Universitat de Lleida

DEGREE CURRICULUM
ICT PROJECT: COMMUNICATION SERVICES AND SECURITY

Coordination: FERNÁNDEZ CAMÓN, CÈSAR

Academic year 2020-21

Subject's general information

Subject name	ICT PROJECT: COMMUNICATION SERVICES AND SECURITY
Code	103087
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION

Typology	Degree	Course	Character	Modality
	Master's Degree in Informatics Engineering	1	COMPULSORY	Attendance-based

Course number of credits (ECTS)	9

Type of activity, credits, and groups	Activity type	PRALAB	TEORIA
	Number of credits	6	3
	Number of groups	1	1

Coordination	FERNÁNDEZ CAMÓN, CÈSAR
Department	COMPUTER SCIENCE AND INDUSTRIAL ENGINEERING
Teaching load distribution between lectures and independent student work	6 ECTS = 25x6 = 150 working hours 30% --> 45 working hours at class/lab rooms 70% --> 105 non guided working hours
Important information on data processing	Consult this link for more information.
Language	English
Distribution of credits	Cèsar Fernández Camon 9

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
FERNÁNDEZ CAMÓN, CÈSAR	cesar.fernandez@udl.cat	9	

Subject's extra information

The subject gives an overview of today's computer networks, dealing with their inherent congestion and mobility problems. At one hand, flow control, congestion and quality of service issues are studied, showing how requirements such as high demand, multimedia traffic and low delay are met. At the other hand, wireless technologies are explained, from technical solutinos to security aspects, showing as well design and deployment issues, based on state-of-the-art technologies. Finally, its is shown how such a heterogeneous services (voice, data, video, ...) are integrated under a unique network architecture.

Learning objectives

To understand flow control mechanisms in current data communications networks

To understand different quality of service mechanisms in current data communications networks

To configure and test quality of service solutions in network devices

To understand wireless communication technologies

To understand and analyze security mechanisms in wireless communications

To deploy and configure common communication services: authentication, DNS, DHCP, VoIP, ...

To design, configure and test wireless deployments

Competences

University of Lleida strategic competences

- UdL2. Master a foreign language
- UdL3. Master Information and Communication Technologies

Degree-specific competences

- CE4. Capacity to draft, design, define architecture, introduce, manage, use, run and maintain computer applications, networks, systems, services and contents
- CE5. Capacity to comprehend and gain knowledge of using the internet and organize component models, intermediary software and services of new generation network technologies and protocols

Degree-transversal competences

- EPS4. Capacity to draft, design and implement projects and/or give novel solutions, using engineering-related tools

Subject contents

1. Network congestion control

- TCP operations
- TCP flow control
- TCP congestion control
- Service policies
2. Quality of Service (QoS):
   - Traffic classification
   - Congestion management
   - Congestion avoidance
   - Policing and shaping
   - RSVP
3. Wireless networks:
   - Wireless LAN
   - Security
   - Deployments
4. VoIP
   - Telephony essentials
   - Digital telephony
   - Solutions. Asterisk

Methodology

Every topic of this subject is presented in master classes. Based on contents, a couple of practice problems per topic are proposed, as well a practical case. Both types of work are developed in group, partially advised by the professor at class time and finally subjected to avaluation.

Development plan

Week 1. Theme 1. Congestion control
Week 2. Theme 1. Congestion control
Week 3. Practice 1. Congestion control
Week 4. Theme 2. QoS
Week 5. Theme 2. QoS
Week 6. Practice 2. QoS
Week 7. Theme 3. Wireless networks
Week 8. Holiday
Week 9. Theme 3. Wireless networks
Week 10. TIC project announcement
Week 11. Practice 3. Wireless networks
Week 12. Practice 3. Wireless networks
Week 13. Theme 4. VoIP
Week 14. Theme 4. VoIP
Week 15. Practice 4. VoIP
Week 16. TIC project defense

Evaluation

- Week 3. Exercise 1 (5/42*100 %)
- Week 3. Exercise 2 (5/42*100 %)
- Week 6. Exercise 3 (6/42*100 %)
- Week 8. Exercise 4 (6/42*100 %)
- Week 10. Exercise 5 (5/42*100 %)
- Week 11. Exercise 6 (5/42*100 %)
- Week 12. Practical case (10/42%*100 %)

Each of the above items are not mandatory. More than a 50% required to pass the subject

Bibliography

- Internetworking with TCP/IP: Volume I. Douglas E. Comer. Prentice Hall, 1991
- TCP/IP Illustrated, Volume I. William R. Stevens. Addison-Wesley, 1994
- 802.11 Wireless Networks: The Definitive Guide. Matthew   Ed. O'Reilly, 2002.
- Implementing 802.1x. Security Solutions for Wired and Wireless Networks. Jim Geier. Wiley Publishing, 2008.
- Switching to VoIP. Ted Wallingford. O'Reilly, 2005
- Asterisk: The Future of Telephony. Jim Van Meggelen, Leif Madsen & Jared Smith. O'Reilly, 2007