INSTITUTO POLITÉCNICO DE BRAGANÇA

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	Level	1-2	ECTS credits	6.0						
Type	Semestral	Semester	2	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. Lammle, 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 assignements, 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