

Computer Networks (CN) 2024

Arquitectura, Diseño y Gestión de Redes (ADG)

Introduction to Computer Networks, Design and Management.

+ Lecturer and Lab instructor

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- e-mail:
 - chema.foces@unileon.com
- Web site (Documents, Lab practices, source code, etc.):
 - <http://paloalto.unileon.es/cn>
 - *This web site is available only on the days classes are given*
- Technology II building
 - Office #363, Internal Phone 5390 (Office) and 5336 (Lab B6)

+ Language and the official course name

- The entire course is taught in **english**
- Course name: *Arquitectura, Diseño y Gestión de Redes (ADG)*
 - Short name:
Computer Newtorks (CN)
- What is Internet made of?
 - Why is it important to us, computer engineers?
- Main goal
 - Understand the most important algorithms and structures underlying the Internet
 - “The Network is the Computer”

+ Course contents

■ Chapters:

1. Networking and Data Communications
2. Protocols for direct links
3. LAN Switching
4. Internetworking with IP
5. End-to-end protocols

■ Lab Practicals:

1. Network Interface configuration, monitoring and troubleshooting
2. Programming with sockets (C and Java)
3. Ethernet switching, STP and VLANs
4. Basic internetworking with IP
5. Introd. to transport protocols

| Contents | |
|---|--|
| Topic | Sub-topic |
| BLOCK I: Theoretical Basis to Computer Networks | Chapter 1: NETWORK ARCHITECTURE. Internet, OSI, multiplexing, encapsulation, layers and service interfaces |
| | Chapter 2: SIGNALS AND SYSTEMS. Transmission, propagation and queues; intro to Information, Communication and Coding Theories, sampling theorem |
| | Chapter 3: DATALINK. The datalink layer. Source and channel encoding; error detection and correction; reliable transmission. |
| BLOCK II: CONNECTIVITY AND DESIGN PRINCIPLES. | Chapter 4: LOCAL AREA NETWORKS Ethernet and WIFI. Spanning Tree Protocol. Switched LAN design; scalable connectivity; network topologies; network sizing; switching, bridges and LAN switches |
| | Chapter 5: IP FORWARDING AND ROUTING IP fragmentation, PMTUD; Longest Prefix Matching; IP numbering and partitioning with CIDR/VLSM; Distance Vector and Dijkstra's algorithms(RIP and OSPF) |
| BLOCK III: INTERNETWORKING WITH IP | Chapter 6: THE TRANSPORT LAYER Algorithms, protocols and service interfaces to TCP and UDP |
| BLOCK IV: END-TO-END COMMUNICATION | Chapter 7: NETWORK MANAGEMENT UDP, SNMP, RMN AND SDN. Functional aspects of Network Management. Models of Network Management. |

+ Types of academic activities

Lectures (**A**)

- Explaining the concepts and structures
- Perspective, orientation and motivation
- Course backbone, coordination, goal setting

Problem resolution sessions (**B1**)

- Word exercises, examples, summaries, questions, difficulties with English terminology

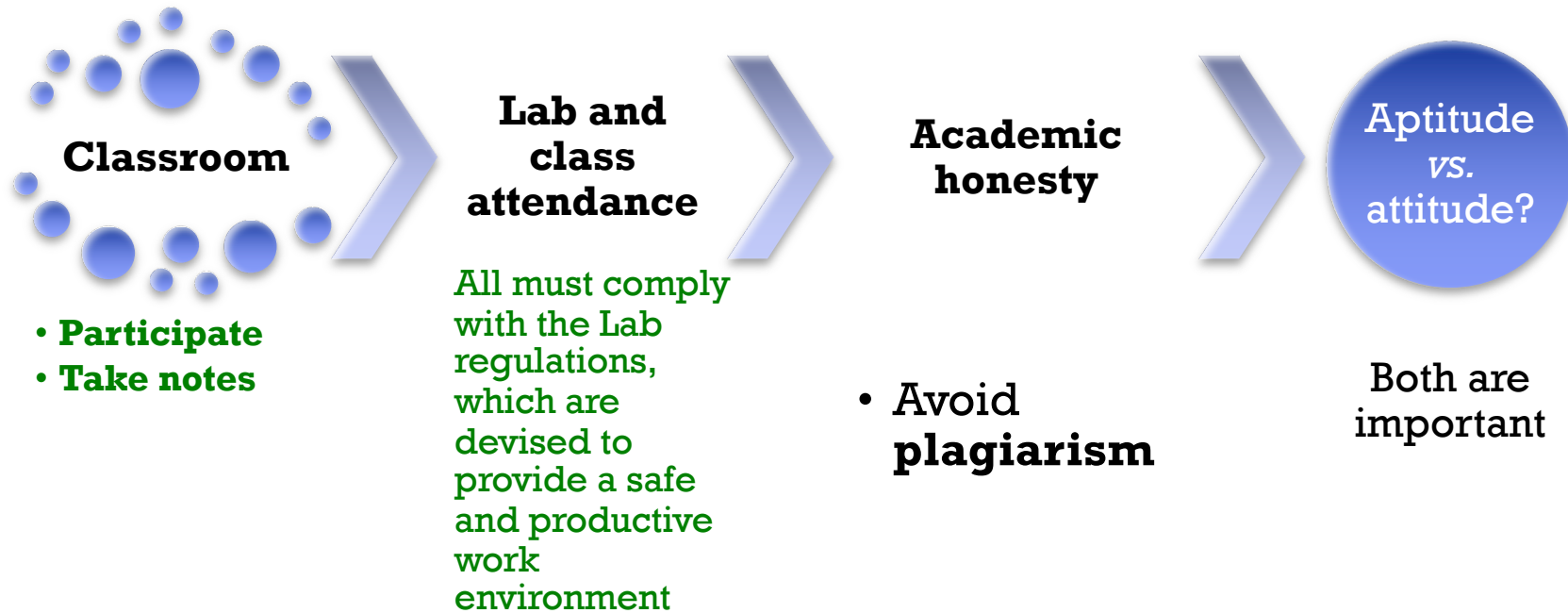
Network-equipment labs (**B3**)

