Professional Master's Degree
Systems Computing

tech global university

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Professional Master's Degree
Systems Computing

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Credits: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/information-technology/professional-master-degree/master-systems-computing

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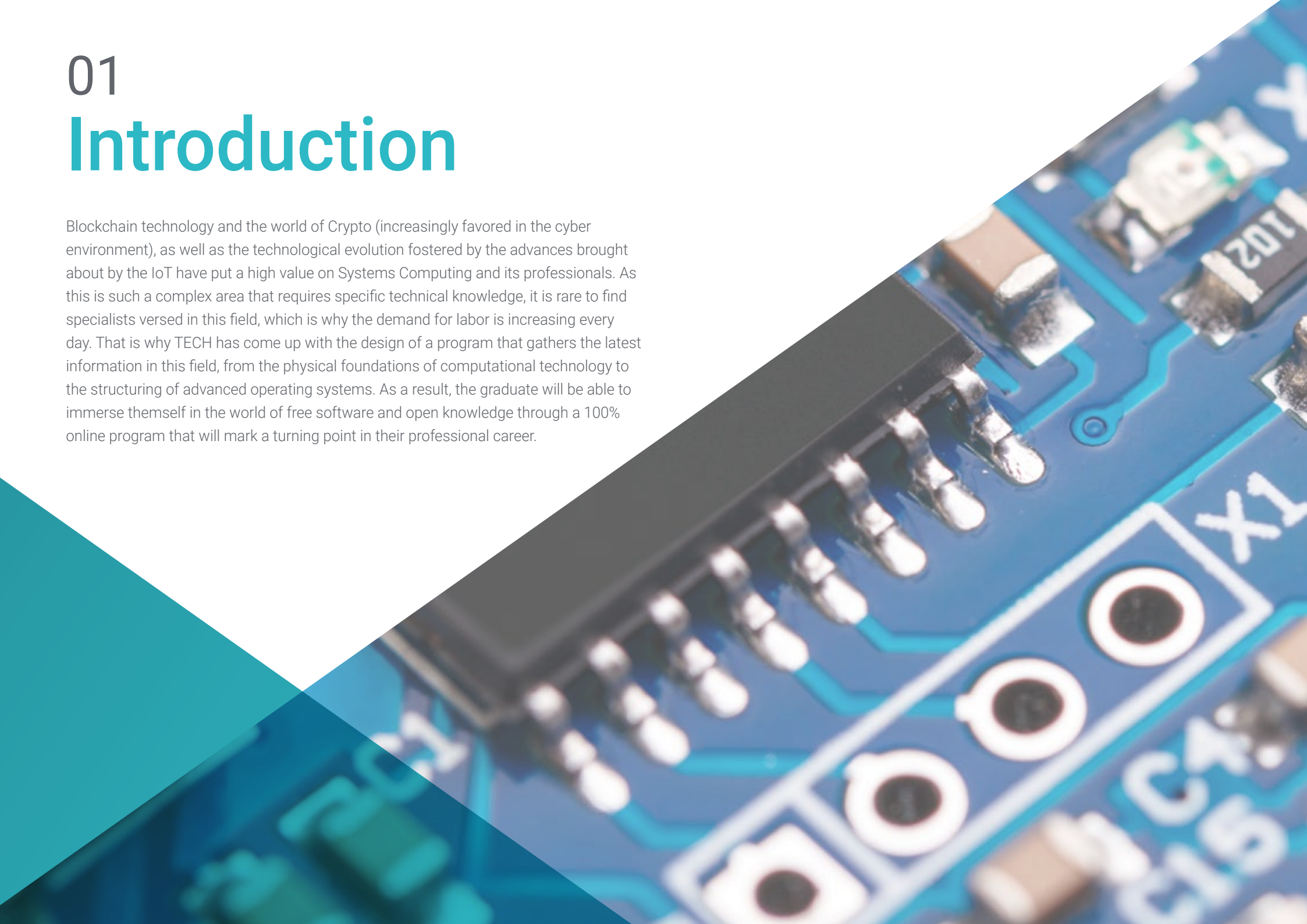
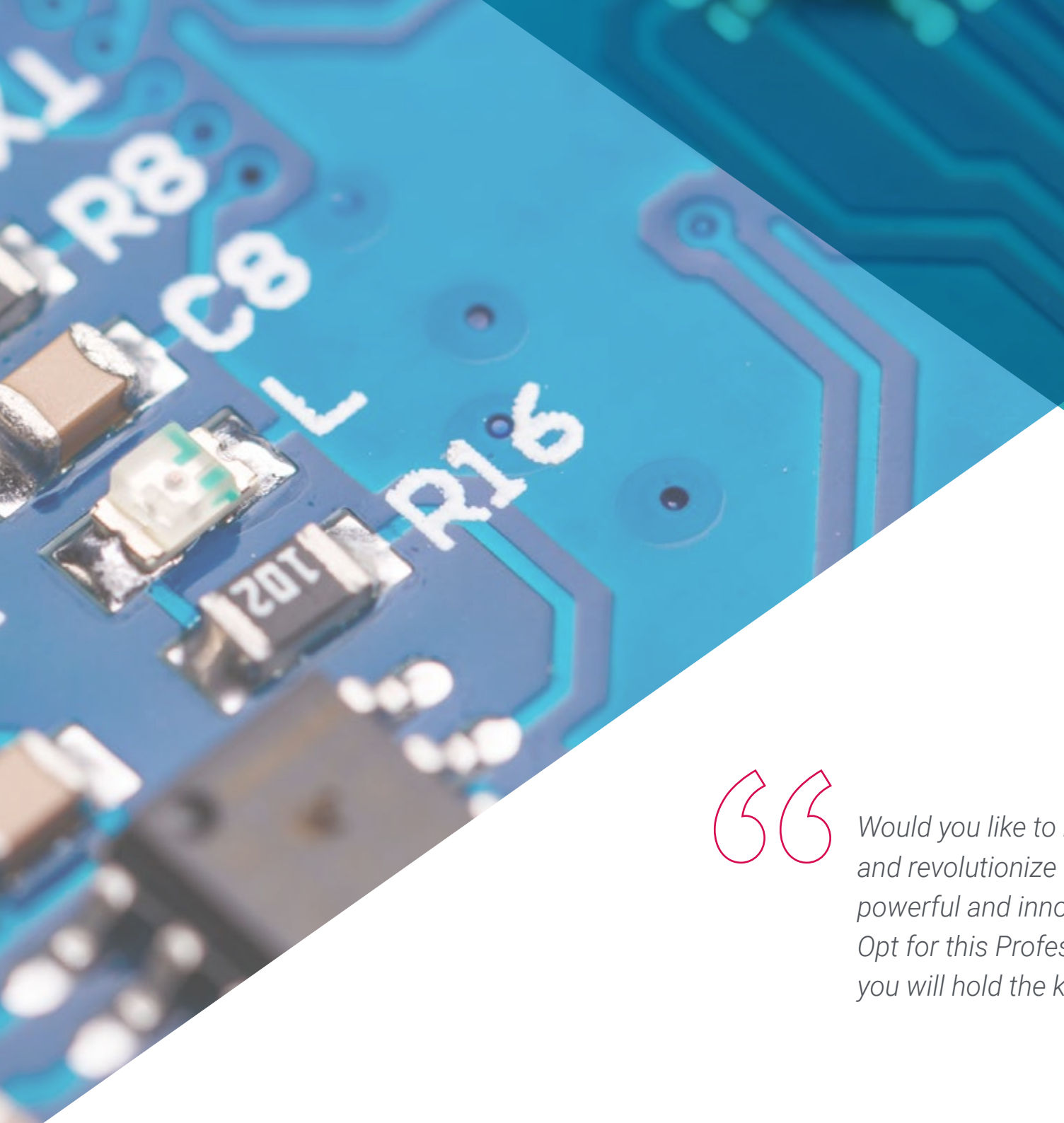
01

Introduction

Blockchain technology and the world of Crypto (increasingly favored in the cyber environment), as well as the technological evolution fostered by the advances brought about by the IoT have put a high value on Systems Computing and its professionals. As this is such a complex area that requires specific technical knowledge, it is rare to find specialists versed in this field, which is why the demand for labor is increasing every day. That is why TECH has come up with the design of a program that gathers the latest information in this field, from the physical foundations of computational technology to the structuring of advanced operating systems. As a result, the graduate will be able to immerse themself in the world of free software and open knowledge through a 100% online program that will mark a turning point in their professional career.





