Master's Degree
Advanced Software Engineering

tech global university

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Master's Degree
Advanced Software Engineering

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

Website:www.techtitute.com/us/information-technology/master-degree/master-degree-advanced-software-engineering

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01

Introduction to the Program

Advanced Software Engineering represents a crucial field in the evolution of technological systems, where efficiency, scalability, and security are indispensable pillars. According to data from the United Nations, more than 57% of organizations worldwide have prioritized the strengthening of advanced software capabilities as a strategic axis of innovation and competitiveness. In response to this need, an academic opportunity emerges at TECH that directly addresses the demands of the sector. Likewise, through a methodology structured around up-to-date instructional materials and delivered in a 100% online environment, the program enables professionals to access specialized knowledge, promoting a flexible, rigorous learning experience adapted to current demands.

Thanks to this 100% online program, you will master the most advanced Software Engineering methodologies to design, build, and maintain robust systems"

In a digital environment marked by the growing complexity of systems, the efficient and secure design of computing solutions is essential. In this context, Advanced Software Engineering has established itself as a key field for optimizing processes, improving productivity, and ensuring the proper functioning of technological products. Through its structured approach, it enables the development of more robust, scalable, and sustainable applications, thereby responding to market demands and the challenges of digital transformation.

In response, TECH launches a ground-breaking program in Advanced Software Engineering. The curriculum delves into crucial areas of this field, such as Software Engineering processes, information systems quality and auditing, and software reuse as a strategy to increase efficiency. Through up-to-date content and an excellence-oriented approach, this university program will enable a comprehensive understanding of the complete software life cycle, optimizing resources and strengthening technical decision-making.

Throughout the academic pathway, students will be provided with the necessary tools to lead complex projects with a focus on quality and continuous improvement. In fact, participants will be prepared to incorporate agile methodologies, apply maturity models, and develop solutions aligned with international standards. Likewise, skills will be strengthened to audit systems, evaluate the feasibility of reuse, and ensure compliance with best practices at every stage of development.

All of this is articulated through a unique model. In this way, TECH Global University offers a 100% online methodology, available 24 hours a day, 7 days a week, and accessible from any device with an internet connection. Thanks to the Relearning system, knowledge consolidation is promoted through the strategic repetition of concepts, significantly increasing retention and understanding. Finally, this modality adapts to the pace of each professional, enabling a flexible, demanding, and highly effective academic experience.

This **Master's Degree in Advanced Software Engineering** contains the most complete and up-to-date university program on the market. Its most notable features are:

- The development of practical case studies presented by experts in Advanced Software Engineering
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where the self-assessment process can be carried out to improve learning
- Special emphasis on innovative methodologies applied to advanced technologies in Software Engineering
- 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

You will gain a systemic and strategic approach to software development, integrating technical aspects"

You will make well-founded decisions based on technical analysis and client needs, adapting to the specific characteristics of digital environments”

You will delve into the use of version control tools, continuous integration, and automated testing.

Enjoy all the benefits of TECH’s revolutionary Relearning methodology, which will allow you to organize your study time and pace effectively.

The faculty includes professionals from the field of Advanced Software Engineering, who contribute their practical experience to the program, along with renowned specialists from leading professional associations 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

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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 has a huge faculty of more than 6,000 professors of the highest international prestige.

Study at the largest online university in the world and ensure your professional success. The future begins 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".

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 Wistuba, chairman of the department of translational molecular pathology at MD Anderson Cancer Center; and D.W. Pine, creative director of TIME magazine, among others.

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.

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.

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.

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Syllabus

Throughout this exclusive academic pathway, which complements this university program, students will address key content that will enhance professional development in Advanced Software Engineering. In fact, the program will explore in depth the use of Unified Modeling Language (UML), indispensable tools for representing system structures and behaviors. Likewise, state diagrams will be analyzed, as they are essential for modeling transitions and events within dynamic applications. Similarly, software architecture will be examined as the foundation for designing scalable, robust, and adaptable solutions. As a whole, this approach fosters the acquisition of strategic competencies to lead technological projects with sound judgment.

Students will have access to high-quality multimedia materials designed to explore in depth the most relevant applications of UML in Software development”

Module 1. Software Engineering

1.1. Introduction to Software Engineering and Modeling
- 1.1.1. The Nature of Software
- 1.1.2. The Unique Nature of Webapps
- 1.1.3. Software Engineering
- 1.1.4. The Software Process
- 1.1.5. Software Engineering Practice
- 1.1.6. Software Myths
- 1.1.7. How It All Begins
- 1.1.8. Object-Oriented Concepts
- 1.1.9. Introduction to UML

1.2. The Software Process
- 1.2.1. A General Process Model
- 1.2.2. Prescriptive Process Models
- 1.2.3. Specialized Process Models
- 1.2.4. The Unified Process
- 1.2.5. Personal and Team Process Models
- 1.2.6. What Is Agility?
- 1.2.7. What Is an Agile Process?
- 1.2.8. Scrum
- 1.2.9. Agile Process Toolkit

1.3. Software Engineering Guiding Principles
- 1.3.1. Principles Guiding the Process
- 1.3.2. Principles Guiding the Practice
- 1.3.3. Principles of Communication
- 1.3.4. Planning Principles
- 1.3.5. Modeling Principles
- 1.3.6. Construction Principles
- 1.3.7. Deployment Principles

1.4. Understanding the Requirements
- 1.4.1. Requirements Engineering
- 1.4.2. Establish the Basis
- 1.4.3. Inquiry of Requirements
- 1.4.4. Development of Cases Studies
- 1.4.5. Elaboration of the Requirements Model
- 1.4.6. Negotiation of Requirements
- 1.4.7. Validation of Requirements

1.5. Requirements Modeling I: Scenarios, Information and Analysis Classes
- 1.5.1. Analysis of Requirements
- 1.5.2. Scenario-Based Modeling
- 1.5.3. UML Models that Provide the Case Study
- 1.5.4. Data Modeling Concepts
- 1.5.5. Class-Based Modeling
- 1.5.6. Class Diagrams

1.6. Requirements Modeling II: Flow, Behavior and Patterns
- 1.6.1. Requirements that Shape Strategies
- 1.6.2. Flow-Oriented Modeling
- 1.6.3. Status Diagrams
- 1.6.4. Creation of a Behavioral Model
- 1.6.5. Sequence Diagrams
- 1.6.6. Communication Diagrams
- 1.6.7. Patterns for Requirements Modeling

1.7. Design Concepts
- 1.7.1. Design in Software Engineering
- 1.7.2. The Design Process
- 1.7.3. Design Concepts
- 1.7.4. Object-Oriented Design Concepts
- 1.7.5. Model of the Design

1.8. Designing the Architecture
- 1.8.1. Software Architecture
- 1.8.2. Architectural Genres
- 1.8.3. Architectural Styles
- 1.8.4. Architectural Design
- 1.8.5. Evolution of Alternative Designs for Architecture
- 1.8.6. Mapping the Architecture Using the Data Flow

1.9. Component-Level and Pattern-Based Design
- 1.9.1. What Is a Component?
- 1.9.2. Class-Based Component Design
- 1.9.3. Realization of the Design at the Component Level
- 1.9.4. Design of Traditional Components
- 1.9.5. Component-Based Development
- 1.9.6. Design Patterns
- 1.9.7. Pattern-Based Software Design
- 1.9.8. Architectural Patterns
- 1.9.9. Design Patterns at the Component Level
- 1.9.10 User Interface Design Patterns

1.10. Software Quality and Project Management
- 1.10.1. Quality
- 1.10.2. Software Quality
- 1.10.3. The Software Quality Dilemma
- 1.10.4. Achieving Software Quality
- 1.10.5. Software Quality Assurance
- 1.10.6. The Administrative Spectrum
- 1.10.7. The Personnel
- 1.10.8. Product Strategy
- 1.10.9. The Process
- 1.10.10. The Project
- 1.10.11. Principles and Practices

