



INTERNATIONAL  
CAMPUS OF  
EXCELLENCE

COORDINATION PROCESS OF  
LEARNING ACTIVITIES  
PR/CL/001



E.T.S. de Ingenieros  
Informaticos

# ANX-PR/CL/001-01

## LEARNING GUIDE

### SUBJECT

**103000603 - Challenges for accessible computing for people with functional diversity**

### DEGREE PROGRAMME

10AM - Master Universitario En Ingenieria Del Software

### ACADEMIC YEAR & SEMESTER

2018/19 - Semester 1

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### Learning guide

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## 1. Description

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### 1.1. Subject details

|                                       |  |
|---------------------------------------|--|
| <b>Name of the subject</b>            | 103000603 - Challenges for accessible computing for people with functional diversity |
| <b>No of credits</b>                  | 4 ECTS   |
| <b>Type</b>                           | Optional   |
| <b>Academic year of the programme</b> | First year   |
| <b>Semester of tuition</b>            | Semester 1   |
| <b>Tuition period</b>                 | September-January  |
| <b>Tuition languages</b>              | English  |
| <b>Degree programme</b>               | 10AM - Master universitario en ingeniería del software                               |
| <b>Centre</b>                         | 10 - Escuela Técnica Superior de Ingenieros Informáticos                             |
| <b>Academic year</b>                  | 2018-19  |

## 2. Faculty

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### 2.1. Faculty members with subject teaching role

| <b>Name and surname</b>       | <b>Office/Room</b> | <b>Email</b>         | <b>Tutoring hours *</b>   |
|-------------------------------|--------------------|----------------------|---|
| Loic Antonio Martinez Normand | D3352              | loic.mnormand@upm.es | Tu - 13:00 - 15:00<br>W - 13:00 - 15:00<br>F - 13:00 - 15:00<br>It is recommended email to ask for an appointment |

|   |       |                         |  |
|---|-------|-------------------------|--|
| Jose Luis Fuertes Castro<br>(Subject coordinator) | D4307 | joseluis.fuertes@upm.es | M - 16:45 - 19:15<br>Tu - 17:00 - 19:00<br>W - 12:30 - 14:00 |
|---|-------|-------------------------|--|

\* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

### 3. Skills and learning outcomes \*

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#### 3.1. Skills to be learned

CE13 - Tener una visión de los distintos aspectos específicos y emergentes de la ingeniería del software, y profundizar en algunos de ellos

CE14 - Comprender lo que pueden y no pueden conseguir las prácticas actuales de ingeniería del software, y sus limitaciones y su posible futura evolución.

CG13 - Apreciación de los límites del conocimiento actual y de la aplicación práctica de la tecnología más reciente

#### 3.2. Learning outcomes

RA1 - Within an application field of Software Engineering, uses and designs the appropriate solution to solve some of its problems, describing the technical difficulties and the application limits

RA3 - Explains which are the Software Engineering limits and frontiers, and the base of new tendencies and developments and advanced topics and their possible application

RA18 - Given a real problem, the student chooses the most appropriate software engineering solution, analyzing the solution feasibility, what can and cannot be achieved through the current status of the chosen solution, and what it can advance in the future.

\* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

## 4. Brief description of the subject and syllabus

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### 4.1. Brief description of the subject

This module provides a specialization about the accessibility of information and communication technologies (ICT) for persons with functional diversity (disability). It is mainly focused on current research issues in the field.

The module will start with an introduction to basic ICT accessibility concepts: functional diversity, design for all, legislation, standards and the assessment of the accessibility degree of ICT products and services.

After that, the students will work on current challenges in the field, such as:

- Methods, techniques and tools for accessibility evaluation
- Applying user centred design and design for all in development methodologies
- New ICT accessibility standards

### 4.2. Syllabus

#### 1. Functional diversity, accessibility and design for all

- 1.1. Introduction
- 1.2. Functional diversity
- 1.3. Assistive products for ICT
- 1.4. Design for all

#### 2. ICT accessibility standards

- 2.1. Introduction to standards
- 2.2. Relevant ICT accessibility standards
- 2.3. Deeper study of one accessibility standard
- 2.4. Conformity assessment

#### 3. User centred design

- 3.1. Introduction to user centred design

#### 4. State of the art in ICT accessibility

- 4.1. State of the art and future trends

## 5. Schedule

### 5.1. Subject schedule\*

| Week | Face-to-face classroom activities  | Face-to-face laboratory activities | Other face-to-face activities | Assessment activities  |
|------|--|------------------------------------|-------------------------------|--|
| 1    | <b>Module introduction</b><br>Duration: 02:00<br>Lecture                               |                                    |                               |  |
| 2    | <b>Chapter 1, 1.1 and 1.2</b><br>Duration: 02:00<br>Lecture                            |                                    |                               |  |
| 3    | <b>Chapter 1, 1.3 and 1.4</b><br>Duration: 02:00<br>Lecture                            |                                    |                               |  |
| 4    | <b>Chapter 2, 2.1 and 2.2. Explanation of exercise 1</b><br>Duration: 02:00<br>Lecture |                                    |                               |  |
| 5    | <b>Chapter 2, 2.3</b><br>Duration: 01:30<br>Cooperative activities                     |                                    |                               | <b>Jigsaw evaluation (discussion)</b><br>Individual presentation<br>Continuous assessment and final examination<br>Duration: 00:30   |
| 6    | <b>Explanation of exercise 2</b><br>Duration: 01:00<br>Lecture                         |                                    |                               | <b>Test 1</b><br>Written test<br>Continuous assessment<br>Duration: 01:00  |
| 7    | <b>Chapter 2, 2.3</b><br>Duration: 01:30<br>Cooperative activities                     |                                    |                               | <b>Jigsaw evaluation (discussion)</b><br>Individual presentation<br>Continuous assessment and final examination<br>Duration: 00:30<br><br><b>Delivery of exercise 1</b><br>Individual work<br>Continuous assessment and final examination<br>Duration: 00:00 |
| 8    | <b>Chapter 2, 2.4</b><br>Duration: 02:00<br>Lecture                                    |                                    |                               |  |
| 9    | <b>Classroom tutoring. Exercise 2</b><br>Duration: 02:00<br>Additional activities      |                                    |                               |  |
| 10   | <b>Chapter 3, 3.1</b><br>Duration: 02:00<br>Lecture                                    |                                    |                               | <b>Delivery of exercise 2</b><br>Individual work<br>Continuous assessment and final examination<br>Duration: 00:00   |

