Universitat de Lleida

DEGREE CURRICULUM

COMMUNICATION NETWORKS

Coordination: MARTINEZ RODRIGUEZ, SANTIAGO

Academic year 2023-24

COMMUNICATION NETWORKS 2023-24

Subject's general information

Subject name	COMMUNICATION NETWORKS
Code	102379
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION
Typology	

Degree	Course	Character	Modality
Bachelor's degree in Digital Interaction and Computing Techniques	2	COMPULSORY	Attendance-based

Course number of credits (ECTS)	6
Type of activity, credits, and groups	Only examination
Coordination	MARTINEZ RODRIGUEZ, SANTIAGO
Department	COMPUTER ENGINEERING AND DIGITAL DESIGN
Teaching load distribution between lectures and independent student work	6 ECTS = 25x6 = 150 working hours: There are no lectures for this subject.
Important information on data processing	Consult this link for more information.
Language	Catalan.
Distribution of credits	There are no lectures for this subject.

COMMUNICATION NETWORKS 2023-24

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
MARTINEZ RODRIGUEZ, SANTIAGO	santi.martinez@udl.cat	0	

Subject's extra information

Office hours need to be appointed beforehand by e-mail with the teacher.

To properly follow this course, previous skills on programming and operating systems are recommended.

Learning objectives

- Knowledge of current standard mechanisms and institutions.
- Learning data link protocols basics, as well as their weaknesses and capacities.
- Designing a physical and data-link level solution for a given scenario.
- Learning current network level protocol basics.
- Understanding network level protocol weaknesses and limitations and their solutions.
- Designing and addressing and routing solution for a given and basic scenario.
- Knowledge and ability to optimize transport protocols.
- Studying current data encoding and compression mechanisms.
- Knowledge and understanding encapsulation and abstraction models between network levels.
- Knowledge and understanding physical level data transmission mechanisms.
- Designing transport level protocols.
- Understanding performance factors and congestion control procedures.
- Knowledge and understanding of application level protocols, particularly those with multimedia containers.

Competences

Basic Competences

- **B03.** That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical issues.

Transversal Competences

- **CT3.** Acquire training in the use of new technologies and information and communication technologies.

General Competences

- **CG2.** Design, develop, evaluate and guarantee the accessibility, ergonomics, usability and security of computer systems.
- **CG3.** Use adequate hardware and software platforms to develop and execute interactive digital applications.

Specific Competences

- **CE7.** Know, manage and maintain systems, services and interactive applications.
- **CE12.** Knowledge and ability to apply the characteristics, functionalities and structure of computer networks and internet, and design and implement interactive applications based on them.

Subject contents

Standards and organizations.

OSI and TCP/IP models.

Physical level: Introduction to data transmission.

Data-link level:

- Medium access.
- Direct access networks: Ethernet (802.3), Wireless (802.11).
- Switching.

Network level:

- IP protocol.
- IP addressing.
- Basic routing: static and vector-distance.
- Advanced routing: link-state.

Transport level:

- End-to-end protocols: TCP and UDP.
- Another end-to-end protocols.

Congestion control and resource management.

Application level: Application protocols.

Methodology

There are no lectures for this subject.
However, the student who wishes may attend, as an auditor, a similar subject (Communication Networks) of the Degree in Computer Engineering that is taught on the same Igualada campus.

Development plan

There are no lectures for this subject.

Evaluation

Continuous evaluation

Block	Evaluation Activity	Weight	Minimum Score	Group	Compulsory	Recoverable
P1	Project 1	20%	No	Yes	No	No
P2	Project 2	20%	No	Yes	No	No

Block	Evaluation Activity	Weight	Minimum Score	Group	Compulsory	Recoverable
P3	Project 3	20%	No	Yes	No	No
E1	1st Midterm Exam	20%	No	No	No	Yes
E2	2nd Midterm Exam	20%	No	No	No	Yes
To pass the subject the final score must be ≥ 5.						
Final Score = 0,2 · P1 + 0,2 · P2 + 0,2 · P3 + 0,2 · E1 + 0,2 · E2						

Remarks:

If the final score < 5, the student can recover the midterm exams (the student can choose one exam or both).

Alternative evaluation (students who waive continuous evaluation):

Students who have the approval to be evaluated by alternative evaluation (see requirements and procedure in the evaluation regulations) will have to do the following activities.

- **Single exam** (100%): It can be improved. Date of the exam: the date of the realization of the 2nd Midterm Exam, defined by the EPS. This exam consists of a written test of the entire subject matter.
- **Improvement of Single exam** (100%): Date of the exam: the date of the realization of the Improvement Exam, defined by the EPS. The realization of the improvement exam **limits to 8** the maximum grade achieved in the subject.

Bibliography

- Larry L. Peterson, Bruce S. Davie: Computer Networks: A Systems Approach, Fifth Edition. Morgan Kaufmann, 2011.
- Andrew S. Tanenbaum, David J. Wetherall: Computer Networks (5th Edition). Pearson, 2010.
- James F. Kurose, Keith W. Ross: Computer Networking: A Top-Down Approach (5th Edition). Addison-Wesley, 2010.
- W. Richard Stevens: TCP/IP Illustrated, Volumes 1 & 2. Addison-Wesley.
- Jeffrey S. Beasley: Networking. Pearson, 2008.