

340356 - XACO-C4044 - Computer Networks

Coordinating unit:	340 - EPSEVG - Vilanova i la Geltrú School of Engineering
Teaching unit:	744 - ENTEL - Department of Network Engineering
Academic year:	2019
Degree:	BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2018). (Teaching unit Compulsory) BACHELOR'S DEGREE IN ELECTRONIC SYSTEMS ENGINEERING (Syllabus 2010). (Teaching unit Compulsory) BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)
ECTS credits:	6
Teaching languages:	Catalan, Spanish, English

Teaching staff

Coordinator: RAFAEL MORILLAS VARON

Others: RAFAEL MORILLAS VARON

Degree competences to which the subject contributes

Specific:

1. CEFB5. Knowledge of informatic systems, its structure, function and interconnection, as well as fundamentals of its programming.
2. CEF11. Knowledge and application characteristics, functions and structure of Distributed Systems, Computer Networks and the Internet and design and implement applications based on them.
3. CEF13. Knowledge and application of necessary tools for storage, processing and access to informatic systems, including the ones based on webs.
4. CET14. Ability to select, design, deploy, integrate and manage network and communications infrastructure in an organization.
5. CET16. Ability to design systems, applications and services based on network technologies, including internet, website, e-commerce, multimedia, interactive services and mobile computing.
6. CE17. Knowledge and use of the concepts of network architecture, protocols and communication interfaces.
7. CE18. Ability to distinguish net concepts of access and transport, circuits and package commutation nets, fixed and mobile nets, as well as of application systems of distributed nets, voic, data and audio services and interactive and multimedia services.
8. CE19. Knowledge of interconnection and routing methods, as well as basics of planning, network dimensioning based on traffic parameters.
9. CE20. Knowledge of current rules and regulation of telecommunication in national, european and international levels.
10. CE6. Ability to independently learn new skills and appropriate techniques to the design development or exploitation of systems and telecommunication services.
11. CE7. Ability to use computing and communication applications (office automation, databases, advanced calculus, project management, visualization, etc.) to support development and operations of networks, applications and services of telecommunications and electronics.
12. CE8. Ability to use research tools and bibliographic information related to telecommunications and electronics

Transversal:

13. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
14. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and

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grammatical errors.

15. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.

16. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

Teaching methodology

As this is an introductory course in Computer Networks, in theory classes / problems explaining the basic concepts and development of techniques for the resolution of related exercises.

Learning objectives of the subject

The course aims to introduce students to the study of computer networks, considering the Internet as the fundamental model where students can check all the concepts presented. Emphasis is placed on the concepts of Application and Transport protocols.

Study load

Total learning time: 150h	Hours large group:	45h	30.00%
	Hours medium group:	0h	0.00%
	Hours small group:	15h	10.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

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Content

<p>Subject 1: Computers Networks and Internet</p>	<p>Learning time: 20h Theory classes: 8h Self study : 12h</p>
<p>Description:</p> <ul style="list-style-type: none"> 1.1 Internet, the End and the Nucleus of the Network 1.2 Networks of Access and Physical Means 1.3 ISP and Main Internet 1.4 Retardation and Loss to the Networks of Commutation of Packages 1.5 Layers of protocol and their Models on watch 	
<p>Subject 2: Application layer</p>	<p>Learning time: 35h Theory classes: 14h Self study : 21h</p>
<p>Description:</p> <ul style="list-style-type: none"> 2.1 Principles of the Protocols of the application layer 2.2 Web and HTTP 2.3 Transference of files: FTP 2.4 Electronic mail in Internet 2.5 Distribution of Contents 	
<p>Subject 3: Transport layer</p>	<p>Learning time: 26h Theory classes: 11h Self study : 15h</p>
<p>Description:</p> <ul style="list-style-type: none"> 3.1 Introduction to the Services of the layer of Transport 3.2 De-multiplex and Multiplex 3.3 Transport connectionless: UDP 3.4 Foundations of the trustworthy transference of data 3.5 Oriented transport to connection: TCP 3.6 Foundations of the Control of Congestion 3.7 The Control of Congestion TCP 	

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Subject 4: Network layer	Learning time: 10h Theory classes: 4h Self study : 6h
Description: 4.1 Introduction and Models on watch of Network 4.2 Principles of Guidance 4.3 Hierarchic guidance 4.4 Internet Protocol (IP)	
Activity 1	Learning time: 4h Laboratory classes: 1h Self study : 3h
Description: HTTP Commands / Responses Specific objectives: Study the HTTP protocol	
Activity 2	Learning time: 4h Guided activities: 1h Self study : 3h
Description: FTP Commands / Responses	
Activity 3	Learning time: 3h Laboratory classes: 1h Self study : 2h
Description: SMTP Commands / Responses	

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<p>Activity 4</p>	<p>Learning time: 5h Laboratory classes: 1h Self study : 4h</p>
<p>Description: Simulation of the TCP Protocol Timeout Interval.</p>	
<p>Activity 5</p>	<p>Learning time: 10h Laboratory classes: 2h Self study : 8h</p>
<p>Description: Congestion Control Algorithm</p>	
<p>Practice 1</p>	<p>Learning time: 33h Laboratory classes: 9h Self study : 24h</p>
<p>Description: Programming of Sockets: TFTP Protocol (RFC 1350) Specific objectives: Characteristics of Internet applications. Services of the Internet Transport layer.</p>	

Qualification system

The evaluation of the course is divided into theory / problems (70%), activities (10%) and practical (20%). The theory grade / problems is determined by two tests that constitute the continuous evaluation of the course, these tests have a percentage of the 30% and 70% respectively, and are not liberators, should make the final course exam.

$Nota_Teoria = \max [0,4 (Ex. Parcial) + 0,6 (Ex. Final); Ex. Final]$

$Nota_Pràctiques = 0,7 (P1) + 0,05 (A1+A2+A3+A4) + 0,1 (A5)$

$Nota_Asignatura = 0,7 (Nota_Teoría) + 0,3 (Nota_Pràcticas)$

Also evaluate the delivery of exercises and presentation of specific jobs within the note of theory.

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Bibliography

Basic:

Kurose, James F. Redes de computadoras : un enfoque descendente [on line]. 7a ed. Madrid: Pearson, 2017 [Consultation: 23/04/2019]. Available on: <https://discovery.upc.edu/iii/encore/record/C__Rb1510239?lang=cat>. ISBN 9788490355282.

León-García, Alberto; Widjaja, Indra. Redes de comunicación : conceptos fundamentales y arquitecturas básicas. Madrid [etc.]: McGraw-Hill, 2002. ISBN 8448131975.

Forouzan, Behrouz A. Transmisión de datos y redes de comunicaciones. 2a ed. Madrid [etc.]: McGraw-Hill, 2002. ISBN 8448133900.

Complementary:

Tanenbaum, Andrew S. Redes de computadoras. 4a ed. México [etc.]: Prentice-Hall, 2003. ISBN 9702601622.

Stallings, William. Comunicaciones y redes de computadores. 7a ed. Madrid [etc.]: Pearson Educación, 2004. ISBN 8420541109.

Others resources:

Hyperlink

http://wps.aw.com/aw_kurose_network_5/

www.librosite.net/kurose