Advanced Master's Degree
Cloud Computing

tech technological university

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Advanced Master's Degree
Cloud Computing

- Modality: **online**
- Duration: **2 years**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/information-technology/advanced-master-degree/advanced-master-degree-cloud-computing

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01

Introduction

Nowadays, Cloud Computing has become a fundamental tool for companies, allowing access to technological resources from anywhere and at any time. Technological advances in the cloud are constantly evolving, which has enabled the creation of new solutions, such as the Internet of Things (IoT), Big Data, Machine Learning and Artificial Intelligence. Given its relevance, TECH has decided to create this 100% online degree that provides IT professionals with a unique opportunity to acquire advanced knowledge in this technology, which will allow them to be at the forefront of technological solutions and face the challenges of today's market. All this, in addition, with the best didactic material, elaborated by authentic experts in this sector.

Specialize in Cloud Computing through a flexible degree, compatible with your daily responsibilities"

The ability to store, process and manage data in the cloud has transformed the way businesses operate, enabling process automation, scalability and cost reduction. These benefits have given impetus to the development of the Cloud and its application in all sectors and organizations, regardless of their size.

In view of this reality, the profile of the computer scientist is of great importance and in recent years has become one of the most in-demand. A favorable scenario that requires specialized professionals who are up to date with the latest trends. This is the origin of this 24-month Grand Master's Degree in Cloud Computing.

This is an advanced program that will take the graduate on an intensive academic journey through the programming of Cloud Computing architectures, Native Cloud application programming, and container orchestration with Kubernetes and Docker. This degree also covers topics such as storage in Cloud Azure, integration of cloud services, and transformation of IT infrastructures towards Cloud Computing.

Furthermore, the numerous teaching materials will enable students to learn more about security, governance and cybersecurity in Cloud infrastructures, as well as monitoring and backup in a much more agile way. A unique teaching that reduces the long hours of study and memorization, thanks to the *Relearning*, method, which is another attraction to take this program.

In this way, through an eminently online and totally flexible academic option, the computer scientist will obtain the knowledge he/she needs to grow in the technology industry. In order to access the content of this degree program at any time of the day, all you need is an electronic device with an Internet connection. An ideal opportunity for quality training compatible with daily responsibilities.

This **Advanced Master's Degree in Cloud Computing** contains the most complete and up-to-date program on the market. The most important features include:

- The development of practical cases presented by rendering experts
- 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 self-assessment can be used to improve learning
- Special emphasis on innovative methodologies in the realization of Cloud Computing Project
- 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

A unique academic option, whose Relearning system will allow you to learn easily and reduce the long hours of study"

Do you want to be at the forefront of digital transformation? Enroll now in this Grand Master in Cloud Computing and learn how to create innovative solutions for the companies of the future"

With this degree you will become an expert in programming cloud architectures with the most widely used technologies, such as Azure, AWS and Google Cloud.

You will learn how to deploy containers with Kubernetes and Docker, key technologies for the implementation of cloud solutions.

Its teaching staff includes professionals from the Cloud Computing, who bring to this program the experience of their work, as well as recognized specialists from reference societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide an immersive learning experience designed to prepare for real-life situations.

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

02

Objectives

This Advanced Master's Degree in Cloud Computing is designed to provide IT professionals with the skills and knowledge necessary to successfully perform in the technology field. Therefore, throughout this academic path, the graduate will perfect his or her skills to design, implement and manage cloud computing solutions that are scalable, secure and cost-effective. In this process you will also have a specialized faculty who will answer any questions you may have about the content of this program.

Become an expert in the cloud and expand your professional horizons thanks to this 100% online university program"

General Objectives

- Analyze the different approaches to cloud adoption and their contexts
- Acquire specialized knowledge to determine the appropriate Cloud
- Develop a virtual machine in Azure
- Establish the sources of threats in application development and best practices to apply.
- Assess the differences in the concrete implementations of different public cloud vendors
- Determine the different technologies applied to containers
- Identify the key aspects of a Cloud-Native adoption strategy
- Fundamentals and evaluation of the programming languages most commonly used in Big Data, necessary for data analysis and processing
- Develop specialized knowledge about what infrastructures are and what motivations exist for their transformation to the cloud.
- Acquire the skills and knowledge necessary to implement and manage IaaS solutions effectively.
- Acquire specialized knowledge to add or remove storage and processing capacity quickly and easily, enabling you to adapt to fluctuations in demand
- Examine the scope of Network DevOps, demonstrating that it is an innovative approach for network management in IT environments.
- Understand the challenges faced by an enterprise in Cloud governance and how to address them
- Use security services in Cloud environments , such as Firewalls, SIEMS and threat protection , to secure applications and services
- Establish best practices in the use of Cloud Services and the main recommendations when using them.
- Increase user efficiency and productivity: by enabling users to access their applications and data from anywhere and on any electronic device, VDI can improve user efficiency and productivity.
- Gain specialized knowledge about Infrastructure as Code
- Identify key points to demonstrate the importance of investing in backup and monitoring in organizations.

Specific Objectives

Module 1. Cloud Programming Azure, AWS and Google Cloud Services

- Generate specialized knowledge about the cloud and the differences with traditional on-premise solutions
- Acquire specialized vocabulary fundamental to the cloud Master the terms used by different vendors
- Establish the main components of the cloud and its use
- Determine the vendors in the cloud market, their strengths and weaknesses, and contributions

Module 2. Architecture Programming in Cloud Computing

- Develop specialized knowledge on the bases of architecture
- Specialize the student in the knowledge of Cloud infrastructures
- Evaluate advantages and disadvantages of deploying On Premise or in the Cloud
- Determine infrastructure requirements
- Identify deployment options
- Train for the implementation of a Cloud infrastructure in production
- Design and define the operation and maintenance of a Cloud architecture

Module 3. Azure Cloud Storage

- Examine a virtual machine in Azure
- Establish the different types of storage
- Evaluate the functions of backup
- Manage Azure resources
- Analyze the different types of services
- Examine the different types of security
- Generate virtual networks
- Concretize the different network connections

Module 4. Cloud Environments: Security/Safety
- Identifying risks of a public cloud infrastructure deployment
- Analyze security risks in application development
- Determine security requirements
- Developing a security plan for a cloud deployment
- Establish guidelines for a logging and monitoring system
- Propose incident response actions

Module 5. Container Orchestration: Kubernetes and Docker
- Develop the foundations of container architecture and technology
- Establish the different technologies applied to containers
- Determine infrastructure requirements
- Examine deployment options

Module 6. Native Cloud Application Programming
- Introduce technologies for continuous development and integration
- Demonstrate how Kubernetes works as an orchestration of services
- Analyze *Cloud-native* observability and security tools
- Evaluate deployment platforms
- Fundamentals of data management strategies in Cloud-native environments
- Identify common techniques in Cloud-native developments

Module 7. Cloud Programming Data Governance
- Generate specialized knowledge on data management, strategies and processing techniques
- Develop data governance strategies targeting people, processes, and tools
- Carry out data governance from ingest to preparation and usage
- Determine techniques to govern data transmission
- Establish data protection for authentication, security, backup and monitors

Module 8. Real-Time Cloud Programming. *Streaming*
- Analyze the process of collecting, structuring, processing, analyzing and interpreting *streaming* data
- Develop the principles of streaming processing, the current context and current use cases in the national context
- Develop key fundamentals of statistics, *maching learning*, data mining and predictive modeling for understanding data analysis and processing
- Analyze the main Big Data programming languages
- Examine the fundamentals of Apache Spark Streaming, Kafka Stream and Flink Stream

Module 9. Cloud Integration with Web Services: Technologies and Protocols
- Assess the progress of web technologies and architectures to determine the complexity of the system and, based on this, propose a software solution
- Develop distributed projects in Cloud Computing using web services and different functional and security requirements
- Analyze different web services implementation technologies, identifying the one that gives the best support considering the problem scenario
- Assess the correct functions of a server-side web service implementation by launching requests from different types of web clients

Module 10. Cloud Programming Project Management and Product Verification
- Know the scenarios and applications in life cycle management
- Manage projects as a process and determine the organization model
- Determine the risks and costs by applying agile methodologies during the conceptualization phase or during project execution
- Lead and manage projects with agile methodologies and the quality of Cloud projects by applying different methodologies

Module 11. Transformation of IT Infrastructures *Cloud Computing*

- List the types of clouds that exist
- Analyze the factors for Cloud Computing adoption
- Identify the types, models and elements of *Cloud Computing*
- Concretize how Cloud Infrastructures work and relevant aspects
- Analyze existing ecosystems and their pillars for successful transformation
- Establish an overview of the different vendors and how they can help the implementation of Cloud Computing
- Present an overview of the automation and security strategy
- Generate a first environment for the management of infrastructures under a DevOps or DevSecOps culture
- Discover the future and evolution of infrastructures, analyzing the challenges and technologies in the field of security and compliance

Module 12. Infrastructure as a Service (IaaS)

- Examine the abstraction layers in Cloud Computing and how they relate to each other
- Concretize the effective management of the Cloud Computing abstraction layers
- Analyze the core decisions in building a Cloud Architecture
- Evaluate how digital transformation and the Cloud can drive business success
- Delve into the DevOps approach and how it can improve the efficiency and effectiveness of software development and delivery
- Establish the different cloud computing resources available and how they can be used effectively

Module 13. Storage and Databases in *Cloud* Infrastructures

- Determine the characteristics and advantages of cloud storage, the different storage options in the cloud(public, private, hybrid) and the selection of the appropriate storage option
- Develop specialized knowledge about Cloud Databases, advantages and disadvantages of cloud databases, the different cloud database options (relational, non-relational) and how to select the right database option
- Examine cloud storage and database design and architecture: cloud storage and database design principles, cloud storage and database architectures and common design patterns
- Manage cloud storage and databases: how to create, manage and monitor cloud storage and databases, how to backup and recover data in of loss
- Analyze security and privacy in the cloud: how to protect stored data and databases in the cloud, privacy and security policies and regulations in the cloud
- Compile use cases and examples of cloud storage and databases: examples of how cloud storage and databases are used in different use cases , of big data management, real-time data analytics, and integration of data from different sources
- Addressing scalability and performance in the cloud and how to optimize them in cloud applications

Module 14. *Network DevOps* and Network Architectures in *Cloud* infrastructures

- Develop the concepts and principles of Network DevOps and its application in Cloud environments
- Determine the requirements needed to implement Network DevOps in Cloud environments
- Use the relevant tools and software for Network DevOps
- Establish how to implement and manage internal network services in cloud environments, such as VPC and subnetting
- Compile the boundary network services available in Cloud environments and how they are used to connect Cloud and on-premise networks
- Substantiate the importance of DNS usage in Cloud environments and how to implement hybrid and multi-tenant network connectivity
- Implement and manage content delivery services in cloud environments, such as CDNs and WAFs
- Examine the important aspects of security in Cloud networks and how security measures can be implemented in these environments
- Monitor and perform network audits in Cloud environments to ensure availability and security

