

Academic Year of Degree: 2025/26

23973 - Network Engineering

Teaching Guide Information

Academic Course: 2025/26

Academic Center: 337 - Engineering School

Study: 3379 - Bachelor's degree in Telecommunications Network Engineering

Subject: 23973 - Network Engineering

Credits: 5.0

Course: 2

Teaching languages:

Theory: Group 1: English

Group 2: Catalan

Practice: Group 101: English

Group 201: Catalan

Seminar: Group 101: English

Group 201: Catalan

Teachers: Boris Bellalta Jimenez, Francisco Jose Wilhelmi Roca

Teaching Period: Second term

Presentation

In this subject, a set of analytical and simulation tools are introduced to study the performance of telecommunications networks.

Associated skills | General learning outcomes

CE1. Solving the mathematical problems which can be set out in engineering and apply the knowledge on: linear algebra; differential and integral calculus; numerical methods, numerical algorithms, statistics and optimization.

CE10. Describing, programming, validating and optimizing communication protocols and interfaces in the different levels of a networks hierarchy.

CE11. Developing and using analysis, simulation and experimentation methods in the design, assessment and optimization of telecommunication networks and systems.

Learning outcomes | Specific learning outcomes

RA.CE1.5 Using knowledge of statistics to solve problems which can be set out in engineering.

RA.CE1.6 Applying knowledge of optimization to solve problems which can be set out in engineering.

RA.CE11.1 Analyzing and designing networks applying methodology of modelling and simulation.

RA.CE11.2 Designing and dimensioning telecommunication links and networks in terms of requirements and resources using queueing theory.

RA.CE10.5 Recognizing the basic principles of the functioning of the current communications networks and details of the functioning of the family of Internet protocols TCP/IP.

Contents

Stochastic processes

Markov chains in discrete and continuous time

Queuing systems M/M/S/K

M/G/1 queuing systems with and without priorities

Wi-Fi

Sustainable Development Goals

9 - Industry, Innovation and Infrastructure

Evaluation and grading system

Course grade = $0.6 * \text{Final exam grade} + 0.2 * \text{Partial exam grade} + 0.2 * \text{Labs grade}$

Considerations: 1) To pass, you must get a grade equal to or greater than 4 in the final exam; 2) In the make-up exam, only the final exam can be made up.