

**1. General information****Course:** COMPUTER NETWORKS I**Type:** CORE COURSE**Degree:** 346 - DEGREE IN COMPUTER SCIENCE AND ENGINEERING**Center:** 604 - SCHOOL OF COMPUTER SCIENCE AND ENGINEERING (AB)**Year:** 1**Main language:** Spanish**Use of additional languages:** English in Group 13 (Bilingual Group)**Web site:** <https://campusvirtual.uclm.es/>**Code:** 42308**ECTS credits:** 6**Academic year:** 2019-20**Group(s):** 10 11 12 13 14**Duration:** C2**Second language:** English**English Friendly:** N**Bilingual:** Y

Lecturer: TERESA OLIVARES MONTES - Group(s): 10 11 12				
Building/Office	Department	Phone number	Email	Office hours
ESII-0.A.7	SISTEMAS INFORMÁTICOS	2035	teresa.olivares@uclm.es	https://www.esiiaab.uclm.es/tutorias.php
Lecturer: LUIS OROZCO BARBOSA - Group(s): 13				
Building/Office	Department	Phone number	Email	Office hours
ESII. 1.C.8	SISTEMAS INFORMÁTICOS	2670	luis.orozco@uclm.es	https://www.esiiaab.uclm.es/tutorias.php Upon request.
Lecturer: JOSE MIGUEL VILLALON MILLAN - Group(s): 10 11 12				
Building/Office	Department	Phone number	Email	Office hours
ESII / 1.C.5	SISTEMAS INFORMÁTICOS	2384	josemiguel.villalon@uclm.es	https://www.esiiaab.uclm.es/tutorias.php Enviar correo.

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
BA2	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.
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.
CO5	Knowledge, administration, and maintenance of systems, services and digital systems.
INS1	Analysis, synthesis, and assessment skills.
SIS1	Critical thinking.

5. Objectives or Learning Outcomes**Course learning outcomes****Description**

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

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.

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** Motivation**Unit 2.2** Current trends**Unit 2.3** Examples of applications: WEB, messenger, FTP, TELNET, mail, ...**Unit 3: NETWORK LAYER AND ADDRESSING****Unit 3.1** Principles of internetworking**Unit 3.2** IP addressing: subnets and VLANs**Unit 3.3** IP datagram**Unit 3.4** Fragmentation and Reassembly**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** Transmission 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	R	Description
Class Attendance (theory) [ON-SITE]	Combination of methods	BA2 CO11 CO5	0.84	21	Y	N	N	
Class Attendance (practical) [ON-SITE]	Workshops and Seminars	BA2 CO11 CO5 INS1	0.8	20	Y	Y	Y	
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	BA2 CO11 CO5 INS1 SIS1	0.44	11	Y	N	N	
Practicum and practical activities report writing or preparation [OFF-SITE]	Practical or hands-on activities	CO11 CO5 INS1 SIS1	0.4	10	Y	N	N	
Study and Exam Preparation [OFF-SITE]	Problem solving and exercises	BA2 CO11 CO5 INS1 SIS1	0.8	20	Y	N	N	
Progress test [ON-SITE]	Assessment tests	BA2 CO11 CO5 INS1 SIS1	0.08	2	Y	Y	Y	
On-line Activities [OFF-SITE]	Assessment tests	BA2 CO11 CO5 INS1 SIS1	0.36	9	Y	N	N	
Study and Exam Preparation [OFF-SITE]	Self-study	BA2 CO11 CO5 INS1 SIS1	2.04	51	N	-	-	
Final test [ON-SITE]	Assessment tests	BA2 CO11 CO5 INS1 SIS1	0.24	6	Y	Y	Y	
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

R: Rescheduling training activity

8. Evaluation criteria and Grading System

Evaluation System	Grading System		Description
	Face-to-Face	Self-Study Student	
Assessment of active participation	5.00%	0.00%	Exercises and test using and on-line application. (PRES)
Final test	20.00%	0.00%	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)
Other methods of assessment	5.00%	0.00%	Pre-lecture tests in preparation for the lecture (INF)
Final test	50.00%	0.00%	The final theory exam will count for 50% of the final mark (ESC)
Other methods of assessment	7.50%	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)
Total:	100.00%	0.00%	

Evaluation criteria for the final exam:

ASSESSMENT CRITERIA IN THE REGULAR EXAM SESSION

LABS

To be eligible to pass the regular final lab exam, the student must previously complete all lab sessions. Previous to each lab session, the student must complete and upload all the pre-lab assignments into the course website before the deadline specified for each lab. 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 lab session scheduled by the end of the semester. The final lab exam will count for 20% of the total final mark.

