECH as the world's top-rated university on the main review websites, with a highest rating of 4.9 out of 5, obtained from more than 1,000 reviews. These results consolidate TECH as the benchmark university institution at an international level, reflecting the excellence and positive impact of its educational model.



# 03 Syllabus

Through a carefully designed syllabus, professionals will learn how to manage routes, controllers, authentication or authorization and work with databases, optimizing the interaction between applications and systems. In addition, they will delve into software design concepts such as separation of responsibilities, design patterns and exception handling. All of this will be approached through multimedia resources and case studies that will allow them to acquire technical skills, while developing a deep understanding of the challenges of modern web development.





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*This comprehensive syllabus will not only give you a thorough grounding in Flask, but will also enable you to design and implement effective solutions in the real world”*

## Module 1. Back-End Development III - Flask, API Creation and Basic Architecture from Scratch

- 1.1. Flask as Back-End Framework
  - 1.1.1. Back-End Framework. Purpose
  - 1.1.2. Flask. Features
  - 1.1.3. Preparing the Development Environment and Installing Flask
  - 1.1.4. First Project with Flask: "Hello World"
- 1.2. Routes and HTTP Requests in Flask
  - 1.2.1. Routes: How They Work in a Web Application
  - 1.2.2. HTTP Methods in Flask: GET, POST, PUT and DELETE
  - 1.2.3. Routes in Flask with Parameters and Data
  - 1.2.4. Organizing Routes in a Project
- 1.3. Controllers and Handling Responses in Flask
  - 1.3.1. Controller: Function and Responsibilities
  - 1.3.2. Types of Responses in Flask: Text, JSON and HTML
  - 1.3.3. Creating Controllers for APIs in Flask
  - 1.3.4. CRUD Operations in Controllers
- 1.4. RESTful APIs
  - 1.4.1. RESTful APIs. Principles
  - 1.4.2. HTTP Methods and Conventions in RESTful APIs
  - 1.4.3. Creating a RESTful API in Flask
  - 1.4.4. Designing a RESTful API with CRUD Operations
- 1.5. Databases and Flask with SQLite
  - 1.5.1. Databases in Web Applications
  - 1.5.2. Connecting to SQLite in Flask Projects
  - 1.5.3. Creating Tables and Models using SQLAlchemy
  - 1.5.4. CRUD Queries in SQLite for Data Management
- 1.6. Authentication and Basic Security in APIs
  - 1.6.1. Authentication and Authorization in APIs
  - 1.6.2. Creating a User Authentication System
  - 1.6.3. Using Tokens for Authentication in Flask
  - 1.6.4. Protecting User Paths and Data in APIs



- 1.7. Data Validation and Error Handling
  - 1.7.1. Error and Exception Handling in Flask
  - 1.7.2. Data Validation in API Requests
  - 1.7.3. Creating Custom Error Messages
  - 1.7.4. Validation Strategies and Error Handling in CRUD
- 1.8. Structuring Scalable APIs
  - 1.8.1. Organization and Structure of a Scalable Flask Project
  - 1.8.2. Modularization and Separation of Responsibilities in APIs
  - 1.8.3. Basic Optimization of APIs for Performance and Scalability
  - 1.8.4. Organizational Strategy for Large Projects
- 1.9. Real-Time Communication with WebSockets
  - 1.9.1. Websockets. Applications
  - 1.9.2. Implementation of WebSockets in Flask with Flask-SocketIO
  - 1.9.3. Real-Time Communication in Flask Applications
- 1.10. Application Deployment and Maintenance
  - 1.10.1. Preparing Flask Applications for Production
  - 1.10.2. Deployment on Popular Platforms such as Heroku and Render
  - 1.10.3. Using Docker for Containerized Deployment
  - 1.10.4. Monitoring and Maintaining Back-end Applications



*The professors, renowned professionals, will guide you throughout this academic journey, providing you with practical tools to address real cases. Take the next step in your career with TECH!"*

# 04

# Teaching Objectives

This Postgraduate Certificate is designed to ensure that specialists acquire a deep and practical understanding of the fundamental principles of modern web development. First, the program will cover the essential aspects of Flask, enabling them to create RESTful APIs from scratch and structure applications efficiently. Through a practical and dynamic methodology, they will learn how to implement key functionalities such as routing, data management and authentication, ensuring that they can develop robust and scalable applications. Finally, they will acquire knowledge of software architecture, understanding how to design modular and easy-to-maintain systems.



