UNIVERSIDAD DE CASTILLA - LA MANCHA
GUÍA DOCENTE

1. General information

Course: COMPUTER NETWORKS I
Type: CORE COURSE
Degree: 405 - DEGREE IN COMPUTER SCIENCE ENGINEERING (TA)
Center: 15 - FACULTY OF SOCIAL SCIENCES AND INFORMATION TECHNOLOGIES
Year: 1
Main language: Spanish
Use of additional languages:
Web site:

Code: 42308
ECTS credits: 6
Academic year: 2023-24
Group(s): 60
Duration: C2
Second language: Spanish
English Friendly: Y
Bilingual: N

Lecturer: **IVÁN LÓPEZ MONTALBÁN** - Group(s): **60**

Building/Office	Department	Phone number	Email	Office hours
B1.2	TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN		Ivan.Lopez@uclm.es	Tuesday: 8.30-10.30 Thursday: 8.30-10.30

2. Pre-Requisites

Not established

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

Computer Networks I is a mandatory course in the Bachelor's Degree in Computer Science curriculum. Its contents are fundamental to practice the profession. It is integrated into the subject "Operating Systems, Distributed Systems and Networks" of the curriculum, and serves as a foundation for the following courses:

- Computer Networks II
- Network Design and Management
- Network Infrastructure Design
- Security of Information Systems
- 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.
INS04	Problem solving skills by the application of engineering techniques.
INS05	Argumentative skills to logically justify and explain decisions and opinions.
PER01	Team work abilities.
PER02	Ability to work in an international context.
PER04	Interpersonal relationship skills.
PER05	Acknowledgement of human diversity, equal rights, and cultural variety.
SIS01	Critical thinking.
SIS03	Autonomous learning.
UCLM02	Ability to use Information and Communication Technologies.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Understanding of the basic concepts of computer networks and protocol architecture.
Ability to choose, install and configure the most suitable interconnection devices and services according to the user's needs.
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.

6. Units / Contents

Unit 1: Introduction to computer networks.
    Unit 1.1 Components of a network

Unit 1.2 Reliable networks

Unit 1.3 Networking today

Unit 2: Physical and Link Layers

Unit 2.1 Connectivity among networks

Unit 2.2 models and protocols

Unit 2.3 basic hardware and terminal configuration

Unit 2.4 Data communication media

Unit 2.5 WANS and LANS

Unit 2.6 Switching ethernet

Unit 3: Network layer

Unit 3.1 Features of the network layer

Unit 3.2 IPv4

Unit 3.3 IPv6

Unit 3.4 Address Resolution

Unit 3.5 IP addresses

Unit 3.6 Routing: Routers configuration

Unit 3.7 Subnetting, supernetting and VLSM

Unit 3.8 ICMP

Unit 4: Transport Layer

Unit 4.1 level 4 addressing

Unit 4.2 TCP

Unit 4.3 UDP

Unit 5: Application layer

Unit 5.1 session, presentation and application

Unit 5.2 client-server model

Unit 5.3 application layer protocols

Unit 6: Fundamentals of network security

Unit 6.1 Vulnerabilities and threats

Unit 6.2 Network attacks. Attack mitigation

Unit 6.3 safety devices

Unit 6.4 dinamic Routing

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]	Lectures	CO11	0.72	18	N	-	Teaching of the subject matter by lecturer (MAG)
Individual tutoring sessions [ON-SITE]		CO11	0.18	4.5	N	-	Individual or small group tutoring in lecturer¿s office, classroom or laboratory (TUT)
Study and Exam Preparation [OFF-SITE]	Self-study	CO11	2.1	52.5	N	-	Self-study (EST)
Other off-site activity [OFF-SITE]	Practical or hands-on activities	CO11	0.6	15	N	-	Lab practical preparation (PLAB)
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	CO11	0.6	15	Y	N	Worked example problems and cases resolution by the lecturer and the students (PRO)
Writing of reports or projects [OFF-SITE]	Self-study	CO11	0.9	22.5	Y	N	Preparation of essays on topics proposed by lecturer (RES)
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	CO11	0.6	15	Y	Y	Realization of practicals in laboratory/computing room (LAB)
Other on-site activities [ON-SITE]	Assessment tests	CO11	0.3	7.5	Y	Y	Partial test 1 of the first half of the syllabus of the subject (EVA)
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
Projects	15.00%	15.00%	Non-compulsory activity that can be retaken. To be carried out before end of teaching period
Laboratory sessions	25.00%	25.00%	Compulsory activity that can be retaken. To be carried out during lab sessions
Oral presentations assessment	10.00%	10.00%	Non-compulsory activity that cannot be retaken. To be carried out during the theory/lab sessions
Final test	50.00%	50.00%	
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:

In compulsory activities, a minimum mark of 40% is required in order to pass that activity and have the possibility to therefore pass the entire subject. The evaluation of the activities will be global and therefore must be quantified by means of a single mark. If the activity consists of several sections, each section may be evaluated separately provided students are informed in writing of this evaluation criterion at the beginning of the academic year. In the case of the activities that may be retaken (i.e., rescheduling), an alternative activity or test will be offered in the resit/retake exam call (convocatoria extraordinaria).

