Web Systems and Technologies

Code: 102750
ECTS Credits: 6

2024/2025

Degree	Type	Year
2502441 Computer Engineering	OB	3
2502441 Computer Engineering	OT	4

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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 ICT systems in consideration of accessibility, ergonomic and usability criteria.
6. Design and evaluate an integrated information technologies and communications.
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

- Lecture 1: User-centered design
    - Comparing alternatives and mixing.
- Lecture 2: Information architecture
    - Information Foraging, design patterns, information organization, traffic analysis and Search Engine Organization (SEO).
- Lecture 3: Advanced web technologies and interactive services
  Frameworks and libraries.

- Lecture 4: Mobile computing
    - Design aspects: devices and limitations. Multi-platform development, app markets, near-field communication.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Problems and projects follow-up	14	0.56	1, 3, 10, 9, 7, 6, 5, 8
Seminars	7	0.28	1, 3, 10, 9, 7, 6, 5, 8
Theory classes	26	1.04	1, 3, 10, 9, 7, 6, 5, 8
Type: Supervised			
Supervised activities in the classroom	18	0.72	1, 3, 10, 9, 7, 6, 5, 8, 12
Type: Autonomous			
Autonomous work in the practical project	35	1.4	1, 3, 10, 9, 7, 6, 5, 8, 12
Preparation and study	20	0.8	1, 3, 10, 9, 7, 6, 5, 8, 12
Preparation for examinations	20	0.8	1, 3, 10, 9, 7, 6, 5, 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 papers that students must prepare independently.	It will be evaluated through evaluation activity A1.
T02.03 - Manage time and resources available. Work in an		It will be evaluated

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.	through evaluation activity C2.
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. It will be essential that the documents delivered are of high technical quality. Students will have to review their work and be able to evaluate their content. Students will receive feedback on their ability to critically evaluate.	It will be evaluated through evaluation activities A1 and C1.
T04 - Communication		
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, the necessary classroom hours will be devoted to learn to prepare a written document of high technical quality. Students will have to prepare one or more papers, where they will have to practice the knowledge they have obtained, and will subsequently receive feedback on this task.	It will be evaluated through evaluation activity A1.

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

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Evaluation of supervised work	15%	0	0	1, 4, 2, 3, 10, 9, 7, 6, 5, 8, 12
Evaluation of the skills achievement in the different web programming technologies.	30%	5	0.2	1, 4, 3, 10, 9, 7, 6, 5, 11, 8, 12
Practical project evaluation	35%	2	0.08	1, 4, 3, 10, 9, 7, 6, 5, 11, 8
Theory Evaluation	20%	3	0.12	1, 3, 10, 9, 7, 6, 5, 8

Evaluation process and activities

The assessment is divided into three main parts. These are indicated below, showing in parenthesis its weighting in the overall grade.

A - Research assignments (15%)

A1 - One or more written papers, or one or more oral presentations. (15%)

B - Theory (20%)

B1 - Tutored problems in the classroom. (5%)

B2 - Theory examination. (15%)

C - Applied project (65%)

C1 - Tutored self-learning exercises. (5%)

C2 - Lab assignments. (30%)

C3 - Applied examination. (30%)

The course is passed by obtaining an overall grade greater than or equal to 5 out of 10.

I.e., 0.15 * A1 + 0.05 * B1 + 0.15 * B2 + 0.05 * C1 + 0.3 * C2 + 0.3 * C3 >= 5.

In addition, individual grades must exceed (>=) 5 out of 10 for item A1 must exceed (>) 0 out of 10 for items B1, B2 and C1, and must exceed (>=) 5 out of 10 for items C2 and C3.

I.e., A1 >= 5 i B1 > 0 i B2 > 0 i C1 > 0 i C2 >= 5 i C3 >= 5.

In the event that the item C2 has two individual excercises both of them need to be passed individually to calculate the mean between the two to calculate the C2's mark.

In the event that the grade obtained for item C2 is the result of two or more individual grades, the C3 applied examination may consist of two or more parts, each one related to one of the individual assignments. In this case, all applied examinations must be passed individually. The grade of each part in C2 equivalent to a failed part in C3 will be 0. It will be necessary to have delivered all the individual lab assignments related to item C2 inorder to be able to participate in the applied examination/s.

Students, inagreement with the subject professors and provided that enough resources are available, may opt to replace some assessment method for an alternative much more demanding evaluation method (e.g., change a written paper for an oral presentation of greater difficulty).

The paper (A1), the problems (B1), the theoretical-practical theory test (B2) and applied exam (C3) will be done individually. If the paper is replaced by a presentation, it will be done in pairs. Self-learning exercises (C1) and practices (C2) will be done in pairs.