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*This Postgraduate Certificate will provide you with the necessary skills to excel in this highly demanded field. You will be ready to face complex challenges in the world of web development”*



## General Objectives

- Understand the fundamentals of Flask and its application in the creation of modern APIs
- Design and develop efficient and scalable RESTful APIs from scratch
- Implement authentication and authorization practices to ensure API security
- Manage relational and non-relational databases integrated with Flask
- Use Flask extensions to optimize and extend project functionality
- Implement unit and integration tests to guarantee code quality
- Manage errors and exceptions effectively in Flask-based applications
- Deploy Flask applications on local or cloud servers
- Apply software architecture principles to build modular and reusable systems
- Integrate APIs with front-end clients or third-party systems to create complete applications





## Specific Objectives

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- Develop RESTful APIs using Flask
- Integrate databases into Flask applications
- Implement authentication and security in APIs
- Design the basic architecture of a back-end application with Flask

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*You will have access to up-to-date educational content developed by the industry's leading experts. You will study online and have access to the content 24 hours a day!”*

05

# Study Methodology

TECH is the world's first university to combine the **case study** methodology with **Relearning**, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.



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*TECH will prepare you to face new challenges in uncertain environments and achieve success in your career”*

## The student: the priority of all TECH programs

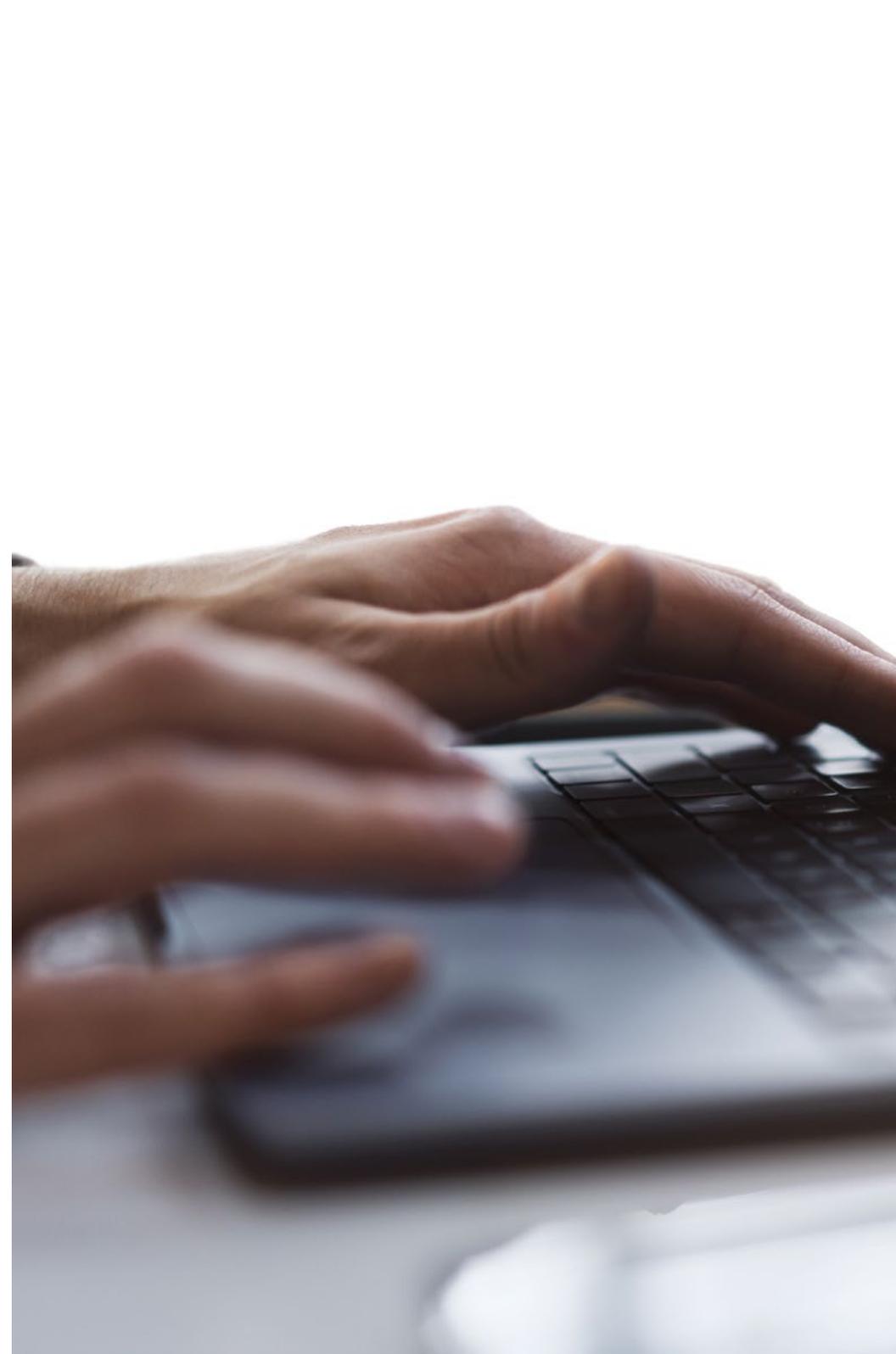
In TECH's study methodology, the student is the main protagonist.