Module 15. Government in *Cloud* Infrastructures

- Analyze the key concepts of compliance and their importance in the *Cloud* context
- Identify the main challenges faced by a CISO in *Cloud* governance and how to address them
- Establish the main privacy considerations in the *Cloud* context and how to ensure compliance with applicable regulations
- Examine the relevant regulatory frameworks and certifications in the *Cloud* environment
- Develop how cloud billing works and how resource usage can be optimized
- Delve into the use of management and governance services in AWS and Azure to optimize resource usage and ensure compliance with security requirements

Module 16. Cybersecurity in *Cloud* Infrastructures

- Develop specialized knowledge about specific risks and threats in Cloud environments
- Analyze security frameworks and apply them to protect the infrastructure
- Design threat models and protect applications and services against threats
- Evaluate code-level cybersecurity tools and how to use them to detect and prevent vulnerabilities in applications and services
- Perform integration of cybersecurity controls into processes
- Master ZAP Proxy to audit Cloud environments
- Perform automated vulnerability scans to detect and prevent vulnerabilities in applications and services
- Examine the different types of Firewalls and configure them to protect infrastructure and services
- Apply transport layer security using SSL/TLS and certificates
- Evaluate SIEMs and use to monitor and optimize the security of the Cloud environment

Module 17. Services Adoption in Cloud Infrastructures

- List the different computing services in each of the main Cloud providers
- Substantiate the advantages of interoperability between services
- Acquire the skills necessary to deploy the application in Cloud and provide it with additional features by incorporating new services
- Determine how to make an application resilient thanks to auto-scaling

Module 18. Virtual Desktop Infrastructure (VDI)

- Providing remote users with access to critical applications: VDI could be used to allow users to access critical applications from anywhere and on any electronic device, which could improve productivity and efficiency for remote users
- Facilitate collaborative work and communication: VDI could be used to enable users to share and collaborate on applications and data in real time, which could improve communication and collaborative work
- Reduce hardware and software costs - VDI could be used to reduce hardware and software costs by not having to install and maintain applications and operating systems on each electronic device individually
- Improve data security and privacy: VDI could be used to improve data security and privacy by storing information on a centralized server and protecting it through security meausre for storage and user
- Facilitate upgrade and maintenance: VDI could be used to facilitate operating system and application upgrade and maintenance by having the virtual desktop centralized on a server

Module 19. Infrastructure Operation-as-Code (IAC)

- Compile the main tools for Infrastructure-as-Code management and their main strengths
- Determine the different approaches proposed by Infrastructure as Code depending OS way you try to define the resources
- Implement and manage test and production environments efficiently using Infrastructure as Code
- Use versioning and change control techniques for Infrastructure as Code

Module 20. Monitoring and *Backup* of *Cloud* Infrastructures

- Determine how to establish a backup strategy and a monitoring strategy
- Establish the most demanded services and the usage of each service
- Identify the types of backup and its uses
- Determine a robust backup strategy that meets business objectives
- Develop a business continuity plan
- Identify the types of monitoring and what each is for
- Generate a proactive attitude towards incidents by establishing a scalable monitoring strategy
- Apply the different strategies on real use cases
- Identify areas for improvement to evolve environments as the business evolves

You will learn how to manage projects and verify products in the cloud, essential skills for professional success in this field"

03

Skills

This program will enable graduates to enhance high-level technical and management skills to lead complex cloud computing projects in companies and organizations of all sizes. For this purpose, TECH provides first class pedagogical tools, which will lead the graduate to acquire skills to perform in areas such as cloud architecture, security and privacy, service management, data analytics, automation and virtualization.

You will develop skills in security, governance and cybersecurity in Cloud infrastructures, essential elements nowadays"

General Skills

- Analyze the transformation process experienced by companies that have adopted the DevOps methodology
- Learn the fundamentals of the DevOps methodology to apply them in the management of the process of implementation and development of digital products
- Master the different existing business analysis techniques for the correct development of the planning phase
- Manage the existing verification and validation techniques to ensure the quality of the developed product
- Establish the differences between virtualization, cloud computing and container technologies for the optimal use of each of them
- Examine the bases on which cloud services are based in order to make proper use of these tools in the company
- Know the providers and the characteristics of the services offered in Cloud Computing to select those that best fit the needs of the company
- Manage the technologies that help to create a DevSecOps culture that unites development, systems and security teams in common objectives
- Have the skills and knowledge necessary to implement and manage IaaS solutions effectively
- Determine the necessary capabilities that facilitate collaboration between teams and departments
- Apply security and monitoring techniques to *Cloud* networks
- Address the challenges faced by a company in the *Cloud* governance
- Monitor and optimize the security of applications and services in *Cloud* environments using monitoring and auditing tools
- Integrate *Cloud* services
- Use collaboration tools and Infrastructure Lifecycle Management as Code
- Master the different tools and services offered by the cloud for their efficient deployment

This program will give you the tools you need to become a technology leader"

Specific Skills

- Identify the main data processing techniques
- Increase knowledge of the different tools and their use in the field of project management
- Generate specialized knowledge on the quality of service and how to achieve an adequate quality with your product
- Substantiate the concrete use of a service architecture to provide a solution to a problem in a specific setting
- Identify the weaknesses and threats of a system in order to propose a technological solution that supports system security
- Examine the different services provided by Cloud providers and justify the use of them in a particular project
- Examine the use of containers and development with microservices
- Identify the Cloud services to be deployed for the implementation of a security plan and the operations required for prevention mechanisms
- Know to Identify the types, models and elements of Cloud Computing
- Effectively manage the different computing resources available in the cloud
- Understand ways to protect stored data and databases in the cloud
- implement and manage internal network services in *cloud*, environments, such as VPC and subnetting
- Optimizing the use of resources and ensuring compliance with safety requirements
- Perform integration of cybersecurity controls into processes
- Deploy application in *Cloud* and provide it with additional features by incorporating new services
- Understand all the benefits and operation of VDI
- Use versioning and change control techniques for Infrastructure as Code
- Develop a business continuity plan

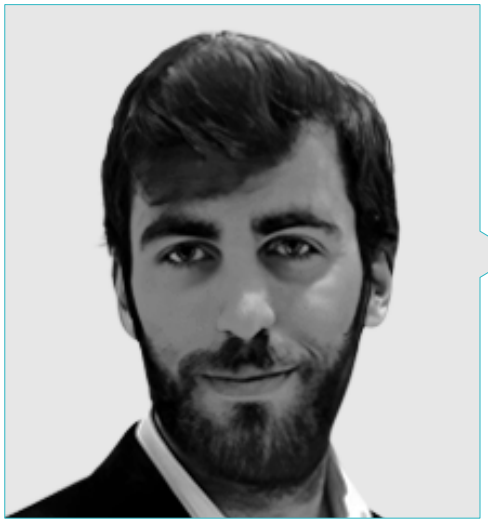
04

Course Management

The teaching team of this Advanced Master's Degree is composed of professionals with excellent professional experience in Computer Systems and Networks, Application Development and Cloud in Oracle. Their consolidated career in this field allows them to transmit to the students practical knowledge adapted to the needs of the market. A unique opportunity to learn from real professionals that only TECH, the world's largest digital university, can offer you.

Specialize in the transformation of IT infrastructures towards Cloud Computing with the best experts"

Management



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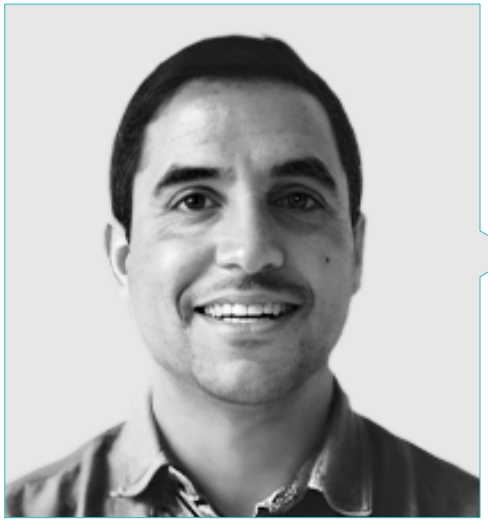
- Specalist in Systems Administration and Computer Networks
- Storage and SAN Network Administrator at Experis IT (BBVA)
- Network Administrator at IE Business School
- Graduate in Computer Systems and Network Administration at ASIR (ASIR)
- Ethical Hacking course at OpenWebinar
- Powershel course at OpenWebinar



Mr. Casado Sarmentero, Iván

- Head of DevOps at TRAK
- IT Director at Madison Experience Marketing
- Infrastructure and Telecommunications Officer at Madison Experience Marketing
- Operations and Support Officer at Madison Experience Marketing
- IT Systems Administrator at Madison Experience Marketing
- Master in Leadership and Team Management in the Chamber of Commerce of Valladolid
- Higher Level Educational Cycle in Computer Applications Development at IES Galileo

Professors

Mr. Gómez Rodríguez, Antonio

- Principal Cloud Solutions Engineer for Oracle
- Co-organizer of Málaga Developer Meetup
- Specialist Consultant for Sopra Group and Everis
- Team Leader at System Dynamics
- Software Developer at SGO Software
- Master's Degree in E-Business from La Salle Business School
- Postgraduate Degree in Information Technologies and Systems, Catalan Institute of Technology
- Degree in Telecommunications Engineering from the Polytechnic University of Catalonia

Mr. Bernal de la Varga, Yeray

- Big Data Architect at Bankia
- Big Data Engineer at Hewlett-Packard
- Adjunct Professor in the Master of Big Data at the University of Deusto
- Degree in IT from the Polytechnic University of Madrid
- Expert in Big Data by U-TAD

Dr. Rodríguez Camacho, Cristina

- Apis consultant and developer of microservices at Inetum.
- Graduate in Health Engineering, with mention in Biomedical Engineering from the University of Malaga.
- Master's Degree in Blockchain and Big Data from the Complutense University of Madrid.
- Expert in DevOps & Cloud at UNIR

Mr. Torres Palomino, Sergio

- IT Engineer with expertise in Blockchain
- Blockchain Lead at Telefónica
- Blockchain Architect at Signeblock
- Blockchain Developer at Blocknitive
- Writer and Publisher at O´Really Media Books
- Lecturer in postgraduate studies and Blockchain related courses
- Degree in Computer Engineering from San Pablo CEU University
- Master's Degree in Big Data Architecture
- Master's Degree in Big Data and Business Analytics

Mr. Rodríguez García, Darío

- Software Architect at NEA F3 MASTER
- Full-Stack Developer in NEA F3 MASTER
- Graduate in Computer Software Engineering from the University of Oviedo
- Master's Degree in Web Engineering by the University of Oviedo
- Professor in Web Engineering software
- Course instructor at Udemy e-learning platform

Dr. Moguel Márquez, Miguel

- Computer Engineer
- Advisor in Web Engineering, design and development of applications in the Web, Software Architectiure and new technological trends
- PhD in Information Technologies from the University of Extremadura
- Master0's Degree in Computer Engineering from the University of Extremadura
- Degree in Computer Engineering from the University of Extremadura

