



Course guide

300044 - XLAM - Local, Access and Metropolitan Networks

Last modified: 01/06/2023

Unit in charge: Castelldefels School of Telecommunications and Aerospace Engineering

Teaching unit: 744 - ENTEL - Department of Network Engineering.

Degree: BACHELOR'S DEGREE IN NETWORK ENGINEERING (Syllabus 2009). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish, English

LECTURER

Coordinating lecturer: Definit a la infoweb de l'assignatura.

Others: Definit a la infoweb de l'assignatura.

PRIOR SKILLS

x

REQUIREMENTS

Fundamentals of Telematics: prerequisite

Network Interconnection Techniques: prerequisite

Internet Architectures and Protocols: co-requisite

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. CE 25 TEL. Capacidad de seguir el proceso tecnológico de transmisión, conmutación y proceso para mejorar las redes y servicios. (CIN/352/2009, BOE 20.2.2009.)

Transversal:

2. 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.

3. 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 grammatical errors.

4. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

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

6. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.

TEACHING METHODOLOGY

x

LEARNING OBJECTIVES OF THE SUBJECT

x

STUDY LOAD

Type	Hours	Percentage
Guided activities	20,5	13.67
Self study	84,0	56.00
Hours small group	19,5	13.00
Hours large group	26,0	17.33

Total learning time: 150 h

CONTENTS

(ENG) Títol contingut 1: Xarxes corporatives

Description:

(ENG) Determinació del tipus d'equip d'interconnexió de xarxa
Disseny i dimensionat de xarxa d'àrea local. Disseny jeràrquic. Fiabilitat i redundància.
VLAN. STP: rutes de backup i temps de recuperació
Agregació d'enllaços. Balanceig de càrrega. Prioritat i qualitat de servei a nivell 2.
Tipus de Commutació: commutació de capa 3 i de capa 4.
Power over Ethernet.
Ethernet Green: IEEE802.3az

Related activities:

(ENG) Teoria, laboratori, projecte-treball en grup, controls, visita/xerrada.

Full-or-part-time: 41h

Theory classes: 8h
Laboratory classes: 4h 30m
Guided activities: 5h 30m
Self study : 23h

(ENG) Títol contingut 2: Xarxes metropolitanas

Description:

(ENG) Aplicació de xarxes metropolitanas i d'àrea estesa per estendre la xarxa local
Carrier Ethernet i Metro Ethernet
Tècniques i tecnologies de transport sobre Ethernet
Serveis MetroEthernet
Introducció Ethernet OAM

Related activities:

(ENG) Teoria, laboratori, projecte-treball en grup, controls, visita/xerrada.

Full-or-part-time: 23h

Theory classes: 4h
Laboratory classes: 4h
Guided activities: 2h
Self study : 13h



(ENG) Títol contingut 3: Xarxes i tecnologies d'accés

Description:

(ENG) Tecnologies del bucle d'abonat digital: ADSL i VDSL
Xarxes híbrides de cable i fibra
Xarxes d'accés basades en fibra òptica: xarxes òptiques passives.
Anàlisi de protocols de xarxes d'accés òptiques. Disponibilitat.
Xarxes ràdio de gran abast: IEEE 802.16 (Wimax).

Related activities:

(ENG) Teoria, laboratori, projecte-treball en grup, controls, visita/xerrada.

Full-or-part-time: 50h

Theory classes: 8h
Laboratory classes: 7h 30m
Guided activities: 6h 30m
Self study : 28h

(ENG) Títol contingut 4: Control d'instal·lacions i xarxes domòtiques

Description:

(ENG) Control d'instal·lacions de telecomunicació en grans edificis.
Xarxes industrials.
Xarxes domòtiques.

Related activities:

(ENG) Teoria, laboratori, projecte-treball en grup, controls, visita/xerrada.

Full-or-part-time: 36h

Theory classes: 6h
Laboratory classes: 3h 30m
Guided activities: 6h 30m
Self study : 20h

ACTIVITIES

(ENG) TÍTOL ACTIVITAT 1 : LABORATORI CORPORATIVES

Full-or-part-time: 3h
Laboratory classes: 3h

(ENG) TÍTOL ACTIVITAT 2: LABORATORI DE XARXES DE BANDA AMPLA

Full-or-part-time: 3h
Laboratory classes: 3h

(ENG) TÍTOL ACTIVITAT 3: LABORATORI XARXES D'ACCÉS

Full-or-part-time: 6h
Laboratory classes: 6h



(ENG) TÍTOL ACTIVITAT 4: LABORATORI DE CONTROL D'INSTAL·LACIONS I DE DOMÒTICA

Full-or-part-time: 3h
Laboratory classes: 3h

(ENG) TÍTOL ACTIVITAT 6: PROJECTE DE DISSSENY DE XARXA

Full-or-part-time: 4h 30m
Laboratory classes: 4h 30m

(ENG) TÍTOL ACTIVITAT 7: PRESENTACIÓ DEL ROJECTE DE DISSSENY DE XARXA

Full-or-part-time: 0h 30m
Guided activities: 0h 30m

(ENG) TÍTOL ACTIVITAT 8: SEMINARIS

Full-or-part-time: 18h
Guided activities: 18h

(ENG) TÍTOL ACTIVITAT 9: VISITES GUIADES I/O XERRADES DE PROFESSIONALS DEL SECTOR

Full-or-part-time: 2h
Guided activities: 2h

GRADING SYSTEM

Criteria defined in the infoweb subject will be applied.

EXAMINATION RULES.

All proposed activities are mandatory. Any activity not done will be marked as zero.
Exams and controls are done individually. Directed activities are done in group or individually, as will be specified for each case.

BIBLIOGRAPHY

Basic:

- Hellberg, Chris; Greene, Dylan; Boyes, Truman. Broadband network architectures : designing and deploying triple-play services. Upper Saddle River, NJ: Prentice Hall, 2007. ISBN 9780132300575.
- Starr, Thomas; Cioffi, John M.; Silverman, Peter. Understanding digital subscriber line technology. Upper Saddle River: Prentice Hall, 1999. ISBN 0137805454.
- Carty, Glen. Broadband Networking. New York [etc.]: McGraw-Hill, 2002. ISBN 007219510X.
- Lin, Chinlon. Broadband optical access networks and fiber-to-the-home : systems technologies and deployment strategies. Chichester: John Wiley & Sons, 2006. ISBN 0470094788.
- Dooley, Kevin. Designing large-scale LANs. Sebastopol: O'Reilly, 2002. ISBN 9780596001506.

Complementary:



- Ibe, Oliver C. Remote access networks and services : the Internet access companion. New York: Wiley, 1999. ISBN 0471348201.
- Tung Ching Wong, D. Wireless broadband networks. Hoboken: John Wiley & Sons, 2009. ISBN 9780470181775.
- Shami, Abdallah; Maier, Martin; Assi, Chadi. Broadband access networks : technologies and deployments [on line]. New York: Springer, 2009 [Consultation: 26/07/2022]. Available on: <https://link-springer-com.recursos.biblioteca.upc.edu/book/10.1007/978-0-387-92131-0>. ISBN 9780387921303.