The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

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*At TECH you will NOT have live classes  
(which you might not be able to attend)”*



### The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

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*TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want”*

## Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.



## Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

*Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.*



## A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.



*The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule”*

### The effectiveness of the method is justified by four fundamental achievements:

1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that assess real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

## The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the teaching quality, the quality of the materials, the structure of the program and its objectives is excellent. Not surprisingly, the institution became the top-rated university by its students according to the global score index, obtaining a 4.9 out of 5.

*Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.*

*You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.*



As such, the best educational materials, thoroughly prepared, will be available in this program:



#### 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.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



#### Practicing Skills and Abilities

You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.



#### Interactive Summaries

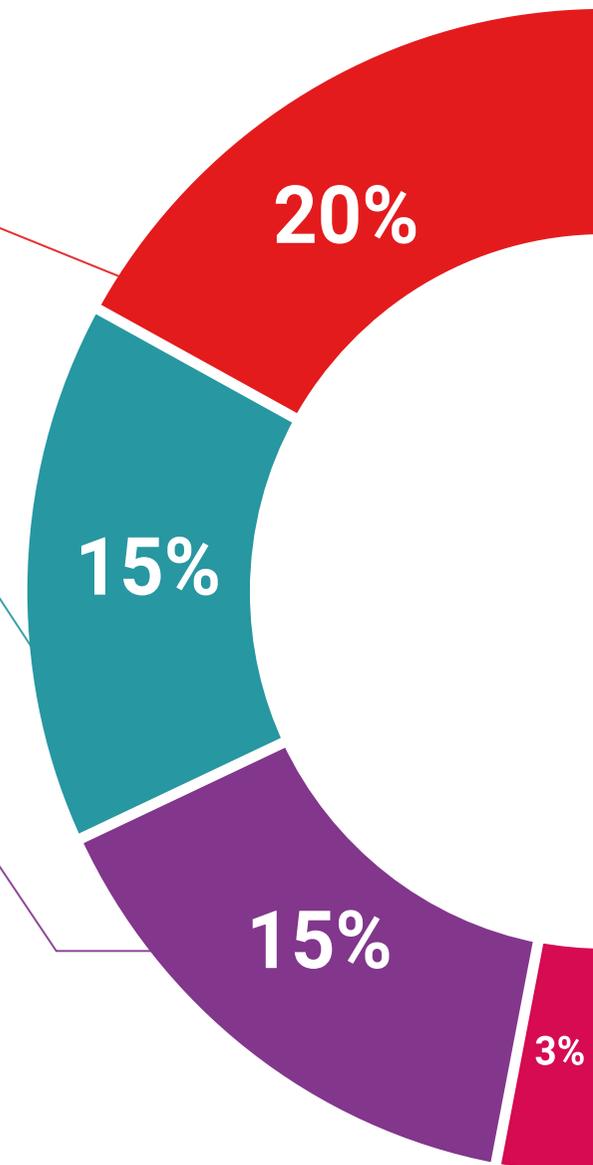
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