Module 2. Advanced Software Engineering

2.1. Introduction to Agile Methodologies
- 2.1.1. Process Models and Methodologies
- 2.1.2. Agility and Agile Processes
- 2.1.3. Agile Manifesto
- 2.1.4. Some Agile Methodologies
- 2.1.5. Agile vs. Traditional

2.2. Scrum
- 2.2.1. Origins and Philosophy of Scrum
- 2.2.2. Scrum Values
- 2.2.3. Scrum Process Flow
- 2.2.4. Scrum Roles
- 2.2.5. Scrum Artifacts
- 2.2.6. Scrum Events
- 2.2.7. User Stories
- 2.2.8. Scrum Extensions
- 2.2.9. Agile Estimates
- 2.2.10 Scrum Scaling

2.3. Extreme Programming
- 2.3.1. Justification and Overview of XP
- 2.3.2. The XP Life Cycle
- 2.3.3. The Five Core Values
- 2.3.4. The Twelve Basic Practices in XP
- 2.3.5. Roles of Participants
- 2.3.6. XP Industrial
- 2.3.7. Critical Assessment of XP

2.4. Software Development Based on Reusability
- 2.4.1. Software Reuse
- 2.4.2. Code Reuse Levels
- 2.4.3. Specific Reuse Techniques
- 2.4.4. Component-Based Development
- 2.4.5. Benefits and Problems of Reuse
- 2.4.6. Reuse Planning

2.5. System Architecture and Software Design Patterns
- 2.5.1. Architectural Design
- 2.5.2. General Architectural Patterns
- 2.5.3. Fault Tolerant Architectures
- 2.5.4. Distributed Systems Architectures
- 2.5.5. Design Patterns
- 2.5.6. Gamma Patterns
- 2.5.7. Interaction Design Patterns

2.6. Cloud Application Architecture
- 2.6.1. Cloud Computing Fundamentals
- 2.6.2. Cloud Application Quality
- 2.6.3. Architectural Styles
- 2.6.4. Design Patterns

2.7. Software Testing: TDD, ATDD and BDD
- 2.7.1. Software Verification and Validation
- 2.7.2. Software Testing
- 2.7.3. Test Driven Development (TDD)
- 2.7.4. Acceptance Test Driven Development (ATDD)
- 2.7.5. Behavior Driven Development (BDD)
- 2.7.6. BDD and Cucumber

2.8. Software Process Improvement
- 2.8.1. Software Process Improvement
- 2.8.2. The Process Improvement Approach
- 2.8.3. Maturity Models
- 2.8.4. The CMMI Model
- 2.8.5. CMMI V2.0 2.8.6. CMMI and Agile

2.9. The Quality of the Software Product: SQuaRE
- 2.9.1. Software Quality
- 2.9.2. Software Product Quality Models
- 2.9.3. ISO/IEC 25000 Family
- 2.9.4. ISO/IEC 25010: Quality Model and Quality Characteristics
- 2.9.5. ISO/IEC 25012: the Quality of the Data
- 2.9.6. ISO/IEC 25020 Software Quality Measurement.
- 2.9.7. ISO/IEC 25022, 25023 and 25024: Software and Data Quality Metrics
- 2.9.8. ISO/IEC 25040 Software Assessment
- 2.9.9. Accreditation Process

2.10. Introduction to DevOps
- 2.10.1. DevOps Concept
- 2.10.2. Core Practices

Module 3. Requirements Engineering

3.1. Introduction to Requirements Engineering
- 3.1.1. The Importance of Requirements
- 3.1.2. Concept of Requirement
- 3.1.3. Dimensions of Requirements
- 3.1.4. Levels and Types of Requirements
- 3.1.5. Requirements Characteristics
- 3.1.6. Requirements Engineering
- 3.1.7. The Requirements Engineering Process
- 3.1.8. Frameworks for Requirements Engineering
- 3.1.9. Best Practices in Requirements Engineering
- 3.1.10 The Business Analyst

3.2. Sources of Requirements
- 3.2.1. The Requirements Network
- 3.2.2. The Stakeholders
- 3.2.3. Business Requirements
- 3.2.4. Vision and Scope Document

3.3. Requirements Elicitation Techniques
- 3.3.1. Elicitation of Requirements
- 3.3.2. Problems of Requirements Elicitation
- 3.3.3. Contexts of Discovery
- 3.3.4. Interviews
- 3.3.5. Observation and Learning
- 3.3.6. Ethnography

3.3.7. Workshops
3.3.8. *Focus Groups*
3.3.9. Questionnaires
3.3.10 *Brainstorming* and Creative Techniques
3.3.11. Group Media
3.3.12. Analysis of System Interfaces
3.3.13. Document Analysis and "Archeology"
3.3.14. Case Studies and Scenarios
3.3.15. Prototypes
3.3.16. Reverse Engineering
3.3.17. Reuse of Requirements
3.3.18. Good Elicitation Practices

3.4. User Requirements
3.4.1. People
3.4.2. Case Studies and User Stories
3.4.3. Scenarios
3.4.5. Types of Scenarios
3.4.6. How to Discover Scenarios

3.5. Prototyping Techniques
3.5.1. Prototyping
3.5.2. Prototypes According to Their Scope
3.5.3. Prototypes According to Their Seasonality
3.5.4. The Fidelity of a Prototype
3.5.5. User Interface Prototypes
3.5.6. Evaluation of Prototypes

3.6. Requirements Analysis
3.6.1. Requirements Analysis
3.6.2. Requirements Analysis Best Practices
3.6.3. The Data Dictionary
3.6.4. Prioritization of Requirements

3.7. Documentation of Requirements
3.7.1. The Requirements Specification Document
3.7.2. Structure and Contents of an SRS
3.7.3. Natural Language Documentation
3.7.4. EARS: Easy Approach to Requirements Syntax
3.7.5. Non-Functional Requirements
3.7.6. Attributes and Templates in Table Form
3.7.7. Good Specifications Practices

3.8. Validation and Negotiation of Requirements
3.8.1. Validation of Requirements
3.8.2. Requirements Validation Techniques
3.8.3. Negotiation of Requirements

3.9. Modeling and Requirements Management
3.9.1. Requirements Modeling
3.9.2. The User's Perspective
3.9.3. The Data Perspective
3.9.4. The Functional or Flow-Oriented Perspective
3.9.5. The Behavioral Perspective
3.9.6. Volatility of Requirements
3.9.7. Requirements Management Process
3.9.8. Tools for Requirements Management
3.9.9. Best Practices in Requirements Management

3.10. Critical Systems and Formal Specification
3.10.1. Critical Systems
3.10.2. Risk-Driven Specification
3.10.3. Formal Specification

Module 4. Software Engineering Processes

4.1. Software Engineering Framework
- 4.1.1. Software Features
- 4.1.2. The Main Processes in Software Engineering
- 4.1.3. Software Development Process Models
- 4.1.4. Standard Reference Framework for the Software Development Process: The ISO/IEC 12207 Standard

4.2. Unified Software Development Process
- 4.2.1. The Unified Process
- 4.2.2. Dimensions of the Unified Process
- 4.2.3. Case Studies Driven Development Process
- 4.2.4. Fundamental Workflows of Unified Processes

4.3. Planning in the Context of Agile Software Development
- 4.3.1. Characteristics of Agile Software Development
- 4.3.2. Different Planning Time Horizons in Agile Development
- 4.3.3. Scrum Agile Development Framework and Planning Time Horizons
- 4.3.4. User Stories as a Planning and Estimating Unit
- 4.3.5. Common Techniques for Deriving an Estimate
- 4.3.6. Scales for Interpreting Estimates
- 4.3.7. *Planning Poker*
- 4.3.8. Common Scheduling Types: Delivery Scheduling and Iteration Scheduling

