UNIVERSIDAD DE CASTILLA - LA MANCHA
GUÍA DOCENTE

1. General information

Course: COMPUTER NETWORKS I

Type: CORE COURSE

Degree: 406 - UNDERGRADUATE DEGREE IN COMPUTER SCIENCE AND ENGINEERING (AB)

Center: 604 - SCHOOL OF COMPUTER SCIENCE AND ENGINEERING (AB)

Year: 1

Main language: Spanish

Use of additional languages:

Web site:

Code: 42308

ECTS credits: 6

Academic year: 2022-23

Group(s): 10 11 12 13

Duration: C2

Second language: English

English Friendly: N

Bilingual: Y

Lecturer: **ESTEFANÍA CORONADO CALERO** - Group(s): **12 13**

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Lecturer: **TERESA OLIVARES MONTES** - Group(s): **10 11 12**

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Lecturer: **LUIS OROZCO BARBOSA** - Group(s): **13**

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Lecturer: **JOSE MIGUEL VILLALON MILLAN** - Group(s): **10**

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2. Pre-Requisites

None

3. Justification in the curriculum, relation to other subjects and to the profession

Computer networks I is a compulsory course in the Computer Engineering programme. Its contents are essential to the practice of the computer engineering profession. It falls into the areas of Operating Systems, Distributed Systems, and Networks of the curricula. It sets the principles of the following subjects:

Computer Networks II
Network Management and Design
Design of Network Infrastructures
Information Systems Security
Network Security
Network Management and Administration
Planning and Integration of Systems and Services

4. Degree competences achieved in this course

Course competences

Code	Description
BA02	Understanding and knowledge of basic terms about fields, waves and electromagnetism, theory of electric circuits, electronic circuits, physical principles of semiconductors and logic families, electronic and photonic devices and their use to solve engineering problems.
CO05	Knowledge, administration, and maintenance of systems, services and digital systems.
CO11	Knowledge and application of the features, functions, and structure of distributed systems, computer networks and the internet, and the design and implementation of application based on them.
INS01	Analysis, synthesis, and assessment skills.
SIS01	Critical thinking.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Capacity to explain the fundamentals of network mobility and multicasting.

Management of a network in a basic way.

Ability to choose, install and configure the most suitable interconnection devices and services according to the user's needs.

Understanding of the basic concepts of computer networks and protocol architecture.

Understanding of the usefulness and operation of the transport layer and application of the TCP / IP architecture.

Additional outcomes

Understanding the basic concepts of computer networks and protocol architecture
Planning and organization of the activities to conduct during the course.

6. Units / Contents

Unit 1: INTRODUCTION TO COMPUTER NETWORKS
    Unit 1.1 Basic concepts
    Unit 1.2 Terminology
    Unit 1.3 Network Architecture
    Unit 1.4 Network examples
Unit 2: INTERNET AND APPLICATIONS
    Unit 2.1 Introduction
    Unit 2.2 Protocols and applications
    Unit 2.3 State-of-the-art technologies
Unit 3: NETWORK LAYER AND ADDRESSING
    Unit 3.1 Principles of internetworking
    Unit 3.2 IP addressing: subnets andVLANs
    Unit 3.3 IP datagram
    Unit 3.4 Fragmentation and Reassemply
    Unit 3.5 Other network protocols
Unit 4: DATA-LINK LAYER AND LOCAL AREA NETWORKS
    Unit 4.1 Medium access control
    Unit 4.2 Flow Control
    Unit 4.3 Error Control
    Unit 4.4 Interconnection devices
    Unit 4.5 Ethernet
    Unit 4.6 Token Ring
    Unit 4.7 Wireless LANs
Unit 5: PHYSICAL LAYER
    Unit 5.1 Terminology
    Unit 5.2 Transmissin media
    Unit 5.3 Digital communications principles