Would you like to become the next Steve Jobs and revolutionize the computer industry with powerful and innovative computer systems? Opt for this Professional Master's Degree and you will hold the keys to achieving it"

The invention of the Z1 as the first truly functional "modern" computer laid the foundations of an industry that, over the years, acquired a technical, complex, unique and innovative character, absolutely unthinkable for pioneers in this field such as Konrad Zuse or Alan Turing. From the launch of the first Colossus Mark to the successful commercialization of the Macintosh 128 K or the IBM PC with Windows 1.0 a year later, only 4 decades have passed, but these machines have gone from only reading encrypted communications to allowing their users to create documents, manage data and send e-mails.

Thanks to technological development, advances in computing and programming and the evolution of the IoT as the nerve center of collective communication of devices around the world, today, systems have reached a very high level of complexity, generating UX increasingly customized and adapted to the needs of society. No matter which way you look at it, information technology is present in all aspects of human life. For this reason, the role played by the professional in this field is fundamental and in high demand in today's market.

Based on this, TECH and its team of experts have developed a program that gathers the most exhaustive, comprehensive and innovative information in this sector, designed to serve as a guide for the graduate in their specialization. Over the course of 1,500 hours of diverse content, you will delve into the fundamentals of physics adapted to the field of computing, as well as the application of current technology and strategies to the design of software and applications for the different platforms and operating systems available. All this being 100% online and offering 12 months of theoretical and practical specialization with which you will not only adjust your profile to match the most demanding requirements of the industry, but in which you will find the keys to embark on the road to the new IT revolution that is about to arrive.

This **Professional Master's Degree in Systems Computing** contains the most complete and up-to-date program on the market. Its most notable features are:

- The development of case studies presented by experts in Computer Engineering
- The graphic, schematic, and practical contents with which they are created, provide practical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- A special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and assignments for individual reflection
- Content that is accessible from any fixed or portable device with an internet connection

The perfect program to get you up to speed on the physical fundamentals of computer science and its application in the computing environment"

If you are looking to acquire the classical concepts of logical software design, this program will provide you with everything you need to handle Boolean algebra and the elements of memory"

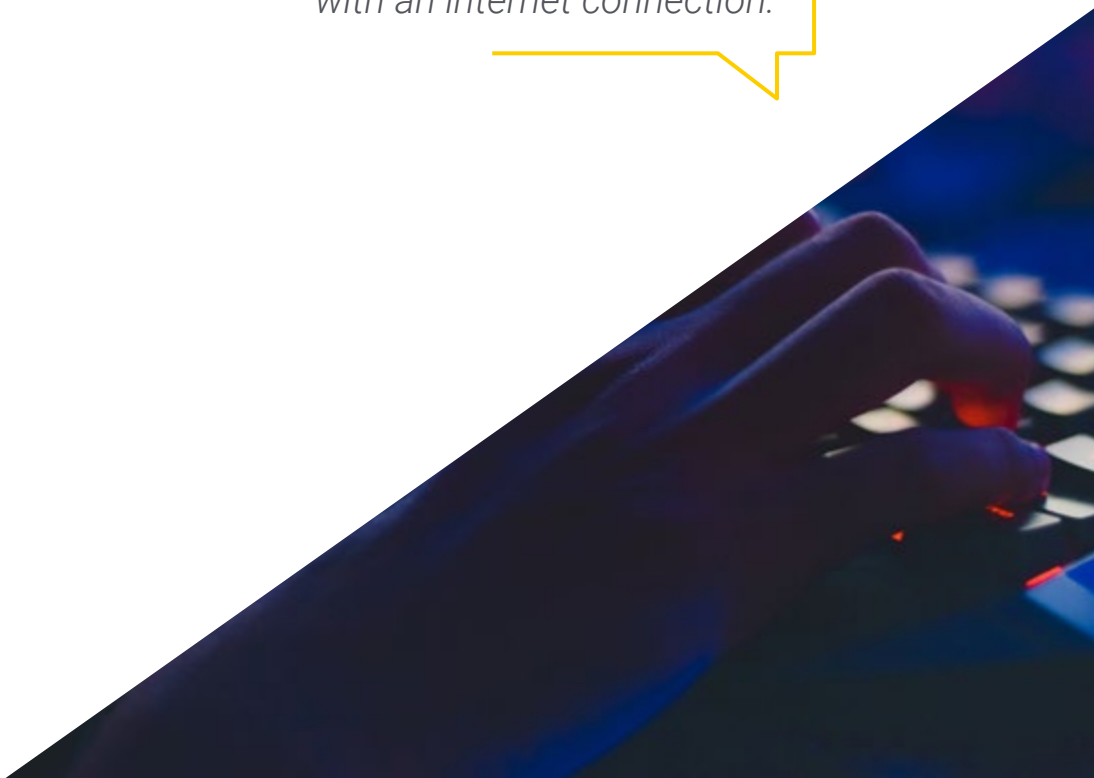
In addition to a high volume of content to develop your knowledge of software, you will also work on computer and systems hardware.

TECH sets no limits: It is a program that you can access from wherever you want and through any device with an internet connection.

The program's teaching staff includes professionals from the sector who contribute their work experience to this program 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 learning designed for real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to resolve 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

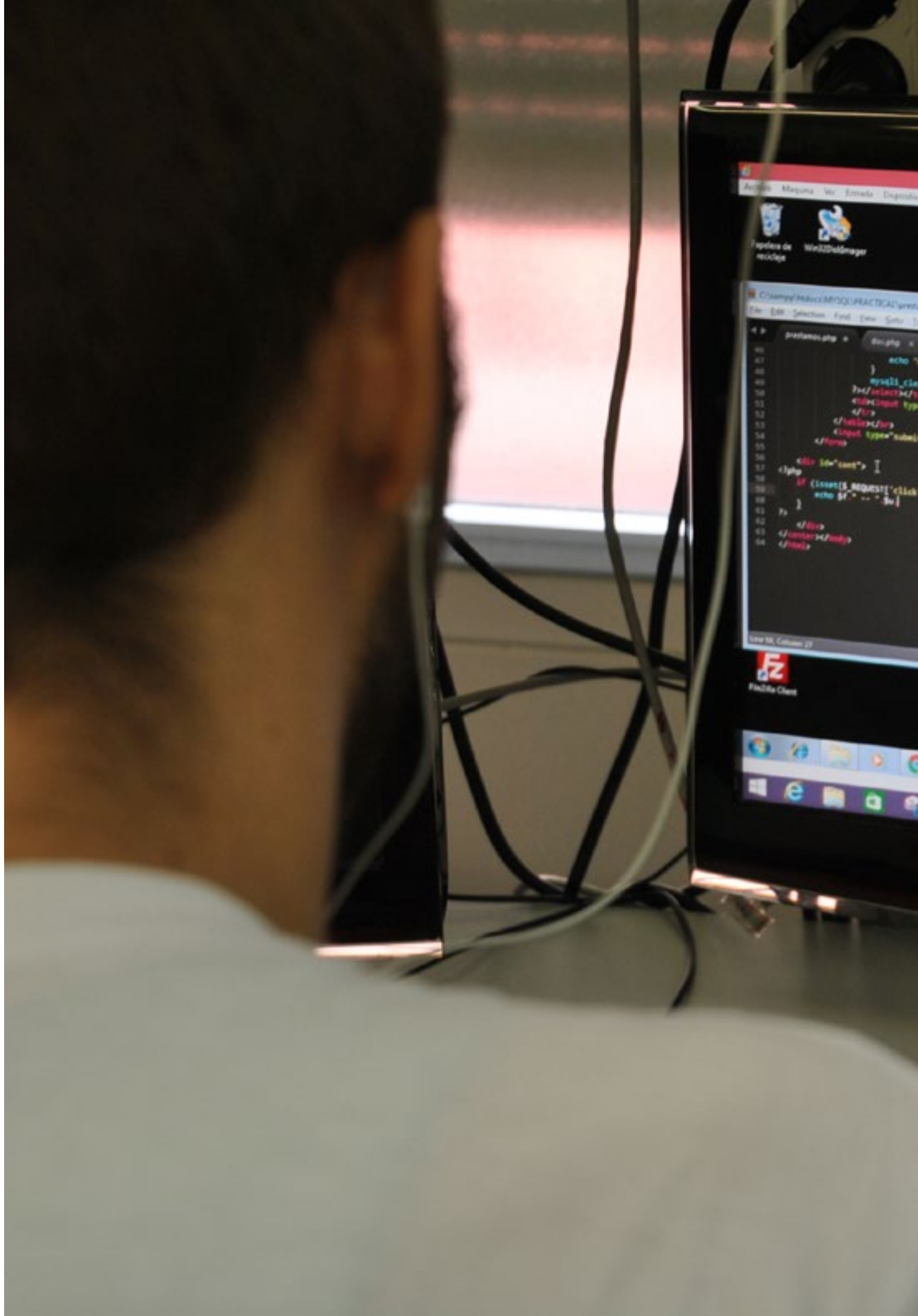
Systems Computing is constantly evolving, so professionals in this field require constant updates to their knowledge in order to future-proof their skills. Based on this, TECH has developed this Professional Master's Degree with the aim of bringing together, in a single degree, the latest and most comprehensive information relating to this area, as well as the strategies and guidelines that give the best results today in the design of software, applications and advanced operational techniques. All this is 100% online and with over 12 months of specialization that will undoubtedly surpass even your most ambitious expectations.