Dr. García Sanz-Calcedo, Justo

- Engineer Specialist in Health
- Director of Engineering and Maintenance at Extremadura Health Service
- PhD Industrial Engineering from the University of Extremadura
- Industrial Engineering, University of Extremadura
- Expert in Team Management Skills and Trainer of Trainers
- Senior Management Program in Healthcare Institutions at IESE Business School

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- Industrial and Mechanical Engineer
- Consultant for Industrial Research and Experimental Development projects
- PhD Industrial Engineering from the University of Extremadura
- Degree in Mechanical Engineering from the University of Extremadura
- Master's Degree in Industrial Engineering from the University of Extremadura
- Specialization in Innovation Project Management
- Certified Project Management Associate (Level D) by International Project Management Association (IPMA)

Dr. González Domínguez, Jaime

- Consultant for Industrial Research and Experimental Development projects
- PhD in Modeling and Experimentation in Science and Technology
- Industrial and Mechanical Engineeri from the University of Extremadura
- Specialization in Innovation Project Management
- Certified Project Management Associate (Level D) by International Project Management Association (IPMA)

Mr. Zarzuelo Rubio, Guillermo

- Site Reliability Manager at Madison Experience Marketing
- DevOps Engineer at Drivies
- Release Engineer at Aubay Isalia
- QA Tester at Axpe Consulting
- Python Analyst Programmer at Telefónica I+D
- AWS Certified Solutions Architect (B2)
- MongoDB for DBAs (MongoDB University)
- Telecommunications Engineer at Valladolid's University

Mr. Nadal Martín, Aser

- Site Reliability Engineering at TELECYL S.A
- Systems Administrator at Altia Consultores S.A
- Degree in Computer Engineering from the Spanish Open University (UNED)
- Course on Website Design at CIFESAL
- Basic Operation of IP Telephony Solution in JCYL
- Advanced GIT at GESDECO

Mr. Pastrián García, José Manuel

- IT Security Engineer at MADISON Experience Marketing
- Cibersecurity Trainee in Fundación General of Valladolid Univesity
- Collaborator at Boss Technical Lighting S.L
- Graduate in Physics from the University of Valladolid

Mr. Fuente Alonso, Rubén

- Operations and Support Officer at Madison Experience Marketing
- Founding Partner and President of the Asociación Informática Palencia Kernel Panic
- Network and Systems Security Administrator at Entelgy Innotec Security
- Network and Systems Security Administrator at Entelgy Innotec Security
- PartyLans Network Administrator in several associations
- Higher University Course on Cybersecurity at Rey Juan Carlos University
- CCNA R&S and CCNA Security at Cisco Networking Academy
- TCP/IP Network Design at IBM
- Senior Technician in Computer Systems Administration at CIFP Palencia

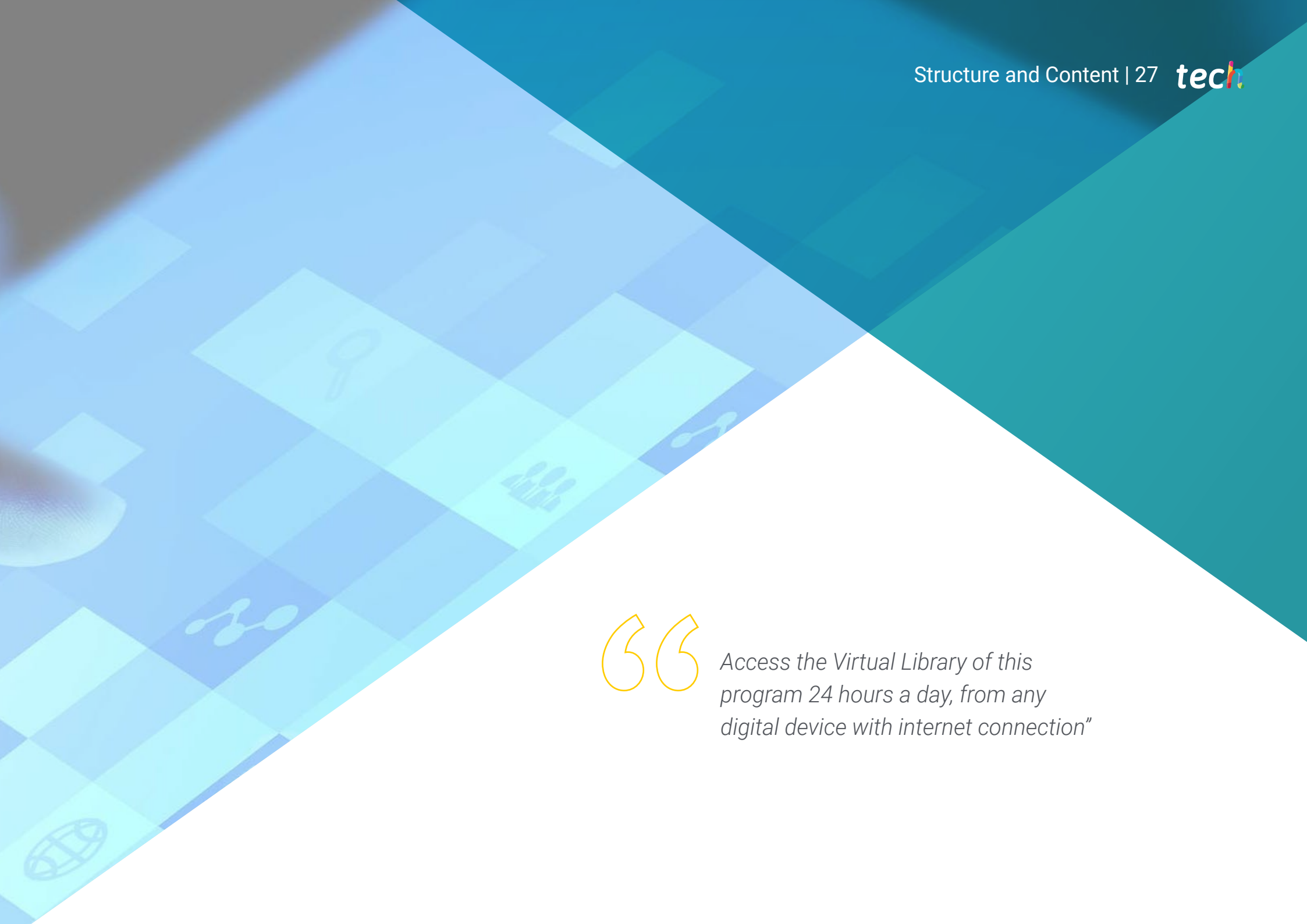
Mr. Velasco Portela, Óscar

- Site Reliability Engineer at Telecyl S.A
- User Support Engineer at Telecyl S.A
- Computer Monitor at Asociación de Vecinos Caño Argales
- Graduate in Network Operating Systems Administration from IES Galileo
- Higher Education Graduate in 3D Animation
- Work Cybersecurity Certification
- CNNA R&S: Introduction to Semantics
- CNNA R&S: Routing and Switching

05

Structure and Content

The syllabus of this program has been designed to provide students with the most current knowledge about Cloud Computing. In order to achieve this goal successfully, TECH provides the graduates with pedagogical tools based on video summaries of each topic, detailed videos, case studies and specialized literature that will allow them to further extend this advanced syllabus. In addition, these materials will be available in the Learning Resources Library 24 hours a day, 7 days a week.



Access the Virtual Library of this program 24 hours a day, from any digital device with internet connection"

Module 1. Cloud Programming Azure, AWS and Google Cloud Services

1.1. Cloud Cloud Services and Technologies
- 1.1.1. Cloud Services and Technologies
- 1.1.2. Cloud Terminology
- 1.1.3. Reference Cloud Providers

1.2. Cloud Computing
- 1.2.1. Cloud Computing
- 1.2.2. Cloud Computing Ecosystem
- 1.2.3. Types of Cloud Computing

1.3. Cloud Service Models
- 1.3.1. IaaS Infrastructure as a Service
- 1.3.2. SaaS Software as a Service
- 1.3.3. PaaS Platform as a Service

1.4. Cloud Computing Technologies
- 1.4.1. Virtualization Systems
- 1.4.2. Service-Oriented Architecture (SOA)
- 1.4.3. GRID Computing

1.5. Architecture Cloud Computing
- 1.5.1. Architecture Cloud Computing
- 1.5.2. Networks Types in Cloud Computing
- 1.5.3. Cloud Computing Security

1.6. Public Cloud
- 1.6.1. Public Cloud
- 1.6.2. Public Cloud Architecture and Costs
- 1.6.3. Public Cloud. Typology

1.7. Public Cloud
- 1.7.1. Public Cloud
- 1.7.2. Architecture and Costs
- 1.7.3. Public Cloud. Typology

1.8. Hybrid Cloud
- 1.8.1. Hybrid Cloud
- 1.8.2. Architecture and Costs
- 1.8.3. Hybrid Cloud Typology

1.9. Cloud Providers
- 1.9.1. Amazon Web Services
- 1.9.2. Azure
- 1.9.3. Google

1.10. Cloud Security
- 1.10.1. Infrastructure Security
- 1.10.2. Operating System and Network Security
- 1.10.3. Cloud Risk Mitigation

Module 2. Architecture Programming in Cloud Computing

2.1. Cloud Architecture for a University Network Cloud Provider Selection Practical Example
- 2.1.1. Cloud Architecture Approach for a University Network According to Cloud Provider
- 2.1.2. Cloud Architecture Components
- 2.1.3. Analysis of Cloud Solutions According to Proposed Architecture

2.2. Economic Estimation of the Project for the Creation of a University Network Financing
- 2.2.1. Cloud Provider Selection
- 2.2.2. Economical Estimation According to Components
- 2.2.3. Project Financing

2.3. Estimation of Human Resources of the Project Composition of a Software Team
- 2.3.1. Composition of the Software Development Team
- 2.3.2. Roles in a Development Team Typology
- 2.3.3. Assessment of the Economic Estimation of the Project

2.4. Execution Schedule and Project Documentation
- 2.4.1. Agile Project Schedule
- 2.4.2. Project Feasibility Documentation
- 2.4.3. Documentation to Be Provided for Project Execution

2.5. Legal Implications of a Project
- 2.5.1. Legal Implications of a Project
- 2.5.2. Data Protection Policy
  - 2.5.2.1. GDPR General Data Protection Regulation
- 2.5.3. Responsibility of the Integrating Company

2.6. Design and Creation of a Cloud Blockchain Network for the Proposed Architecture
- 2.6.1. Blockchain – Hyperledger Fabric
- 2.6.2. Hyperledger Fabric Basics
- 2.6.3. Design of an International University Hyperledger Fabric Network

2.7. Proposed Architecture Expansion Approach
- 2.7.1. Creation of the Proposed Architecture with Blockchain
- 2.7.2. Proposed Architecture Expansion
- 2.7.3. Configuration of a High Availability Architecture