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Combination of methods	BA02 CO05 CO11	0.84	21	Y	N	Lectures. Introduction and review of network principles and operation, tests, questions. Recoverable by exam.
Class Attendance (practical) [ON-SITE]	Workshops and Seminars	BA02 CO05 CO11 INS01	0.8	20	Y	Y	Lab sessions. Recoverable by exam
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	BA02 CO05 CO11 INS01 SIS01	0.44	11	Y	N	Exercises guided by the professor. Recoverable by exam.
Practicum and practical activities report writing or preparation [OFF-SITE]	Practical or hands-on activities	CO05 CO11 INS01 SIS01	0.4	10	Y	Y	Lab preparation previous to the lab sessions (off-site).This activity is mandatory for the students registered under the continuous evaluation modality. Students registered under the non-continuos modality will have to take a hands-on exam in the lab.
Study and Exam Preparation [OFF-SITE]	Problem solving and exercises	BA02 CO05 CO11 INS01 SIS01	0.8	20	Y	N	Problem solving (off-site). Recoverable by final exam.
Progress test [ON-SITE]	Assessment tests	BA02 CO05 CO11 INS01 SIS01	0.08	2	Y	Y	Continouos evaluation of the theoretical part. Recoverable by exam.
Study and Exam Preparation [OFF-SITE]	Self-study	BA02 CO05 CO11 INS01 SIS01	2.4	60	N	-	
Final test [ON-SITE]	Assessment tests	BA02 CO05 CO11 INS01 SIS01	0.24	6	Y	Y	Final exam
		Total:	**6**	**150**			
		Total credits of in-class work: 2.4					**Total class time hours: 60**
		Total credits of out of class work: 3.6					**Total hours of out of class work: 90**

As: Assessable training activity
Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
			Problem solving exerecise to be carried in class and as

Assessment of problem solving and/or case studies	7.50%	0.00%	homework.
Other methods of assessment	5.00%	0.00%	Homework tests. Before each class, students must review the material and solve a test.
Test	20.00%	20.00%	Lab exam in the lab premises. (INF)
Laboratory sessions	7.50%	0.00%	Nine lab sessions. At the end of each session the student has to take a test assessing the comprehension. (INF)
Assessment of active participation	5.00%	0.00%	Exercises and test using and on-line application. (PRES)
Test	45.00%	67.50%	The final theory exam will count for 50% of the final mark (ESC)
Other methods of assessment	5.00%	0.00%	Exercises and preparation of class presentations (PRES)
Laboratory sessions	5.00%	0.00%	Lab preparation session, the student should perform some tasks and upload them into the course website. (INF)
Test	0.00%	12.50%	Test - evaluation of the lab skills acquired on preparing an conducting the lab activities (LAB)
Total:	**100.00%**	**100.00%**	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

LABS

To be eligible to take the final lab exam, the student must previously complete all lab sessions. For each lab, the student must complete and upload all the pre-lab assignments into the course website before the deadline specified for each lab session. Failure to do so will result in the ineligibility to participate in the corresponding lab session. If for a justified reason, a student misses participating in one or two lab sessions, he/she will be able to attend a retake lab session scheduled by the end of the semester. A maximum of two lab sessions may be recovered.

The final lab exam will take place at the scheduled final exam date. The final lab exam will count for 20% of the total final mark. The student must get at least 4/10 in the lab exam to be eligible to pass the course.

THEORY

One mid-term exam will be scheduled during the term, Exam 1. The exam will consist of two parts: test and problems. A minimum mark of 40% must be obtained in each part to pass the exam. Students passing the mid-term exam (Exam 1) will be exempted from taking it once again.

During the final exam session, all students have to take Exam 2 based on the material covered in the second part of the course. Exam 2 will consist of two parts: a test and problems. A minimum mark of 40% must be obtained in each part of the Exam 2. An overall mark of 4/10 to pass Exam 2. Exam 1 and Exam 2 will count for 50% of the final course mark.

IMPORTANT: To pass the course, an overall average of 5/10 is required and the following conditions should be met. A mark of at least 4/10 in the lab exams, Exam 1 and Exam 2 and participation in all lab sessions. A mark of 40% or higher in the tests and problems of Exam 1 and Exam 2. The student who fails to meet all these requirements will automatically get a failure mark no greater than 4.0, even if he/she has obtained an average mark of 5/10 or higher.

Non-continuous evaluation:

LABS

The student will have to take a final lab exam using the Packet Tracer tool, counting for 20% of the final mark. The student must get at least 4/10 in the lab exam to be eligible to pass the course.

The student who has NOT participated in all lab sessions will also have to take a practical exam done at the lab. The student will have to show that he/she is familiar with the lab equipment, characteristics, and configuration procedures. Only those students having successfully passed the final Lab Exam, Exam 1, and Exam 2 (see below) will be eligible to take the practical exam. This practical lab exam will count for 12,5% of the final mark. Failure to pass this exam will result in a final mark no higher than 4 (failed).

THEORY

The student will have to take an exam consisting of two parts: test and problems. To pass the exam, the student must get a minimum mark of 40% in each one of the parts. The exam will count for 67,5% of the final mark.