4.4. Distributed Software Design Styles and Service-Oriented Software Architectures
- 4.4.1. Communication Models in Distributed Software Systems
- 4.4.2. Middleware
- 4.4.3. Architecture Patterns for Distributed Systems
- 4.4.4. General Software Service Design Process
- 4.4.5. Design Aspects of Software Services
- 4.4.6. Composition of Services
- 4.4.7. Web Services Architecture
- 4.4.8. Infrastructure and SOA Components

4.5. Introduction to Model Driven Software Development
- 4.5.1. The Model Concept
- 4.5.2. Model-Driven Software Development
- 4.5.3. MDA Model-Driven Development Framework
- 4.5.4. Elements of a Transformation Model

4.6. Graphical User Interface Design
- 4.6.1. Principles of User Interface Design
- 4.6.2. Architectural Design Patterns for Interactive Systems: Model View Controller (MVC)
- 4.6.3. UX User Experience
- 4.6.4. User-Centered Design
- 4.6.5. Graphical User Interface Analysis and Design Process
- 4.6.6. Usability of User Interfaces
- 4.6.7. Accessibility in User Interfaces

4.7. Web Application Design
- 4.7.1. Characteristics of Web Applications
- 4.7.2. Web Application User Interface
- 4.7.3. Navigation Design
- 4.7.4. Basic Interaction Protocol for Web Applications
- 4.7.5. Architecture Styles for Web Applications

4.8. Software Testing Strategies and Techniques and Software Quality Factors
- 4.8.1. Testing Strategies
- 4.8.2. Test Case Designs
- 4.8.3. Value for Money
- 4.8.4. Quality Models
- 4.8.5. ISO/IEC 25000 Family of Standards (SQuaRE)
- 4.8.6. Product Quality Model (ISO 2501n)
- 4.8.7. Data Quality Models (ISO 2501n)
- 4.8.8. Software Quality Management

4.9. Introduction to Software Engineering Metrics
- 4.9.1. Basic Concepts: Measurements, Metrics and Indicators
- 4.9.2. Types of Metrics in Software Engineering
- 4.9.3. The Measurement Process
- 4.9.4. ISO 25024 External and Quality Metrics in Use
- 4.9.5. Object-Oriented Metrics

4.10. Software Maintenance and Re-Engineering
- 4.10.1. Maintenance Process
- 4.10.2. Standard Maintenance Process Framework. ISO/EIEC 14764
- 4.10.3. Software Re-Engineering Process Model
- 4.10.4. Reverse Engineering

Module 5. Quality and Auditing of Information Systems

5.1. Introduction to Information Security Management Systems
- 5.1.1. Fundamental Principles of ISMS
- 5.1.2. ISMS Golden Rules
- 5.1.3. Role of IT Audit in ISMSs

5.2. Safety Management Planning
- 5.2.1. Concepts Related to Safety Management
- 5.2.2. Classification of Information: Objectives, Concepts and Roles
- 5.2.3. Implementation of Security Policies: Security Policies, Standards and Procedures
- 5.2.4. Risk Management: Information Assets Risk Principles and Analysis

5.3. Main Mechanisms for the Protection of Information Assets I
- 5.3.1. Summary of the Main Cryptographic Tools for the Protection of the CID Triad of the CID Triad
- 5.3.2. Consideration of Privacy, Anonymity and Adequate Management of User Traceability Requirements

5.4. Main Mechanisms for the Protection of Information Assets II
- 5.4.1. Communications Security: Protocols, Devices and Security Architectures
- 5.4.2. Operating System Security

5.5. ISMS Internal Controls
- 5.5.1. ISMS Controls Taxonomy: Administrative, Logical and Physical Controls
- 5.5.2. Classification of Controls According to How Threats Are Addressed: Controls for Threat Prevention, Detection and Correction
- 5.5.3. Implementation of Internal Control Systems in ISMSs

5.6. Types of Audits
- 5.6.1. Difference between Audit and Internal Control
- 5.6.2. Internal vs. External Audit
- 5.6.3. Audit Classification according to the Objective and Type of Analysis

5.7. Screenwriter and Screenplay: Subject Matter and Object Protected by Intellectual Property
- 5.7.1. Introduction to Penetration Testing and Forensic Analysis
- 5.7.2. Definition and Relevance of *Fingerprinting* and *Footprinting* Concepts

5.8. Vulnerability Scanning and Network Traffic Monitoring
- 5.8.1. Tools for Vulnerability Analysis in Systems
- 5.8.2. Main Vulnerabilities in the Context of Web Applications
- 5.8.3. Analysis of Communications Protocols

5.9. The IT Audit Process
- 5.9.1. Life Cycle Concept in Systems Development
- 5.9.2. Activity and Process Monitoring: Collection and Treatment of Evidence
- 5.9.3. IT Audit Methodology
- 5.9.4. IT Audit Process
- 5.9.5. Identification of the Main Crimes and Misdemeanors in the Context of Information Technologies
- 5.9.6. Computer Crime Investigation: Introduction to Forensic Analysis and its relation to Computer Auditing

5.10. Business Continuity and Disaster Recovery Plans
- 5.10.1. Definition of Business Continuity Plan and the Business Interruption Concept
- 5.10.2. NIST Recommendation on Business Continuity Plans
- 5.10.3. Disaster Recovery Plan
- 5.10.4. Disaster Recovery Plan Process

Module 6. Integration Systems

6.1. Introduction to Information Systems in the Enterprise
- 6.1.1. The Role of Information Systems
- 6.1.2. What is an Information System?
- 6.1.3. Dimensions of Information Systems
- 6.1.4. Business Processes and Information Systems
- 6.1.5. The IS/IT Department

6.2. Opportunities and Needs of Information Systems in the Enterprise
- 6.2.1. Organizations and Information Systems
- 6.2.2. Features of Organizations
- 6.2.3. Impact of Information Systems in the Enterprise
- 6.2.4. Information Systems to Achieve a Competitive Advantage
- 6.2.5. Use of Systems in the Administration and Management of the Enterprise

6.3. Basic Concepts of Information Systems and Technologies
- 6.3.1. Data, Information and Knowledge
- 6.3.2. Technology and Information Systems
- 6.3.3. Technology Components
- 6.3.4. Classification and Types of Information Systems
- 6.3.5. Service and Business Process Based Architectures
- 6.3.6. Forms of Systems Integration

6.4. Systems for the Integrated Enterprise Resource Planning
- 6.4.1. Business Needs
- 6.4.2. An Integrated Enterprise Resource Planning
- 6.4.3. Acquisition vs. Development
- 6.4.4. ERP Implementation
- 6.4.5. Implications for Management
- 6.4.6. Leading ERP Vendors

6.5. Supply Chain and Customer Relationship Management Information Systems
- 6.5.1. Definition of Supply Chain
- 6.5.2. Effective Supply Chain Management
- 6.5.3. The Role of Information Systems
- 6.5.4. Supply Chain Management Solutions
- 6.5.5. Customer Relationship Management
- 6.5.6. The Role of Information Systems
- 6.5.7. Implementation of a CRM System
- 6.5.8. Critical Success Factors in CRM Implementation
- 6.5.9. CRM, e-CRM and Other Trends

6.6. ICT Investment Decision-Making and Information Systems Planning
- 6.6.1. Criteria for ICT Investment Decisions
- 6.6.2. Linking the Project to the Management and Business Plan
- 6.6.3. Management Implications
- 6.6.4. Redesign of Business Processes
- 6.6.5. Management's Decision on Implementation Methodologies
- 6.6.6. Need for Information Systems Planning
- 6.6.7. Objectives, Participants and Moments
- 6.6.8. Structure and Development of the Systems Planning
- 6.6.9. Follow-Up and Updating