2.8. Administration of the Proposed Cloud Architecture
- 2.8.1. Adding a New Participant to the Initial Proposed Architecture
- 2.8.2. Administration of the Cloud Architecture
- 2.8.3. Project Logic Management – Smart Contracts

2.9. Administration and Management of Specific Components in the Proposed Cloud Architecture
- 2.9.1. Management of Network Certificates
- 2.9.2. Security Management of Various Components: CouchDB
- 2.9.3. Blockchain Network Nodes Management

2.10. Modification of an Initial Basic Installation in the Creation of a Blockchain Network
- 2.10.1. Adding a Node to the Blockchain Network
- 2.10.2. Addition of Extra Data Persistence
- 2.10.3. Smart Contracts Management
- 2.10.4. Addition of a New University to the Existing Network

Module 3. Cloud Azure Storage

3.1. MV Installation in Azure
- 3.1.1. Creation Commands
- 3.1.2. Visualization Commands
- 3.1.3. Modification Commands

3.2. Azure Blobs
- 3.2.1. Types of Blobs
- 3.2.2. Container
- 3.2.3. Azcopy
- 3.2.4. Reversible Blob Suppression

3.3. Managed Disk and Storage in Azure
- 3.3.1. Managed Disk
- 3.3.2. Security/Safety
- 3.3.3. Cold Storage
- 3.3.4. Replication
  - 3.3.4.1. Local Redundancy
  - 3.3.4.2. Redundancy in a Zone
  - 3.3.4.3. Geo-Redundant

3.4. Azure Tables, Queues, Files
- 3.4.1. Tables
- 3.4.2. Queues
- 3.4.3. Files

3.5. Azure Encryption and Security
- 3.5.1. Storage Service Encryption (SSE)
- 3.5.2. Access Codes
  - 3.5.2.1. Shared Access Signature
  - 3.5.2.2. Container-Level Access Policies
  - 3.5.2.3. Access Signature at Blob Level
- 3.5.3. Azure AD Authentication

3.6. Azure Virtual Network
- 3.6.1. Subnetting and Matching
- 3.6.2. Vnet to Vnet
- 3.6.3. Private Link
- 3.6.4. High Availability

3.7. Types of Azure Connections
- 3.7.1. Azure Application Gateway
- 3.7.2. Site-to-Site VPN
- 3.7.3. Point-to-Site VPN
- 3.7.4. ExpressRoute

3.8. Azure Resources
- 3.8.1. Blocking Resources
- 3.8.2. Resource Movement
- 3.8.3. Removal of Resources

3.9. Azure Backup
- 3.9.1. Recovery Services
- 3.9.2. Azure Agent Backup
- 3.9.3. Azure Backup Server

3.10. Solutions Development
- 3.10.1. Compression, Deduplication, Replication
- 3.10.2. Recovery Services
- 3.10.3. Disaster Recovery Plan

Module 4. Cloud Environments: Security/Safety

4.1. Cloud Environments: Security/Safety
- 4.1.1. Cloud Environments, Security
  - 4.1.1.1. Cloud Security
  - 4.1.1.2. Security Position

4.2. Cloud Shared Security Management Model
- 4.2.1. Security Elements Managed by Vendor
- 4.2.2. Elements Managed by Customer
- 4.2.3. Security Strategy

4.3. Cloud Prevention Mecanisms
- 4.3.1. Authentication Management Systems
- 4.3.2. Authorization Management System Access Policies
- 4.3.3. Key Management Systems

4.4. Cloud Infrastructure Data Security
- 4.4.1. Securing Storage Systems:
  - 4.4.1.1. Block
  - 4.4.1.2. Object Storage
  - 4.4.1.3. File Systems
- 4.4.2. Protection of Database Systems
- 4.4.3. Securing Data in Transit

4.5. Cloud Infrastructure Protection
- 4.5.1. Secure Network Design and Implementation
- 4.5.2. Security in Computing Resources
- 4.5.3. Tools and Resources for Infrastructure Protection

4.6. Application Risks and Vulnerabilities
- 4.6.1. Application Development Risks
- 4.6.2. Critical Safety Risks
- 4.6.3. Vulnerabilities in Software Development

4.7. Application Defenses against Attacks
- 4.7.1. Application Development Design
- 4.7.2. Securitization through Verification and Testing
- 4.7.3. Secure Programming Practices

4.8. DevOps Environment Security
- 4.8.1. Security in Virtualized and Container Environments
- 4.8.2. Security in Development and Operations (DevSecOps)
- 4.8.3. Best Security Practices in Containerized Production Environments

4.9. Security in Public Clouds
- 4.9.1. AWS
- 4.9.2. Azure
- 4.9.3. Oracle Cloud

4.10. Security Regulations, Governance and Compliance
- 4.10.1. Security Compliance
- 4.10.2. Risk Management
- 4.10.3. Processes in Organizations

Module 5. Container Orchestration: Kubernetes and Docker

5.1. Basis of Application Architectures
- 5.1.1. Current Application Models
- 5.1.2. Application Execution Platforms
- 5.1.3. Container Technologies

5.2. Docker Architecture
- 5.2.1. Docker Architecture
- 5.2.2. Docker Architecture Installation
- 5.2.3. Commands Local Project

5.3. Docker Architecture Storage Management
- 5.3.1. Image and Register Management
- 5.3.2. Docker Networks
- 5.3.3. Storage Management

5.4. Advanced Docker Architecture
- 5.4.1. Docker Compose
- 5.4.2. Docker in Organization
- 5.4.3. Docker Adoption Example

5.5. Kubernetes Architecture
- 5.5.1. Kubernetes Architecture
- 5.5.2. Kubernetes Deployment Elements
- 5.5.3. Distributions and Managed Solutions
- 5.5.4. Installation and Environment

5.6. Kubernetes Architecture Kubernetes Development
- 5.6.1. Tools for K8s Development
- 5.6.2. Imperative vs. Declarative Mode
- 5.6.3. Application Deployment and Exposure

5.7. Kubernetes in Enterprise Environments
- 5.7.1. Data Persistence
- 5.7.2. High Availability, Scaling and Networking
- 5.7.3. Kubernetes Security
- 5.7.4. Kubernetes Management and Monitoring

5.8. K8s Distributions
- 5.8.1. Deployment Environment Comparison
- 5.8.2. Deployment on GKE, AKS, EKS or OKE
- 5.8.3. On Premise Deployment

5.9. Rancher and Openshift
- 5.9.1. Rancher
- 5.9.2. Openshift
- 5.9.3. Openshift: Configuration and Application Deployment

5.10. Kubernetes Architecture and Containers Updates
- 5.10.1. Open Application Model
- 5.10.2. Tools for Deployment Management in Kubernetes Environments
- 5.10.3. References to Other Projects and Trends

Module 6. Native Cloud Application Programming

6.1. Cloud Native Technologies
- 6.1.1. Cloud Native Technologies
- 6.1.2. Cloud Native Computing Foundation
- 6.1.3. Cloud-Native Development Tools

6.2. Cloud-Native Application Architecture
- 6.2.1. Cloud-Native Application Design
- 6.2.2. Cloud-Native Architecture Components
- 6.2.3. Legacy Application Modernization

6.3. Containerization
- 6.3.1. Container-Oriented Development
- 6.3.2. Development with Microservices
- 6.3.3. Tools for Teamwork

6.4. DevOps and Continuous Integration and Deployments
- 6.4.1. Continuous Integration and Deployments: CI/CD
- 6.4.2. Tools Ecosystem for CI/CD
- 6.4.3. Creating a CI/CD Environment

6.5. Observability and Platform Analysis
- 6.5.1. Cloud-Native Application Observability
- 6.5.2. Tools for Monitoring, Logging and Tracing
- 6.5.3. Implementation of an Observability and Analysis Environment

6.6. Data Management in Cloud-Native Applications
- 6.6.1. Cloud-Native Database
- 6.6.2. Data Management Patterns
- 6.6.3. Technologies to Implement Data Management Patterns

6.7. Communications in Cloud-Native Applications
- 6.7.1. Synchronous and Asynchronous Communications
- 6.7.2. Technologies for Synchronous Communications Patterns
- 6.7.3. Technologies for Asynchronous Communications Patterns

6.8. Resilience, Security and Performance in Cloud-Native Applications
- 6.8.1. Application Resilience
- 6.8.2. Secure Development in Cloud-Native Applications
- 6.8.3. Application Performance and Scalability

6.9. Serverless
- 6.9.1. Cloud Native Serverless
- 6.9.2. Serverless Platforms
- 6.9.3. Use Cases for Serverless Development

6.10. Deployment Platforms
- 6.10.1. Cloud-Native Development Environments
- 6.10.2. Orquestration Platforms Comparison
- 6.10.3. Infrastructure Automation

Module 7. Cloud Programming Data Governance

7.1. Data Management
- 7.1.1. Data Management
- 7.1.2. Data Handling Ethics

7.2. Data Governance
- 7.2.1. Classification. Access Control
- 7.2.2. Data Processing Regulation
- 7.2.3. Data Governance Value

7.3. Data Governance Data Science
- 7.3.1. Lineage
- 7.3.2. Metadata
- 7.3.3. Data Catalog Business Glossary

7.4. User and Processes in Data Governance
- 7.4.1. Users
  - 7.4.1.1. Roles and Responsibilities
- 7.4.2. Processes
  - 7.4.2.1. Data Enrichment

7.5. Data Life Cycle in the Enterprise
- 7.5.1. Data Creation
- 7.5.2. Data Processing
- 7.5.3. Data Storage
- 7.5.4. Data Use
- 7.5.5. Data Destruction

7.6. Data Quality
- 7.6.1. Quality in Data Governance
- 7.6.2. Data Quality in Analytics
- 7.6.3. Data Quality Techniques

7.7. Data Governance in Transit
- 7.7.1. Data Governance in Transit
  - 7.7.1.1. Lineage
- 7.7.2. The Forth Dimension

7.8. Data Protection
- 7.8.1. Access Levels
- 7.8.2. Classification
- 7.8.3. Compliance Regulations

7.9. Data Governance Monitoring and Measurement
- 7.9.1. Data Governance Monitoring and Measurement
- 7.9.2. Lineage Monitoring
- 7.9.3. Data Quality Monitoring

7.10. Data Governance Tools
- 7.10.1. Talend
- 7.10.2. Collibra
- 7.10.3. IT specialist

Module 8. Real-Time Cloud Programming. *Streaming*

8.1. Processing and Structuring of Streaming Information
- 8.1.1. Data Collection, Structuring, Processing, Analysis, and Interpretation Process
- 8.1.2. Streaming Data Processing Techniques
- 8.1.3. Streaming Processing
- 8.1.4. StreamingProcessing Use Cases

8.2. Statistics for Understanding Streaming Data Flows
- 8.2.1. Descriptive Statistics
- 8.2.2. Probability Calculation
- 8.2.3. Inference