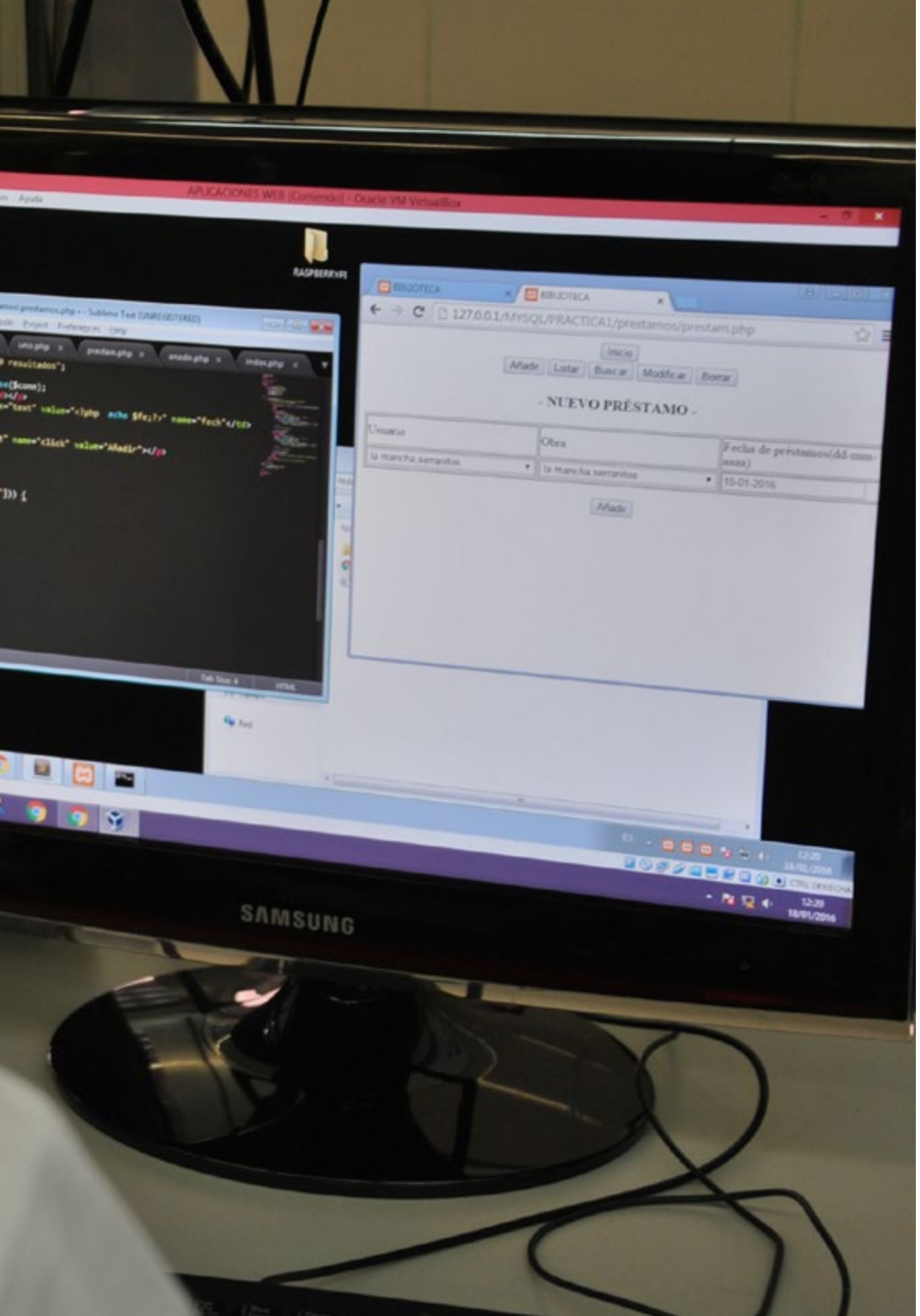
Do you want to specialize in Systems Computing and do not have time to attend classes? Opt for this 100% Online Professional Master's Degree and access it from wherever you want, without schedules or demands"

General Objective

- To train professionals scientifically and technologically, as well as preparing them to work in Systems Computing, by means of a transversal and versatile course adapted to the new technologies and innovations in this field

A training and professional growth path that will propel you towards a greater level of competitiveness in the employment market"





Specific Objectives

Module 1. Physical Fundamentals of Computing

- Acquire basic fundamental knowledge of engineering physics, such as fundamental forces and conservation laws
- Learn the concepts related to energy, its types, measurements, conservation and units
- Know how electric, magnetic and electromagnetic fields work
- Understand the basic fundamental concepts of direct current and alternating current electrical circuits
- Assimilate the structure of atoms and subatomic particles
- Understand the basics of quantum physics and relativity

Module 2. Computer Technology

- Learn about the history of computers, as well as the main types of existing organizations and architectures
- Acquire the knowledge necessary to understand computer arithmetic and the basics of logic design
- Understand the operation and composition of a computer, from the different devices that compose it to the ways of interacting among them and with them
- Learn the different types of memory (internal memory, cache memory and external memory), as well as the operation of input/output devices
- Understand the structure and operation of the processor, as well as the operation of the control unit and micro-operations
- Learn the basics of machine instructions, types, assembly language, and addressing

Module 3. The Structure of Computers

- Learn the fundamentals of computer design and evolution, including parallel architectures and levels of parallelism
- Understand how the different ways to evaluate the performance of a computer work, as well as the use of programs to perform performance tests
- Understand the operation of the memory hierarchy, the different types of storage and input/output issues
- Learn the features of different types of processors, such as segmented, superscalar, VLIW and vector processors
- Understand the operation of parallel computers, their purpose, performance and architecture
- Know the features of computer interconnection networks and the characteristics of multiprocessors

Module 4. Operating Systems

- Learn the basic concepts of operating systems, as well as the structure of operating systems, including services, system calls and user interface
- Understand how process scheduling works in an operating system and gain general knowledge on the concepts related to processes and threads
- Assimilate the principles of concurrence, mutual exclusion, synchronization and interlocking
- Understand how memory management works in operating systems and the basics of virtual memory and its policies
- Learn about the interface and implementation of operating systems, understanding the concepts of files, file systems, directory structure and their implementation, as well as the methods of allocation and management of free space
- Understand the existing protection mechanisms in operating systems

Module 5. Advanced Operating Systems

- Deepen your knowledge of operating systems, their functions, process management, memory, directories and files, as well as the keys to their security and design objectives
- Get to know step by step the different stages in the history of operating systems
- Understand the structure of the main operating systems in current use
- Learn about the structure of the two main operating systems, as well as the use of their terminals
- Learn the basics of shell scripting and the main tools for programming in C language.
- Understand the operation of system calls, either on files or processes

Module 6. Free Software and Open Knowledge

- Learn the concepts of Free Software and Open Knowledge, as well as the different types of associated licenses
- Know the main free tools available in different areas such as operating systems, business management, content management systems and multimedia content creation, among others
- Understand the importance and benefits of open-source software in the business world, both in terms of features and costs
- Deepen your knowledge of the GNU/Linux operating system, as well as the different distributions that exist, and how to make customized adaptations of them
- Learn about the operation and development of WordPress, given that this CMS accounts for more than 35% of the active websites in the world, and more than 60% in the particular case of CMSs
- Understand how the operating system for Android mobile devices works, as well as the basics for the development of mobile applications: both native development and with cross-platform frameworks

Module 7. Computer Networks

- Acquire essential knowledge of computer networks on the internet
- Understand the operation of the different layers that define a networked system, such as the application, transport, network and link layers
- Understand the composition of LANs, their topology, and their network and interconnection elements
- Learn how IP addressing and subnetting work
- Understand the structure of wireless and mobile networks, including the new 5G Network
- Know the different network security mechanisms, as well as the different Internet security protocols

Module 8. Emerging Technologies

- Knowledge of the different mobile technologies and services currently available in the market
- Learn how to design user experiences adapted to the new emerging technologies available today
- To learn about new developments in the world of extended reality, with AR and VR applications and services, as well as location-based services
- Understand how the Internet of Things (IoT) works, its fundamental features, main components, cloud computing and smart cities
- Acquire the basic knowledge to understand the fundamentals of Blockchain and Blockchain-based applications and services
- Learn about the latest innovative technologies and study an introduction to the bases of research

