Course guides
340356 - XACO-C4O44 - Computer Networks

Unit in charge: Vilanova i la Geltrú School of Engineering
Teaching unit: 744 - ENTEL - Department of Network Engineering.

Degree: BACHELOR’S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2010). (Compulsory subject).
BACHELOR’S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2018). (Compulsory subject).

Academic year: 2020 ECTS Credits: 6.0 Languages: Catalan, English, Spanish

LECTURER

Coordinating lecturer: RAFAEL MORILLAS VARON
Others: RAFAEL MORILLAS VARON

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. CEFBS. Knowledge of informatic systems, its structure, function and interconnection, as well as fundamentals of its programming.
2. CEFC11. Knowledge and application characteristics, functions and structure of Distributed Systems, Computer Networks and the Internet and design and implement applications based on them.
3. CEFC13. Knowledge and application of necessary tools for storage, processing and access to informatic systems, including the ones based on webs.
4. CETI4. Ability to select, design, deploy, integrate and manage network and communications infrastructure in an organization.
5. CETI6. 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 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

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>45,0</td>
<td>30.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>10.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

Subject 1: Computers Networks and Internet

Description:
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

Full-or-part-time: 20h
Theory classes: 8h
Self study: 12h

Subject 2: Application layer

Description:
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

Full-or-part-time: 35h
Theory classes: 14h
Self study: 21h
Subject 3: Transport layer

Description:
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

Full-or-part-time: 26h
Theory classes: 11h
Self study: 15h

Subject 4: Network layer

Description:
4.1 Introduction and Models on watch of Network
4.2 Principles of Guidance
4.3 Hierarchic guidance
4.4 Internet Protocol (IP)

Full-or-part-time: 10h
Theory classes: 4h
Self study: 6h

Activity 1

Description:
HTTP Commands / Responses

Specific objectives:
Study the HTTP protocol

Full-or-part-time: 4h
Laboratory classes: 1h
Self study: 3h

Activity 2

Description:
FTP Commands / Responses

Full-or-part-time: 4h
Guided activities: 1h
Self study: 3h
Activity 3

Description:
SMTP Commands / Responses

Full-or-part-time: 3h
Laboratory classes: 1h
Self study : 2h

Activity 4

Description:
Simulation of the TCP Protocol Timeout Interval.

Full-or-part-time: 5h
Laboratory classes: 1h
Self study : 4h

Activity 5

Description:
Congestion Control Algorithm

Full-or-part-time: 10h
Laboratory classes: 2h
Self study : 8h

Practice 1

Description:
Programming of Sockets: TFTP Protocol (RFC 1350)

Specific objectives:
Characteristics of Internet applications.
Services of the Internet Transport layer.

Full-or-part-time: 33h
Laboratory classes: 9h
Self study : 24h

GRADING 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 = máx [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.
BIBLIOGRAPHY

Basic:

Complementary:

RESOURCES

Hyperlink:
- www.librosite.net/kurose