8.3. Programmng with Python
- 8.3.1. Typology, Conditionals, Functions and Loops
- 8.3.2. Numpy, Matplotlib, Dataframes, Csv Files and Json Formats
- 8.3.3. Sequences: Lists, Loops, Files and Dictionaries
- 8.3.4. Mutability, Exceptions and Higher-Order Functions

8.4. R Programming
- 8.4.1. R Programming
- 8.4.2. Vector and Factors
- 8.4.3. Matrix and Array
- 8.4.4. Lists and Data Frame
- 8.4.5. Functions

8.5. SQL Database for Streaming Data Processing
- 8.5.1. SQL Databases
- 8.5.2. Entity-Relationship Model
- 8.5.3. Relational Model
- 8.5.4. SQL

8.6. Non-SQL Database for Streaming Data Processing
- 8.6.1. Non-SQL Databases
- 8.6.2. MongoDB
- 8.6.3. MongoDB Architecture
- 8.6.4. CRUD Operations
- 8.6.5. Find, Projections, Index Aggregation and Cursors
- 8.6.6. Data Model

8.7. Data Mining and Predictive Modeling
- 8.7.1. Multivariate Analysis
- 8.7.2. Dimension Reduction Techniques
- 8.7.3. Cluster Analysis
- 8.7.4. Sets

8.8. Maching learning for Streaming Data Processing
- 8.8.1. Maching learning and Advanced Predictive Modeling
- 8.8.2. Neural Networks
- 8.8.3. Deep Learning
- 8.8.4. Bagging and Random Forest
- 8.8.5. Gradient Bosting
- 8.8.6. SVM
- 8.8.7. Assembly Methods

8.9. Streaming Data Processing Technologies
- 8.9.1. Spark Streaming
- 8.9.2. Kafka Streaming
- 8.9.3. Flink Streaming

8.10. Apache Spark Streaming
- 8.10.1. Apache Spark Streaming
- 8.10.2. Spark Components
- 8.10.3. Spark Architecture
- 8.10.4. RDD
- 8.10.5. SPARK SQL
- 8.10.6. Jobs, Stages and Tasks

Module 9. Cloud Integration with Web Services: Technologies and Protocols

9.1. Web Standards and Protocols
- 9.1.1. Web and Web 2.0
- 9.1.2. Client-Server Architecture
- 9.1.3. Communication Protocols and Standards

9.2. Web Services
- 9.2.1. Web Services
- 9.2.2. Communication Layers and Mecanisms
- 9.2.3. Service Architectures

9.3. Service Oriented Architectures
- 9.3.1. ServiceOriented Architecture (SOA)
- 9.3.2. Web Service Design
- 9.3.3. SOAP and REST

9.4. SOAP Service Oriented Arquitecture
- 9.4.1. Structure and Message Passing
- 9.4.2. Web Service Description Language (WSDL)
- 9.4.3. Client Implementation and SOAP Servers

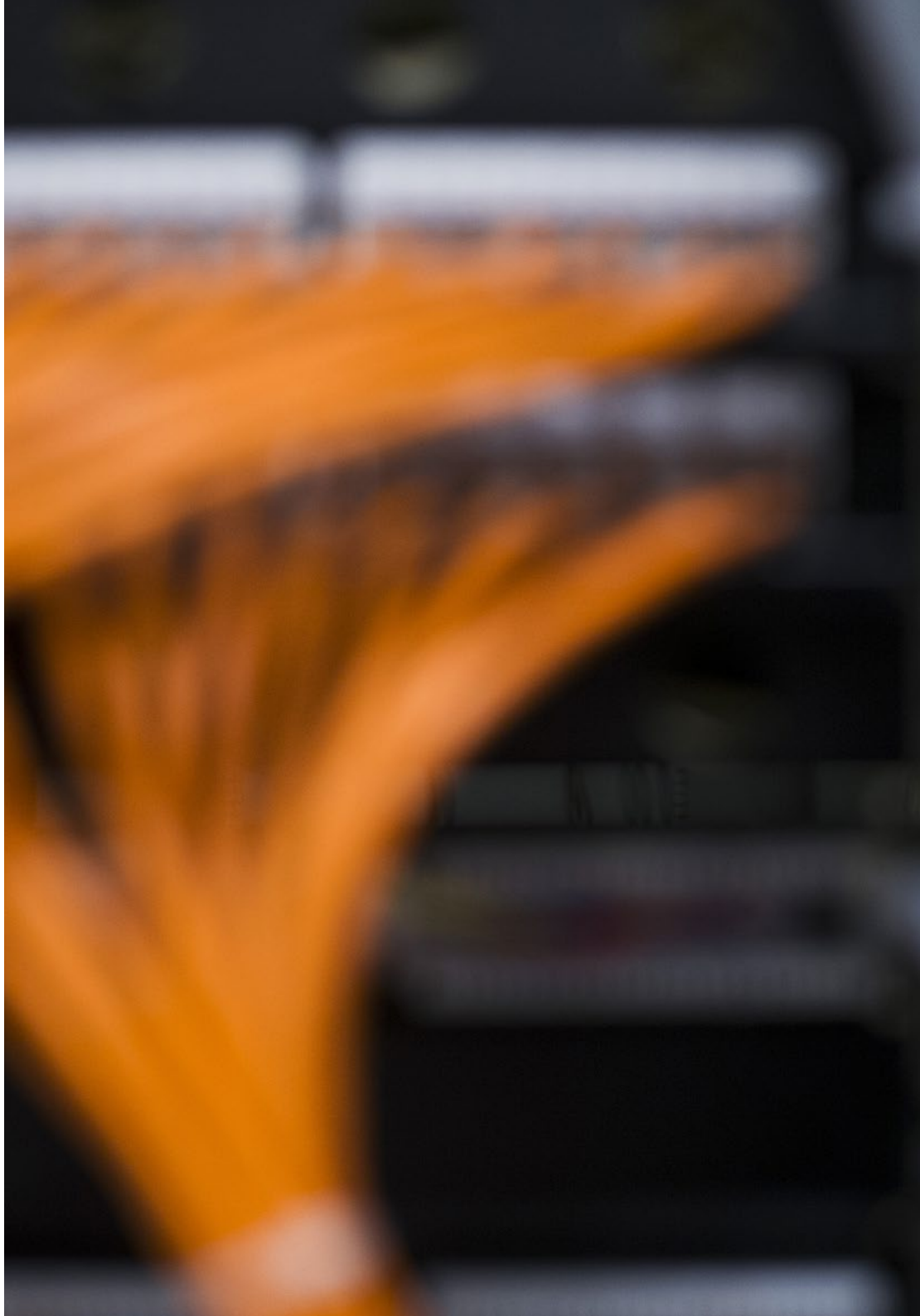
9.5. REST Architecture
- 9.5.1. REST Architectures and RESTful Web Services
- 9.5.2. HTTP Verbs: Semantics and Purposes
- 9.5.3. Swagger
- 9.5.4. Client Implementation and REST Servers

9.6. Microservices-Based Architectures
- 9.6.1. Monolithic Architectural Approach vs. Use of Microservices
- 9.6.2. Microservices-Based Architectures
- 9.6.3. Communication Flows with the Use of Microservices

9.7. Invoking APIs from the Client Side
- 9.7.1. Types of Web Clients
- 9.7.2. Development Tools for Web Services Processing
- 9.7.3. Cross-Origin Resources (CORS)

9.8. API Invocation Security
- 9.8.1. Web Services Security
- 9.8.2. Authentication and Authorization
- 9.8.3. Authentication Methods Based on the Degree of Security

9.9. Cloud Provider Application Integration
- 9.9.1. Cloud Computing Suppliers
- 9.9.2. Platform Services
- 9.9.3. Services Oriented to the Implementation/Consumption of Web Services



9.10. Implementation of Bots and Wizards
- 9.10.1. Use of Bots
- 9.10.2. Use of the Bots Web Service
- 9.10.3. Implementation of Chatbots and Web Assistants

Module 10. Cloud Programming Project Management and Product Verification

10.1. Waterfall Methodologies
- 10.1.1. Classification of Methodologies
- 10.1.2. Waterfall Model Waterfall
- 10.1.3. Strength and Weakness
- 10.1.4. Model Comparison Waterfall vs. AGILE

10.2. Agile Methodology
- 10.2.1. Agile Methodology
- 10.2.2. The Agile Manifesto
- 10.2.3. Use of Agile

10.3. Scrum Methodology
- 10.3.1. Scrum Methodology
  - 10.3.1.1. Use of Scrum
- 10.3.2. Scrum Events
- 10.3.3. Scrum Artifacts
- 10.3.4. Scrum Guide

10.4. Agile Inception Desk
- 10.4.1. Agile Inception Desk
- 10.4.2. Inception Desk Phases

10.5. Impact Mapping Technique
- 10.5.1. Impact Mapping
- 10.5.2. Use of Impact Mappig
- 10.5.3. Impact Mapping Structure

10.6. User Stories
- 10.6.1. User Stories
- 10.6.2. Writing User Stories
- 10.6.3. User Story Hierarchy
- 10.6.4. Use Story Mapping

10.7. Test Qa Manual
- 10.7.1. Testing Manual
- 10.7.2. Validation and Verification Differences
- 10.7.3. Manual Tests Typology
- 10.7.4. UAT User Acceptance Testing
- 10.7.5. UAT and Alpha & Beta Testing
- 10.7.6. Software Quality

10.8. Automatic Tests
- 10.8.1. Automatic Tests
- 10.8.2. Manual Tests vs Automatic
- 10.8.3. The Impact of the Automatic Test
- 10.8.4. The Result of Applying Automation
- 10.8.5. The Quality Wheel

10.9. Functional and Non-Functional Testing
- 10.9.1. Functional and Non-Functional Testing
- 10.9.2. Functional Tests
  - 10.9.2.1. Unit Tests
  - 10.9.2.2. Integration Tests
  - 10.9.2.3. Regression Testing
  - 10.9.2.4. Smoke Tests
  - 10.9.2.5. Mono Tests
  - 10.9.2.6. Sanitation Tests
- 10.9.3. Non-Functional Tests
  - 10.9.3.1. Load Testing
  - 10.9.3.2. Performance Testing
  - 10.9.3.3. Security Tests
  - 10.9.3.4. Configuration Tests
  - 10.9.3.5. Stress Tests

10.10. Verification Methods and Tools
- 10.10.1. Heat Map
- 10.10.2. Eye Tracking
- 10.10.3. Scroll Maps
- 10.10.4. Movement Maps
- 10.10.5. Confetti Maps
- 10.10.6. Test A/B
- 10.10.7. Blue & Green Deployment Method
- 10.10.8. Canary Release Method
- 10.10.9. Tool Selection
- 10.10.10. Analytical Tools

Module 11. Transformation of IT Infrastructures *Cloud Computing*

11.1. Cloud Computing Cloud Computing Adoption
- 11.1.1. Computing
- 11.1.2. Cloud Computing Adoption
- 11.1.3. Types of Cloud Computing

11.2. Cloud Computing Adoption. Adoption Factors
- 11.2.1. Adoption Factors of Cloud Infrastructures
- 11.2.2. Uses and Services
- 11.2.3. Evolution

