

Degree	Type	Year
Computer Engineering	OB	3
Computer Engineering	OT	4

## Contact

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## Teachers

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## Teaching groups languages

You can view this information at the [end](#) of this document.

## Prerequisites

The subject does not have any official prerequisite but it is highly recommended to have taken the subject of Internet and Web Development Technologies to have the basic knowledge of HTML, CSS, JavaScript, REST API and client/server architecture.

Students who have not passed *Fonaments de Computadors* or *Metodologia de la Programació* may have serious difficulties in this course.

It is highly recommended that you have completed *Sistemes Operatius*, *Laboratori de Programació*, *Informació i Seguretat*, *Xarxes*, *Enginyeria del Software*, and *Tecnologies de Desenvolupament per a Internet i Web*. Only basic knowledge of the previous subjects is necessary, therefore, it is not essential to have passed them, although it is advisable.

Students taking this course must have a sufficient command of English language to understand the written materials of the subject that may be in English. It will not be necessary to write in English. It will not be necessary to write in English in the groups in Catalan.

## Objectives and Contextualisation

This subject is framed within the increasingly everyday uses that society gives to web technologies. Knowledge of these technologies is at the frontier of innovation in business models, which aim to adapt to the use of new

technologies to improve their competitiveness and to offer added value.

The aim of this subject is to provide an overview of these technologies, and at the same time allow students to deepen their understanding of particular elements by fostering their innovative spirit.

## Competences

- Computer Engineering
- Acquire personal work habits.
- Communication.
- Have the capacity to conceive network technology based systems, applications and services, including Internet, Web, e-commerce, multimedia, interactive services and mobile computers.
- Have the capacity to employ user and organisation centred design methodologies for the development, evaluation and management of applications and systems based on information technologies that guarantee the accessibility, ergonomics and usability of systems.
- Have the capacity to select, design, deploy, integrate and manage the communications networks and infrastructures of an organisation.
- Have the capacity to select, design, deploy, integrate, evaluate, build, manage, exploit and maintain hardware, software and network technologies within the suitable parameters of cost and quality.

## Learning Outcomes

1. Apply user and organisation centred design methodologies to ICT systems.
2. Communicate efficiently, orally or in writing, knowledge, results and skills, both in the professional environment and before non-expert audiences.
3. Conceive applications and services based on network technologies , including the Internet , web, e-commerce , multimedia, interactive services and mobile computing .
4. Critically evaluate the work done.
5. Design and evaluate an integrated information technologies and communications.
6. Design ICT systems in consideration of accessibility, ergonomic and usability criteria.
7. Develop and manage social software applications.
8. Integrate and manage advanced multimedia and web technologies to increase operative capacity in an organisation.
9. Know about user and organisation centred design methodologies.
10. Know and understand the alternatives that allow the incorporation of electronic commerce in the commercial environment .
11. Manage time and resources available. Work in an organized manner .
12. Work independently.

## Content

- Topic 1: Advanced Web Technologies and Interactive Services  
Frameworks and libraries. Asynchronous websites.
- Topic 2: Protocols for Real-Time Communication in Web Applications  
WebSockets
- Topic 3: Routing in Web Applications Developed as Single Page Applications (SPA)
- Topic 4: Information Architecture  
Traffic analysis, Search Engine Optimization (SEO).
- Topic 5: Cross-Platform Technologies  
Frameworks for cross-platform application development.

## Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Problems and projects follow-up	14	0.56	1, 3, 10, 9, 7, 5, 6, 8
Seminars	2	0.08	1, 3, 10, 9, 7, 5, 6, 8
Theory classes	26	1.04	1, 3, 10, 9, 7, 5, 6, 8
Type: Supervised			
Graded knowledge-check problems	8	0.32	1, 4, 2, 9, 5, 6, 11, 12
Type: Autonomous			
Autonomous work in the practical project	40	1.6	1, 3, 10, 9, 7, 5, 6, 8, 12
Preparation and study	30	1.2	1, 3, 10, 9, 7, 5, 6, 8, 12
Preparation for examinations	20	0.8	1, 3, 10, 9, 7, 5, 6, 8, 12

The contents of this subject are organized in groups of different and sometimes distant thematic. It is essential to have a broad vision of the web technology landscape, while at the same time having the knowledge that is acquired when a student deepens its knowledge in one topic, simply because of the direct experience that this brings. That is why the subject combines these two differentiated methodologies, the first one designed to provide broad knowledge (base), while the second one is aimed at enlightening students in a specific technology (deepening).

