

## Course guide

### 330244 - IU - User Interfaces

**Last modified:** 04/05/2023

**Unit in charge:** Manresa School of Engineering  
**Teaching unit:** 750 - EMIT - Department of Mining, Industrial and ICT Engineering.

**Degree:** BACHELOR'S DEGREE IN ICT SYSTEMS ENGINEERING (Syllabus 2010). (Optional subject).

**Academic year:** 2023    **ECTS Credits:** 6.0    **Languages:** Catalan

#### LECTURER

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**Coordinating lecturer:** Llusà Serra, Aleix

**Others:**

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Specific:**

1. Know the architecture of the user interfaces.
2. Know the theoretical foundations that surround user interfaces.
3. Know the concept of usability to delve into the design of efficient, secure and accessible user interfaces.
4. Ability to design and implement user interfaces for multiple mobile devices using hybrid applications.
5. Ability to design and implement web user interfaces through HTML, CSS and JS languages.
6. Ability to design and implement back-ends with services for user interface front-ends. Ability to connect front-ends to external APIs.
7. Develop skills to choose the appropriate architecture and technologies in user interface modeling.

**Transversal:**

8. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.
9. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

#### TEACHING METHODOLOGY

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#### LEARNING OBJECTIVES OF THE SUBJECT

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At the end of the course, the student:

1. You will be able to design user interfaces.
2. You will be able to create programs to manage the back-end of the interfaces with connection to databases.
3. You will be able to design the front-end of an interface and connect it to the back-end.
4. You will be able to integrate the design of an interface in the development of a mobile application.
5. You will know the standard technologies of web interfaces.
6. Detect one's own training needs and acquire them using the services and tools available.

## STUDY LOAD

Type	Hours	Percentage
Hours small group	30,0	20.00
Hours large group	30,0	20.00
Self study	90,0	60.00

**Total learning time:** 150 h

## CONTENTS

### TOPIC 1: Theoretical concepts of user interfaces

**Description:**

This topic presents the basic theoretical concepts of user interfaces: usability, apprehension, efficiency, security, interface architecture, internationalization and localization, user testing and accessibility.

**Related activities:**

All that appear.

**Full-or-part-time:** 42h

Theory classes: 9h

Laboratory classes: 9h

Self study : 24h

### TOPIC 2: Front-end for web user interfaces

**Description:**

This topic introduces the concepts required to design the front-end of web user interfaces. It delves into HTML, CSS and JS web technologies.

**Related activities:**

All that appear.

**Full-or-part-time:** 36h

Theory classes: 2h

Laboratory classes: 12h

Self study : 22h

### TOPIC 3: Back-end for web user interfaces

**Description:**

This topic introduces the concepts required for designing the back-end part of web user interfaces. It also includes connection architectures from the front-end to the back-end APIs and databases.

**Related activities:**

All that appear.

**Full-or-part-time:** 36h

Theory classes: 2h

Laboratory classes: 12h

Self study : 22h



#### TOPIC 4: User interfaces for mobile devices

**Description:**

It presents current trends in user interface design for mobile devices: responsive applications, native applications and hybrid applications. The student designs a hybrid mobile application and checks the operation on its personal device.

**Related activities:**

All that appear.

**Full-or-part-time:** 36h

Theory classes: 2h

Laboratory classes: 12h

Self study : 22h

## ACTIVITIES

#### ACTIVITY 1: MASTER AND PARTICIPATORY CLASSES

**Description:**

They are face-to-face classes specifically dedicated to understanding the subject's contents, especially those of a rather theoretical nature.

**Material:**

The supporting materials are:

- Recommended basic bibliography.
- Published teaching material.

**Full-or-part-time:** 12h

Theory classes: 12h

#### ACTIVITY 2: CLASS OF PROBLEMS

**Description:**

They are face-to-face classes specifically dedicated to problem solving. They are made in the laboratory and are complementary to the activity in the laboratory. They are classes that require student participation.

**Specific objectives:**

The whole subject.

**Material:**

The supporting materials are:

- Basic bibliography.
- Collection of problems of the subject.

**Full-or-part-time:** 12h

Laboratory classes: 12h

### ACTIVITY 3: LABORATORY CLASS

**Description:**

The student's objective is to solve small projects related to the subject's syllabus. For its realization, an autonomous learning time is required.

**Material:**

The supporting materials are:

- Manual of practices.
- Laboratory equipment.
- Recommended bibliography.
- Published teaching material.

**Delivery:**

Periodically, the results of the different activities carried out are delivered.