6.7. Security Considerations in the Use of ICTs
- 6.7.1. Risk Analysis
- 6.7.2. Security in Information Systems
- 6.7.3. Practical Tips

6.8. Feasibility of ICT Project Implementation and Financial Aspects in Information Systems Projects
- 6.8.1. Description and Objectives
- 6.8.2. EVS Participants
- 6.8.3. Techniques and Procedures
- 6.8.4. Cost Structure
- 6.8.5. Financial Projection
- 6.8.6. Budgets

6.9. *Business Intelligence*
- 6.9.1. What Is Business Intelligence?
- 6.9.2. BI Implementation Strategy
- 6.9.3. Present and Future in BI

6.10. ISO/IEC 12207
- 6.10.1. What is "ISO/IEC 12207"?
- 6.10.2. Analysis of Information Systems
- 6.10.3. Information System Design
- 6.10.4. Implementation and Acceptance of the Information System

Module 7. Software Reuse

7.1. General Overview of the Software Reuse
- 7.1.1. What is Software Reuse?
- 7.1.2. Advantages and Disadvantages of Software Reuse
- 7.1.3. Main Techniques of Software Reuse

7.2. Introduction to Design Patterns
- 7.2.1. What is a Design Patterns?
- 7.2.2. Catalog of the Main Design Patterns
- 7.2.3. How to Use Patterns to Solve Design Problems
- 7.2.4. How to Select the Best Design Pattern

7.3. Creation Patterns I
- 7.3.1. Creation Patterns
- 7.3.2. Abstract Factory Pattern
- 7.3.3. Example of Abstract Factory Pattern Implementation
- 7.3.4. Builder Pattern
- 7.3.5. Builder Implementation Example
- 7.3.6. Abstract Factory Pattern vs. Builder

7.4. Creation Patterns II
- 7.4.1. Factory Method Pattern
- 7.4.2. Factory Method vs. Abstract Factory
- 7.4.3. Singleton Pattern

7.5. Structural Patterns I
- 7.5.1. Structural Patterns
- 7.5.2. Adapter Pattern
- 7.5.3. Bridge Pattern

7.6. Structural Patterns II
- 7.6.1. Composite Pattern
- 7.6.2. Decorator Pattern

7.7. Structural Patterns III
- 7.7.1. Facade Pattern
- 7.7.2. Proxy Pattern

7.8. Behavioral Patterns I
- 7.8.1. Concept of Behavioral Patterns
- 7.8.2. Behavior Pattern: Chain of Responsibility
- 7.8.3. Behavior Pattern Order

7.9. Behavioral Patterns II
- 7.9.1. Interpreter Pattern
- 7.9.2. Iterator Pattern
- 7.9.3. Observer Pattern
- 7.9.4. Strategy Pattern

7.10. *Frameworks*
- 7.10.1. Concept of Framework
- 7.10.2. Development Using Frameworks
- 7.10.3. Model View Controller Pattern
- 7.10.4. Framework for Graphical User Interface Design
- 7.10.5. Frameworks for Web Application Development
- 7.10.6. Frameworks for Managing Object Persistence in Databases

Module 8. Information Technology Services

8.1. Digital Transformation I
- 8.1.1. Business Innovation
- 8.1.2. Production Management
- 8.1.3. Financial Management

8.2. Digital Transformation II
- 8.2.1. The Evolution of Marketing Paradigms
- 8.2.2. HR Management
- 8.2.3. The Integrated Information System

8.3. Case Study
- 8.3.1. Company Presentation
- 8.3.2. Methodologies to Analyze the Acquisition of IT
- 8.3.3. Determining the Costs, Benefits and Risks
- 8.3.4. Economic Evaluation of Investment

8.4. ICT Governance and Management
- 8.4.1. Definition of IT and Information Systems Governance
- 8.4.2. Difference Between IT Systems Governance and Management
- 8.4.3. Framework for IT Systems Governance and Management
- 8.4.4. Regulations and IT Systems Governance and Management

8.5. ICT Corporate Governance
- 8.5.1. What Is Good Corporate Governance?
- 8.5.2. ICT Governance Background
- 8.5.3. The ISO/IEC 38500:2008 Standard
- 8.5.4. Implementation of Good ICT Governance
- 8.5.5. ICT Governance and Best Practices
- 8.5.6. Corporate Governance Summary and Trends

8.6. Control Objectives for Information and Related Technologies (COBIT)
- 8.6.1. Application Framework
- 8.6.2. Domain: Planning and Organization
- 8.6.3. Domain: Acquisition and Implementation
- 8.6.4. Domain: Delivery and Support
- 8.6.5. Domain: Supervision and Evaluation
- 8.6.6. Application of the COBIT Guide

8.7. The Information Technology Infrastructure Library (ITIL)
- 8.7.1. Introduction to ITIL
- 8.7.2. Service Strategies
- 8.7.3. Service Design
- 8.7.4. Transition Between Services
- 8.7.5. Service Operation
- 8.7.6. Improving the Service

8.8. The Service Management System
- 8.8.1. Basic Principles of UNE-ISO/IEC 20000-1
- 8.8.2. The Structure of the ISO/IEC 20000 Regulations
- 8.8.3. Service Management System (SMS) Requirements
- 8.8.4. Design and Transition of New or Modified Services
- 8.8.5. Service Provision Processes
- 8.8.6. Groups of Processes

8.9. The Software Asset Management System
- 8.9.1. Justification of Needs
- 8.9.2. Background
- 8.9.3. Presentation of the 19770 Regulation
- 8.9.4. Management Implementation

8.10. Business Continuity Management
- 8.10.1. Business Continuity Plan
- 8.10.2. Implementation of a BCP

Module 9. Information Systems Security

9.1. A Global Perspective on Security, Cryptography and Classical Cryptanalysis
- 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 Security
- 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. Criptovirus
- 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. Project Management

10.1. Fundamental Concepts of Project Management and the Project Management Life Cycle
10.1.1. What Is a Project?
10.1.2. Common Methodology
10.1.3. What Is Project Management?
10.1.4. What Is a Project Plan?
10.1.5. Benefits
10.1.6. Project Life Cycle
10.1.7. Process Groups or Project Management Life Cycle
10.1.8. The Relationship between Process Groups and Knowledge Areas
10.1.9. Relationships between Product and Project Life Cycle
10.2. Start-Up and Planning
10.2.1. From the Idea to the Project
10.2.2. Development of the Project Record
10.2.3. Project Kick-Off Meeting
10.2.4. Tasks, Knowledge and Skills in the Startup Process
10.2.5. The Project Plan
10.2.6. Development of the Basic Plan. Steps
10.2.7. Tasks, Knowledge and Skills in the Planning Process
10.3. Stakeholders and Outreach Management
10.3.1. Identify Stakeholders
10.3.2. Develop Plan for Stakeholder Management
10.3.3. Manage Stakeholder Engagement
10.3.4. Control Stakeholder Engagement
10.3.5. The Objective of the Project
10.3.6. Scope Management and Its Plan
10.3.7. Gathering Requirements
10.3.8. Define the Scope Statement
10.3.9. Create the WBS
10.3.10. Verify and Control the Scope
10.4. The Development of the Time-Schedule
10.4.1. Time Management and Its Plan
10.4.2. Defining Activities
10.4.3. Establishment of the Sequence of Activities
10.4.4. Estimated Resources for Activities
10.4.5. Estimated Duration of Activities
10.4.6. Development of the Time-Schedule and Calculation of the Critical Path
10.4.7. Schedule Control
10.5. Budget Development and Risk Response
10.5.1. Estimate Costs
10.5.2. Develop Budget and S-Curve
10.5.3. Cost Control and Earned Value Method
10.5.4. Risk Concepts
10.5.5. How to Perform a Risk Analysis
10.5.6. The Development of the Response Plan
10.6. Quality Management