Module 9. Information Systems Security

- Learning schedule development for time management, budget development and risk response
- Analyze the nature of network attacks and the different types of security architectures
- Understanding the different System Protection Techniques and the Development of Secure Code
- Understand the essential components of botnets and spam, as well as malware and malicious code
- Lay the foundations for forensic analysis in the world of software and computer audits
- Gain a global perspective of security, cryptography and classical cryptanalysis
- Understand the fundamentals of symmetric cryptography and asymmetric cryptography, as well as their main algorithms

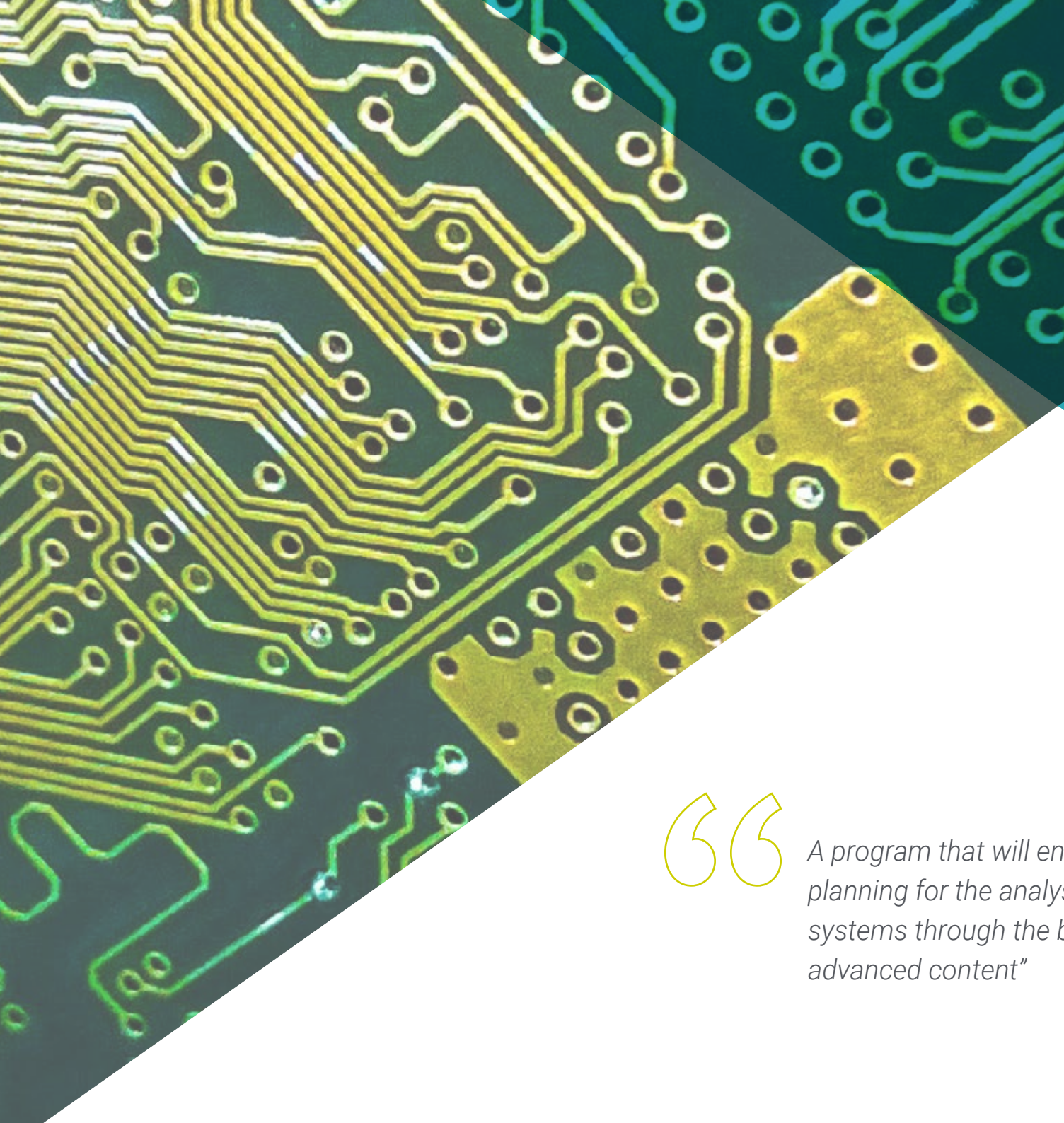
Module 10. Integration Systems

- Acquire the essential concepts related to information systems in the enterprise, as well as identify the opportunities and needs of information systems in the enterprise
- Get to know the basics of Business Intelligence, its strategies and implementation, as well as the present and future of BI
- Understand the working of systems for the integrated management of company resources
- Understand digital transformation from the point of view of business innovation, financial and production management, marketing and human resources management

03

Skills

TECH's interest in ensuring that its graduates reach the highest professional level through the course of their degrees has led it to design programs as empowering as this Professional Master's Degree, thanks to which students can improve their skills in the field of Systems Computing. Its highly practical content, reflected by the use of multiple cases based on real contexts, will allow you to participate, in a simulated manner, in various situations in which you will have to apply the knowledge acquired in the theoretical section of the degree: data analysis and management strategies, computational techniques, planning and design guidelines for advanced structures, etc.



A program that will enhance your skills in process planning for the analysis and restoration of operating systems through the best theoretical, practical and advanced content"

General Skills

- Correctly perform the tasks related to Systems Computing
- Master the concepts of fields, waves and electromagnetism, electric circuit theory, electronic circuits, physical principle of semiconductors and logic families, among others, to solve potential problems relating to these areas
- Know, understand and evaluate the structure and architecture of computers

In less than 12 months of education, you will have mastered the main tools of free software and open knowledge"

Specific Skills

- Know the structure, organization, operation and interconnection of computer systems
- Perform programming of computers, operating systems, databases and software
- Understand operating systems and design applications for their services
- Know and understand the main characteristics of free software
- Know the characteristics of computer networks and perform applications associated with them
- Use tools to store, process and access information systems
- Gain knowledge of possible network attacks and security systems to prevent them
- Get to know in-company information systems

04

Structure and Content

The program curriculum has been developed by a team of computer scientists and engineers specializing in the area of systems computing. Thanks to this, it has been possible to put together an exhaustive and comprehensive syllabus that gathers the latest and most specific information on computing, programming and software and hardware project management. In addition, it includes hundreds of hours of diverse additional material, from research articles and complementary readings, to detailed videos and self-learning exercises, so that you can not only contextualize the theoretical content, but also delve into it in a personalized, dynamic and multidisciplinary way.

The perfect academic choice to implement the latest emerging technologies in your IT strategies: IoT fundamentals, Blockchain, V2X, AR and VR techniques and many more!"

Module 1. Physical Fundamentals of Computing

1.1. Fundamental Forces
- 1.1.1. Newton's Second Law
- 1.1.2. The Fundamental Forces of Nature
- 1.1.3. Gravitational Force
- 1.1.4. The Electric Force

1.2. Conservation Laws
- 1.2.1. What is Mass?
- 1.2.2. The Electric Charge
- 1.2.3. The Millikan Experiment
- 1.2.4. Conservation of Linear Momentum

1.3. Energy
- 1.3.1. What is Energy?
- 1.3.2. Measuring Energy
- 1.3.3. Energy Types
- 1.3.4. Dependence on the Observer's Energy
- 1.3.5. Potential Energy
- 1.3.6. Derivation of Potential Energy
- 1.3.7. Energy Conservation
- 1.3.8. Energy Units

1.4. Electric Field
- 1.4.1. Static Electricity
- 1.4.2. Electric Field
- 1.4.3. Capacity
- 1.4.4. Potential

1.5. Electrical Circuits
- 1.5.1. Circulation of Electric Charge
- 1.5.2. Batteries
- 1.5.3. Alternating Current

1.6. Magnetism
- 1.6.1. Introduction and Magnetic Materials
- 1.6.2. Magnetic Field
- 1.6.3. Electromagnetic Introduction

1.7. Electromagnetic Spectrum
- 1.7.1. Maxwell's Equations
- 1.7.2. Optics and Electromagnetic Waves
- 1.7.3. The Michelson Morley Experiment

1.8. The Atom and Subatomic Particles
- 1.8.1. The Atom
- 1.8.2. The Atomic Nucleus
- 1.8.3. Radioactivity

1.9. Quantum Physics
- 1.9.1. Color and Heat
- 1.9.2. Photoelectric Effect
- 1.9.3. Matter Waves
- 1.9.4. Nature as Probability

1.10. Relativity
- 1.10.1. Gravity, Space and Time
- 1.10.2. Lorentz Transformations
- 1.10.3. Speed and Time
- 1.10.4. Energy, Momentum and Mass