11.3. Cloud Computing Infrastructures
- 11.3.1. Cloud Computing Infrastructures
- 11.3.2. Types of Infrastructures (IaaS, PaaS, SaaS)
- 11.3.3. Types of Implementation (private, public, hybrid)
- 11.3.4. Elements (hardware, storage, network)

11.4. Cloud Computing Infrastructure: Operation
- 11.4.1. Virtualisation
- 11.4.2. Automation
- 11.4.3. Management

11.5. Cloud Computing Ecosystem
- 11.5.1. Observability and Analysis
- 11.5.2. Procurement
- 11.5.3. Orchestration and Management
- 11.5.4. Cloud Platforms

11.6. Services Management in Cloud Infrastructures
- 11.6.1. Service Orientation
- 11.6.2. Standard and Ecosystem
- 11.6.3. Types of Services

11.7. Cloud Infrastructure Management Automation
- 11.7.1. Ecosystem
- 11.7.2. DevOps Culture
- 11.7.3. Infrastructure as Code (Terraform, Ansible, Github, Jenkins)

11.8. Security in Cloud Infrastructures
- 11.8.1. Ecosystem
- 11.8.2. DevSecOps Culture
- 11.8.3. Data Science

11.9. Preparation of the Cloud Infrastructure Management Environment
- 11.9.1. Data Science
- 11.9.2. Preparation of the Environment
- 11.9.3. First Steps

11.10. Cloud Infrastructures Future and Evolution
- 11.10.1. Cloud Infrastructures Challenges
- 11.10.2. Evolution of Cloud Infrastructures
- 11.10.3. Challenges in Security and Complaince

Module 12. Infrastructure as a Service (IaaS)

12.1. Cloud Computing Abstraction Layers and Their Management
- 12.1.1. Abstraction Core Concepts
- 12.1.2. Services Models
- 12.1.3. Management of Cloud Services. Benefits

12.2. Construction of Architecture. Core Decisions
- 12.2.1. HDDC and SDDC. Hypercompetition
- 12.2.2. Market
- 12.2.3. Working Model amd Professional Profiles Changes
  - 12.2.3.1. Cloudbroker Figure

12.3. Digital Transformation and Cloud Infrastructures
- 12.3.1. Cloud Work Demo
- 12.3.2. The Role of the Navigator as Tool
- 12.3.3. New Device Concept
- 12.3.4. Advanced Architectures and the Role of the CIO

12.4. Agile Management in Cloud Infrastructures
- 12.4.1. Life Cycle of New Services and Competitiveness
- 12.4.2. Development Methodology of Apps and Microservices
- 12.4.3. Relationship between Development and IT Transactions
  - 12.4.3.1. Use of Cloud as Support

12.5. Cloud Computing Resources I. Identity, Storage and Domain Management
- 12.5.1. Identity and Access Management
- 12.5.2. Secure Data Storage, Flexible File and Database Storage
- 12.5.3. Domain Management

12.6. Cloud Computing Resources II. Network, Infrastructure and Monitoring Resources
- 12.6.1. Private Virtual Network
- 12.6.2. Cloud Computing Capabilities
- 12.6.3. Monitoring

12.7. Cloud Computing Resources III. Automation
- 12.7.1. Serverless Code Execution
- 12.7.2. Message Queuing
- 12.7.3. Workflow Services

12.8. Cloud Computing Resources IV. Other Services
- 12.8.1. Notification Queuing
- 12.8.2. Streaming Services and Transcoding Technologies
- 12.8.3. Turnkey Solution to Publish APIs for External and Internal Consumers

12.9. Cloud V Computing Resources. Data-Centric Services
- 12.9.1. Data Analytics Platforms and Automation of IT Manual Task
- 12.9.2. Data Migration
- 12.9.3. Hybrid Cloud

12.10. LaaS Services Practice Lab
- 12.10.1. Exercise 1
- 12.10.2. Exercise 2
- 12.10.3. Exercise 3

Module 13. Storage and Databases in *Cloud* Infrastructures

13.1. Cloud Storage Infraestucture
- 13.1.1. Cloud Storage Fundamentals
- 13.1.2. Cloud Storage Advantages
- 13.1.3. Operation

13.2. Types of Cloud Storage
- 13.2.1. SaaS
- 13.2.2. IaaS

13.3. Cloud Storage Use Cases
- 13.3.1. Data Analysis
- 13.3.2. Backup and Archiving
- 13.3.3. Software Development

13.4. Cloud Storage Security
- 13.4.1. Security in the Transport Layer
- 13.4.2. Storage Security
- 13.4.3. Storage Encryption

13.5. Cloud Storage Analysis
- 13.5.1. Profitability
- 13.5.2. Agility and Scalability
- 13.5.3. Administration

13.6. Infrastructure of Cloud Database
- 13.6.1. Fundamentals of Databases
- 13.6.2. Analysis of Databases
- 13.6.3. Cloud Database Classification

13.7. Infrastructure of Cloud Database
- 13.7.1. Relational Databases
- 13.7.2. NO-SQL Databases
- 13.7.3. OnCloud Databases

13.8. The use cases of Infrastructure of Cloud Database
- 13.8.1. Data Storage
- 13.8.2. Data Analysis. IA.ML
- 13.8.3. Big Data

13.9. Safety Infrastructure of Cloud Database
- 13.9.1. Access Control ACL, IAM, SG
- 13.9.2. Data Encryption
- 13.9.3. Audits

13.10. Infrastructure of Cloud Database
- 13.10.1. Backups of Databases
- 13.10.2. Migration of Databases
- 13.10.3. Optimization of Databases

Module 14. Network DevOps and Network Architectures in Cloud infrastructures

14.1. Network DevOps (NetOps)
- 14.1.1. Network DevOps (NetOps)
- 14.1.2. NetOps Methodology
- 14.1.3. NetOps Benefits

14.2. Network DevOps Fundamentals
- 14.2.1. Networking Fundadamentals
- 14.2.2. OSI TCP/IP Model, CIDR and Subnetting
- 14.2.3. Main Protocols
- 14.2.4. HTTP Responses

14.3. Tools and software for Network DevOps
- 14.3.1. Network Layer Tools
- 14.3.2. Tools in Application Layer
- 14.3.3. DNS Tools

14.4. Networking in Cloud Environments: Internal Network Services
- 14.4.1. VLAN Virtual Networks
- 14.4.2. Subnetworks
- 14.4.3. Routing Tables
- 14.4.4. Availability Zones

14.5. Networking in Cloud Environments: Border Network Services
- 14.5.1. Internet Gateway
- 14.5.2. NAT Gateway
- 14.5.3. Load Balancing

14.6. Networking in Cloud Environments: DNS
- 14.6.1. DNS Fundamentals
- 14.6.2. Cloud DNS Services
- 14.6.3. HA / LB via DNS

14.7. Hybrid / Multitenant Network Connectivity
- 14.7.1. VPN Site to Site
- 14.7.2. VPC Peering
- 14.7.3. Transit Gateway / VPC Peering

14.8. Content Delivery Network Services
- 14.8.1. Content Delivery Services
- 14.8.2. AWS CLoudFront
- 14.8.3. Others CDNs

14.9. Security in Cloud Networks
- 14.9.1. Security Principles in Networks
- 14.9.2. Layer 3 and 4 Protection
- 14.9.3. Layer 7 Protection

14.10. Network Monitoring and Auditing
- 14.10.1. Monitoring and Auditing
- 14.10.2. Flow Logs
- 14.10.3. Monitoring Services: CloudWatch

Module 15. Government in *Cloud* Infrastructures

15.1. Compliance with in Cloud Environments
- 15.1.1. Shared Responsibilities Model
- 15.1.2. Laws, Regulations and Contracts
- 15.1.3. Audits

15.2. The CISO in Cloud Governance
- 15.2.1. Organizational Framework. Figures of the CISO in the Organisation
- 15.2.2. Relationship of the CISO with data processing areas
- 15.2.3. GRC Strategy against Shadow IT

15.3. Cloud Governance Standard
- 15.3.1. Previous Assessments
- 15.3.2. Cloud Service Provider Compliance
- 15.3.3. Personnel Obligations

15.4. Privacy in Cloud Environments
- 15.4.1. Consumer and User Relationship with Privacy
- 15.4.2. Privacy in the Americas, Asia Pacific, Middle East and Africa
- 15.4.3. Privacy in the European context

15.5. Approvals and regulatory frameworks in Cloud Environments
- 15.5.1. American Approvals and Frameworks
- 15.5.2. Asian Approvals and Frameworks
- 15.5.3. Approvals and Frameworks in Europe

15.6. Certifications and accreditations in Cloud Environments
- 15.6.1. America and Asia Pacific
- 15.6.2. Europe, Middle East and Africa
- 15.6.3. Global

15.7. Laws / Regulations in Cloud Environments
- 15.7.1. CLOUD Act, HIPAA, IRS 1075
- 15.7.2. ITAR, SEC Rule 17a-4(f), VPAT/Section 508
- 15.7.3. European Regulation

15.8. Cost control and billing in Cloud Governance
- 15.8.1. Pay-Per-Use Models Costs
- 15.8.2. CFO Figure and FinOps Profiles
- 15.8.3. Expense Control

15.9. Tools in Cloud Governance
- 15.9.1. OvalEdge
- 15.9.2. ManageEngine ADAudit Plus
- 15.9.3. Erwin Data Governance

15.10. Corporate Governance
- 15.10.1. Code of Conduct
- 15.10.2. Complaints Channel
- 15.10.3. Due Diligence

Module 16. Cybersecurity in *Cloud* Infrastructures

16.1. Risk in Cloud Environments
- 16.1.1. Cybersecurity Strategies
- 16.1.2. Risk-Based Approach
- 16.1.3. Categorization of risks in Cloud environments

16.2. Security Frameworks in Cloud Environments
- 16.2.1. Cybersecurity Frameworks and Standards
- 16.2.2. Technical Cybersecurity Frameworks
- 16.2.3. Organizational Cybersecurity Frameworks

16.3. Threats Modeling in Cloud Environments
- 16.3.1. Threat Modeling Process
- 16.3.2. Phases of Threat Management
- 16.3.3. STRIDE

16.4. Cybersecurity Data Science at Code Level
- 16.4.1. Classification of tools
- 16.4.2. Integrations
- 16.4.3. Examples of use

16.5. Cybersecurity Controls Integrations in Cloud Environments
- 16.5.1. Security in Processes
- 16.5.2. Safety Controls in the Different Phases
- 16.5.3. Examples of Integrations

16.6. ZAP Proxy Tool
- 16.6.1. ZAP Proxy
- 16.6.2. ZAP Proxy Features
- 16.6.3. ZAP Proxy Automation

16.7. Automated Vulnerability Scanning in Cloud Environments
- 16.7.1. Persistent and Automated Vulnerability Scanning
- 16.7.2. OpenVAS
- 16.7.3. Vulnerability Analysis in Cloud Environments

