

Information Structure and Transmission

Code: 104751
ECTS Credits: 6

Degree	Type	Year	Semester
2503873 Interactive Communication	OB	3	1

Contact

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Teaching groups languages

You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

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

- Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
- 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.

- Display the ability to lead, negotiate and work in a team.
- Identify the characteristics of information systems from both a conceptual and a practical perspective.
- Introduce changes in the methods and processes of the field of knowledge to provide innovative responses to the needs and demands of society.
- 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.
- Take account of social, economic and environmental impacts when operating within one's own area of knowledge.

Learning Outcomes

1. Analyse a situation and identify its points for improvement.
2. Consider security issues in the interconnection of networks and services.
3. Create different cloud services.
4. Critically analyse the principles, values and procedures that govern the exercise of the profession.
5. Cross-check information to establish its veracity, using evaluation criteria.
6. Design user-friendly networks based on end-users' needs and abilities.
7. Distinguish the salient features in all types of documents within the subject.
8. Evaluate the impact of problems, prejudices and discrimination that could be included in actions and projects in the short or medium term in relation to certain people or groups.
9. Explain the explicit or implicit deontological code in your area of knowledge.
10. Identify situations in which a change or improvement is needed.
11. Interpret and discuss major concepts in the subject area.
12. Plan and conduct academic studies in the field of information structure and transmission.
13. Plan different types of networks.
14. Plan the interconnection of cloud services and virtual networks.
15. Plan the interconnection of local and wireless networks.
16. Propose projects and actions that are in accordance with the principles of ethical responsibility and respect for fundamental rights and obligations, diversity and democratic values.
17. Propose viable projects and actions to boost social, economic and environmental benefits.
18. Show leadership, negotiation and team-working capacity, as well as problem-solving skills.
19. Submit course assignments on time, showing the individual and/or group planning involved.
20. 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	3, 7, 20, 13, 12, 14, 15, 2, 19
Specific task designated	8	0.32	6, 11, 13, 14, 2
Theoretical class	20	0.8	5, 3, 7, 20, 6, 11, 13, 12, 14, 15, 2, 19
Type: Supervised			
Tutoring classes	6	0.24	5, 7, 11
Type: Autonomous			
Exam Preparation	14	0.56	5, 11, 12
Lab practices	12	0.48	3, 6, 13, 14, 15, 2, 19

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 (45% of the final grade): It will consist of theoretical questions and / or exercises. Minimum mark of each exam separately: 4.5.
- Problems and exercises/seminars (15% of the final grade): 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 (30% of the final grade): group resolution of a practical case or practice during the course. Minimum mark of each practice separately: 4.5
- Class attendance (10% of the final grade).

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.

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 the case, it would be communicated at the beginning of the course.

In the event that the student performs any irregularity that may lead to a significant variation of an evaluation act, this evaluation act will be graded with 0, regardless of the disciplinary process that could be instructed. In the event, that several irregularities occur in the evaluation acts of the same subject, the final grade for this subject will be 0.

This subject doesn't provide for the single assessment system.

SECOND ENROLMENT: In the case of the second enrolment, students can do a single synthesis test consisting of content exam and practical exercises/exam. The subject's grade will correspond to the grade of the synthesis test. The student who wants to take a single test must communicate it in writing to the coordinator of the subject.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
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Class Attendance	10	2	0.08	5, 9, 11, 16
Lab practices	30	2	0.08	4, 5, 3, 6, 10, 13, 14, 15, 2, 19, 17
Problems and exercises/seminars	15	2	0.08	1, 18, 7, 20, 6, 13, 14, 15, 8
Theoretical exams	45	4	0.16	5, 7, 20, 6, 13, 12, 14, 15, 2

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.