The base part will be taught through theoretical classes and problems, which will be evaluated accordingly.

The deepening part will be carried out by students through formative activities, both theoretically with the realization of one or more papers, as well as applied with the realization of a practical project.

Transversal competences:

Competence	Methodology	Evaluation
T02 - Acquire personal work habits.		
T02.01 - Work independently.	This competence will be acquired, among others, through the graded knowledge-check assessments.	It will be evaluated through evaluation activity A2, B1 and B2.
T02.03 - Manage time and resources available. Work in an organized manner.	Activities developed in tutorial sessions require the development of a relatively complex project where it will be necessary to work in an organized way to carry it out successfully.	It will be evaluated through evaluation activity B2.
T02.08 - Critically evaluate the work done.		

Initially, students will carry out tutored self-learning exercises, which they will have to critically evaluate.

Students will have to complete one or more assignments. Students will have to review their work and be able to evaluate their content. Students will receive feedback on their result.

It will be evaluated through evaluation activities A1 and B1.

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#### T04 - Communication

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T04.01 -Communicate efficiently, orally or in writing, knowledge, results and skills, both in the professional environment and before non-expert audiences.

During the course, students will complete some graded assessments to measure their knowledge of the subject up to that point. These assessments will be done in the classroom, and students will subsequently receive feedback on their work.

It will be evaluated through evaluation activity A2.

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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.

## Assessment

### Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Evaluation of knowledge-check problems	20%	0	0	1, 4, 2, 3, 10, 9, 7, 5, 6, 11, 8, 12
Evaluation of the skills achievement in the different web programming technologies.	35%	5	0.2	1, 4, 3, 10, 9, 7, 5, 6, 11, 8, 12
Practical project evaluation	35%	2	0.08	1, 4, 3, 10, 9, 7, 5, 6, 11, 8
Self-evaluation of the consolidation of knowledge	10%	3	0.12	1, 3, 10, 9, 7, 5, 6, 8

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### Evaluation Process and Activities

Evaluation is divided into two main parts, detailed below along with their weight in the final grade:

#### A - Problems (25%)

- A1 - Classroom-tutored problems (5%)
- A2 - Individual practical exercises on computer (20%)

#### B - Practical Project (75%)

- B1 - Tutored self-learning exercises (5%)

- B2 - Activities developed in tutored sessions (labs) (35%)
- B3 - Individual theoretical-practical test on computer (practical exam) (35%)

The course will be considered passed if the final grade, resulting from the weighted average of the individual scores, is equal to or greater than 5 out of 10.

That is:

$$0.05 \times A1 + 0.2 \times A2 + 0.05 \times B1 + 0.35 \times B2 + 0.35 \times B3 \geq 5$$

To calculate the weighted average, the following minimum conditions must be met:

$$A1 > 0, B1 > 0, B2 \geq 5, \text{ and } B3 \geq 5$$

If B2 consists of two independent lab. exercises, both must be passed separately to calculate the average. If B2 results from averaging several individual exercises, B3 may consist of multiple parts, each corresponding to a lab. exercise. Each part of B3 must be passed individually. Any failed part of B3 will result in a score of 0 for the corresponding part of B2. Additionally, all B2 exercises must be submitted in order to participate in B3.

The knowledge-check problems (A2), classroom problems (A1), and the individual practical test (B3) must be done individually. Self-learning exercises (B1) and labs. (B2) are done in pairs.

### Retakes

Students may request to retake the practical project (B2) and the individual practical test (B3), and other parts, provided they attended at least 80% of sessions. A1, A2, and B1 cannot be retaken. New grades will replace the previous ones, unless the new score is lower.

According to academic regulations (Article 261 ter. 2), to be eligible for retakes, students must have been assessed on activities that together count for at least 67% of the course. Therefore:

B3 cannot be retaken if the student did not participate in B1, B2, or A1.

### Plagiarism and Other Irregularities

Any irregularity that affects the evaluation outcome will result in a grade of 0 for that activity and cannot be retaken. If the activity is required to pass the course, the course will be failed with no opportunity to recover. Irregularities include:

- Total or partial copying of assignments, reports, etc.
- Letting others copy your work.
- Submitting group work not fully completed by group members.
- Submitting third-party material as your own, including translations or adaptations.
- Having communication devices during individual assessments.