16.8. Firewalls in Cloud Environments
- 16.8.1. Types of Firewalls
- 16.8.2. Importance of Indicators
- 16.8.3. OnPremise firewalls and Cloud firewalls

16.9. Security Transport in Cloud Environments
- 16.9.1. SSL/TLS and Certificates
- 16.9.2. SSL Audits
- 16.9.3. The Automation for Certificates

16.10. SIEM in Cloud Environments
- 16.10.1. SIEM as a Security Core
- 16.10.2. Cyberintelligence
- 16.10.3. Examples of SIEM Systems

Module 17. Services Adoption in Cloud Infrastructures

17.1. SIEM as a Security Core
- 17.1.1. Hardware Configuration
- 17.1.2. Software Configuration
- 17.1.3. Network and Security/Safety Configuration

17.2. Cloud Service Configuration
- 17.2.1. Assigning Permissions to my Cloud Server
- 17.2.2. Security Configuration
- 17.2.3. Deployment of a Cloud Service

17.3. Administration of a Cloud Server
- 17.3.1. Management of Storage Units
- 17.3.2. Network Management
- 17.3.3. Security Copies Management

7.4. Persistence
- 17.4.1. Decoupling our Cloud Service
- 17.4.2. Configuration of Persistence Service
- 17.4.3. BB.DD Integration with our CloudService

17.5. Auto Scaling
- 17.5.1. Image Generation of our Server
- 17.5.2. Creation of Marketing Groups
- 17.5.3. Definition of Automatic Scaling Rules

17.6. Balancing Services
- 17.6.1. Emergency Services
- 17.6.2. Generation of a Load Balancer
- 17.6.3. Connection of the Balancer to our Cloud Service

17.7. Content Delivery Services
- 17.7.1. Content Delivery Services
- 17.7.2. Content Delivery Service Configuration
- 17.7.3. CDN Integration with our Cloud Service

17.8. Configuration Parameters and Secrets
- 17.8.1. Configuration Parameter Management Services
- 17.8.2. Secrets Management Services
- 17.8.3. Integrating Configuration and Secrecy Services with our Cloud Service

17.9. Queues Management Services
- 17.9.1. Decoupling our Application
- 17.9.2. Settings of Emergency Services
- 17.9.3. Integrating the Queue with our Cloud Service

17.10. Notification Queuing
- 17.10.1. Notification Services in the Cloud
- 17.10.2. Settings of Notification Services
- 17.10.3. Notifications Added to our Cloud Service

Module 18. Virtual Desktop Infrastructure (VDI)

18.1. Virtual Desktop Infrastructure (VDI)
- 18.1.1. The VDI. Operation
- 18.1.2. Advantages and Disadvantages of VDI
- 18.1.3. Common VDI Usage Scenarios

18.2. Hybrid and Cloud VDI Architectures
- 18.2.1. Hybrid VDI Architectures
- 18.2.2. Cloud-Based Implementation
- 18.2.3. Clouds VDI Management

18.3. Design and Planning of a VDI Implementation
- 18.3.1. Hardware and Software Selection
- 18.3.2. Network and Storage Infrastructure Design
- 18.3.3. Implementation Planning and Scaling

18.4. VDI Management
- 18.4.1. VDI Set-up and Configuration
- 18.4.2. Desktop Image and Application Management
- 18.4.3. Safety and compliance management
- 18.4.4. Availability and Performance Management

18.5. Integration of Applications and Peripherals in the VDI
- 18.5.1. Enterprise Application Integration
- 18.5.2. Integration of Peripherals and Devices
- 18.5.3. VDI Integration with Video Conferencing and Instant Messaging Solutions
- 18.5.4. VDI Integration with Online Collaboration Platforms

18.6. Optimization and Improvement of VDI
- 18.6.1. Optimization of Quality Service and Performance
- 18.6.2. Improved and scalability Efficiency
- 18.6.3. Improve User Experience Final Assessment

18.7. VDI Life Cycle Management
- 18.7.1. Hardware and Software Life Cycle Management
- 18.7.2. Infrastructure Migration and Replacement Management
- 18.7.3. Support and Maintenance Management

18.8. Cloud Security Infrastructure and User Data Protection
- 18.8.1. Security in the the VDI Networks
- 18.8.2. Protection of Data Stored in the VDI
- 18.8.3. User Safety Protection of Privacy on the Internet

18.9. Advanced VDI Use Cases
- 18.9.1. Using VDI for Secure Remote Access
- 18.9.2. Using VDI for Virtualization of Specialized Applications
- 18.9.3. Using VDI for Mobile Device Management

18.10. Trends and Future of VDI
- 18.10.1. New Technologies and trends in VDI Fields
- 18.10.2. Predictions on the Future of VDI
- 18.10.3. Future Challenges and Opportunities for DV

Module 19. Infrastructure Operation-as-Code (IAC)

19.1. Infrastructure as-Code, IAC
- 19.1.1. IaC, Infrastructure as Code
- 19.1.2. Infrastructure Management. Evolution
- 19.1.3. Advantages of the IaC

19.2. Strategies for TSI Definition
- 19.2.1. Requirements Analysis
- 19.2.2. Imperative Definition
- 19.2.3. Definition of Statement

19.3. IAC Tools
- 19.3.1. Objectives of the Educational and Vocational Guidance Plan
- 19.3.2. Proprietary Tools
- 19.3.3. Third-party Tools

19.4. Evolution of Infrastructure as a Codes
- 19.4.1. IaC on Kubernetes
- 19.4.2. Platform as Code
- 19.4.3. Compliance as Code

19.5. IAC in Devops
- 19.5.1. Flexible Infrastructures
- 19.5.2. Continuous Integration
- 19.5.3. Pipeline as code

19.6. IAC - VPC - Proprietary Tools
- 19.6.1. Design of a VPC
- 19.6.2. Solution Uniqueness
- 19.6.3. Validation and Analysis

19.7. IAC - Serverless - Proprietary Tools
- 19.7.1. Design of a Serverless Solution
- 19.7.2. Solution Uniqueness
- 19.7.3. Validation and Analysis

19.8. IAC - VPC - Third Party Tools
- 19.8.1. Design of a VPC
- 19.8.2. Solution Uniqueness
- 19.8.3. Validation and Analysis

19.9. IAC - Serverless - Third Party Tools
- 19.9.1. Design of a Serverless Solution
- 19.9.2. Solution Uniqueness
- 19.9.3. Validation and Analysis

19.10. IAC Comparison Future Trends
- 19.10.1. Assessment of Proprietary Solutions
- 19.10.2. Assessment of Third-Party Solutions
- 19.10.3. Future lines

Module 20. Monitoring and Backup of Cloud Infrastructures

20.1. Monitoring and Backup of Cloud Infrastructures
- 20.1.1. Benefits of Backup in Clouds
- 20.1.2. Backup Types
- 20.1.3. Benefits of Monitoring in Clouds
- 20.1.4. Types of Monitoring

20.2. Availability and Security of systems in Cloud Infrastructures
- 20.2.1. Main Factors
- 20.2.2. Most Demanded Uses and Services
- 20.2.3. Evolution

20.3. Types of backup services in Cloud Infrastructures
- 20.3.1. Total Backup
- 20.3.2. Backup increase
- 20.3.3. Differential Backup
- 20.3.4. Other Types of Backup

20.4. Strategy, Planning and Management of Cloud Infrastructure Backups
- 20.4.1. Establishment of Objectives and Scope
- 20.4.2. Backup copy type
- 20.4.3. Good Practices

20.5. Cloud Infrastructure Continuity Flat
- 20.5.1. Strategy Continuity Plan
- 20.5.2. Types of Plans
- 20.5.3. Creating a Continuity Plan

20.6. Monitoring Types in Cloud Infrastructures
- 20.6.1. Performance Monitoring
- 20.6.2. Availability Monitoring
- 20.6.3. Event Monitoring
- 20.6.4. Log Monitoring
- 20.6.5. Network Traffic Monitoring

20.7. Strategy, Tools and Techniques for Monitoring Cloud Infrastructures
- 20.7.1. How to set objectives and scope
- 20.7.2. Types of Monitoring
- 20.7.3. Good Practices

20.8. Continuous Improvement in Cloud Infrastructures
- 20.8.1. Continuous Improvement in Operations
- 20.8.2. Key performance metrics (KPIs) in the cloud
- 20.8.3. Designing a continuous improvement plan in the cloud

20.9. Studies Cases in Cloud Infrastructures
- 20.9.1. Study Case Backup
- 20.9.2. Study Case Monitoring
- 20.9.3. Difficulties and Good Practices

20.10. Cloud Infrastructure Case Studies
- 20.10.1. Laboratory 1
- 20.10.2. Laboratory 2
- 20.10.3. Laboratory 3

A program that offers you a practical approach through the numerous case studies in Cloud Infrastructures"

06

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

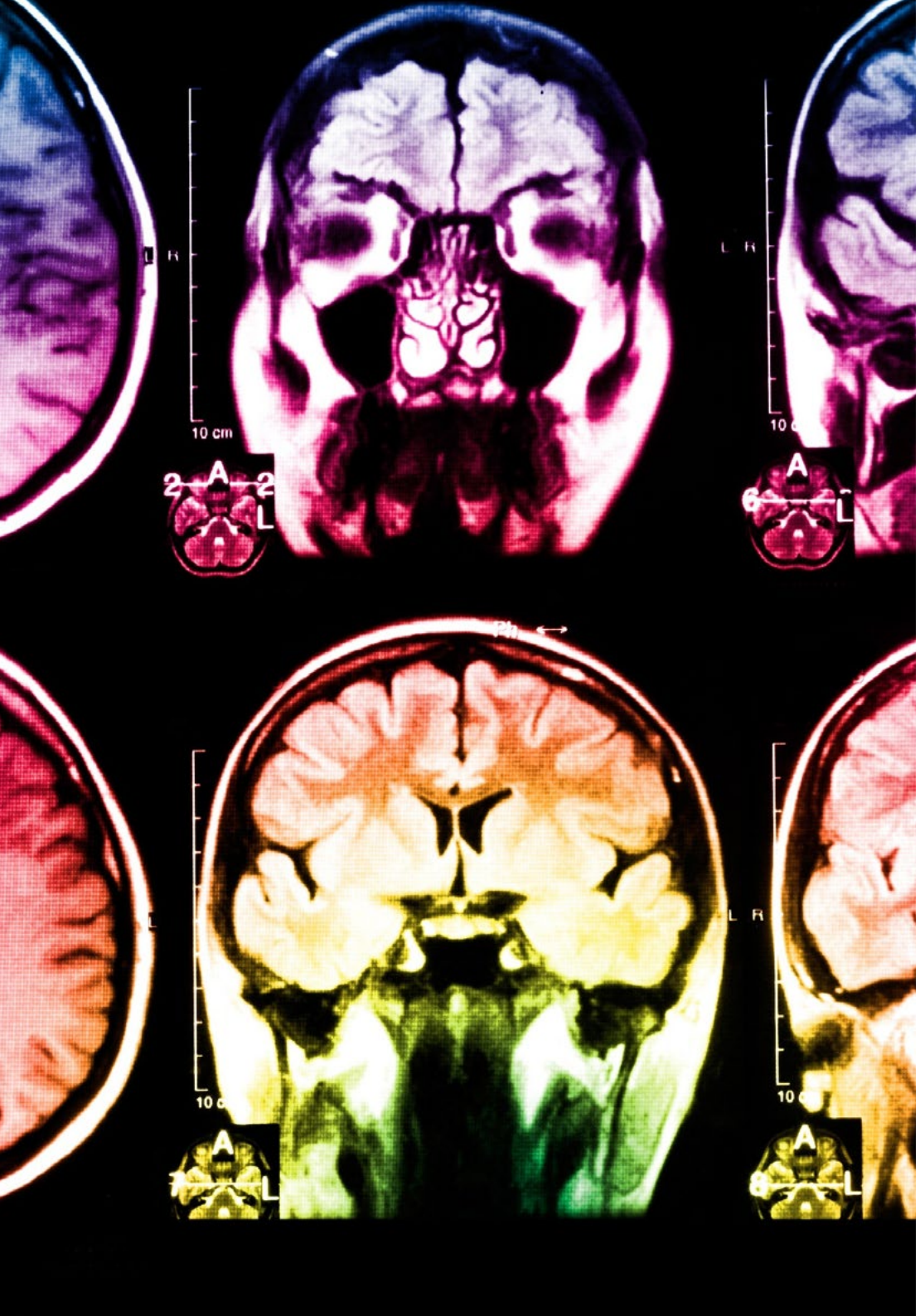
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

