UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: COMMUNICATION NETWORKS I
Code: 59618
Type: CORE COURSE
ECTS credits: 6
Degree: 385 - DEGREE IN TELECOMMUNICATI TECHNOLOGY ENGINEERING
Academic year: 2022-23
Center: 308 - SCHOOL POLYTECHNIC OF CUENCA
Group(s): 30
Year: 2
Duration: First semester
Main language: Spanish
Second language:
Use of additional languages:
English Friendly: Y
Web site:
Bilingual: N

Lecturer: **JUAN JOSE DE DIOS DE DIOS** - Group(s): **30**

Building/Office	Department	Phone number	Email	Office hours
E. Politécnica Cuenca (2.18)	INGENIERÍA ELÉCTRICA, ELECTRÓNICA, AUTOMÁTICA Y COMUNICACIONES	926053898	juanjose.dedios@uclm.es	It will be published at the beginning of the term.

2. Pre-Requisites

It is advisable to have attended the basic courses such as "Foundations of Math I", "Foundations of Math II", " "Foundations of Math III", "Computer Science" and "Systems Analysis".

However, it is recommended to have basic knowledge of digital systems and high-level programming languages, for which it is recommended that "Computer Programming", "Communication Theory" and "Transmission media" are taken simultaneously or have already been completed.

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

Telematics is one of the working fields for the telecommunication engineers. This is the first course in the subject of Telematics and, therefore, establishes its basics. Its main objective is the understanding for operating a communications network, especially the Internet. This subject is essential to subsequently study "Communication Networks II", as well as the optional "Security in communications" and "Sensors and Wireless Sensor Networks".

4. Degree competences achieved in this course

Course competences

Code	Description
E06	The ability to independently acquire new knowledge and techniques suitable for the design, development or operation of telecommunication systems and services.
E07	The ability to use communication and computer applications (office automation, databases, advanced calculation, project management, visualisation, etc.) to support the development and operation of telecommunication and electronic networks, services and applications.
E08	The ability to use computer tools to search for bibliographic resources or for information related to telecommunications and electronics.
E17	Knowledge and use of the concepts of network architecture, protocols and communications interfaces.
E18	The ability to differentiate the concepts of access and transport networks, circuit and packet switching networks, fixed and mobile networks, as well as distributed network systems and applications, voice, data, audio, video services and interactive and multimedia services.
E19	Knowledge of network interconnection and routing methods, as well as the fundamentals of planning, sizing of networks based on traffic parameters.
G01	Knowledge of Information and Communication Technologies (ICT).
G02	Correct, oral and written, communication skills.
G05	Knowledge, understanding and ability to apply the necessary legislation during the development of the profession of Technical Telecommunications Engineer and being able to easily deal with specifications, regulations and mandatory regulations
G06	Knowledge of basic subjects and technologies, enabling students to learn new methods and technologies, as well as providing great versatility to adapt to new situations
G09	Being able to easily handle specifications, regulations and mandatory regulations
G11	Knowing and applying basic elements of economics and human resources management, organisation and planning of projects, as well as legislation, regulation and standardisation in telecommunications
G12	The ability to work in a multidisciplinary group and in a multilingual environment and to communicate, both in writing and orally, knowledge, procedures, results and ideas related to telecommunications and electronics
G13	The ability to look for and understand information, wether technical or commercial in different sources, to relate and structure it to integrate ideas and knowledge. Analysis, synthesis and implementation of ideas and knowledge.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Identification of network components, network topologies and types of networks.

Identification and understanding of the functions developed in a TCP / IP network.

Correct use of oral and written expression to convey ideas, technologies, results, etc.

Use of ICT to achieve the specific objectives set in the subject.
Distinction between circuit and packet switching networks.
Understanding of the functions associated with a LAN network and especially the Ethernet network.
Understanding of the different principles of networks interconnection.
Identification of network services, both broadcast and interactive, both centralized and distributed, both voice and audio and data and video.
Understanding and using the applications and distributed services typical of a TCP / IP network.
Distinction of the different elements of network interconnection.
Distinction between fixed and mobile networks.
Analysis of the traffic generated in a TCP / IP network.
Analysis, synthesis and compression of technical documentation and mastery of specific vocabulary.
Understanding a local-level wireless network, for example an IEEE-802.11, as well as a personal-level wireless network, for example Bluetooth.
Understanding of the different techniques for managing traffic in a network and distinguishing the different scopes covered.
Construction and configuration of an Ethernet network.
Understanding and distinction of the concepts of communication protocol, network architecture and communication interface.

