Syllabus
2025 - 2026

GENERAL INFORMATION

Data of the subject	
Subject name	Fundamentals of telematic systems
Subject code	DTC-GITT-124
Mainprogram	Bachelor's Degree in Engineering in Telecommunication Technologies
Involved programs	Grado en Ing. en Tecnologías de Telecom. y Grado en Análisis de Negocios/Bachelor in Busi. Analytics [First year]
Level	Reglada Grado Europeo
Quarter	Semestral
Credits	7,5 ECTS
Type	Básico
Department	Department of Telematics and Computer Sciencies
Coordinator	Israel Alonso Martínez

Teacher Information	
Teacher	
Name	Israel Alonso Martínez
Department	Department of Telematics and Computer Sciencies
Office	Alberto Aguilera 25
EMail	ialonso@icai.comillas.edu
Phone	4267
Teacher	
Name	Gabriel Javier Maestroarena Rodas
Department	Department of Telematics and Computer Sciencies
EMail	gjmaestroarena@icai.comillas.edu
Teacher	
Name	Enrique Díaz-Plaza Sanz
Department	Department of Telematics and Computer Sciencies
EMail	ediazp@comillas.edu

DESCRIPTION OF THE SUBJECT

Contextualization of the subject

Prerequisites

Computer Basics and Programming.

Course contents

Contents
1: INTRODUCTION TO OPERATING SYSTEMS. 2: THEORETICAL CONCEPTS OF DATABASES. (Relational Model and Logical Design) 3: SQL DATABASES (SQL Language and Programming) 4: NoSQL DATABASES (MongoDB)

EVALUATION AND CRITERIA

The use of AI to produce full assignments or substantial parts thereof, without proper citation of the source or tool used, or without explicit permission in the assignment instructions, will be considered plagiarism and therefore subject to the University's General Regulations.

Evaluation activities	Evaluation criteria	Weight
Exams:	Inter-semester test (20%) Final Exam (60%) NO AI • The assessment is completed entirely without AI assistance in a controlled environment, ensuring that students rely solely on their existing knowledge, understanding, and skills. • You must not use AI at any point during the assessment. You must demonstrate your core skills and knowledge	80 %
Continuous evaluation:	Participation in class and completion of short tests are evaluated (5%) AI COLLABORATION • AI may be used to help complete the task, including idea generation, drafting, feedback, and refinement. Students should critically evaluate and modify the AI suggested outputs, demonstrating their understanding. • You may use AI to assist with specific tasks such as drafting text, refining and evaluating your work. You must critically evaluate and modify any AI-generated content you use.	5 %

Experimental work evaluation:	Laboratory Reports (15%) AI COLLABORATION • AI may be used to help complete the task, including idea generation, drafting, feedback, and refinement. Students should critically evaluate and modify the AI suggested outputs, demonstrating their understanding. • You may use AI to assist with specific tasks such as drafting text, refining and evaluating your work. You must critically evaluate and modify any AI-generated content you use.	15 %

Grading

Ordinary Exams:

The percentage for the final grade will be:

- Exam (60%)
- Inter-semester test (20%)
- Laboratory Reports + Continuous evaluation (15%+5%)

ExtraOrdinary Exams:

The percentage for the final grade will be:

- Exam (80%)
- Inter-semester test (10%)
- Laboratory Reports + Continuous evaluation (10%)

GENERAL RULES:

- Failure to attend 15% or more of the contact hours for this subject may result in the impossibility of taking the ordinary and extraordinary exams.
- Practices or projects that are delivered outside the established deadline will not be evaluated.

WORK PLAN AND SCHEDULE

Activities	Date of realization	Delivery date

Introduction to the Linux Operating System and Weekly Labs	week 1	week 2
Introduction to the theory of Normalization and Design of Relational Databases + Practical Design Exercises.	week 4	week 5
Relational Databases: SQL Language + Weekly Labs. • SQL Introduction. • Predicates. • Scalar and Column Functions. • Grouping. • Yunctions. • Creation of BD's and access by program.	week 6	week 11
NoSQL Databases + Weekly Labs. • Introduction DB's NoSQL. • Basic MongoDB. (CRUD operations). • Advanced MongoDB. (Use of indexes, performance and aggregation operations).	week 12	week 14

BIBLIOGRAPHY AND RESOURCES

Basic References

- Bases de datos Relacionales: Fundamentos y Diseño Lógico. Enrique Rivero, Israel Alonso, Luis Martinez. Publicaciones UPCo, 2005.
- Introducción al SQL para usuarios y programadores. Rivero, E., Martínez, L., Reina, L., Benavides, J., Olaizola, J. Mª. Paraninfo, 2002.
- Keir, Thomas. Beginning Ubuntu Linux: From Novice to Professional. ISBN 1590596277.
- Mako Hill, Benjamin; Bacon, Jono; Burger, Corey; Jesse, Jonathan; Krstic, Ivan. The Official Ubuntu Book. p. 320. ISBN 0132435942.
- Grant, Rickford. Ubuntu Linux for Non-Geeks. p. 464. ISBN 1593271182.
- Dan Sullivan. NoSQL for Mere Mortals. Addison-Wesley Educational Publishers Inc; (2015) ISBN-10: 0134023218 ISBN-13: 978-0134023212
- Kristina Chodorow. MongoDB: The Definitive Guide. O'Reilly Media; (2013) ISBN-10: 1449344682 ISBN-13: 978-1449344689