COURSE DATA

DATA SUBJECT

Code: 44827
Name: Client-Side Programming and Visualisation
Cycle: Master's Degree
ECTS Credits: 4
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
2234 - Master's Degree in Web Technology, Cloud Computing and Mobile Applications	Escola Tècnica Superior d'Enginyeria	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2234 - Master's Degree in Web Technology, Cloud Computing and Mobile Applications	Client-Side Development and Graphics	COMPULSORY

COORDINATION

OLANDA RODRIGUEZ RICARDO

SUMMARY

The subject aims to give an overview of the development languages that are used for programming web applications on the client side. Markup languages and style sheets will be reviewed. In addition, we will deepen the development of web applications using low level scripting languages and high level programming libraries.

It is intended that the student will be able to handle client-side programming and to develop applications that include data storage and visualization.

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PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

COMPETENCES / LEARNING OUTCOMES

2234 - Master's Degree in Web Technology, Cloud Computing and Mobile Applications

Ability to analyze the storage needs that arise in an environment and to carry out the implantation of a solution in the fields of Web technologies, cloud computing and mobile applications.

Ability to apply acquired knowledge and solve problems in new or little-known environments within broader and multidisciplinary contexts, being able to integrate this knowledge.

Ability to design, develop and maintain Web applications using technologies and frameworks both in the client and in the server sides.

Ability to understand and apply the operation and organization of component models, intermediary software and services.

Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.

Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.

Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.

Students should demonstrate self-directed learning skills for continued academic growth.

Students should possess and understand foundational knowledge that enables original thinking and research in the field.

To foster, in academic and professional contexts, technological, social or cultural advancement within a society based on In knowledge and respect for: a) fundamental rights and equal opportunities between men and women; b) principles of equal opportunities and universal accessibility of persons with disabilities; and, c) the values of a culture of peace and democratic values.

DESCRIPTION OF CONTENTS

1. Review HTML5, CSS and JavaScript

- HTML5, Javascript and CSS review. This knowledge must have been previously acquired by the student.
- Special attention will be paid to the management of the DOM through Javascript.
- An introduction to AJAX technology will be made.
- The basic elements of the Bootstrap content manager will be displayed.

2. JavaScript Frameworks

- A study of the most used javascript frameworks will be carried out.
- First, the JSON text format will be explained.
- Next, the functionality of the JQuery Javascript library will be reviewed.
- Finally, the Angular framework will be studied, where the following topics will be covered:
1. Introduction to Angular: Development environment, npm, node.js, package.json, Angular cli, angular Material, Visual Studio Code, etc.
2. Angular Elements: Components, Directives, Data-binding, Services, Dependency Injection.
3. Angular Router: Configuration, route definition, etc.
4. Angular Forms: forms based on template, "reactive" forms, validation of forms.
5. Asynchronous Communications: Promise, Observable, RxJS.
6. Directives: Structural directives, attribute directives.
7. Webpack.
8. Animations.
9. Application testing: Jasmine, Karma, Protractor.

3. Asynchronous communication and WebSockets

- A study will be made of the existing mechanisms to establish connections asynchronously: HTTP and REST.
- WebSockets and its use on the client side will be reviewed.

4. Client-side storage

We will study the different storage mechanisms on the client side that includes HTML5: Web Storage, IndexedDB.

5. Frameworks for data visualization

We will work with the d3.js library for data visualization.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theoretical and practical classes	28,90
Laboratory	11,10
Total hours	**40,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours

Attendance at other activities	0,00
Individual or group project	6,00
Independent study and work	35,00
Preparation of lessons	16,00
Preparation for assessment activities	3,00
Resolution of case studies	0,00
Total hours	**60,00**

TEACHING METHODOLOGY

- Theory class
- Problem resolution
- Project-oriented learning

EVALUATION

The assesment modalities used in this subject are:

SE1: Online assessment and/or degree of participation

SE2: Assessment of problems, works, reports and/or memories

SE4: Exam or face-to-face assessment

SE6: Assessment of laboratory

- First call:

10% Attendance and participation in class. (SE1).

30% Realization of works, problems, ... (SE2).

30% Completion of laboratory practices (SE6)

30% Face-to-face assessment (SE3): Face-to-face examination or defense of an individual project where a minimum grade of 5 must be obtained.

- In the second call, an exam must be carried out where a minimum grade of 5 must be obtained.

All the undelivered works (SE2 and SE6) sould be submitted.

The percentages will be as follows:

30% Realization of work, problems, ... (SE2).

30% Completion of laboratory practices (SE6)

40% Face-to-face assessment (SE4): Face-to-face examination or defense of an individual project where a minimum grade of 5 must be obtained.

The grading system is specified at the following link:

http://www.uv.es/uvweb/universidad/es/estudios-postgrado/informacion-administrativa-postgrado/permanencia-calificaciones/calificaciones-1285897761928.html

The applicable regulations can be found at the following link:

http://www.uv.es/uvweb/universidad/es/estudios-grado/informacion-academica-administrativa/normativas/normativas-universidad-valencia-1285850677111.html

REFERENCES

- Pro HTML5 with CSS, JavaScript, and Multimedia, (Complete Website Development and Best Practices) Authors: Mark J. Collins ISBN: 978-1-4842-2462-5 (Print) 978-1-4842-2463-2 (Online)
- Pro Angular Authors: Adam Freeman ISBN: 978-1-4842-2306-2 (Print) 978-1-4842-2307-9 (Online)

- WebSocket Essentials Building Apps with HTML5 WebSockets Authors: Varun Chopra Web ISBN-13: 978-1-78439-500-1 Print ISBN-13: 978-1-78439-675-6