Universitat Autònoma de Barcelona

2019/2020

Introduction to Computer Networks

Code: 102169
ECTS Credits: 6

Degree	Type	Year	Semester
2501232 Business and Information Technology	OT	4	0

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Use of Languages

Principal working language: spanish (spa)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: Yes

Prerequisites

For a good understanding of the subject, it would be convenient to have basic computer skills equivalent to the subject of Fundamentals of Programming of the first year of the Degree.

Objectives and Contextualisation

The subject of Networks is part, together with Fundamentals of Programming, Introduction to Problem Solving and Algorithm Design, Operating Systems and Databases of the technological training of the Business and Technology student. The basic objectives of the subject are the following:

- Achieve a general vision of the concepts related to computer networks, knowing how to situate them in a hierarchical model of protocols.
- Know the fundamental concepts of local area networks, focusing on the most used network in the sector: Ethernet.
- Know the fundamental concepts of the network interconnection protocols that give rise to the network of networks (Internet) and the applications that can be used on it.

Upon completion of the course, students will be able to set up a local area network using the appropriate communication elements such as routers and switches. They will also be able to manage IP address networks and configure network access points. They will also know several network applications of business interest. Likewise, they will have to be able to present in a convenient way the descriptions that are derived from the designed networks.

Competences

- Communicating orally and in written form and at a technical level in Catalan, Spanish and another language, preferably English.
- Demonstrating a concern for quality in the objectives and development of the work.
- Demonstrating the ability to plan in accordance to the objectives and available resources.
- Developing self-learning strategies.
- Proposing, analysing, validating and maintaining IT solutions in the context of a business organisation.

Learning Outcomes

1. Communicating orally and in written form and at a technical level in Catalan, Spanish and another language, preferably English.
2. Defining concepts and protocols that are related to the interconnection and joint operation among heterogeneous systems and knowing how to design extensible and robust Internet networks.
3. Demonstrating a concern for quality in the objectives and development of the work.
4. Demonstrating the ability to plan in accordance to the objectives and available resources.
5. Describing the essential mechanisms of data transmission, and international standards.
6. Designing and comprehending the local and wide area networks, and their operational models.
7. Designing topographies of local area networks and configuring basic aspects of wide area networks.
8. Developing self-learning strategies.

Content

After an introduction to the context and functioning of the subject, a series of specialized topics will be developed. Particularly, the contents are:

Topic 0. Presentation

Presentation of the subject and its functioning.

Topic 1. Introduction to computer networks

In this topic, the concepts and basic components of a computer network will be introduced. Likewise, the different types of networks and their operating model will be presented. In particular, we will study the WAN networks and circuit and packet switching, Frame Relay and ATM. The OSI reference model and the fundamental principles and elements of the Internet will be presented: interconnection of networks (routers, IP protocol).

Topic 2. Local area networks

In this second topic, specific issues of local area networks and basic concepts of media sharing, IEEE 802 family of networks and wireless networks will be discussed.

Topic 3. The TCP/IP protocol stack

In this topic the Internet model and the TCP/IP protocol stack will be introduced. The most important protocols of the different layers and the basic operating principles of the Internet will be studied.

Topic 4. Applications of business interest

In this topic some networked computer tools will be introduced that allow the collaborative work in group, communication between different centers of the company and videoconference, electronic mail, remote access, file transfer, services in the cloud, voice over IP, etc.

Methodology

The educational methodology to be followed is oriented to the learning of the subject by part of the student in a continuous form. This process is based on the realisation of three types of activities that will be developed along the course: classes of theory, seminars of problems and practical sessions with computer and work in groups.

- Sessions of theory: the professor will provide information on the subject and on strategies to acquire, expand and organise the knowledge. He will boost the active participation of the students during these sessions, for example posing discussions in those points that have a higher conceptual load.

- Seminars of problems: the students will have to participate actively to consolidate the knowledge acquired by resolving, presenting and debating problems.

- Practices with computer and work in groups: the students will have to work in teams of two people in the analysis of network configuration and operational issues by using computational tools. They will have to present the obtained results by means of oral and writing reports.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Oral Expositions	2	0.08	1, 2, 5, 6, 7
Seminars of Problems and Practices	15	0.6	2, 5, 6, 7
Theory Sessions	28	1.12	2, 5, 6, 7
Type: Supervised			
Tutories	15	0.6	3
Type: Autonomous			
Preparation of oral presentations	10	0.4	2, 3, 5, 8, 6
Preparation of reports in writing	26	1.04	1, 3, 5
Reading and study of course lectures and cases of study	52	2.08	3, 8

Assessment

The evaluation of the subject is done in a progressive form and continuously during all the semester. The system of evaluation bases in the following rules:

a) Process and activities of evaluation

The following activities are foreseen:

- ***Activity A. Individual and small group contributions*** made during the in-class sessions of the course, thus encouraging the active participation of students in their own learning process. This section includes the resolution of problems during problem seminars. This activity counts 10% on the final grade of the subject.
- ***Activity B.Presentation of reports, by writing and orally***, related to the practices with computer, worked during the course, with the aim to follow the evolution of each student in the understanding and use of the tools worked in the subject, and to improve at the same time the acquisition of transversal competitions. This activity contributes 40% on the final grade of the subject.
- ***Activity C. Examination,*** to favour the consolidation of the material worked during the course. This activity contributes 50% on the final grade of the subject.

In order to pass the subject, it will be necessary to take out a minimum grade of 5 in activity ***B*** and of ***4,5*** in the activity***C***. It is necessary to take into account that the activity ***B*** is non-recoverable. Therefore, failing the activity ***B*** with an inferior grade to the indicated previously, supposes to fail the subject.

b) Calendar of activities of evaluation

The dates of the evaluation activities (exercises, assignments ...) will be announced well in advance duringthesemester.

The date ofthe final exam is scheduled in the assessment calendar of the Faculty.

*"The dates of evaluation activities cannot be modified, unless there is an exceptional and duly justified reason why an evaluation activity cannot be carried out. In this case, the degree coordinator will contact both the teaching staff and the affected student, and a new date will be scheduled within the same academic period to make up for the missed evaluation activity."*Section 1 of Article 115. Calendar of evaluation activities (Academic Regulations UAB).Students of the Faculty of Economics and Business, who in accordance with the previous paragraph need to change an evaluation activity date must process the request by filling out an Application for exams' rescheduleat
https://eformularis.uab.cat/group/deganat_feie/application-for-exams-reschedule

c) Grade revision process

After all grading activities have ended students will be informed of the date and way in which the course grades will be published. Students will be also be informed of the procedure, place, date and time of grade revision following University regulations. If the student does not present to this review, he will not be able to review later the grades.

d) Retake process

For those students that at the end of the process of evaluation have not obtained an equal or higher qualification to 5 as final grade or 4,5 in Activity ***C*** but have more than a 5 in the practices (Activity ***B***), there will be a re-evaluation. This will consist in the realisation, in the planned date by the Faculty, of an examination containing representative situations worked during the course. If a student does not arrive to the minimum grade of 4,5 in Activity ***C*** and by this reason he does not approve the subject, he will have a 4.5 as maximum, in the final grade of the subject.

e) Qualifications

The final grade of the subject will be calculated by applying the percentages mentioned in the section a of this guide. It is necessary to take into account that:

- *Matrícula de Honor (MH)*. Award a qualification of *matrícula de honor*is only decision of the professor in charge of the subject. The rule of the UAB indicates that the MH only will be able to be awarded to students that have obtained an equal final qualification or upper to 9.00.
- Not evaluable. A student is considered "not evaluable" when he has not presented to any activity ***C***. In any another case the criteria of evaluation detailed further up are followed.

f) Irregularities in evaluation activities

Despite other disciplinary measures deemed appropriate, and in accordance with current academic regulations, *"whenever a student makes any irregularity that could lead to a significant variation in the grade of an evaluation activity, it will be graded with a 0, regardless of the disciplinary process that can be instructed. In case of occurrence of various irregularities in the evaluation of the same subject, the final grade of this subject will be 0"*. ***Section 10 of Article 116. Results of the evaluation. (UAB Academic Regulations).***

g) Evaluation of the students doing the subject again

For those students doing the subject again, the grades of Activities ***A*** and ***C*** are not recorded from the previous course. Nevertheless, the note of the practices (Activity ***B***) will be transmitted from one course to another. The students repeating the subject follow the same norms of evaluation that any another student.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
1. Contributions in the in-class sessions of the course	10%	0	0	1, 3, 5, 6
2. Presentation of reports (practices)	40%	0	0	1, 2, 4, 3, 5, 6, 7

3. Final Exam	50%	2	0.08	2, 5, 8, 6, 7

Bibliography

Platform used for the communication with studentship: Moodle.

Basic bibliography

- W. Stallings (2004). Comunicaciones y redes de computadores, 7a ed. Pearson Prentice-Hall.
- D.E. Comer (2000). Internetworking with TCP/IP vol I, 4th ed. Prentice-Hall.
- J. L. Higues Sigüenza (1997). Fundamentos prácticos de comunicaciones, , Ed. Síntesis.
- J. M. Huidobro (2010). Telecomunicaciones. Tecnologías, Redes y Servicios., Ed. Ra-Ma.