



UNIVERSITAT D'ANDORRA

Seminar's teaching plan

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| Syllabus | Bachelor in Computer Science |
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|--------------------------------|---------------------------------------|
| Module | M7. Xarxes i seguretat informàtica |
| Seminar | Networks and Systems Administration |
| Semester | 4 |
| Professor A/e | Alfred Alcón Beltrán aalcon@uda.ad |
| Mode | Face-to-face and virtual |
| Teaching language | English |

1. Seminar presentation

The seminar puts into practice everything learnt previously about local networking, implementing services like automatic setup systems, DNS service, web mail... This seminar's goal is that students become able to plan, setup and manage essential services in a medium or big company.

2. Seminar contents

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| Application Layer |
| <ul style="list-style-type: none">• Domain Name System (DNS)• DHCP• eMail (POP, IMAP, SMTP)• Web (HTTP) |
| Virtualization |
| <ul style="list-style-type: none">• What is and why is it interesting• Alternatives for servers and desktops |

- Sharing CPU, memory and other resources
- Network setup

System administration

- Basic OS installation
- Initial understanding of Debian i CentOS operative systems
- Network configuration
- Core services setup (DNS, DHCP)
- Shared services setup (Web, eMail, Shared folders)
- Securing services using SSL
- Securing messages using PGP/GPG

Distributed and redundant content

- Server farms
- Web proxies
- Content Delivery Networks
- P2P Networks

High availability and load balancing

- Single point of failure
- Load balancing
- Physical replication
- Service replication in active/active or active/passive modes
- Virtual IP address
- Replicated and distributed storage

3. Seminar activities

3.1. Continuous assessment

The continuous assessment includes the performance of different assessment activities during the semester:

- 2 Virtual Projects (TV)
- 2 In person tests (CP)
- Modul's Challenge

| | TV 1 | TV 2 | CP 1 | CP 2 | CHALLENGE Mandatory | Total Evaluation |
|--|------|------|------|------|------------------------|---------------------|
| Blinfo-E004-04 Understands the basic operation of a free environment and knows how to implement the basic network services of any small / medium enterprise. | 40% | 0% | 60% | 0% | 0% | 100% |
| Blinfo-E004-05 Implements basic security policies to improve the confidentiality of access to network services. | 0% | 0% | 10% | 10% | 80% | 100% |
| Blinfo-E004-06 Designs and implements load distribution and high availability solutions that minimize the impact of critical system crashes. | 0% | 40% | 0% | 60% | 0% | 100% |

3.2. Final assessment

If you opt for the Final Exam (EF) evaluation, the weighting of the learning results of the final assessment will be:

| | TV 1 | TV 2 | EF | CHALLENGE Mandatory | Total Evaluation |
|---|------|------|-----|------------------------|---------------------|
| BInfo-E004-04 Understands the basic operation of a free environment and knows how to implement the basic network services of any small / medium enterprise. | 40% | 0% | 60% | 0% | 100% |
| BInfo-E004-05 Implements basic security policies to improve the confidentiality of access to network services. | 0% | 0% | 20% | 80% | 100% |
| BInfo-E004-06 Designs and implements load distribution and high availability solutions that minimize the impact of critical system crashes. | 0% | 40% | 60% | 0% | 100% |

IMPORTANT:

In both assessments (continuous and final exam) it is mandatory to submit and present the challenge in order to pass the Module.

4. Seminar resources

| Basic Bibliography |
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| Professor material Professor prompts. Moodle material. |
| Reference books <ul style="list-style-type: none">• Computer Networks, 5th Edition (Tanenbaum, Wetherall) |

- Unix and Linux System Administration Handbook, 5th Edition (Nemeth et al.) (complementary)

Other resources

- Wireshark
- Simulador GNS3
- Maquinari de xarxa (hosts, cablejat, servidors...)
- Commutadors i encaminadors de diferents fabricants i components GNU/Linux

5. Seminar remarks

- No exam (CP or ExF) will be repeated.
- Late submissions will not be accepted.
- The continuous assessment (CP) exams are face-to-face tests and will be set in the seminar schedule.
- The final exam (ExF) and the recovery of the challenge are face to face test and are carried out on the date indicated in the seminar recovery calendar published by the UdA.
- If a student does not submit a TR assignment or doesn't attend an ExAC exam, the grade for that assignment or exam is zero.
- All evaluable submissions will be made on the UdA campus and in the format indicated in the statement of work or challenge (the UdA campus does not accept submissions larger than 50 MB).



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