- Practices on network design and implementation with real networks
- Software project

+ Important dates

- Homework submission dates are advertised in the **agora** virtual campus
 - HW#1 Moodle Questionnaire
 - LabBook submission is via Agora (Week #22, June)
 - CNPro advanced practice is via Agora (Week #24, June)
- Exam dates are announced in the official course calendar
 - Term Exam #1, Lab B6
 - Thursday/Friday 18th– April – 2024
 - Term Exam #2, Classroom #18
 - Monday 6th – June – 2024

+ Our responsibilities



+ Grading (Based on the official course guide)

| Assessment | | |
|-----------------------|--|----------------------|
| | Description | Qualification |
| Mixed tests | In-lab progress-report practical exam. Students are required to keep up-to-date a LabBook record of the results obtained in each practical, this LabBook will be required by the instructor to be submitted several times in the semester. | 10% |
| Practical tests | A single, final submission of a practical work composed of software and documentation. Can only be submitted and assessed in the continuous assessment period. Every submission will be subject to a written exam which must be passed in order for the instructor to evaluate the practical submission. | 10% |
| Extended-answer tests | Two closed-book written exams that consist of test, quiz, short answer and exercise questions. The pass grade is awarded on the basis that the student obtained a passing grade in each of the two term tests. Each of the two term exams must be passed so that the final grade is computed. | 80% |

Other comments and second call

The pass grade is awarded on the basis that the student obtained a passing grade in each of the two term exams. Lab Practice writeups must be submitted on their due date in June only; notice, no other new submission will be planned in July. Each of the two term exams must be passed for the final passing to be computed. Regular attendance and completion of Lab practicals is a requirement for awarding the overall pass grade.

Sources of information

+ Textbook

Conceptual Computer Networks

•Notes composed by professor

- Lecture slides, exercises, labs, questionnaires, study guides, practices and source code
 - paloalto.unileon.es/cn
- And also will use “Computer Networks” by Larry Peterson and Bruce Davie. This book can be found in Internet:
<https://github.com/SystemsApproach/book/releases/download/v6.1/book.pdf>

Course schedule

- Google calendar @ Virtual campus (agora)
- <http://paloalto.unileon.es/cn/calendar.html>

Course web site:

- Course Notes, practicals and other resources
<http://paloalto.unileon.es/cn>
- Open during Labs and Lectures, only!

+ Practices

Technology II bldg., LAB B6

- **The documents containing the practicals can be downloaded from paloalto.unileon.es/cn**

Lab time must be supplemented by your independent study

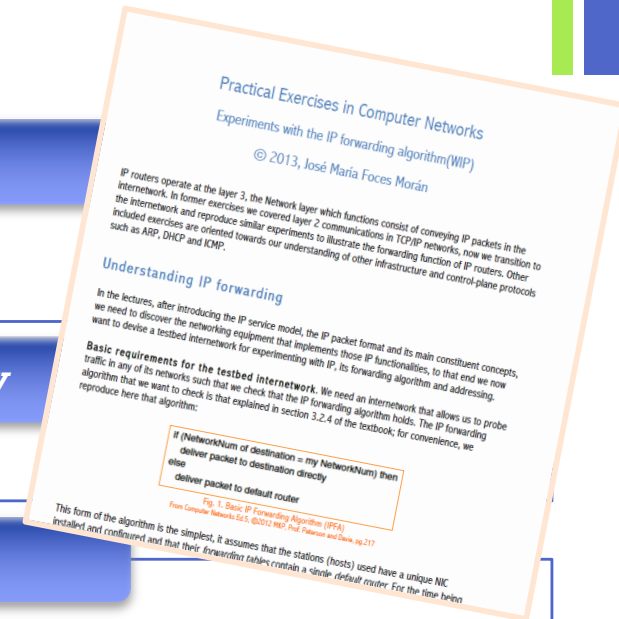
- **Regular attendance is essential**

Must keep a Lab Book containing the most relevant results

- **Composition guide is available at paloalto.unileon.es/cn**

Software for practices

- **GNU Linux (Debian or Ubuntu recommended)**
- **C and Java for programming the network stack**
- **Wireshark**
- **Other network utilities**



+ Questions, so far