Module 2. Computer Technology

2.1. General Information and a Brief History of Computers
- 2.1.1. Organization and Architecture
- 2.1.2. Brief History of Computers

2.2. Computer Arithmetic
- 2.2.1. The Arithmetic-Logic Unit
- 2.2.2. Numbering Systems
- 2.2.3. Integer Representation
- 2.2.4. Arithmetic with Integers
- 2.2.5. Floating Point Representation
- 2.2.6. Floating Point Arithmetic

2.3. Classic Concepts of Logic Design
- 2.3.1. Boolean Algebra
- 2.3.2. Logic Gates
- 2.3.3. Logical Simplification
- 2.3.4. Combinational Circuits
- 2.3.5. Sequential Circuits
- 2.3.6. Concept of Sequential Machine
- 2.3.7. Memory Element
- 2.3.8. Types of Memory Elements
- 2.3.9. Synthesis of Sequential Circuits
- 2.3.10. Synthesis of Sequential Circuits with PLA

2.4. Basic Computer Organization and Operation
- 2.4.1. Introduction
- 2.4.2. Components of a Computer
- 2.4.3. Operation of a Computer
- 2.4.4. Interconnection Structures
- 2.4.5. Interconnection with Buses
- 2.4.6. PCI Bus

2.5. Internal Memory
- 2.5.1. Introduction to Memory Systems in Computers
- 2.5.2. Semiconductor Main Memory
- 2.5.3. Correction of Errors
- 2.5.4. Advanced DRAM Memory Organization

2.6. Input/Output
- 2.6.1. External Devices
- 2.6.2. Input/Output Modules
- 2.6.3. Scheduled Input/Output
- 2.6.4. Input/Output via Interrupts
- 2.6.5. Direct Memory Access
- 2.6.6. Input/Output Channels and Processors

2.7. Machine Instructions: Features and Functions
- 2.7.1. Characteristics of Machine Instructions
- 2.7.2. Types of Operands
- 2.7.3. Types of Transactions
- 2.7.4. Assembly Language
- 2.7.5. Address
- 2.7.6. Formats of Instructions

2.8. Processor Structure and Operation
- 2.8.1. Processor Organization
- 2.8.2. Record Organization
- 2.8.3. Training Cycle
- 2.8.4. Instruction Segmentation

2.9. Cache and External Memory
- 2.9.1. Basic Principles of Cache Memories
- 2.9.2. Cache Design Elements
- 2.9.3. Magnetic Disks
- 2.9.4. RAID
- 2.9.5. Optical Memory
- 2.9.6. Magnetic Tape

2.10. Introduction to the Operation of the Control Unit
- 2.10.1. Microoperations
- 2.10.2. Processor Control
- 2.10.3. Wired Implementation

Module 3. The Structure of Computers

3.1. Fundamentals of Computer Design and Evolution
- 3.1.1. Definition of Computer Architecture
- 3.1.2. Evolution and Performance of Architectures
- 3.1.3. Parallel Architectures and Levels of Parallelism

3.2. Computer Performance Evaluation
- 3.2.1. Performance Measures
- 3.2.2. Test Programs (Benchmarks)
- 3.2.3. Improved Performance
- 3.2.4. Costs of a Computer

3.3. Leveraging the Memory Hierarchy
- 3.3.1. Memory Hierarchy
- 3.3.2. Basic Concepts of the Cache
- 3.3.3. Cache Evaluation and Improvements
- 3.3.4. Virtual Memory

3.4. Storage and Other Input/Output Aspects
- 3.4.1. Reliability, Dependability and Availability
- 3.4.2. Disk Storage
- 3.4.3. Flash Storage
- 3.4.4. Connection and Information Transfer Systems

3.5. Segmented Processors
- 3.5.1. What are Segmented Processors?
- 3.5.2. Principles of Segmentation and Performance Enhancement
- 3.5.3. Segmented Processor Design
- 3.5.4. Optimization of Functional Channels
- 3.5.5. Interrupt Handling on a Segmented Processor

3.6. Superscalar Processors
- 3.6.1. What are Superscalar Processors?
- 3.6.2. Parallelism between Instructions and Machine Parallelism
- 3.6.3. Superscalar Instruction Processing
- 3.6.4. Jump Instruction Processing
- 3.6.5. Handling Interruptions on a Superscalar Processor

3.7. VLIW Processors
- 3.7.1. What are VLIW Processors?
- 3.7.2. Exploiting Parallelism in VLIW Architectures
- 3.7.3. Compiler Support Resources

3.8. Vector Processors
- 3.8.1. What are Vector Processors?
- 3.8.2. Vector Architecture
- 3.8.3. The Memory System in Vector Processors
- 3.8.4. Performance Measurements on Vector Processors
- 3.8.5. Vector Processing Efficiency

3.9. Parallel Computers
- 3.9.1. Parallel Architectures and Levels of Parallelism
- 3.9.2. Reasons for the Study of Parallel Computers
- 3.9.3. Design Space. Classification and General Structure
- 3.9.4. Performance on Parallel Computers
- 3.9.5. Classification of Communication Systems in Parallel Computers
- 3.9.6. General Structure of the Communication System in Parallel Computers
- 3.9.7. The Network Interface in Parallel Computers
- 3.9.8. The Interconnection Network in Parallel Computers
- 3.9.9. Communication System Performance on Parallel Computers

3.10. Interconnection Networks and Multiprocessors
- 3.10.1. Topology and Types of Interconnection Networks
- 3.10.2. Switching in Interconnection Networks
- 3.10.3. Flow Control in Interconnection Networks
- 3.10.4. Routing in Interconnection Networks
- 3.10.5. Memory System Coherence on Multiprocessors
- 3.10.6. Multiprocessor Memory Consistency
- 3.10.7. Multiprocessor Synchronization

Module 4. Operating Systems

4.1. Introduction to Operating Systems
- 4.1.1. Concept
- 4.1.2. Historical Recap
- 4.1.3. Fundamental Building Blocks of Operating Systems
- 4.1.4. Objectives and Functions of Operating Systems

4.2. Structure of Operating Systems
- 4.2.1. Operating System Services
- 4.2.2. Operating System User Interface
- 4.2.3. System Calls
- 4.2.4. Types of System Calls

4.3. Process Planning
- 4.3.1. Basic Concepts
- 4.3.2. Planning Criteria
- 4.3.3. Planning Algorithms

4.4. Processes and Threads
- 4.4.1. Process Concept
- 4.4.2. Thread Concept
- 4.4.3. Process Status
- 4.4.4. Process Control

4.5. Concurrence. Mutual Exclusion, Synchronization, and Interlocking
- 4.5.1. Principles of Concurrence
- 4.5.2. Mutual Exclusion
- 4.5.3. Traffic Lights
- 4.5.4. Monitors
- 4.5.5. Message Passing
- 4.5.6. Fundamentals of Interlocking
- 4.5.7. Interlock Prevention
- 4.5.8. Interlock Avoidance
- 4.5.9. Interlock Detection and Recovery

4.6. Memory Management
- 4.6.1. Memory Management Requirements
- 4.6.2. Process Memory Model
- 4.6.3. Contiguous Assignment Scheme
- 4.6.4. Segmentation
- 4.6.5. Pagination
- 4.6.6. Segmented Pagination

4.7. Virtual Memory
- 4.7.1. Virtual Memory Fundamentals
- 4.7.2. Life Cycle of a Page
- 4.7.3. Virtual Memory Management Policy
- 4.7.4. Localization Policy
- 4.7.5. Extraction Policy
- 4.7.6. Replacement Policy

4.8. Input/Output System
- 4.8.1. Input/Output Devices
- 4.8.2. Input/Output System Organization
- 4.8.3. Use of Buffers
- 4.8.4. Magnetic Disk

4.9. File System Interface and Implementation
- 4.9.1. Archiving Concept
- 4.9.2. Access Methods
- 4.9.3. Directory Structure
- 4.9.4. Structure of a File System
- 4.9.5. File System Interface and Implementation
- 4.9.6. Directories System Interface and Implementation
- 4.9.7. Allocation Methods
- 4.9.8. Management of Free Space

4.10. Protection
- 4.10.1. Objectives
- 4.10.2. Authentication
- 4.10.3. Authorization
- 4.10.4. Cryptography

Module 5. Advanced Operating System

5.1. Concept of System Operations
- 5.1.1. Operating System Functions
- 5.1.2. Process Management
- 5.1.3. Memory Management
- 5.1.4. Directory and File Management
- 5.1.5. The Shell: Interactivity
- 5.1.6. Security/Safety
- 5.1.7. Design Objectives

5.2. History of Operating Systems
- 5.2.1. The First Generation
- 5.2.2. The Second Generation
- 5.2.3. Third Generation
- 5.2.4. Fourth Generation
- 5.2.5. The OS/2 Case
- 5.2.6. The History of GNU/Linux
- 5.2.7. The History of Windows