THEORY

One mid-term exam will be scheduled during the term. The exam will consist of a theoretical part and problems. A minimum mark must be obtained in the theoretical part 4/10 and at least 5/10 in the overall exam mark to pass the theory part. Students passing the mid-term exam will be exempted from taking it once again during final-exam session. All students will have to take the second part theory exam during the final-exam session. The final exam will consist of a theory and problems. A minimum mark of 4/10 must be obtained in the theory part and at least 5/10 in the exam to pass the theory exam. The theory exams will count for 50% of the final course mark.

course, the students must pass all lab and theory exams and get an overall mark of at least 5/10.

IMPORTANT: To pass the course, the students must pass all lab and theory exams and get an overall mark of at least 5/10. The student who fails to get a minimum mark of 5.0 in all the exams (theory and lab) will automatically get a failure mark no greater than 4.0 even having obtained an average mark higher than 5.0.

Specifications for the resit/retake exam:

ASSESSMENT CRITERIA IN THE SUPPLEMENTARY EXAM SESSION

LABS

The lab exam will take place in the lab (20%). Those students having completed all the nine lab sessions will only be required to take the lab exam. Those students having missed one or more lab sessions will have to pass the lab exam and a test in the lab in order to show that he/she has acquired the required skills to configure and operate real-world network devices. The test will take place after having successfully passed all the other exams. In both cases, to pass the lab exam, the student must get a minimum mark of 5/10. The lab exam will count for 20% of the total final mark.

THEORY

The supplementary theory exam will consist of two exams. Each exam will cover the material corresponding to the mid-term and final exam scheduled during the semester. Each exam will consist of a theoretical part and problems. Students must take the supplementary exams not having passed during the term or the final exam session. A minimum mark of 4/10 in the theory part will be required, and an overall minimum exam mark of 5/10 is required to pass an exam. The theory exams will count for 50% of the total course mark.

IMPORTANT: To pass the course, the students must pass all lab and theory exams and get an overall mark of at least 5/10. The student who fails to get a minimum mark of 5.0 in each and every exam (theory and lab) will automatically get a failure mark no greater than 4.0 even having obtained an average mark higher than 5.0

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. The assessment activities could be performed in the afternoon, in case of necessity.	
Unit 1 (de 5): INTRODUCTION TO COMPUTER NETWORKS	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	3
On-line Activities [AUTÓNOMA][Assessment tests]	1
Study and Exam Preparation [AUTÓNOMA][Self-study]	5
Unit 2 (de 5): INTERNET AND APPLICATIONS	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	5
On-line Activities [AUTÓNOMA][Assessment tests]	1
Study and Exam Preparation [AUTÓNOMA][Self-study]	6
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
On-line Activities [AUTÓNOMA][Assessment tests]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	12

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
On-line Activities [AUTÓNOMA][Assessment tests]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	10
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
On-line Activities [AUTÓNOMA][Assessment tests]	1
Study and Exam Preparation [AUTÓNOMA][Self-study]	7
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
On-line Activities [AUTÓNOMA][Assessment tests]	9
Study and Exam Preparation [AUTÓNOMA][Self-study]	51
Final test [PRESENCIAL][Assessment tests]	6
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 http://novella.mhhe.com/sites/844815617x/information_center_view0/	McGraw-Hill		978-84-481-5617-6	2007	
Cisco	Cisco Packet Tracer 6.2 https://supportforums.cisco.com/document/12739396/cisco-packet-tracer-62-free-download-link				2015	Simulador de Redes de Computadores
Stallings, William	Comunicaciones y Redes de Computadores	Prentice Hall		978-84-205-4110-5	2008	