10.6.1. Quality Planning
10.6.2. Assuring Quality
10.6.3. Quality Control
10.6.4. Basic Statistical Concepts
10.6.5. Quality Management Tools
10.7. Communication and Human Resources
10.7.1. Planning Communications Management
10.7.2. Communications Requirements Analysis
10.7.3. Communication Technology
10.7.4. Communication Models
10.7.5. Communication Methods
10.7.6. Communications Management Plan
10.7.7. Managing Communications
10.7.8. Management of Human Resources
10.7.9. Main Stakeholders and their Roles in the Projects
10.7.10. Types of Organization
10.7.11. Project Organization
10.7.12. The Production Team
10.8. Procurement
10.8.1. The Procurement Process
10.8.2. Planning
10.8.3. Search for Suppliers and Request for Quotations
10.8.4. Contract Allocation
10.8.5. Contract Administration
10.8.6. Contracts
10.8.7. Types of Contracts
10.8.8. Contract Negotiation
10.9. Execution, Monitoring and Control and Closure
10.9.1. Process Groups
10.9.2. Project Execution
10.9.3. Project Monitoring and Control
10.9.4. Project Closure
10.10. Professional Responsibility
10.10.1. Professional Responsibility
10.10.2. Characteristics of Social and Professional Responsibility
10.10.3. Project Leader Code of Ethics
10.10.4. Liability vs. PMP®
10.10.5. Examples of Liability
10.10.6. Benefits of Professionalization

04

Teaching Objectives

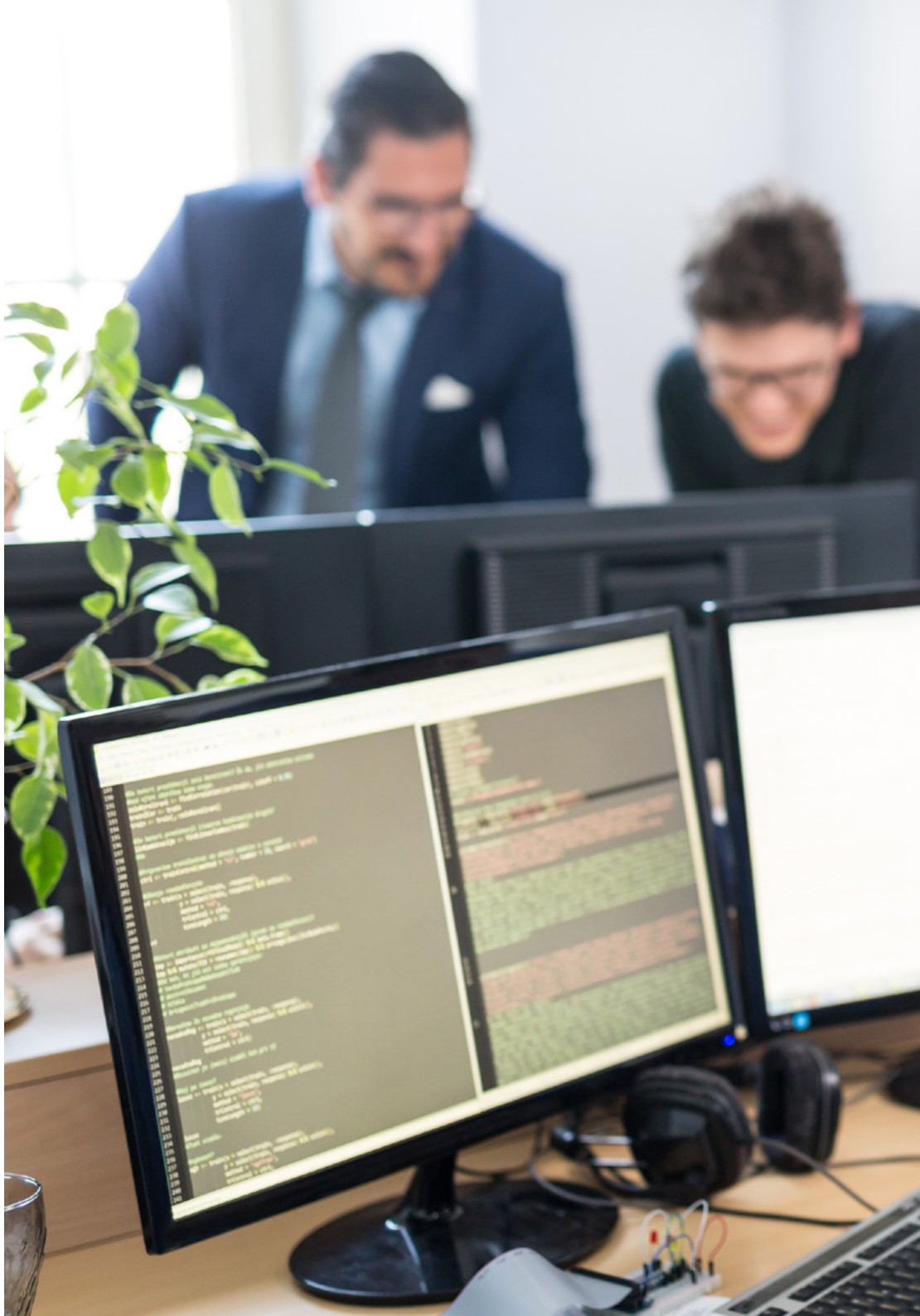
The main focus of this university program is to provide professionals with specialized competencies to understand the nature of software and competently manage its entire development process. Therefore, through the analysis of the specific characteristics of web applications, the program will strengthen the ability to structure solutions adapted to dynamic digital environments. In addition, the fundamentals of Software Engineering and associated best practices will be addressed, enabling the adoption of efficient methodologies from the initial phases. In this way, the program promotes a technical profile with analytical judgment, prepared to face challenges and lead projects focused on quality and sustainability.

You will strengthen your understanding of the nature of software, enabling you to approach its design and development with greater precision and technical effectiveness"

General Objectives

- Develop technical competencies to apply Software Engineering principles in real-world environments
- Employ advanced methodologies in the design and maintenance of complex information systems
- Master requirements elicitation and management techniques in technological projects
- Manage software development processes using efficiency and scalability criteria
- Establish audit and quality control mechanisms in information systems
- Integrate technological solutions into heterogeneous and distributed infrastructures
- Apply reuse strategies to optimize resources and reduce development time
- Assess risks and define security measures in critical digital environments

You will strengthen the protection of sensitive information through the strategic implementation of advanced cryptographic algorithms"



Specific Objectives

Module 1. Software Engineering

- Integrate the fundamentals of Software Engineering to structure more efficient and sustainable development processes
- Apply object-oriented modeling techniques and UML to accurately represent system requirements
- Use architectural design principles and patterns to improve software scalability and maintainability
- Implement quality assurance strategies to optimize the performance of technological projects

Module 2. Advanced Software Engineering

- Incorporate agile methodologies such as Scrum and XP to streamline the software life cycle
- Design robust, cloud-oriented, fault-tolerant architectures by applying advanced patterns
- Integrate reuse-based development strategies to optimize efficiency and reduce costs
- Use approaches such as TDD, ATDD, and BDD to strengthen software product verification and validation

Module 3. Requirements Engineering

- Develop skills to identify, elicit, and document functional and non-functional requirements based on diverse sources and techniques
- Build effective prototypes and representative scenarios to facilitate early validation of system requirements
- Apply analysis and prioritization criteria that ensure consistency, traceability, and feasibility of defined requirements
- Integrate modeling and management approaches that allow control over requirements evolution, even in highly volatile environments

