BASIC DETAILS:

Subject:	REDES Y COMUNICACIONES I		
Id.:	33429		
Programme:	DOBLE GRADO EN INGENIERÍA INFORMÁTICA Y BIOINFORMÁTICA		
Module:	COMUNICACIONES		
Subject type:	OBLIGATORIA		
Year:	3	**Teaching period:**	Primer Cuatrimestre
Credits:	6	**Total hours:**	150
Classroom activities:	68	**Individual study:**	82
Main teaching language:	Inglés	**Secondary teaching language:**	Castellano
Lecturer:	CARRO FERNANDEZ, JESUS (T) PEREZ FANTOVA, ALFREDO	**Email:**	jcarro@usj.es aperez@usj.es

PRESENTATION:

The course *Networks and Communications I* presents a complete overview of the layer organization in communication networks. Networks and their protocols are analyzed using the OSI model as a reference. The OSI model has been used for many years as an standard model to compare different organizations in layers of networks.

During this course, students will learn the functionalities assigned to each of the OSI layers and they will learn their behavior by studying how the main protocols work.

In the practical sessions, students will create a simulator of the OSI stack.

PROFESSIONAL COMPETENCES ACQUIRED IN THE SUBJECT:

General programme competences	G02	Innovative capacity to propose and find new and efficient ways to undertake any task and/ or function within the professional environment - highly motivated by quality.
	G03	Capacity to work in multidisciplinary teams to achieve common objectives, placing group interests before personal ones.
	G04	Capacity to always commit to working responsibly - creating a strong sense of duty and fulfilment of obligations.
	G06	Capacity to analyse and find a solution to complex problems or unforeseen situations which may arise while working in any type of socio-economic organisation.
	G10	Critical and analytical capacity when assessing information, data and courses of action.
	G12	Capacity to undertake professional activities with integrity, respecting social, organisational and ethical norms.
	G13	Capacity to use individual learning strategies aimed at continuous improvement in professional life and to begin further studies independently.
	G14	Capacity for abstraction to handle various complex knowledge models and apply them to examining and solving problems.
	G15	Capacity to structure reality by means of linking objects, situations and concepts through logical mathematical reasoning.
Specific programme competences	E01	Capacity to understand the engineering profession and commitment to serve society under the corresponding professional code of conduct.
	E02	Capacity to apply the intrinsic engineering principles based on mathematics and a combination of scientific disciplines.
	E03	Capacity to recognise the technical principles and apply the appropriate practical methods satisfactorily to analyse and solve engineering problems.
	E08	Capacity to communicate productively with clients, users and colleagues both orally and in writing, so as to pass on ideas, solve conflicts and achieve agreements.
	E10	Capacity to understand and assess the impact of technology on individuals, organisations, society and the environment, including ethical, legal and political factors, recognising and applying the pertinent standards and regulations.s éticos, legales y políticos, reconociendo y aplicando los estándares y regulaciones oportunos
	E11	Capacity to remain up-to-date in the technological and business worlds in the area of information and communication technologies.
	E13	Capacity to identify, assess and use current and emerging technologies, considering how they apply in terms of individual or organisational needs.
	E17	Capacity to identify and analyse user needs with the intention of designing effective, usable IT

		solutions which can be incorporated into the user's operating environment.
	E18	Capacity to identify and define the requirements to be satisfied by IT systems to cover the stated needs of organisations or individuals.
	E19	Capacity to design and define the architecture of IT systems (software, hardware and communications) under the requirements agreed upon by the parties involved.

PRE-REQUISITES:

It is recommended to have attended or have knowledge of:

- Fundamentals of Networks and Communications.

- Object Oriented Programming II, or failing that, knowledge of Java.

SUBJECT PROGRAMME:

Subject contents:

1 - Basic Concepts and Terminology
1.1 - Basic terminology in Computer Networks
1.2 - Digital bandwidth
1.3 - Communications hardware
1.4 - The OSI Model
1.5 - Local Area Networks
2 - The OSI Stack
2.1 - Physical Layer
2.2 - Data Link Layer
2.3 - Network Layer
2.4 - Transport Layer
2.5 - Session Layer
2.6 - Presentation Layer
2.7 - Application Layer

Subject planning could be modified due unforeseen circumstances (group performance, availability of resources, changes to academic calendar etc.) and should not, therefore, be considered to be definitive.

TEACHING AND LEARNING METHODOLOGIES AND ACTIVITIES:

Teaching and learning methodologies and activities applied:

Theory Sessions: Lectures will be used to explain the basis of the different chapters. Wherever possible, explanations will be accompanied by images, text or sounds to be used as practical examples and discussion topics. During the sessions, the lecturer will propouse activities or to look for information out of the class and he will resolve doubts.

Practical Sessions: Students will be grouped into groups of 2 or 3. Practices will be the goal of the whole group. During practice, students will use problem-based learning methodological strategy.

The student will have the slides of all the chapters of the course. They should be able to expand it with the content explained in class and other bibliographic resources. In these notes the exercises that students must complete yourself to study matter and group practices that are proposed include relationship. The lecturer will be available to students during the tutorial schedule to help them in all matters concerning the course.

On request, group tutorials may be programmed to control the work of the group.

The course requires a significant effort by the student. The concepts explained in one chapter will be used in the followings.

Student work load:

Teaching mode	Teaching methods	Estimated hours
Classroom activities	Master classes	24
	Practical exercises	8
	Practical work, exercises, problem-solving etc.	8
	Debates	2
	Laboratory practice	22
	Assessment activities	4
Individual study	Tutorials	5
	Individual study	26
	Individual coursework preparation	20
	Group cousework preparation	26
	Research work	5
	Total hours:	150

ASSESSMENT SCHEME:

Calculation of final mark:

Written tests:	40	%
Individual coursework:	15	%
Group coursework:	40	%
Participation:	5	%
TOTAL	100	%

*Las observaciones específicas sobre el sistema de evaluación serán comunicadas por escrito a los alumnos al inicio de la materia.

BIBLIOGRAPHY AND DOCUMENTATION:

Basic bibliography:

- STALLINGS, William. Data and Copmputer Communications. Pearson. 2007. 8th Edition

Recommended bibliography:

- COMER, Douglas. Internetworking with TCP/ IP Volume 1. ISBN: 0131876716
- STEVENS, W. Richard. TCP/ IP Illustrated,Volume 1.
- TANENBAUM, Andrew S. Computer Networks. 4th Edition. Pearson Education International
- LAMMLE, Todd. CCNA: Cisco Certified Network Associate - Study Guide. Wiley Publishing Inc., 6th Edition (2007).

Recommended websites:

CISCO	www.cisco.com
Request For Comments	www.rfc-es.org