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|------------------|--------------------------------|----------------|--|
| Course Unit      | Communication Networks I       | Field of study | Network and Computer Systems                           |
| Bachelor in      | Informatics and Communications | School         | School of Public Management, Communication and Tourism |
| Academic Year    | 2023/2024                      | Year of study  | 2  |
| Type             | Semestral                      | Semester       | 2  |
| Level            | 1-2                            | ECTS credits   | 6.0  |
| Code             | 9188-320-2204-00-23            |                |  |
| Workload (hours) | 162                            | Contact hours  | T - , TP 45, PL 15, TC - , S - , E - , OT 20, O -      |

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) João Pedro Carneiro Borges Gomes

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. understand and describe the devices and services used to support communications in data networks and the Internet;
2. understand and describe the role of protocol layers in data networks, namely the OSI reference model and the TCP/IP architecture;
3. design, calculate, and apply addressing in IP networks;
4. explain fundamental Ethernet concepts such as media, services and operations;
5. build wired and wireless LANs;
6. perform local network devices basic configurations;
7. know how to use common network utilities to verify network operations.

### Prerequisites

Not applicable

### Course contents

Basic Network Connectivity and Communications. Ethernet Concepts. Communicating Between Networks. IP Addressing. Network Application Communications. Building and Securing a SOHO Network.

### Course contents (extended version)

1. Basic Network Connectivity and Communications
  - Networking Today
  - Basic Switch and End Device Configuration
  - Protocol Models
2. Ethernet Concepts
  - Physical Layer
  - Number Systems
  - Data Link Layer
  - Ethernet Switching
3. Communicating Between Networks
  - Network Layer
  - Address Resolution
  - Basic Router Configuration
4. IP Addressing
  - IPv4 Addressing
  - IPv6 Addressing
  - ICMP
5. Network Application Communications
  - Transport Layer
  - Application Layer
6. Building and Securing a SOHO Network
  - Network Security Fundamentals
  - Build a SOHO Network

### Recommended reading

1. Cisco Networking Academy (2020). Introduction to Networks Companion Guide (CCNAv7). Cisco Press. ISBN-13: 978-0-13-663366-2
2. Lammler, T. (2019). Understanding Cisco Networking Technologies, Volume 1: Exam 200-301 (CCNA Certification) 1st Edition. Sybex. ISBN-13: 978-1119659020
3. Véstias, M. (2016). Redes Cisco - Para Profissionais (7.ª ed.). FCA. ISBN-13: 978-972-722-828-7
4. Gouveia, J., & Magalhães, A. (2013). Redes de Computadores - Curso Completo (10.ª ed.). FCA. ISBN-13: 978-972-722-582-8
5. Odom, W. (2019). CCNA 200-301 Official Cert Guide, Volume 1, 1st Edition. Cisco Press. ISBN-13: 978-0135792735

### Teaching and learning methods

Lectures, demonstrations, case analysis and discussion, interactive multimedia activities, laboratorial activities, practical assignments, self guided learning, Will be used computer network laboratories, simulators and e-learning.

### Assessment methods

1. Continuous Evaluation - (Regular, Student Worker) (Final)
  - Intermediate Written Test - 40% (Two tests. Minimum global grade: 35%. Alternative: Tests (20%) + Networking Academy (20%))
  - Practical Work - 60% (Minimum global grade: 35%)
2. Final Evaluation - (Regular, Student Worker) (Supplementary, Special)
  - Final Written Exam - 40% (Minimum grade: 35%. Alternative: Exam (20%) + Networking Academy Exam (20%))
  - Practical Work - 60% (Minimum global grade: 35%. Admission requirement for the final exam.)

### Language of instruction

Portuguese, with additional English support for foreign students.

## Electronic validation

|                                  |                                      |                              |                              |
|----------------------------------|--------------------------------------|------------------------------|------------------------------|
| João Pedro Carneiro Borges Gomes | Elisabete da Anunciacao Paulo Morais | Anabela Neves Alves de Pinho | Luisa Margarida Barata Lopes |
| 04-03-2024                       | 04-03-2024                           | 04-03-2024                   | 12-03-2024                   |