In case of plagiarism, the maximum grade will be 3.0. For group activities, the penalty will apply to the entire group, even if some members were unaware of the misconduct.

In summary: copying, letting others copy, or plagiarism equals a fail with a grade lower than 3.5, making it impossible to pass via compensation.

### Special Grades (Honors and not evaluable)

A maximum of X honours distinctions may be awarded, where:

$X = \max(1, \text{floor}(\text{number of students} / 20))$ , based on the following criteria:

- Only students with a final grade of 9 or higher are eligible.
  - Priority is given to those with the highest grades.
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#### Final Grades and Failing the Course

If any block (A or B) does not reach the minimum required grade, the final grade will be the lower of 4.5 and the weighted average. A grade of "Not Evaluable" will be given to students who do not participate in any evaluation activity. In case of irregularities, the final grade will be the lower of 3.0 and the weighted average.

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#### Review of Grades

Regular grade review begins at least 24 hours after grades are published, or on the same day if previously announced. If the student does not attend the review session, no further review will be allowed.

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#### Validation of Previous Grades

Students may request to validate individual grades from previous editions of the same course if they can demonstrate they achieved the learning outcomes. B2 will not be validated if the B3 grade does not support it. A2 will not be validated. In cases of plagiarism, no part of the course may be validated.

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#### Attendance to laboratory

Attendance to laboratory sessions is mandatory, except for students opting for single assessment. If attendance is below 80% (fewer than 10 sessions), the student will receive a "Not Assessable" grade for the practical part and cannot resit.

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#### Dates and Communication

Assessment and submission dates will be published on the course forum and may be adjusted in case of incidents. All updates will be communicated via the forum:

<https://cv.uab.cat>, unless otherwise indicated.

Communication with the teaching staff will take place in class or via virtual campus forums.

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#### Materials

The course is 100% practical. Theory classes will take place in a regular classroom, and students must bring a laptop. The university will provide one to those who do not have access. Problem classes will be held in computer room B (Q1/1019).

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#### Single Evaluation

Although the course allows for single evaluation, it is not recommended. Theoretical and practical concepts in front-end and back-end technologies require continuous work for proper assimilation. It is a semester-long effort where theory, problems, and practicals combine to build knowledge incrementally. Even students with prior experience may find some concepts challenging due to the depth covered.

Assessment activities and their weights are the same as in continuous assessment. A2 is not assessable in single assessment format.

## Submissions:

- A1 and B1: due the day before the B3 exam at 23:59h
- B2: due on the same day as the B3 exam
- B2 retake: will take place on the same day as the B3 retake

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## Restricted Use of AI

Use of Artificial Intelligence (AI) tools is allowed only for support tasks such as searching for information or explanations for practical activities.

Students must clearly identify the parts generated using AI, specify the tools used, and explain how these tools influenced the process and outcome. Lack of transparency will be considered academic dishonesty and may result in partial or total penalties, or more serious sanctions in severe cases.

## Bibliography

- <https://nodejs.org/en/docs>
- <https://vuejs.org/guide/>
- C. Wodtke and A. Govella, Information Architecture: Blueprints for the Web (2nd Edition). New Riders Press, Feb. 2009.
- P. Morville, L. Rosenfeld, and L. Rosenfeld, Information architecture for the World Wide Web. O'Reilly, Nov. 2007.
- J. Tidwell, Designing Interfaces. O'Reilly Media, Dec. 2010.

## Software

Various web development tools will be used: a code editor, a web browser, one or more interpreters of a web-oriented programming language, others.

## Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	451	English	second semester	morning-mixed
(PAUL) Classroom practices	452	Catalan	second semester	morning-mixed
(PAUL) Classroom practices	453	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	451	Catalan	second semester	morning-mixed

(PLAB) Practical laboratories	452	English	second semester	morning-mixed
(PLAB) Practical laboratories	453	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	454	English	second semester	morning-mixed
(PLAB) Practical laboratories	455	Catalan	second semester	morning-mixed
(PLAB) Practical laboratories	456	Catalan	second semester	morning-mixed
(TE) Theory	450	Catalan	second semester	morning-mixed