Module 4. Software Engineering Processes

- Recognize the phases, models, and standards that structure Software Engineering development processes, such as ISO/IEC 12207 and the Unified Process
- Design service-oriented solutions through the use of distributed architectures, middleware components, and SOA patterns
- Develop accessible and usable graphical interfaces aligned with user-centered design and user experience (UX) principles
- Evaluate software quality through testing strategies, metrics, and standards such as the ISO/IEC 25000 family

Module 5. Quality and Auditing of Information Systems

- Identify the key principles of Information Security Management Systems and their relationship with IT auditing
- Establish protection mechanisms for information assets, including cryptographic tools and privacy requirements
- Differentiate the main types of IT audits according to their objectives and analytical approaches
- Design effective business continuity and disaster recovery plans in accordance with international recommendations

Module 6. Integration Systems

- Recognize the strategic role of information systems within organizations and their impact on business processes
- Determine key elements in systems integration, including architectures, technologies, and implementation methodologies
- Examine information technology solutions applied to resource management, customer relationships, and supply chains
- Assess the importance of planning, financial viability, and security in information technology projects

Module 7. Software Reuse

- Distinguish software reuse techniques and their implications for efficient system design
- Understand the purpose of design patterns and their application in solving recurring programming problems
- Explore different pattern categories, from creational to structural and behavioral
- Analyze the use of frameworks as a key tool to accelerate development and ensure consistency in software projects

Module 8. Information Technology Services

- Recognize the impact of digital transformation across different functional areas of the organization, such as production, marketing, and human resources
- Investigate methodologies used to analyze feasibility and risks in the acquisition of information technologies
- Examine the principles of corporate IT governance, its regulatory frameworks, and associated best practices
- Explore reference models such as COBIT, ITIL, and ISO/IEC 20000 for the efficient management of technology services and software assets

Module 9. Information Systems Security

- Recognize the historical foundations of cryptography and its evolution toward modern symmetric and asymmetric encryption methods
- Compare major cryptographic algorithms and their usefulness in protecting information within computing systems
- Examine different types of network security threats and the architectural mechanisms used to mitigate risks
- Assess the importance of forensic analysis in digital environments through the collection, processing, and interpretation of evidence

Module 10. Project Management

- Understand the phases of the project life cycle and their relationship with key knowledge areas in project management
- Design effective plans that integrate scope, schedule, budget, and risk management from project initiation to closure
- Manage communication, human resources, and stakeholder engagement to ensure efficient development of each project phase
- Apply ethical criteria and principles of professional responsibility in decision-making throughout project management

05

Career Opportunities

This program will provide a wide range of professional opportunities, enabling students to stand out in research centers, technological innovation hubs, or laboratories specialized in cybersecurity. Thanks to the development of highly demanded competencies, graduates will be able to assume leadership roles, coordinate strategic projects, or collaborate within teams dedicated to protecting digital environments. Likewise, access to national and international collaboration networks will enhance professional impact, open new lines of specialization, and allow active contribution to the advancement of knowledge in a field that is essential to the present and future of digital transformation.

You will work in institutions specialized in Cybersecurity, optimizing complex processes"

Graduate Profile

Graduates will stand out for their ability to anticipate emerging risks and design more secure digital environments. For example, they will master defensive architectures, incident management, and forensic analysis, and will possess the necessary tools to intervene effectively in highly demanding contexts. They will also be capable of implementing comprehensive strategies that strengthen the protection of complex systems. Through a critical and solution-oriented perspective, graduates will actively contribute to the consolidation of more reliable infrastructures. Therefore, they will not only respond to current threats, but will also promote innovative practices in information security.

You will optimize software integration, deployment, and monitoring processes in continuous development environments.

- **Critical Thinking and Complex Problem-Solving:** Competence to analyze situations from multiple perspectives, identify potential risks, and propose strategic solutions to technical or security challenges
- **Effective Communication in Technical and Multidisciplinary Environments:** Skill that facilitates the clear transmission of ideas, reports, or protocols, even to audiences with different levels of technological knowledge
- **Adaptability to Changing Technological Environments:** Aptitude that supports continuous updating in response to new tools, threats, or standards, maintaining an agile and relevant response
- **Ethical and Responsible Information Management:** Ability to contribute to decision-making aligned with principles of confidentiality, integrity, and respect for sensitive data

After completing the university program, you will be able to apply your knowledge and skills in the following positions:

1. **Cybersecurity Specialist:** Responsible for identifying vulnerabilities, implementing protective measures, and responding to incidents to safeguard the integrity of digital systems
2. **Security Architect:** Responsible for developing robust defensive infrastructures, integrating policies, technologies, and protocols that prevent high-level cyber threats
3. **Threat Intelligence Analyst:** Dedicated to monitoring malicious patterns, anticipating risks, and recommending strategies to mitigate complex cyberattacks
4. **Information Security Manager:** Leads an organization's data protection strategy, defining policies, assessing risks, and coordinating response teams
5. **IT Security Auditor:** Responsible for reviewing and evaluating technological systems to ensure compliance with regulations, standards, and cybersecurity best practices
6. **Cybersecurity Consultant:** Advises organizations on the creation of digital security policies, contingency planning, and optimization of technological environments
7. **Network Security Engineer:** Focuses on developing and maintaining secure networks, applying advanced configurations and protocols to minimize vulnerabilities and unauthorized access
8. **Incident Response Specialist:** Manages immediate actions in response to security breaches, analyzing causes, containing impact, and leading recovery plans
9. **Secure Software Developer:** Responsible for programming applications with structures resistant to cyberattacks, applying secure coding principles and vulnerability testing
10. **Cybersecurity Researcher:** Leads cutting-edge research projects, generating knowledge, exploring new threats, and proposing innovative defensive solutions

06

Software Licenses Included

TECH is a leading reference in the academic world for combining the latest technology with teaching methodologies to enhance the teaching-learning process. To achieve this, it has established a network of alliances that grants access to the most advanced software tools used in the professional world.

Upon enrolling, you will receive, completely free of charge, academic credentials for the following professional software applications"

TECH has established a network of professional alliances with the leading providers of software applied to various professional fields. These alliances allow TECH to access hundreds of software applications and licenses, making them available to its students.

The academic software licenses will allow students to use the most advanced applications in their professional field, so they can become familiar with them and master their use without incurring additional costs. TECH will handle the licensing process so that students may use these resources without limitation throughout the duration of the Master's Degree in Advanced Software Engineering, completely free of charge.

TECH will provide free access to the following software applications:

Google Career Launchpad

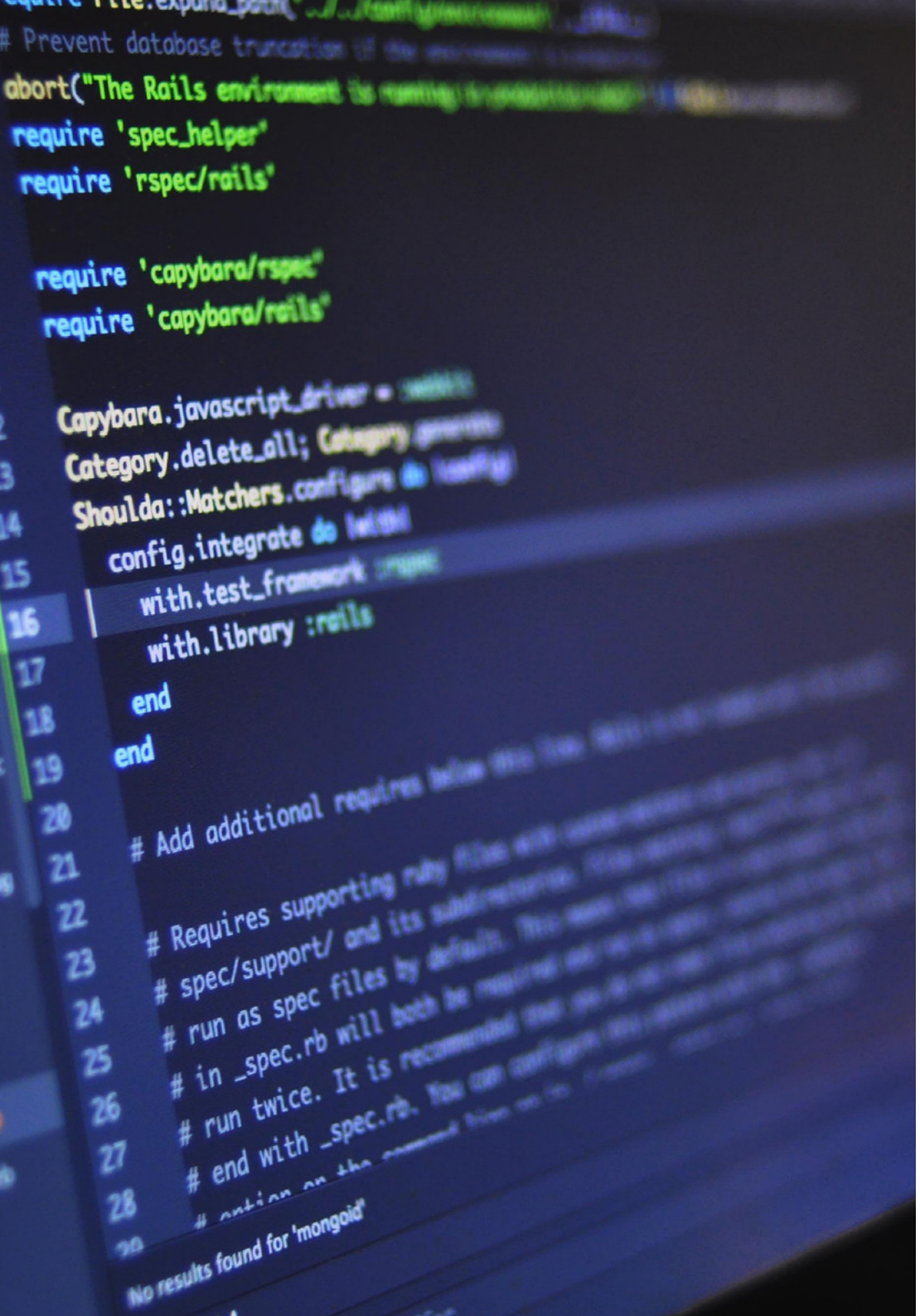
Google Career Launchpad is a solution for developing digital skills in technology and data analysis. With an estimated value of **5,000 dollars**, it is included **for free** in TECH's university program, providing access to interactive labs and certifications recognized in the industry.

This platform combines technical training with practical cases, using technologies such as BigQuery and Google AI. It offers simulated environments to work with real data, along with a network of experts for personalized guidance.

Key Features:

- **Specialized Courses:** Updated content in cloud computing, machine learning, and data analysis
- **Live Labs:** Hands-on practice with real Google Cloud tools, no additional configuration required
- **Integrated Certifications:** Preparation for official exams with international validity
- **Professional Mentoring:** Sessions with Google experts and technology partners
- **Collaborative Projects:** Challenges based on real-world problems from leading companies

In conclusion, **Google Career Launchpad** connects users with the latest market technologies, facilitating their entry into fields such as artificial intelligence and data science with industry-backed credentials.



Thanks to TECH, you will have free access to the best software applications in your professional field"

07

Study Methodology

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

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

TECH prepares 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.

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

The most comprehensive academic programs worldwide

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.

> *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 or 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 **Method**

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 more performance, involving you more in your specialization, developing a critical spirit, 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.

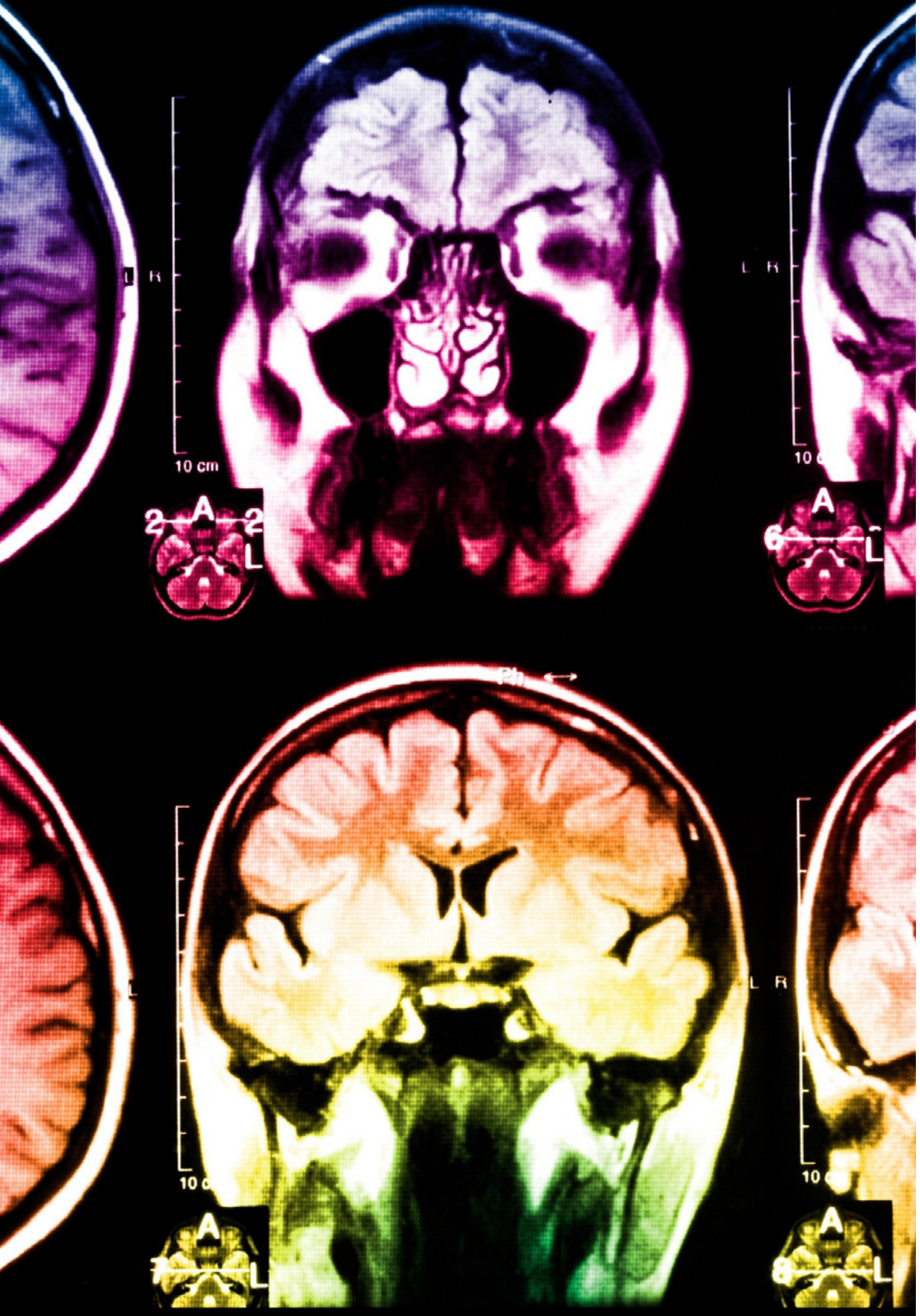
In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

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 best 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.