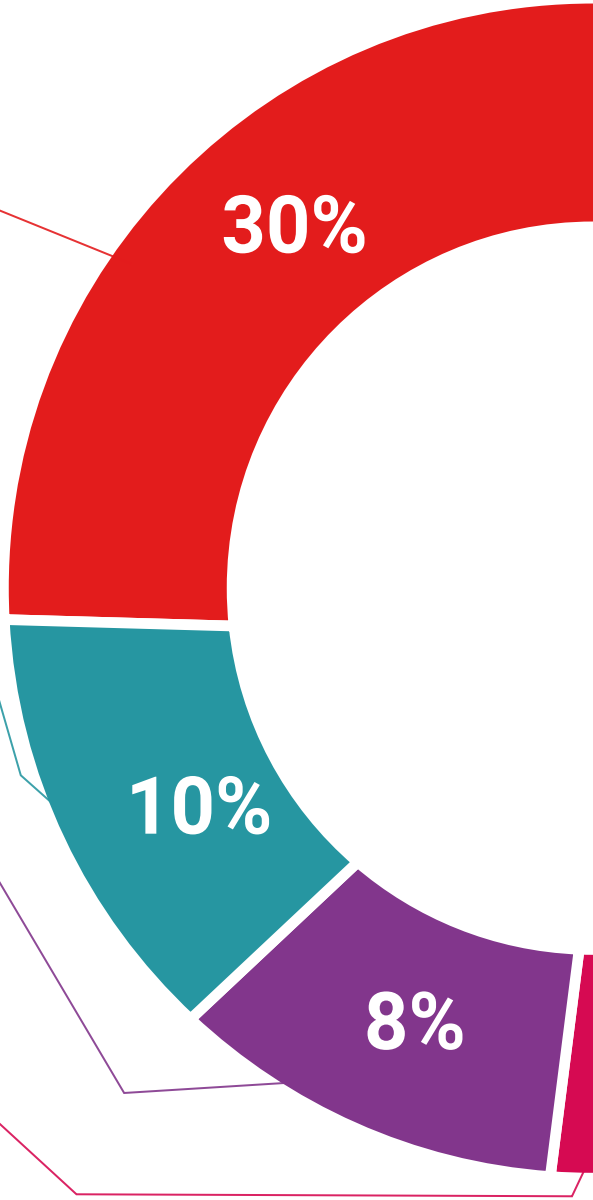
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

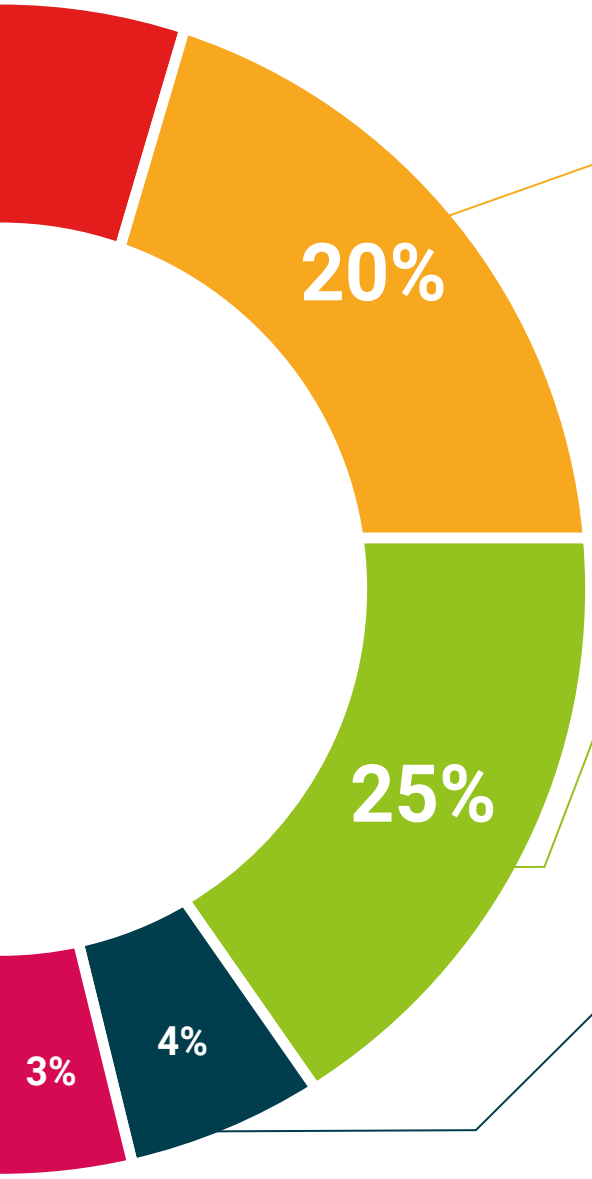
Practising Skills and Abilities

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.

07

Certificate

The Advanced Master's Degreein Cloud Computing guarantees students, in addition to the most rigorous and up-to-date education, access to a Advanced Master's Degree diploma issued by TECH Technological University.

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

This **Advanced Master's Degree in Cloud Computing** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Advanced Master's Degree** issued by **TECH Technological University** via tracked delivery*.

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the Advanced Master's Degree, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Advanced Master's Degree in Cloud Computing**
Official Nº of Hours: **3,000 h.**

tech technological university

Awards the following

DIPLOMA

to

Mr./Ms. _____, with identification number _____.
For having successfully passed and accredited the following program

ADVANCED MASTER'S DEGREE
in
Cloud Computing

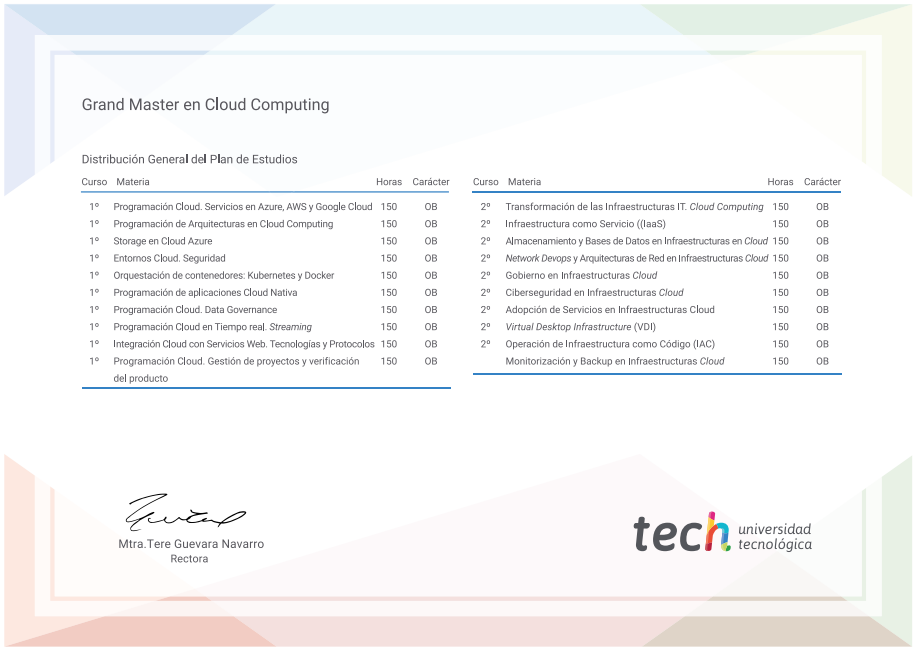
This is a qualification awarded by this University, equivalent to 3,000 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

Unique TECH Code: AFWORD23S techtitute.com/certificates



Grand Master en Cloud Computing

Distribución General del Plan de Estudios

Curso	Materia	Horas	Carácter
1º	Programación Cloud. Servicios en Azure, AWS y Google Cloud	150	OB
1º	Programación de Arquitecturas en Cloud Computing	150	OB
1º	Storage en Cloud Azure	150	OB
1º	Entornos Cloud. Seguridad	150	OB
1º	Orquestación de contenedores: Kubernetes y Docker	150	OB
1º	Programación de aplicaciones Cloud Nativa	150	OB
1º	Programación Cloud. Data Governance	150	OB
1º	Programación Cloud en Tiempo real. *Streaming*	150	OB
1º	Integración Cloud con Servicios Web. Tecnologías y Protocolos	150	OB
1º	Programación Cloud. Gestión de proyectos y verificación del producto	150	OB

Curso	Materia	Horas	Carácter
2º	Transformación de las Infraestructuras IT. *Cloud Computing*	150	OB
2º	Infraestructura como Servicio (IaaS)	150	OB
2º	Almacenamiento y Bases de Datos en Infraestructuras en *Cloud*	150	OB
2º	*Network Devops* y Arquitecturas de Red en Infraestructuras *Cloud*	150	OB
2º	Gobierno en Infraestructuras *Cloud*	150	OB
2º	Ciberseguridad en Infraestructuras *Cloud*	150	OB
2º	Adopción de Servicios en Infraestructuras Cloud	150	OB
2º	*Virtual Desktop Infrastructure* (VDI)	150	OB
2º	Operación de Infraestructura como Código (IAC)	150	OB
	Monitorización y Backup en Infraestructuras *Cloud*	150	OB

Mtra.Tere Guevara Navarro
Rectora

tech universidad tecnológica

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

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Advanced Master's Degree
Cloud Computing

- Modality: **online**
- Duration: **2 years**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Advanced Master's Degree
Cloud Computing

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