



## GENERAL INFORMATION

Data of the subject	
Subject name	Architecture of Network Services
Subject code	DTC-MIT-515
Main program	<a href="#">Máster Universitario en Ingeniería de Telecomunicación por la Universidad Pontificia Comillas</a>
Involved programs	Máster Universitario en Ingeniería de Telecomunicación [First year] Máster Universitario en Ingeniería de Telecomunicación y Máster en Ciberseguridad [First year] Máster Universitario en Ingeniería de Telecomunicación y Mást. Univ. en Administración de Empresas [First year] Máster Universitario en Ingeniería de Telecomunicación + Máster Big Data.Tecnología y Anal. Avanzada [First year] Máster Universitario en Ingeniería de Telecomunicación + Máster in Smart Grids [First year]
Credits	6,0 ECTS
Type	Obligatoria
Department	Department of Telematics and Computer Sciences
Coordinator	Agustín Gómez & Lucas Álvarez

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## DESCRIPTION OF THE SUBJECT

### Contextualization of the subject

### Course contents



## Contents

Topic 1: Introduction to the network, computing and storage technologies of a Data Center.

- 1.1. General infrastructure of a Data Center.
- 1.2. Computing and storage services.
- 1.3. Availability and certifications.

Topic 2: Virtualization

- 2.1. Virtualization platforms and techniques.
- 2.2. Virtual machines.
- 2.3. Infrastructure as code. Ansible and Terraform
- 2.4. containers.
- 2.5. Container orchestration. Kubernetes.

Topic 3: Cloud Computing

- 3.1. From virtualization to the Cloud.
- 3.2. Cloud types.
- 3.3. platforms.
- 3.4. Administration and operation of a Cloud platform:
  - Management and monitoring tools.
  - Availability.
  - Elasticity and availability.
  - Services.
- 3.5. Design and deployment of native Cloud applications.
  - Storage, Databases and Network.
  - DevOps.
  - Architecture based on microservices.
- 3.6. Cloud programmatic management.
- 3.7. Cloud cost estimation. Migration.

Topic 4: Big Data Architecture

- 4.1. Hardware and software infrastructure:
  - Introduction to mass storage and processing systems.
- 4.2. Tools:

Tools and libraries of the Hadoop ecosystem.

HDFS file system.

Bulk Processing: MapReduce, YARN, and Spark.

Kafka messaging system.

noSQL databases

4.3. Deployment:

- Deployment of Stacks with the use of a container orchestration tool.
- Sizing of a cluster.
- Big Data in the Cloud.

## EVALUATION AND CRITERIA



Evaluation activities	Evaluation criteria	Weight
exams Individual exams or tests, made in classroom.	Mid-term test. will be evaluated assimilation of theoretical concepts and practical on the subject of Virtualization: 15%. Final exam. understanding of concepts through open tests on architecture design and use of case-focused tools/techniques practical: 50%	65 %
Continuous performance evaluation: Individual or group practical work cluster. Projects developed by students. Exercises or problems solved in a way individually or in a group. Active participation in class.	Testing and work individual work done in class: 30%	30 %
Evaluation of the experimental work: Active participation in the laboratory. Raising doubts outside the content seen in class.	Have completed the practices correctly in time and form to be considered	5 %

## Grading

The qualification in the ordinary call of the subject will be obtained as:

50% of the final exam grade.

15% of the qualification of the intersemester test.

30% will be the qualification of the laboratory practices.

5% will be the qualification of the continuous evaluation.

The qualification in the extraordinary call:

50% of the final exam grade.

15% of the qualification of the intersemester test.

30% will be the qualification of the laboratory practices.

5% will be the qualification of the continuous evaluation.

To pass the subject, students must have at least 5 points out of 10 in the final exam and in the final practice of the course. subject both in the ordinary and in the extraordinary call.

## BIBLIOGRAPHY AND RESOURCES



# COMILLAS

UNIVERSIDAD PONTIFICIA

ICAI

ICADE

CIHS

**Syllabus**  
**2023 - 2024**

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