5.3. Structure of an Operating System
- 5.3.1. Monolithic Systems
- 5.3.2. Layered Systems
- 5.3.3. Virtualisation
- 5.3.4. Exokernel
- 5.3.5. Client-Server Model
- 5.3.6. Distributed Systems

5.4. System Calls
- 5.4.1. System Calls. Concepts
- 5.4.2. System Calls for Process Management
- 5.4.3. System Calls for File and Directory Administration
- 5.4.4. Calls to the Communication System

5.5. Windows and GNU/Linux
- 5.5.1. Windows Structure
- 5.5.2. Structure of GNU/Linux

5.6. The GNU/Linux Shell and PowerShell
- 5.6.1. The Command Interpreter
- 5.6.2. Using the Command Interpreter
- 5.6.3. GNU/Linux Commands
- 5.6.4. Basic PowerShell Syntax
- 5.6.5. Basic PowerShell Commands

5.7. Shell Programming
- 5.7.1. Script Programming
- 5.7.2. Syntax

5.8. System Programming in GNU/Linux
- 5.8.1. C Language under UNIX
- 5.8.2. Compilation Tools
- 5.8.3. Error Handling

5.9. System Calls on Files
- 5.9.1. Basic Calls
- 5.9.2. Calls on Directories
- 5.9.3. Advanced Calls

5.10. System Calls on Processes
- 5.10.1. Basic Calls
- 5.10.2. Signals
- 5.10.3. Pipelines

Module 6. Free Software and Open Knowledge

6.1. Introduction to Free Software
- 6.1.1. History of Free Software
- 6.1.2. "Freedom" in Software
- 6.1.3. Licenses for the Use of Software Tools
- 6.1.4. Intellectual Property of Software
- 6.1.5. What is the Reason for Using Free Software?
- 6.1.6. Free Software Myths
- 6.1.7. Top500

6.2. Open Knowledge and CC Licenses
- 6.2.1. Basic Concepts
- 6.2.2. Creative Commons Licenses
- 6.2.3. Other Content Licenses
- 6.2.4. Wikipedia and Other Open Knowledge Projects

6.3. Main Free Software Tools
- 6.3.1. Operating Systems
- 6.3.2. Office Applications
- 6.3.3. Business Management Applications
- 6.3.4. Web Content Managers
- 6.3.5. Multimedia Content Creation Tools
- 6.3.6. Other Applications

6.4. The Company: Free Software and its Costs
- 6.4.1. Free Software: Yes or No?
- 6.4.2. Truths and Lies about Free Software
- 6.4.3. Business Software Based on Free Software
- 6.4.4. Software Costs
- 6.4.5. Free Software Models

6.5. The GNU/Linux Operating System
- 6.5.1. Architecture
- 6.5.2. Basic Directory Structure
- 6.5.3. File System Characteristics and Structure
- 6.5.4. Internal Representation of the Files

6.6. The Android Mobile Operating System
- 6.6.1. History
- 6.6.2. Architecture
- 6.6.3. Android Forks
- 6.6.4. Introduction to Android Development
- 6.6.5. Frameworks for Mobile Application Development

6.7. Website Creation with WordPress
- 6.7.1. WordPress Features and Structure
- 6.7.2. Creation of Sites on WordPress.com
- 6.7.3. Installation and Configuration of WordPress on Your Own Server
- 6.7.4. Installing Plugins and Extending WordPress
- 6.7.5. Creation of WordPress Plugins
- 6.7.6. WordPress Theme Creation

6.8. Free Software Trends
- 6.8.1. Cloud Environments
- 6.8.2. Monitoring tools
- 6.8.3. Operating Systems
- 6.8.4. Big Data and Open Data 2.0
- 6.8.5. Quantum Computing

6.9. Version Control
- 6.9.1. Basic Concepts
- 6.9.2. Git
- 6.9.3. Cloud and Self-hosted Git Services
- 6.9.4. Other Version Control Systems

6.10. Custom GNU/Linux Distributions
- 6.10.1. Main Distributions
- 6.10.2. Distributions Derived from Debian
- 6.10.3. Deb Package Creation
- 6.10.4. Modification of the Distribution
- 6.10.5. ISO Image Generation

Module 7. Computer Networks

7.1. Computer Networks on the Internet
- 7.1.1. Networks and Internet
- 7.1.2. Protocol Architecture

7.2. The Application Layer
- 7.2.1. Model and Protocols
- 7.2.2. FTP and SMTP Services
- 7.2.3. DNS Service
- 7.2.4. HTTP Operation Model
- 7.2.5. HTTP Message Formats
- 7.2.6. Interaction with Advanced Methods

7.3. The Transport Layer
- 7.3.1. Communication Between Processes
- 7.3.2. Connection-oriented Transportation: TCP and SCTP

7.4. The Network Layer
- 7.4.1. Circuit and Packet Switching
- 7.4.2. IP Protocol (v4 and v6)
- 7.4.3. Routing Algorithms

7.5. The Link Layer
- 7.5.1. Link Layer, Error Detection and Correction Techniques
- 7.5.2. Multiple Access Links and Protocols
- 7.5.3. Link Level Addressing

7.6. LAN Networks
- 7.6.1. Network Topologies
- 7.6.2. Network and Interconnection Elements

7.7. IP Addressing
- 7.7.1. IP Addressing and Subnetting
- 7.7.2. Overview: An HTTP Request

7.8. Wireless and Mobile Networks
- 7.8.1. 2G, 3G and 4G Mobile Networks and Services
- 7.8.2. 5G Networks

7.9. Network Security
- 7.9.1. Fundamentals of Communications Security
- 7.9.2. Access Control
- 7.9.3. System Security
- 7.9.4. Fundamentals of Cryptography
- 7.9.5. Digital Signature

7.10. Internet Security Protocols
- 7.10.1. IP Security and Virtual Private Networks (VPN)
- 7.10.2. Web Security with SSL/TLS

Module 8. Emerging Technologies

8.1. Mobile Technologies
- 8.1.1. Mobile Devices
- 8.1.2. Mobile Communications

8.2. Mobile Services
- 8.2.1. Types of Applications
- 8.2.2. Decision on the Type of Mobile Application
- 8.2.3. Mobile Interaction Design

8.3. Location-based Services
- 8.3.3. Location-Based Services
- 8.3.4. Technologies for Mobile Localization
- 8.3.5. GNSS-Based Localization
- 8.3.6. Accuracy and Accuracy in Localization Technologies
- 8.3.7. Beacons: Location by Proximity

8.4. User Experience (UX) Design
- 8.4.1. Introduction to User Experience (UX)
- 8.4.2. Technologies for Mobile Localization
- 8.4.3. Methodology for UX Design
- 8.4.4. Best Practices in the Prototyping Process

8.5. Extended Reality
- 8.5.1. Extended Reality Concepts
- 8.5.2. Technologies for Mobile Localization
- 8.5.3. AR and VR Application and Services

8.6. The Internet of Things (IoT) I
- 8.6.1. IoT Fundamentals
- 8.6.2. IoT Devices and Communications

8.7. The Internet of Things (IoT) II
- 8.7.1. Beyond Cloud Computing
- 8.7.2. (Smart Cities)
- 8.7.3. Digital Twins
- 8.7.4. IoT Projects

8.8. Blockchain
- 8.8.1. Blockchain Fundamentals
- 8.8.2. Blockchain-based Applications and Services

8.9. Autonomous Driving
- 8.9.1. Technologies for Autonomous Driving
- 8.9.2. V2X Communications

8.10. Innovative Technology and Research
- 8.10.1. Fundamentals of Quantum Computing
- 8.10.2. Applications of Quantum Computing
- 8.10.3. Introduction to Research

Module 9. Information Systems Security

9.1. A Global Perspective on Security, Cryptography and Classical Crypto-analysis
- 9.1.1. Computer Security: Historical Perspective
- 9.1.2. But What Exactly is Meant by Security?
- 9.1.3. History of Cryptography
- 9.1.4. Substitution Ciphers
- 9.1.5. Case Study: The Enigma Machine

9.2. Symmetric Cryptography
- 9.2.1. Introduction and Basic Terminology
- 9.2.2. Symmetric Encryption
- 9.2.3. Modes of Operation
- 9.2.4. DES
- 9.2.5. The New AES Standard
- 9.2.6. Encryption in Flow
- 9.2.7. Cryptanalysis

9.3. Asymmetric Cryptography
- 9.3.1. Origins of Public Key Cryptography
- 9.3.2. Basic Concepts and Operation
- 9.3.3. The RSA Algorithm
- 9.3.4. Digital Certificates
- 9.3.5. Key Storage and Management