The partial tests will be common for all the theory/laboratory groups of the subject and will be evaluated by the lecturers of the subject in a serial way, i.e., each part of the final exam will be evaluated by the same lecturer for all the students.

A student is considered to pass the subject if she/he obtains a minimum of 50 points out of 100, taking into account the points obtained in all the evaluable activities, and also has passed all the compulsory activities.

For students who do not pass the subject in the final exam call (convocatoria ordinaria), the marks of activities already passed will be conserved for the resit/retake exam call (convocatoria extraordinaria). The oral presentations assessment (non-recoverable activity) will be conserved for the resit/retake exam call even if it has not been passed. In the case of the passed recoverable activities, the student will have the opportunity to receive an alternative evaluation of those activities in the resit/retake exam call and, in that case, the final grade of the activity will correspond to the latter grade obtained.

The qualification of the passed activities in any call, except for the partial tests, will be conserved for the next academic year at the request of the student, provided that it is equal or superior to 5 and the training activities and the evaluation criteria of the subject are not modified in the next academic year.

The failure of a student to attend the partial 1 and partial 2 tests will automatically result in her/him receiving a "Failure to attend¿ (no presentado). If the student has not passed any compulsory evaluation activity, the maximum final grade will be 40%.

Non-continuous evaluation:

Students who cannot regularly attend lessons
can request, at the beginning of the semester, to take advantage of the non-assessment modality
keep going. Similarly, if students who are taking the assessment modality
continues, incurs any circumstance that prevents them from regularly attending lessons, they can take advantage of the non-continuous assessment modality. In this
This case must be notified before the scheduled date for the ordinary call tests,
according to a deadline that will be reported at the beginning of the semester.

Students who take the non-continuous assessment mode will be graded
globally, in 2 annual calls, one ordinary and one extraordinary, evaluating the
100% of the competences, through the evaluation systems indicated in the column
¿Evaluation not continuous¿.

In the "non-continuous" evaluation mode, there is no obligation to keep the grade
obtained by the student in the activities or tests (progress or partial) that have
carried out in a continuous evaluation mode.

In the non-continuous mode, the contents of the activity "Assessment of participation with use in class" will be evaluated by means of a written test on the same day as the official exam.

Specifications for the resit/retake exam:
Evaluation tests will be conducted for all recoverable activities.

Specifications for the second resit / retake exam:
Same characteristics as the resit/retake exam call.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	**hours**
Individual tutoring sessions [PRESENCIAL][]	4.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	52.5
Other off-site activity [AUTÓNOMA][Practical or hands-on activities]	15
Writing of reports or projects [AUTÓNOMA][Self-study]	22.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	15
Other on-site activities [PRESENCIAL][Assessment tests]	4
General comments about the planning: The subject is taught in 3 x 1,5 hour sessions per week.	
Unit 1 (de 6): Introduction to computer networks.	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	1.5
Unit 2 (de 6): Physical and Link Layers	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	4
Unit 3 (de 6): Network layer	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	6
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	6
Unit 4 (de 6): Transport Layer	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	3
Unit 5 (de 6): Application layer	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	2

Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2.5

Unit 6 (de 6): Fundamentals of network security

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2.5

Global activity

Activities	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	18.5
Individual tutoring sessions [PRESENCIAL][]	4.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	52.5
Other off-site activity [AUTÓNOMA][Practical or hands-on activities]	15
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	18
Writing of reports or projects [AUTÓNOMA][Self-study]	22.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	15
Other on-site activities [PRESENCIAL][Assessment tests]	4
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	City	ISBN	Year	Description
Forouzan, Behrouz A.	Data communications and Networks	McGraw-Hill		0-07-337622-1	2013	
Stallings, William	Data and computer communications	Pearson		978-0-13-217217-2	2011	
Tanenbaum, Andrew S.	Redes de computadoras	Pearson Educación		970-26-0162-2	2003	