Reassessment

The student will only be able to request a reassessment of items A1, C2 (if the student has attend at least at the 80% of the lab sessions), C3. The marks obtained through reassessment will only replace the previously obtained ones is they are higher.

In accordance with the academic regulations (Article 261 ter.2), to be able to request a reassessment, students must have been previously evaluated in activities whose combined weight is at least 67%.

Plagiarism and other irregularities

Notwithstanding other disciplinary measures deemed appropriate, and in accordance with the academic regulations in force, assessment activities will receive a zero whenever a student commits academic irregularities that may alter such assessment. Assessment activities graded in this way and by this procedure will not be re-assessable. If passing the assessment activity or activities in question is required to pass the subject, the awarding of a zero for disciplinary measures will also entail adirect fail for the subject, with no opportunity to re-assess thisin the same academic year. Irregularities contemplated in this procedure include, among others:
- the total or partial copying of a practical exercise, report, or any other evaluation activity;

- allowing others to copy;
- presenting group work that has not been done entirely by the members of the group;
- presenting work asone's own any materials prepared by a third party, even if these are translations or adaptations, including work that is not originalorexclusively that of the student;
- having communication devices (such as mobile phones, smart watches, etc.)accessible during theoretical-practical assessment tests (individual examinations).

In case of irregularity, the overall grade for this subject will be at most 3.0.

Honors and not evaluable

A maximum of X students will be able to pass the course with honors, where X = max (1, floor (number of students / 20)), with the following indicative criteria:
- as many as possible academic honors will be awarded;
- only students having obtained a final grade of at least 9 will be considered;
- academic honors will be assigned to students with highest grades.

The overall grade for students not passing the subject will be capped as follows:

- For students not reaching the minimum grade required for any assessment activity, overall grade will be capped at 4.5.

- For students having committed evaluation irregularities, overall grade will be capped at 3.0.

Students not having participated in any of the assessment activities will obtain an overall grade of "not evaluable".

Assessment review

The ordinary review of the assessment activities will begin at least twenty-four hours after grades have been made public, or on the same day, if previously announced publicly. No reviews will be possible at later dates.

Validations

The students coursing this subject for a second timewill be able to request the validation of their previous grades. Professors will resolve validations favorably when, in their opinion, the student has demonstrated previously and reliably the learning outcomes obtained. In any case,professors will unfavorablyresolve the validation of part C2 when the grade obtained in partC3 is not in accordance with the grade obtainedin part C2 (either partially or totally). That is to say, it will be necessary to have passed the practical examinations to validate the practical assignments.

No validation will be possible for students having failed due to plagiarism or other irregularities.

Labs attendance

The labs attendance is mandatory, except for the students under the single assessment formula. If the labs attendance is less thatn 80% (wich would be attendint to less than 10 sessions) the student would have a "Not evaluable" mark for the labs and would not have the chance to reassess them.

Dates and communications

Assignment deadlines will be published, unless indicated otherwise, in the Campus Virtual https://cv.uab.cat. Deadlines may be subject to changes, but changes will be communicated in the online forum of the subject.

The teaching staff will communicate with the students in the classroom, during office hours, and through the forums available in the Campus Virtual.

Material

This subject is 80% practical, for this reason the theory classes will be held in the normal classroom, but the students will need to bring a laptop. For students who do not have one, the center will provide them with a laptop that they can use during the theory session. The problems classes will be held in the computers room B (Q1/1019).

Single Assessment Evaluation

This subject considers the unique evaluation system, but it is not recommended at all. The theoretical-practical concepts of front and back-end technologies should be practiced on in a weekly base in order to assimilate them. It is an ongoing work throughout the semester, where theory, problems, and practical exercises intertwineto allow individuals to incrementally build knowledge. Even peoplewho have worked with these technologies may find the acquisition of some basic concepts challenging, given the level of detail they entail.

- The evaluation activities and their weight are the same as in the case of continuous evaluation.
- The same assessment review system as for continuous evaluation will be applied.
- The review of the final grade follows the same procedure as continuous evaluation.
- The submissions of the evaluation activities: A1, B1, C1, and C2, will be made on the same day as C3 (practical exam). The reassessment of these activities willalso coincide with the C3 reassessment date. The theoretical exam (B2) will coincide with the date of this test for the continuous evaluation. This is because it is not possible to have B2 and C3 on the same day due to the strain it would impose on the students.

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.

Language list

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	451	English	second semester	morning-mixed
(PAUL) Classroom practices	452	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	English	second semester	morning-mixed
(TE) Theory	450	Catalan	second semester	morning-mixed