9.4. Network Attacks
- 9.4.1. Network Threats and Attacks
- 9.4.2. Enumeration
- 9.4.3. Traffic Interception: Sniffers
- 9.4.4. Denial of Service Attacks
- 9.4.5. ARP Poisoning Attacks

9.5. Security Architectures
- 9.5.1. Traditional Security Architectures
- 9.5.2. Secure Socket Layer: SSL
- 9.5.3. SSH Protocol
- 9.5.4. Virtual Private Networks (VPNs)
- 9.5.5. External Storage Unit Protection Mechanisms
- 9.5.6. Hardware Protection Mechanisms

9.6. System Protection Techniques and Secure Code Development
- 9.6.1. Operational Safety
- 9.6.2. Resources and Controls
- 9.6.3. Monitoring
- 9.6.4. Intrusion Detection Systems
- 9.6.5. Host IDS
- 9.6.6. Network IDS
- 9.6.7. Signature-Based IDS
- 9.6.8. Lure Systems
- 9.6.9. Basic Security Principles in Code Development
- 9.6.10. Failure Management
- 9.6.11. Public Enemy Number 1: Buffer Overflows
- 9.6.12. Cryptographic Botches

9.7. Botnets and Spam
- 9.7.1. Origin of the Problem
- 9.7.2. Spam Process
- 9.7.3. Sending Spam
- 9.7.4. Refinement of Mailing Lists
- 9.7.5. Protection Techniques
- 9.7.6. Anti-Spam Service offered by Third-Parties
- 9.7.7. Study Cases
- 9.7.8. Exotic Spam

9.8. Web Auditing and Attacks
- 9.8.1. Information Gathering
- 9.8.2. Attack Techniques
- 9.8.3. Tools

9.9. Malware and Malicious Code
- 9.9.1. What is Malware?
- 9.9.2. Types of Malware
- 9.9.3. Virus
- 9.9.4. Cryptovirus
- 9.9.5. Worms
- 9.9.6. Adware
- 9.9.7. Spyware
- 9.9.8. Hoaxes
- 9.9.9. Phishing
- 9.9.10. Trojans
- 9.9.11. The Economy of Malware
- 9.9.12. Possible Solutions

9.10. Forensic Analysis
- 9.10.1. Evidence Collection
- 9.10.2. Evidence Analysis
- 9.10.3. Anti-Forensic Techniques
- 9.10.4. Case Study

Module 10. Integration Systems

10.1. Introduction to Information Systems in the Company
- 10.1.1. The Role of Information Systems
- 10.1.2. What is an Information System?
- 10.1.3. Dimensions of Information Systems
- 10.1.4. Business Processes and Information Systems
- 10.1.5. The IS/IT Department

10.2. Opportunities and Needs of Information Systems in the Company
- 10.2.1. Organizations and Information Systems
- 10.2.2. Features of Organisations
- 10.2.3. Impact of Information Systems in the Company
- 10.2.4. Information Systems to Achieve a Competitive Advantage
- 10.2.5. Use of Systems in the Administration and Management of the Company

10.3. Basic Concepts of Information Systems and Technologies
- 10.3.1. Data, Information and Knowledge
- 10.3.2. Technology and Information Systems
- 10.3.3. Technology Components
- 10.3.4. Classification and Types of Information Systems
- 10.3.5. Service and Business Process Based Architectures
- 10.3.6. Forms of Systems Integration

10.4. Systems for the Integrated Management of Company Resources
- 10.4.1. Business Needs
- 10.4.2. An integrated Information System for the Company
- 10.4.3. Acquisition vs. Development
- 10.4.4. ERP Implementation
- 10.4.5. Implications for Management
- 10.4.6. Leading ERP Vendors

10.5. Supply Chain and Customer Relationship Management Information Systems
- 10.5.1. Definition of Supply Chain
- 10.5.2. Effective Supply Chain Management
- 10.5.3. The Role of Information Systems
- 10.5.4. Supply Chain Management Solutions
- 10.5.5. Customer Relationship Management
- 10.5.6. The Role of Information Systems
- 10.5.7. Implementation of a CRM System
- 10.5.8. Critical Success Factors in CRM Implementation
- 10.5.9. CRM, e-CRM and Other Trends

10.6. ICT Investment Decision-Making and Information Systems Planning
- 10.6.1. Criteria for ICT Investment Decisions
- 10.6.2. Linking the Project to the Management and Business Plan
- 10.6.3. Management Implications
- 10.6.4. Redesign of Business Processes
- 10.6.5. Management's Decision on Implementation Methodologies
- 10.6.6. Need for Information Systems Planning
- 10.6.7. Objectives, Participants and Moments
- 10.6.8. Structure and Development of the Systems Planning
- 10.6.9. Follow-up and Updating

10.7. Security Considerations in the Use of ICTs
- 10.7.1. Risk Analysis
- 10.7.2. Security in Information Systems
- 10.7.3. Practical Advice

10.8. Feasibility of ICT Project Implementation and Financial Aspects in Information Systems Projects
- 10.8.1. Description and Objectives
- 10.8.2. EVS Participants
- 10.8.3. Techniques and Procedures
- 10.8.4. Cost Structure
- 10.8.5. Financial Projection
- 10.8.6. Budgets

10.9. Business Intelligence
- 10.9.1. What is Business Intelligence?
- 10.9.2. BI Implementation Strategy
- 10.9.3. Present and Future in BI

10.10. ISO/IEC 12207
- 10.10.1. What is "ISO/IEC 12207"?
- 10.10.2. Analysis of Information Systems
- 10.10.3. Information System Design
- 10.10.4. Implementation and Acceptance of the Information System

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

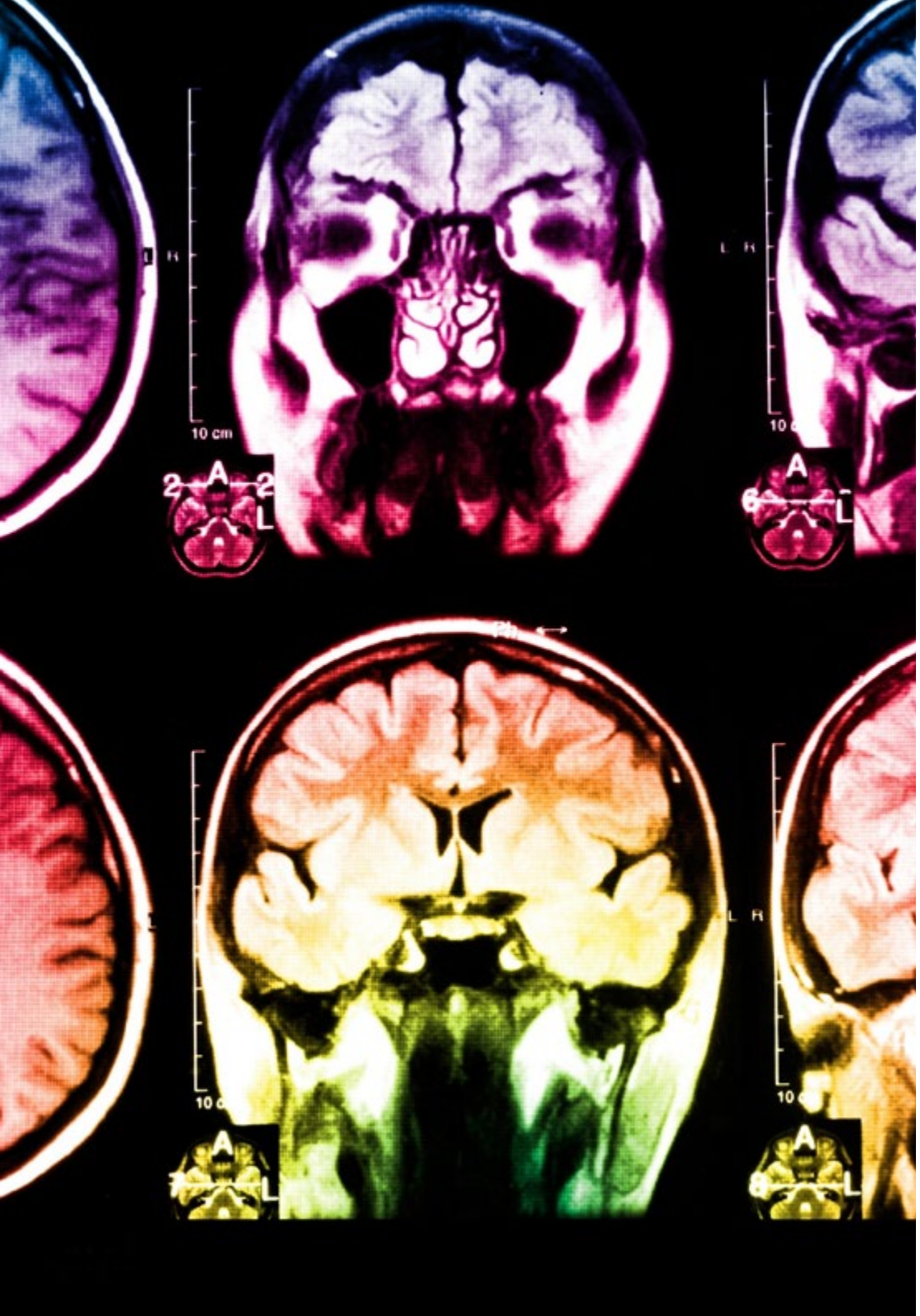
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