6. Units / Contents

Unit 1: Communication networks
- **Unit 1.1** Introduction to telematics
- **Unit 1.2** Digital transmission
- **Unit 1.3** Network models
- **Unit 1.4** Switched networks
- **Unit 1.5** Protocols and architectures
- **Unit 1.6** Performance of a network

Unit 2: The Internet
- **Unit 2.1** Basic structure
- **Unit 2.2** Application layer
- **Unit 2.3** Transport layer
- **Unit 2.4** Network layer

Unit 3: Network Access
- **Unit 3.1** Link layer
- **Unit 3.2** Physical layer
- **Unit 3.3** Local Area Networks
- **Unit 3.4** Personal Area Networks
- **Unit 3.5** Switching devices
- **Unit 3.6** A day in the life of a web request

Unit 4: Laboratory
- **Unit 4.1** Protocol analysis
- **Unit 4.2** Network services
- **Unit 4.3** Line codes
- **Unit 4.4** Physical elements

ADDITIONAL COMMENTS, REMARKS

Software: Windows y Ubuntu-Linux, web browser, Matlab, PacketTracer, WireShark.

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	E07 E08 E17 E18 E19 G01 G02 G06 G09 G11	1.2	30	N	-	Theoretical lessons
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	E07 E08 E17 E18 E19 G01 G02 G05 G06 G09 G11 G12	0.5	12.5	N	-	Problems solved during the lessons
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	E06 E07 E08 E17 E18 E19 G01 G02 G05 G06 G09 G11 G12 G13	0.5	12.5	N	-	Introduction to lab sessions
Practicum and practical activities report writing or preparation [OFF-SITE]	Practical or hands-on activities	E06 E07 E08 E17 E18 E19 G01 G02 G05 G06 G09 G11 G12 G13	1	25	Y	Y	Assessment of individual (or team) laboratory reports, which must be submitted in pdf format, including the collected results and the conclusions obtained during the lab sessions. If necessary, the resulting files must be added. Only delivered using Campus Virtual. Failed practical activities can be retaken by delivering again the laboratory reports in the resit/retake exam. If copy or plagiarism is detected, the grade will be 0 for all of the involved students.
Writing of reports or projects [OFF-SITE]	Self-study	E06 E07 E08 E17 E18 E19 G01 G02 G05 G06 G09 G11 G12 G13	0.2	5	N	-	Individual work of the student to solve the proposed exercises.

Individual tutoring sessions [ON-SITE]		E06 E07 E08 E17 E18 E19 G01 G02 G05 G06 G09 G11 G12 G13	0.05	1.25	N	-	Individual tutoring sessions
Final test [ON-SITE]	Assessment tests	E06 E07 E08 E17 E18 E19 G01 G02 G05 G06 G09 G11 G12 G13	0.15	3.75	Y	Y	Final written test of theory and problem solving. Final test can be retaken.
Study and Exam Preparation [OFF-SITE]	Self-study	E06 E07 E08 E17 E18 E19 G01 G02 G05 G06 G09 G11 G12 G13	2.4	60	N	-	Student's self-study
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%	A final written test of theory and problem solving will be assessed.
Practicum and practical activities reports assessment	50.00%	50.00%	Practical tests and/or written reports to assess hands-on activities.
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:

Marks obtained according to the "Evaluation System" table will be used to calculate the weighted average grade. If it is not greater than 5 points, the course will be considered as failed. Evaluation criteria are described in the "Evaluation System" table.

Non-continuous evaluation:

Same evaluation criteria as the continuous assessment will be applied.

Specifications for the resit/retake exam:

Same evaluation criteria as the continuous assessment will be applied.

Specifications for the second resit / retake exam:

The evaluation criteria will be as stated in "Evaluation System" table. If the student passed the laboratory sessions in advance, final test could be retaken with the same evaluation criteria of the resit/retake exam.
If not, it will be assessed through a theory-practice test.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents	
Hours	**hours**
Writing of reports or projects [AUTÓNOMA][Self-study]	5
Individual tutoring sessions [PRESENCIAL][]	1.25
Final test [PRESENCIAL][Assessment tests]	3.75
Study and Exam Preparation [AUTÓNOMA][Self-study]	60
Unit 1 (de 4): Communication networks	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Unit 2 (de 4): The Internet	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	14
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	5
Unit 3 (de 4): Network Access	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	13
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	5.5
Unit 4 (de 4): Laboratory	
Activities	**Hours**
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	12.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Practical or hands-on activities]	25
Global activity	
Activities	**hours**
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	12.5
Class Attendance (theory) [PRESENCIAL][Lectures]	30
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	12.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Practical or hands-on activities]	25

Writing of reports or projects [AUTÓNOMA][Self-study]	5
Individual tutoring sessions [PRESENCIAL][]	1.25
Final test [PRESENCIAL][Assessment tests]	3.75
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
Gast, Matthew, S.	802.11 wireless networks : the definitive guide	O'Reilly		0-596-00183-5	2005	
Kurose, James F.	Redes de computadoras : un enfoque descendente	Pearson Education		978-84-9035-528-2	2017	
Molenaar, René	How to master CCNA http://gns3vault.com	GNS3 Vault		978-1482364873	2013	
Spurgeon, Charles E.	Ethernet : the definitive guide	O'Reilly		004.7 SPU eth	2000	
Stallings, William	Comunicaciones y redes de computadores	Prentice Hall		84-205-2986-9	2002	
Tanenbaum, Andrew	Computer networks	Pearson Educación		0-13-394248-1	1996	
	https://campusvirtual.uclm.es					Campus virtual de la asignatura