IMPORTANT: To pass the course, the students must obtain a mark of 4 or higher in the lab exam and in the final exam with a mark of at least 40% in each of the parts of the latter: test and problems. The student who fails to get an overall mark of at least 5/10 will automatically get a failure mark no greater than 4.0, even if he/she has obtained an average mark of 5.0 or higher.

Specifications for the resit/retake exam:

CONTINUOUS ASSESSMENT

The same criteria as for the final exam will apply. The students registered under the continuous evaluation modality will only have to take those exams whose pass conditions are not met. The marks of all the activities evaluated throughout the term and the marks of those exams whose marks are equal or greater than 5 will be taken into account. Failing to meet all conditions will result in a final mark no greater than 4/10 (failure), even if the overall average is 5/10 or higher.

NON-CONTINUOUS ASSESSMENT

The same criteria as for the final exam will apply.

The student who has NOT participated in all lab sessions will have to take a practical exam, done at the lab. The student will have to show that he/she is familiar with the lab equipment, characteristics, and configuration procedures. Only those students having successfully passed all the exams will be eligible to take the practical exam.

The marks of all the activities evaluated throughout the term and the marks of the final theory and lab exams will be considered only if their marks are equal or greater than 5. These marks together with the ones obtained in the retake exam will be used to compute the final mark. In the case that the mark of any of the retake exam is lower than 4/10 and/or if the marks of any of its parts are lower than 40% will result on a final course mark no greater than 4/10 (failure), even if the overall average is 5/10 or higher.

The marks of those students obtaining a mark of 5 or higher in the lab exam and having participated in all lab sessions will be kept and validated only for one course.

Specifications for the second resit / retake exam:

ASSESSMENT CRITERIA THE SPECIAL EXAM SESSION FOR COMPLETION OF STUDIES

There will be a written exam. This examination will consist of a theory part (70%), and a lab part (30%). To pass the course, the student must get at least 5/10 in each one of the two parts: theory and lab. Those students having missed one or more lab sessions will have to pass a final test in the lab in order to show that he/she has acquired the required skills to configure and operate real-world network devices.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours	hours
Class Attendance (practical) [PRESENCIAL][Workshops and Seminars]	20
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Practicum and practical activities report writing or preparation [AUTÓNOMA][Practical or hands-on activities]	10
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	5
Progress test [PRESENCIAL][Assessment tests]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	11
Final test [PRESENCIAL][Assessment tests]	6

General comments about the planning: This course schedule is APPROXIMATE. It could vary throughout the academic course due to teaching needs, bank holidays, etc. A weekly schedule will be properly detailed and updated on the online platform (Virtual Campus). Note that all the lectures, lab sessions, exams and related activities performed in the bilingual groups will be entirely taught and assessed in English. Classes will be scheduled in 3 sessions of one hour and a half per week.

Unit 1 (de 5): INTRODUCTION TO COMPUTER NETWORKS

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	6

Unit 2 (de 5): INTERNET AND APPLICATIONS

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	5
Study and Exam Preparation [AUTÓNOMA][Self-study]	7

Unit 3 (de 5): NETWORK LAYER AND ADDRESSING

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	4
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	7
Study and Exam Preparation [AUTÓNOMA][Self-study]	15

Unit 4 (de 5): DATA-LINK LAYER AND LOCAL AREA NETWORKS

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	3
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	5
Study and Exam Preparation [AUTÓNOMA][Self-study]	13

Unit 5 (de 5): PHYSICAL LAYER

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	3
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	8

Global activity

Activities	hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	21
Class Attendance (practical) [PRESENCIAL][Workshops and Seminars]	20
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	11
Practicum and practical activities report writing or preparation [AUTÓNOMA][Practical or hands-on activities]	10
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	20
Progress test [PRESENCIAL][Assessment tests]	2
Final test [PRESENCIAL][Assessment tests]	6
Study and Exam Preparation [AUTÓNOMA][Self-study]	60
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Behrouz A. Forouzan	Transmisión de Datos y Redes de Comunicaciones	McGraw-Hill		978-84-481-5617-6	2007	
	http://novella.mhhe.com/sites/844815617x/information_center_view0/					
Cisco	Cisco Packet Tracer 6.2				2015	Simulador de Redes de Computadores
	https://supportforums.cisco.com/document/12739396/cisco-packet-tracer-62-free-download-link					
Stallings, William	Comunicaciones y Redes de Computadores	Prentice Hall		978-84-205-4110-5	2008	