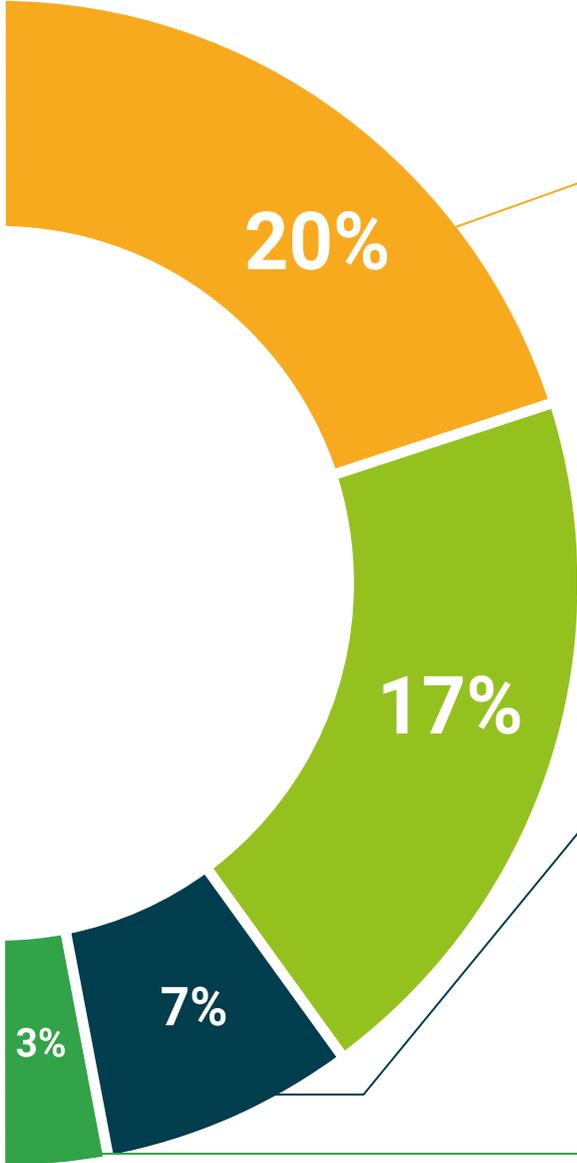
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### Additional Reading

Recent articles, consensus documents, international guides... In our virtual library you will have access to everything you need to complete your education.





**Case Studies**

Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.



**Testing & Retesting**

We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.



**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 for future difficult decisions.



**Quick Action Guides**

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical and effective way to help students progress in their learning.



# 06

# Teaching Staff

The teaching staff for this qualification is made up of highly qualified experts with extensive experience in the development of web applications and the creation of APIs. Thanks to their solid academic background and professional experience, the mentors are in a unique position to offer quality learning, adapted to the needs of today's market. In short, each of them will provide a practical and up-to-date vision of the challenges developers face when working with modern technologies such as Flask.



