

## 340456 - PMUD-I7P23 - Cross-Platform and Distributed Programming

Coordinating unit:	340 - EPSEVG - Vilanova i la Geltrú School of Engineering
Teaching unit:	723 - CS - Department of Computer Science
Academic year:	2019
Degree:	BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2018). (Teaching unit Optional)
ECTS credits:	6
Teaching languages:	Catalan

### Teaching staff

Coordinator: Esteve Cusine, Jordi

Others: Esteve Cusine, Jordi

### Opening hours

Timetable: See the current timetable in the EPSEVG people list:

<https://web3.epsevg.upc.edu/coneix-lepsevg/directori-epsevg>

### Prior skills

Basic knowledge of programming (variables, functions, alternative instructions with if, repetitive instructions with while or for).

### Requirements

Have been passed the FOPR course (computer students) or INFO course (students from other degrees).

Have a laptop.

### Degree competences to which the subject contributes

Specific:

I\_CEFC11. CEFC11. Knowledge and application characteristics, functions and structure of Distributed Systems, Computer Networks and the Internet and design and implement applications based on them.

I\_CEFC17. CEFC17. Ability to design and evaluate computer interfaces that guarantee accessibility and usability of informatic systems, services and applications.

I\_CEIS3. CEIS3. Ability to solve problems of integration in terms of strategies, standards and available technologies.

I\_CETI3. CETI3. Ability to set up methodologies focused on user and development organization, valuation and application management and systems based on information technologies which secure ergonomic accessibility and use of

I\_CETI6. CETI6. Ability to design systems, applications and services based on network technologies, including internet, website, e-commerce, multimedia, interactive services and mobile computing.

Transversal:

04 COE N2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.

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04 COE N3. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.

06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

07 AAT. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.

### Teaching methodology

Presentation in the classroom, in participatory lessons, of concepts associated with the subjects.  
Performing individually practices in attendance and non-attendance way.

Mainly workshop, always developed in front of the student's computer laptop. The student is responsible for his own learning.

### Learning objectives of the subject

1. Learn the basic principles of Internet (IP, URL, protocols, client/server).
2. Understanding the implications behind the fact of developing a cross-platform application.
3. Learning to program web multiplatform and responsive applications with HTML5, CSS3 and Java-Script using libraries.
4. Understanding how distributed applications work on internet, what are Web Services, and knowing in detail the REST services and the RESTful APIs.
5. Learning how to program web servers that offer a web application or a RESTful APIs.
6. Learning how to program web clients that interact with a RESTful API.
7. Obtain the resources to be up to date in this quickly changing world.

### Study load

Total learning time: 150h	Hours large group:	30h	20.00%
	Hours medium group:	0h	0.00%
	Hours small group:	30h	20.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

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### Content

<p>Introduction to the Internet and multiplatform programming</p>	<p>Learning time: 4h Theory classes: 2h Self study : 2h</p>
<p>Description: Theoretical concepts of Internet (URL, protocols, client/server) and multiplatform programming based on Internet standards (HTML5, CSS3, Java-Script).</p>	
<p>Practice 1. HTML5</p>	<p>Learning time: 10h Laboratory classes: 6h Self study : 4h</p>
<p>Description: Development of basic web pages with HTML5. Discovering the new features offered by HTML5.</p>	
<p>Practice 2: CSS3</p>	<p>Learning time: 4h Laboratory classes: 2h Self study : 2h</p>
<p>Description: Giving style to web pages with CSS3. Discovering the new features offered by CSS3.</p>	
<p>Practice 3: Java-Script</p>	<p>Learning time: 16h Laboratory classes: 8h Self study : 8h</p>
<p>Description: Discovery of Java-Script programming language and its features. How Java-Script can modify the DOM (Document Object Model) of an HTML document. Practice for developing an interactive static website programmed in Java-Script.</p>	
<p>Practice 4: jQuery library</p>	<p>Learning time: 8h Laboratory classes: 4h Self study : 4h</p>
<p>Description: Features and advantages of jQuery library. Development of a small project with HTML5, CSS3 and Java-Script using jQuery.</p>	

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Practice 5: Bootstrap library	Learning time: 8h Laboratory classes: 4h Self study : 4h
Description: Development of a small project about an adaptive and responsive website with Bootstrap.	
Distributed Programming	Learning time: 4h Theory classes: 2h Self study : 2h
Description: Theoretical aspects of Distributed Programming: Types of software architectures, how distributed applications work on the Internet, Web Services (in particular REST services and RESTful APIs).	
Practice 6. Servidor web with NodeJS	Learning time: 4h Laboratory classes: 2h Self study : 2h
Description: Programming web servers with NodeJS. Package management with npm (Node Packet Manager).	
Practice 7. Framework Express for NodeJS	Learning time: 16h Laboratory classes: 8h Self study : 8h
Description: Web servers programming with an MVC architecture (Model-View-Controller) using the Express framework for NodeJS. Concepts of templates, routes and middlewares.	
Practice 8. Web server with RESTful API	Learning time: 8h Laboratory classes: 4h Self study : 4h
Description: Programming of web servers that offer a RESTful API with NodeJS and Express.	

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Practice 9. Web client connected to a RESTful API	Learning time: 8h Laboratory classes: 4h Self study : 4h
Description: Programming a web client with that connects to the RESTful API made in the previous practice.	
Final project	Learning time: 30h Laboratory classes: 0h Self study : 30h
Description: Develop a web service with a RESTful API that allows you to manage a specific need. Develop a web application that uses this service.	
Research work	Learning time: 30h Theory classes: 6h Self study : 24h
Description: Research work around multiplatform and distributed programming (for example on some client or server web technology we have not seen in class). There will be a public presentation in class (20-30 min. exposure + 10 min. questions).	

### Qualification system

60% Work done in classroom and evaluation of the applications submitted (30% work during the course, 30% final work).

30% Preparation and public presentation of a technical work analyzing the state of the question.

10% Participation and motivation (if any additional activity is necessary for this last 10%, it may be in the form of a control or mini-test).

Because 100% of the subject is evaluated with practical work, there is not a final control or a review control in the form of a written test.

### Bibliography