UNIVERSIDAD DE CASTILLA - LA MANCHA
GUÍA DOCENTE

1. General information

Course: COMPUTER NETWORKS I

Type: CORE COURSE

Degree: 407 - DEGREE PROGRAMME IN COMPUTER SCIENCE ENGINEERING

Center: 108 - SCHOOL OF COMPUTER SCIENCE OF C. REAL

Year: 1

Main language: English

Use of additional languages:

Web site:

Code: 42308

ECTS credits: 6

Academic year: 2023-24

Group(s): 20 21 22 23

Duration: C2

Second language: Spanish

English Friendly: N

Bilingual: Y

Lecturer: JESÚS BLANCO RODRÍGUEZ DE GUZMAN - Group(s): 20

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Lecturer: JOSE LUIS SEGURA LUCAS - Group(s): 21 22

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Lecturer: ARTURO JOSÉ VILLEGAS GÓMEZ - Group(s): 23

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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 multidisciplinary teams.
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

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

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

6. Units / Contents

Unit 1: Introduction to computer networks.
  Unit 1.1 History of the Internet.
  Unit 1.2 Classification of networks.
  Unit 1.3 Network architectures.
Unit 2: Applications and services.
  Unit 2.1 WWW and HTTP protocol.
  Unit 2.2 DNS.
  Unit 2.3 P2P communication.
Unit 3: Transport Layer TCP/IP.
  Unit 3.1 Process-to-Process delivery.
  Unit 3.2 TCP protocol.
  Unit 3.3 UDP protocol.
Unit 4: Network layer.
  Unit 4.1 Internet, IP protocol.
  Unit 4.2 Direct Delivery: ARP.
  Unit 4.3 Internet Control Protocol.
  Unit 4.4 Network management protocols.
Unit 5: IP addressing.
  Unit 5.1 IP addresses.
  Unit 5.2 Private addressing.
  Unit 5.3 Subnetting and VLSM
  Unit 5.4 Network grouping (supernetting).
Unit 6: Routing.
  Unit 6.1 Message delivery.
  Unit 6.2 Redirection.
  Unit 6.3 Routing tables.
Unit 7: Data Link.
  Unit 7.1 Node-to-node Communication.
  Unit 7.2 Ethernet protocol.
Unit 8: Means of data transmission and communication.
  Unit 8.1 Wired systems.
  Unit 8.2 Wireless systems.

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	BA02 CO05 CO11	0.72	18	N	-	Teaching of the subject matter by lecturer (MAG)
Individual tutoring sessions [ON-SITE]		CO05 CO11 UCLM02	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	CO05 CO11 INS01 SIS01 SIS03	2.1	52.5	N	-	Self-study (EST)
Other off-site activity [OFF-SITE]	Practical or hands-on activities	CO05 CO11 INS01 INS04 PER01 PER02 PER05 SIS03	0.6	15	N	-	Lab practical preparation (PLAB)
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	BA02 CO05 CO11 INS04 INS05 PER02 PER04 PER05 UCLM02	0.6	15	Y	N	Worked example problems and cases resolution by the lecturer and the students (PRO)
		CO05 CO11 INS01 INS04					

Writing of reports or projects [OFF-SITE]	Self-study	INS05 PER01 PER02 PER04 PER05	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	CO05 CO11 INS01 INS04 INS05 PER02 PER04 PER05 UCLM02	0.6	15	Y		Y	Realization of practicals in laboratory /computing room (LAB)
Final test [ON-SITE]	Assessment tests	CO05 CO11 INS01 INS04 INS05 PER01	0.3	7.5	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 (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**
Final test	50.00%	50.00%	Compulsory activity that can be retaken (rescheduling) to be carried out within the planned exam dates of the final exam call (convocatoria ordinaria).
Theoretical papers assessment	10.00%	10.00%	Non-compulsory activity that can be retaken. To be carried out before end of teaching period
Laboratory sessions	30.00%	30.00%	Compulsory activity that can be retaken. To be carried out during lab sessions
Assessment of active participation	10.00%	10.00%	Non-compulsory activity that can be retaken. To be carried out during the theory/lab sessions for students in the continuous assessment modality. The students of non-continuous modality will be evaluated of this activity through an alternative system in the final exam call (convocatoria ordinaria).
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. A compulsory activity cannot be divided into eliminatory parts, nor can minimum marks be established for each of its parts. 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 final exam 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). If an activity is not recoverable, its assessment will be preserved for the resit/retake exam call (convocatoria extraordinaria) 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 mark of the passed activities in any call, except for the final exam, will be conserved for the subsequent academic year at the request of the student, provided that mark is equal or greater than 50% and that the activities and evaluation criteria of the subject remain unchanged prior to the beginning of that academic year.

The failure of a student to attend the final exam 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 may apply at the beginning of the semester for the non-continuous assessment mode. In the same way, the student may change to the non-continuous evaluation mode as long as she/he has not participated during the teaching period in evaluable activities that together account for at least 50% of the total mark of the subject. If a student has reached this 50% of the total obtainable mark or the teaching period is over, she/he will be considered in continuous assessment without the possibility of changing to non-continuous evaluation mode.

Students who take the non-continuous evaluation mode will be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences), through the assessment systems indicated in the column "Non-continuous evaluation".

In the "non-continuous evaluation" mode, it is not compulsory to keep the mark obtained by the student in the activities or tests (progress test or partial test) taken in the continuous assessment mode.

Specifications for the resit/retake exam:

Evaluation tests will be conducted for all recoverable activities. The failure of a student to attend the final exam will automatically result in her/him receiving a "Failure to attend" (no presentado), except in the case that the student conserves the mark for the final exam from the final exam call (convocatoria ordinaria). In the latter case, the student's carrying out of any other evaluable activity in the resit/retake exam call (convocatoria extraordinaria) will result in a numerical mark.

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
Final test [PRESENCIAL][Assessment tests]	7.5

General comments about the planning: The course is taught in three weekly sessions of 1.5 hours. This planning is for all groups. The planning can be modified in the event of unforeseen causes.

Unit 1 (de 8): Introduction to computer networks.

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	1.5

Unit 2 (de 8): Applications and services.

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2

Unit 3 (de 8): Transport Layer TCP/IP.

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	3

Unit 4 (de 8): Network layer.

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	3

Unit 5 (de 8): IP addressing.

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

Unit 6 (de 8): Routing.

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

Unit 7 (de 8): Data Link.

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1

Unit 8 (de 8): Means of data transmission and communication.

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	1.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1

Global activity

Activities	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	18
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]	15
Writing of reports or projects [AUTÓNOMA][Self-study]	22.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	15
Final test [PRESENCIAL][Assessment tests]	7.5
Total horas:	150

10. Bibliography and Sources

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