Information Structure and Transmission

Code: 104751
ECTS Credits: 6

Degree	Type	Year	Semester
2503873 Interactive Communication	OB	3	1

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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Use of Languages

Principal working language: spanish (spa)

Some groups entirely in English: No

Some groups entirely in Catalan: Yes

Some groups entirely in Spanish: No

Prerequisites

No pre-requisites are needed.

Objectives and Contextualisation

The main objectives of the course are:

• Achieve a general vision of the concepts related to computer networks and the interconnection of heterogeneous networks, especially the Internet.

• Understand the operation of the protocols related to the operation of interconnected networks.

• Introduce virtual networks and cloud architectures and services.

• Understand how to apply security measures in network infrastructures.

• Present specific applications of heterogeneous networks and their particularities.

Competences

- Apply and integrate knowledge in the fields of social sciences, humanities and engineering to generate complex products and services tailored to citizens' needs.
- Determine and plan the technological infrastructure necessary for the creation, storage, analysis and distribution of interactive multimedia and social-networking products.
- Identify the characteristics of information systems from both a conceptual and a practical perspective.
- Manage time efficiently and plan for short-, medium- and long-term tasks.
- Search for, select and rank any type of source and document that is useful for creating messages, academic papers, presentations, etc.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.

Learning Outcomes

1. Consider security issues in the interconnection of networks and services.
2. Create different cloud services.
3. Cross-check information to establish its veracity, using evaluation criteria.
4. Design user-friendly networks based on end-users' needs and abilities.
5. Distinguish the salient features in all types of documents within the subject.
6. Interpret and discuss major concepts in the subject area.
7. Plan and conduct academic studies in the field of information structure and transmission.
8. Plan different types of networks.
9. Plan the interconnection of cloud services and virtual networks.
10. Plan the interconnection of local and wireless networks.
11. Submit course assignments on time, showing the individual and/or group planning involved.
12. Understand internet infrastructure.

Content

• Network architectures. OSI model

• Families of TCP / IP protocols.

• Types and basic technologies of networks.

• Network interconnection protocols.

• TCP / IP applications (DNS, DHCP, ...)

• Virtual private networks.

• Architectures and cloud services.

• Network security.

• Description of specific applications on networks.

Methodology

There is no clear distinction between theory sessions, problems and laboratory practice. These will alternate during the course as appropriate to the follow-up of the subject. In general, and for each topic to be discussed, theoretical concepts will be introduced and more applied activities such as problem solving or seminars will be carried out. It is recommended that the student review the materials corresponding to each session beforehand. Active participation in problem solving will be encouraged by participating in their resolution, presentation and debate in the classroom.

More specifically, during the course they will alternate:

• Theory sessions: master classes where the objective is to introduce the basic concepts that allow students to obtain a general vision and a good basis from which to develop the contents and competencies of the subject. Interactivity and active participation of the students will be encouraged.

• Problem sessions: sessions in which specific problems or exercises are raised, mainly of a practical nature and follow-up. These exercises should serve the student to achieve and practice the concepts and skills related to the subject. The problems are carried out in the general case individually.

• Practices: a problem that is broader than those dealt with in problem sessions such as a project or laboratory practice will be posed. This will be done and evaluated as a group. The number of practices to carry out will depend on their difficulty and length and may change in each course.

The detailed calendar with the content of the different sessions will be exposed on the day of presentation of the subject. It will also be posted on the Virtual Campus where students can find the detailed description of the

exercises and practices, the various teaching materials and any information necessary for proper monitoring of the subject. In the event of a change in the teaching modality for health reasons, the teaching staff will inform about the changes that will take place in the programming of the subject and in the teaching methodologies.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Laboratories practices	20	0.8	2, 5, 12, 8, 7, 9, 10, 1, 11
Specific task designated	8	0.32	4, 6, 8, 9, 1
Theorical class	20	0.8	3, 2, 5, 12, 4, 6, 8, 7, 9, 10, 1, 11
Type: Supervised			
Tutoring classes	6	0.24	3, 5, 6
Type: Autonomous			
Exam Preparation	14	0.56	3, 6, 7
Lab practices	12	0.48	2, 4, 8, 9, 10, 1, 11
Personal study	60	2.4	3, 5, 6

Assessment

The evaluation is continuous and responds to various types of evaluable tests following the academic regulations of the UAB. Each subject will have, at least, three different evaluative activities where none of them can represent more than 50% of the final grade.

The evaluation activities that can be used for the evaluation are:

• Theoretical exams: It will consist of theoretical questions and / or exercises. Minimum mark of each exam separately: 4.5.

• Problems and exercises/seminars: problem solving and exercises during problem sessions and / or the virtual campus. They can be practical or theoretical activities. It does not require minimum grades.

• Practices: group resolution of a practical case or practice during the course. Minimum mark of each practice separately: 4.5

To pass the course it is necessary that the evaluation of each of the parts exceeds the minimum required and that the final evaluation exceeds 5 points out of 10. The student who makes any irregularity (copying, plagiarism, identity theft, ...) This act of evaluation will be classified as 0. In the event of several irregularities, the final grade for the course will be 0.

In case of not passing the subject due to the fact that some of the evaluation activities do not reach the required minimum mark, the numerical mark of the file will be the lower value between 4.5 and the weighted average of the marks.

The grade of "not evaluable" will be awarded to students who do not participate in any of the evaluation activities.

The grade of "honors" will be awarded to students with a grade equal to or greater than 9 in order of the best final grade.

The theoretical and practical tests can be recovered in the form of a final recovery exam. In order to access the recovery exam, it will be necessary to have previously returned the suspended practices.

It may be the case of some small variation in the weighting of each part of the subject. If this were thecase, it would be communicated at the beginning of the course.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Class Attendance	10	2	0.08	3, 6
Lab practices	30	2	0.08	3, 2, 4, 8, 9, 10, 1, 11
Problems and exercises/seminars	15	2	0.08	5, 12, 4, 8, 9, 10
Theorical exams	45	4	0.16	3, 5, 12, 4, 8, 7, 9, 10, 1

Bibliography

William Stallings. Comunicaciones y redes de computadores, 7a edition (2004). Pearson Prentice Hall.

William Stallings, Lawrie Brown. Computer Security: Principles and Practice. 4a edition (2017). Pearson Education.

María del Carmen Barba Riquel. Redes Locales (2020). Editorial Síntesis.

Software

During the course, different software will be used depending on the activity carried out.