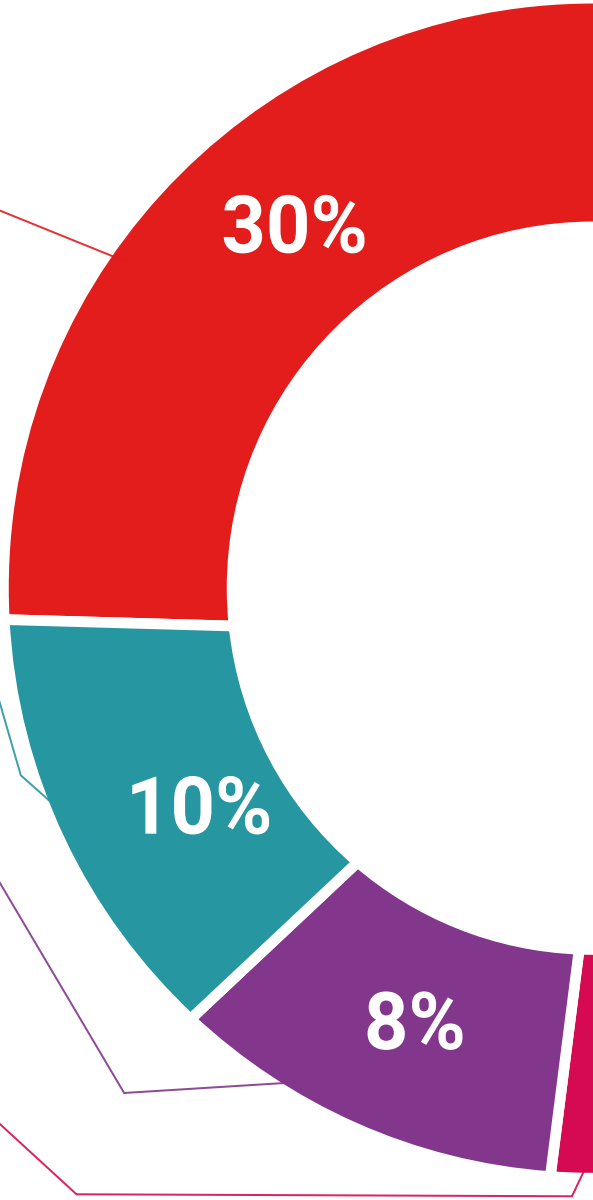
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

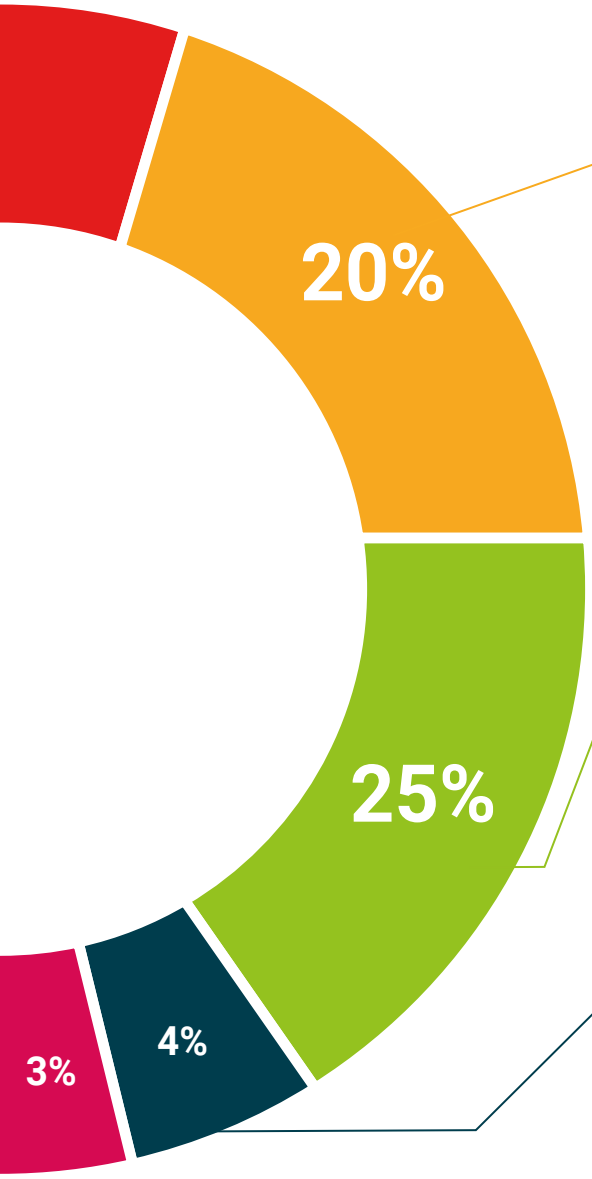
Practising Skills and Abilities

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 Professional Master's Degree in Systems Computing guarantees students, in addition to the most rigorous and up-to-date education, access to a Professional Master's Degree issued by TECH Global University.

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

This program will allow you to obtain your **Professional Master's Degree diploma in Systems Computing** endorsed by **TECH Global University**, the world's largest online university.

TECH Global University is an official European University publicly recognized by the Government of Andorra (***official bulletin***). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

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

Title: **Professional Master's Degree in Systems Computing**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**


tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Professional Master's Degree in Systems Computing

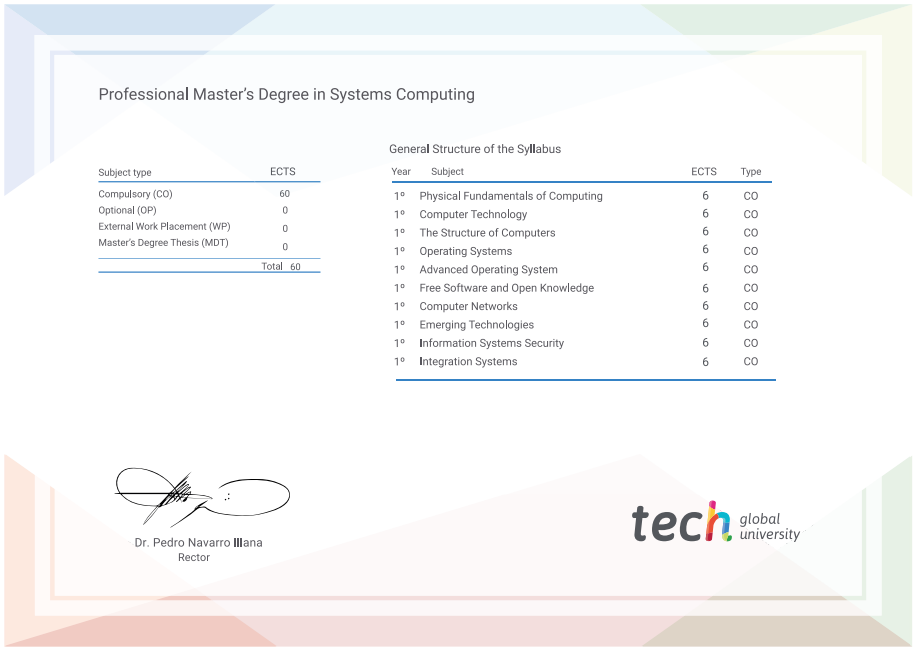
This is a program of 1,500 hours of duration equivalent to 60 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

Unique TECH Code: AFWORD23S techtitute.com/certificates


Professional Master's Degree in Systems Computing

Subject type	ECTS
Compulsory (CO)	60
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
Total	60

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	Physical Fundamentals of Computing	6	CO
1º	Computer Technology	6	CO
1º	The Structure of Computers	6	CO
1º	Operating Systems	6	CO
1º	Advanced Operating System	6	CO
1º	Free Software and Open Knowledge	6	CO
1º	Computer Networks	6	CO
1º	Emerging Technologies	6	CO
1º	Information Systems Security	6	CO
1º	Integration Systems	6	CO

Dr. Pedro Navarro Illana
Rector

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*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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Professional Master's Degree

Systems Computing

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Credits: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Professional Master's Degree
Systems Computing

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