Universitat de Lleida

DEGREE CURRICULUM
ADVANCED NETWORK SERVICES

Academic year 2015-16

Subject's general information

Subject name	Advanced Network Services
Code	103058
Semester	2n Quadrimestre 2N Cicle Informàtica i Màster
Typology	Obligatòria
ECTS credits	6
Theoretical credits	0
Practical credits	0
Department	Informàtica i Enginyeria Industrial
Modality	Presencial
Important information on data processing	Consult this link for more information.
Language	Català
Degree	MASTER in Computer Enginneering
Distribution of credits	Cèsar Fernández Camon 6
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Cèsar Fernández Camon

Subject's extra information

The subject deals with modern communication networks, giving answers to their inherent congestion and mobility problems. On the one hand, flow control, congestion and quality service mechanisms are presented, giving to modern communication networks the required skills for supporting high demand, multimedia traffic and low latency. On the other hand, wireless technologies are also studied, as well as their technical aspects and security mechanisms, showing how mobility services are deployed and related. Finally, it is shown how services different nature; data, voice, video, ... can be integrated under a unique network scenario

Learning objectives

This subject gives an approach to the current data networks, showing solutions to congestion and mobility inherent problems. At one hand, flow control, congestion an quality of service mechanisms are studied, showing how such mechanisms provide to the current networks their required capabilities of high throughput, low delay and multimedia contents. In the other hand, wireless technology is explained, from its technical aspects to security matters, showing design issues as well as state of the art deployments and its relationship with communication services. Finally, it is shown how heterogeneous services: voice, data, video, ... are integrated in the same network.

Competences

University of Lleida strategic competences

- Master Information and Communication Technologies.

- Master a foreign language.

Degree-specific competences

- 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.

- Capacity to draft, design, define architecture, introduce, manage, use, run and maintain computer applications, networks, systems, services and contents

Degree-transversal competences

- 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

Development plan

Week 1. Theme 1. Congestion control
Week 2. Theme 1. Congestion control
Week 3. Practice 1. Congestion control
Week 4. Theme 2. Quality of Service
Week 5. Theme 2. Quality of Service
Week 6. Practice 2. Quality of Service
Week 7. Theme 2. Quality of Service
Week 8. Holiday
Week 9. Practice 2. Quality of Service
Week 10. Partial exams
Week 11. Theme 3. Wifi
Week 12. Theme 3. Wifi
Week 13. Theme 3. Wifi
Week 14. Practice 3. Wifi
Week 15. Practice 3. Wifi
Week 16. Examns

Evaluation

- 11/3/2014. Practice 1. Weight: 15%
- 11/4/2014. Parcial exam 1. Validation P1. Weight: 20%
- 29/4/2014. Practice 2. Weight: 15%
- 2/6/2014. Practice 3. Weight: 15%
- 11/6/2014. Final exam. Validation P2 and P3. Weight: 20%

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.