It will be necessary to develop certain activities personally to achieve the objectives of the subject. These exercises are computed under heading A in the final grade.

**Full-or-part-time:** 41h

Laboratory classes: 26h

Self study: 15h

### ACTIVITY 4: CONTENT STUDY

**Description:**

The study of the contents is the individual or collective activity that leads to understanding and assuming the knowledge, vocabulary and techniques that are part of the contents of the subject.

**Material:**

The supporting materials are:

- Collection of problems of the subject.
- Recommended basic bibliography.
- Published teaching material.

**Full-or-part-time:** 20h

Self study: 20h

### ACTIVITY 5: PERFORMING EXERCISES

**Description:**

It is an activity that the student does independently and that consists of solving programming problems, generally without the need for computer support.

**Material:**

The supporting materials are:

- Recommended basic bibliography.
- Published teaching material.
- Collection of problems of the subject.

**Delivery:**

The activity involves the delivery during the course of some problems that are conveniently corrected and are part of the evaluation of the subject. These exercises are computed under heading A in the final grade.

**Full-or-part-time:** 25h

Self study: 25h

## ACTIVITY 6: PROJECT

### Description:

The course requires a medium-sized programming project. The project consists of the implementation and testing of an application whose design is given by the statement. This activity is carried out in a group and also involves the writing of a technical report on the program.

This activity has the nature of synthesis of all the knowledge of the subject.

### Material:

The supporting materials are:

- CCEPSEM computer laboratory service.
- Statement and script of the project.
- Example of report.
- Personal notes and other support material for the course.

### Delivery:

As a result of the activity, the following are delivered:

1. The project report.
2. The source code resulting from the project.

The delivery is made with the presence of the entire work team. The report and the result that has been reached in the preparation of the project are evaluated. The result constitutes the P-value of the final grade.

### Full-or-part-time: 28h

Theory classes: 1h

Laboratory classes: 7h

Self study: 20h

## ACTIVITY 7: EXAM

### Description:

The subject includes a final exam that consists of a set of exercises to be solved individually on paper without the support of any type of material and in a limited time.

This activity includes a personal test preparation time.

### Material:

The individual solution of the exam is delivered and it is evaluated. The result contributes the F concept in the total evaluation.

### Full-or-part-time: 12h

Theory classes: 2h

Self study: 10h

## GRADING SYSTEM

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The qualification is made based on 3 elements:

1. The evaluation of the autonomous work of the student (A). This component contains both the progress made in the theoretical and practical aspects. Its measurement is carried out based on compulsory exercises delivered during the course.
2. The evaluation of the project (P). It is carried out from a face-to-face delivery of the course project that may entail a public presentation and the preparation of a report.
3. The final evaluation (F). It is done through a final exam that is global in nature and integrates all the knowledge and skills acquired during the course.

From these elements the final grade is calculated with the following weightings:

$$\text{Final} = 0.40A + 0.30P + 0.30F$$

## EXAMINATION RULES.

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The activities will be carried out following the uses and customs of academic work and, in particular, the following guidelines will be respected:

1. Those activities that are explicitly declared as individual, whether in person or not, will be carried out without any collaboration from other people.
2. The dates, formats and other delivery conditions that are set will be mandatory.
3. The use of the computer laboratory will be reserved exclusively for academic activities and in no case may abuse be made.

## BIBLIOGRAPHY

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### Basic:

- Morville, Peter; Rosenfeld, Louis. Information architecture: for the web and beyond [on line]. 4. Sebastopol, CA: O'Reilly, 2015 [Consultation: 30/10/2020]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=4333758>.
- Schmitt, Christopher ; Simpson, Kyle. HTML5 Cookbook [on line]. Sebastopol, Calif.: O'Reilly, 2012 [Consultation: 31/05/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=801432>. ISBN 9781449396794.
- Powers, Shelley. JavaScript cookbook [on line]. 2a edició. Sebastopol, CA: O'Reilly, 2015 [Consultation: 27/05/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=1931360>. ISBN 9781491901885.
- Norman, Donald A. The Design of everyday things. Revised and expanded edition. Cambridge: MIT Press, 2013. ISBN 9780262525671.

## RESOURCES

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### Other resources:

- Teaching material published in Open CourseWare of the subject
- W3C and others. WebPlatform. 2012-2015. <https://www.webplatform.org/> />- Apache Software Foundation. Apache Cordova Documentation. 2012-2017. <http://cordova.apache.org/docs/en/latest/> />