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*The teaching staff is a fundamental pillar to ensure that you receive a comprehensive, quality education that is completely aligned with the demands of today's market”*

## Management



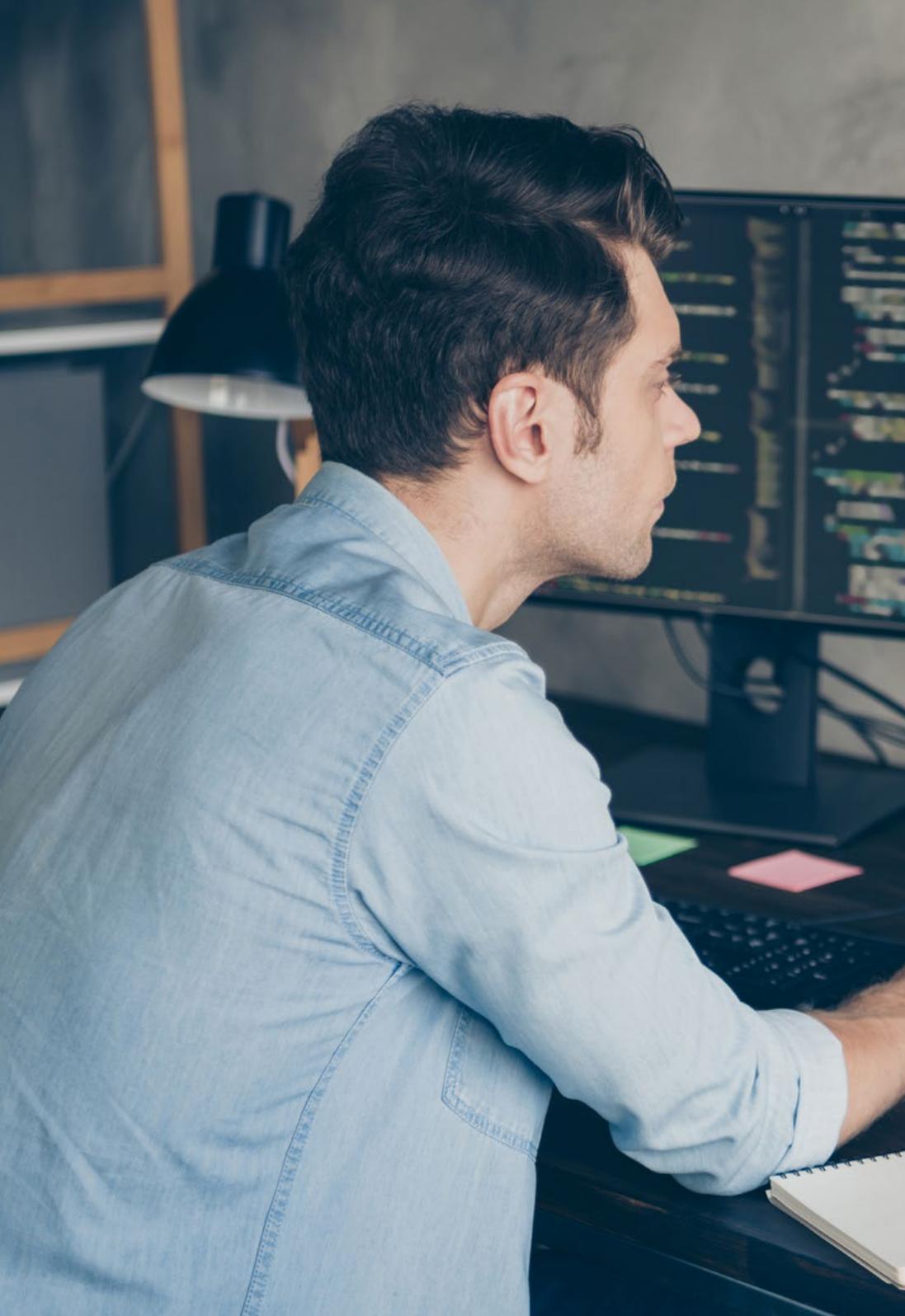
### Dr. Lucas Cuesta, Juan Manuel

- ♦ Senior Software Engineer and Analyst at Indizen – Believe in Talent
- ♦ Senior Software Engineer and Analyst at Krell Consulting and IMAGiNA Artificial Intelligence
- ♦ Software Engineer at Intel Corporation
- ♦ Software Engineer at Intelligent Dialog Systems
- ♦ PhD in Electronic Systems Engineering for Intelligent Environments from the Polytechnic University of Madrid
- ♦ Graduate in Telecommunications Engineering at the Polytechnic University of Madrid
- ♦ Master's Degree in Electronic Systems Engineering for Intelligent Environments from the Polytechnic University of Madrid