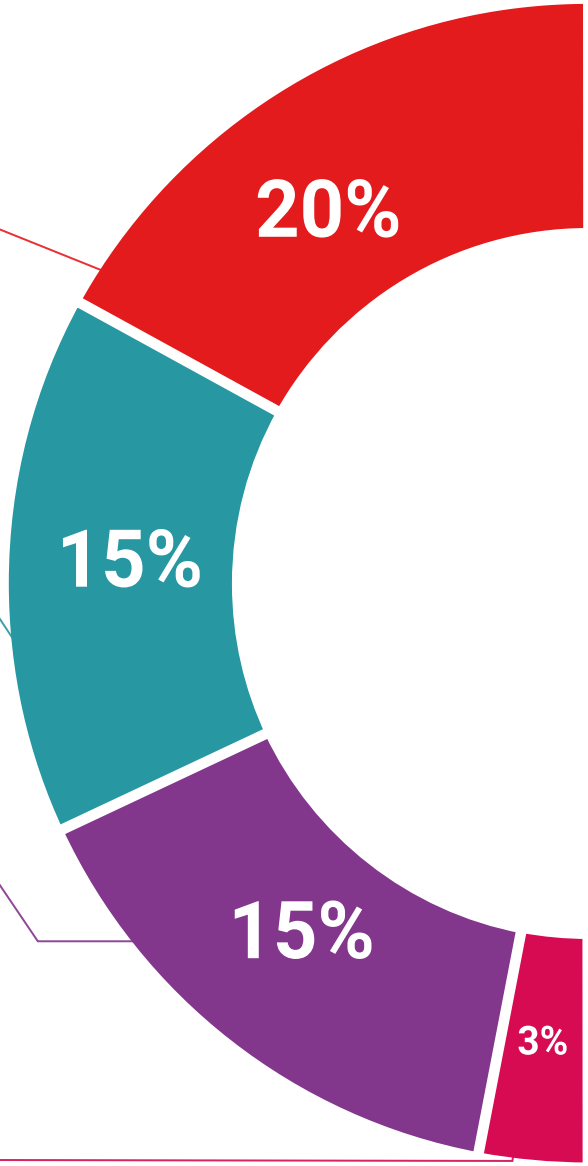
Interactive Summaries

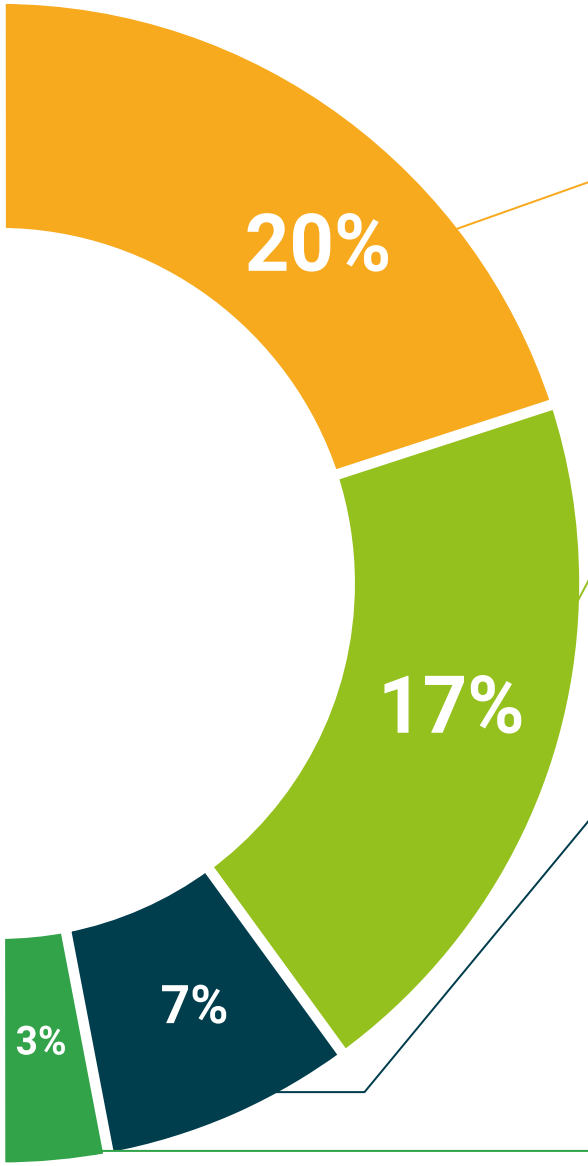
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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.

08

Certificate

The Master's Degree in Advanced Software Engineering guarantees students, in addition to the most rigorous and up-to-date education, access to a diploma for the 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 private qualification will allow you to obtain a diploma for the **Master's Degree in Advanced Software Engineering** 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 private qualification from **TECH Global University** is a European continuing education and professional development program that guarantees the acquisition of competencies in its area of expertise, providing significant curricular value to the student who successfully completes the program.

Title: **Master's Degree in Advanced Software Engineering**

Modality: **online**

Duration: **12 months.**

Accreditation: **60 ECTS**


tech global university

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

Master's Degree in Advanced Software Engineering

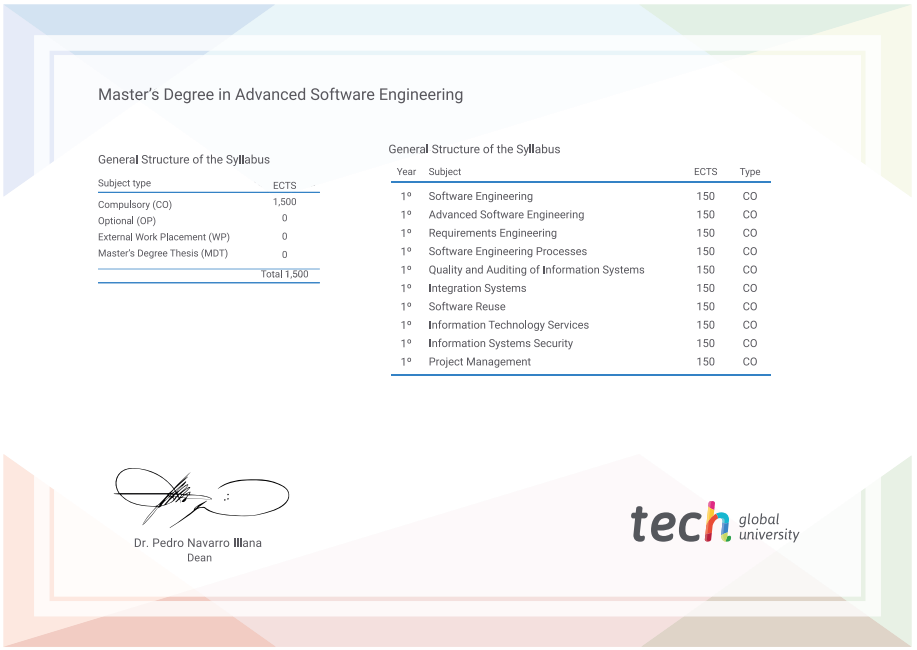
This is a private qualification of 1,800 hours of duration equivalent to 60 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

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
Dean

Unique TECH Code: AFWORD23S techtitute.com/certificates


Master's Degree in Advanced Software Engineering

General Structure of the Syllabus

Subject type	ECTS
Compulsory (CO)	1,500
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
	Total 1,500

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	Software Engineering	150	CO
1º	Advanced Software Engineering	150	CO
1º	Requirements Engineering	150	CO
1º	Software Engineering Processes	150	CO
1º	Quality and Auditing of Information Systems	150	CO
1º	Integration Systems	150	CO
1º	Software Reuse	150	CO
1º	Information Technology Services	150	CO
1º	Information Systems Security	150	CO
1º	Project Management	150	CO

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Dean

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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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Master's Degree
Advanced Software Engineering

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

Master's Degree

Advanced Software Engineering