### Mr. Márquez Ruiz de Lacanal, Juan Antonio

- ♦ Software Developer at GTD Defense & Security Solutions
- ♦ Software Developer at Solera Inc
- ♦ Development and Research Engineer at GRVC Sevilla
- ♦ Co-founder of Unmute
- ♦ Co-founder of VR Educa
- ♦ Academic Exchange in Engineering and Entrepreneurship at the University of California, Berkeley
- ♦ Degree in Industrial Engineering from the University of Sevilla



## Professors

### Mr. Péris Millán, Eduardo

- ◆ Director of the Technological Consultancy Department
- ◆ Specialist in Computer Engineering
- ◆ Master's Degree in Strategic Management of Information and Knowledge in Organizations
- ◆ Master's Degree in Leadership and Public Management
- ◆ Expert in Public Management
- ◆ Expert in Computer Systems for Smart CITIES

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*A unique, key and decisive learning experience to boost your professional development”*

# 07 Certificate

This Postgraduate Certificate in API Creation and Architecture with Flask from Scratch guarantees, in addition to the most rigorous and up-to-date program, access to an Postgraduate Certificate diploma issued by TECH Global University.



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*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"*

This private qualification will allow you to obtain a diploma for the **Postgraduate Certificate in API Creation and Architecture with Flask from Scratch** 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.

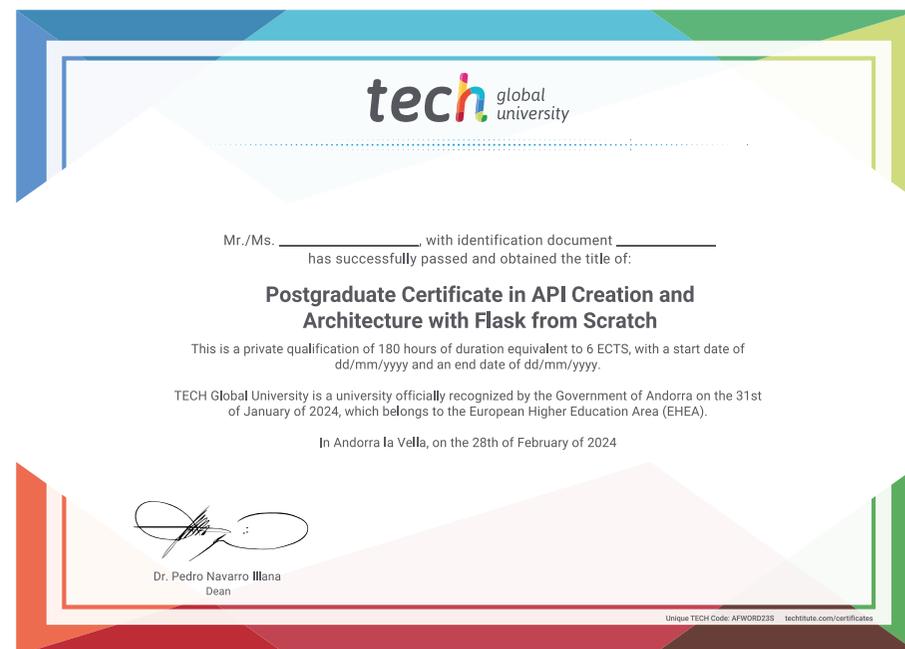
This **TECH Global University** private qualification, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in API Creation and Architecture with Flask from Scratch**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



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



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