|    |   |  |  |  |
|----|---|--|--|--|
| 11 | <b>Chapter 4, 4.1. Explanation of exercise 3</b><br>Duration: 02:00<br>Lecture                                |  |  |  |
| 12 | <b>Classroom tutoring about Collective revision of exercise 2</b><br>Duration: 02:00<br>Additional activities |  |  |  |
| 13 | <b>Classroom tutoring. Exercise 3</b><br>Duration: 02:00<br>Additional activities                             |  |  |  |
| 14 | <b>Classroom tutoring. Exercise 3</b><br>Duration: 02:00<br>Additional activities                             |  |  |  |
| 15 |   |  |  | <b>Classroom presentation of exercise 3</b><br>Individual presentation<br>Continuous assessment<br>Duration: 02:00   |
| 16 |   |  |  | <b>Classroom presentation of exercise 3</b><br>Individual presentation<br>Continuous assessment<br>Duration: 02:00<br><br><b>Delivery of exercise 3</b><br>Individual work<br>Continuous assessment and final examination<br>Duration: 00:00   |
| 17 |   |  |  | <b>Test 1</b><br>Written test<br>Final examination<br>Duration: 01:00<br><br><b>Presentation of exercise 3</b><br>Individual presentation<br>Final examination<br>Duration: 02:00<br><br><b>Test 2</b><br>Written test<br>Continuous assessment and final examination<br>Duration: 01:00 |

The independent study hours are training activities during which students should spend time on individual study or individual assignments.

Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

\* The subject schedule is based on a previous theoretical planning of the subject plan and might go through experience some unexpected changes along throughout the academic year.

## 6. Activities and assessment criteria

### 6.1. Assessment activities

#### 6.1.1. Continuous assessment

| Week | Description                          | Modality                | Type          | Duration | Weight | Minimum grade | Evaluated skills |
|------|--------------------------------------|-------------------------|---------------|----------|--------|---------------|------------------|
| 5    | Jigsaw evaluation (discussion)       | Individual presentation | Face-to-face  | 00:30    | 5%     | / 10          | CE14             |
| 6    | Test 1                               | Written test            | Face-to-face  | 01:00    | 10%    | / 10          | CE13             |
| 7    | Jigsaw evaluation (discussion)       | Individual presentation | Face-to-face  | 00:30    | 5%     | / 10          | CE14             |
| 7    | Delivery of exercise 1               | Individual work         | No Presential | 00:00    | 15%    | / 10          | CE14             |
| 10   | Delivery of exercise 2               | Individual work         | No Presential | 00:00    | 20%    | / 10          | CE14             |
| 15   | Classroom presentation of exercise 3 | Individual presentation | Face-to-face  | 02:00    | 10%    | / 10          | CE13<br>CG13     |
| 16   | Classroom presentation of exercise 3 | Individual presentation | Face-to-face  | 02:00    | 10%    | / 10          | CE13<br>CG13     |
| 16   | Delivery of exercise 3               | Individual work         | No Presential | 00:00    | 15%    | / 10          | CE13<br>CG13     |
| 17   | Test 2                               | Written test            | Face-to-face  | 01:00    | 10%    | / 10          | CE14<br>CG13     |

#### 6.1.2. Final examination

| Week | Description                    | Modality                | Type          | Duration | Weight | Minimum grade | Evaluated skills |
|------|--------------------------------|-------------------------|---------------|----------|--------|---------------|------------------|
| 5    | Jigsaw evaluation (discussion) | Individual presentation | Face-to-face  | 00:30    | 5%     | / 10          | CE14             |
| 7    | Jigsaw evaluation (discussion) | Individual presentation | Face-to-face  | 00:30    | 5%     | / 10          | CE14             |
| 7    | Delivery of exercise 1         | Individual work         | No Presential | 00:00    | 15%    | / 10          | CE14             |
| 10   | Delivery of exercise 2         | Individual work         | No Presential | 00:00    | 20%    | / 10          | CE14             |
| 16   | Delivery of exercise 3         | Individual work         | No Presential | 00:00    | 15%    | / 10          | CE13<br>CG13     |



|    |                            |                         |              |       |     |      |              |
|----|----------------------------|-------------------------|--------------|-------|-----|------|--------------|
| 17 | Test 1                     | Written test            | Face-to-face | 01:00 | 10% | / 10 | CE13         |
| 17 | Presentation of exercise 3 | Individual presentation | Face-to-face | 02:00 | 20% | / 10 | CE13<br>CG13 |
| 17 | Test 2                     | Written test            | Face-to-face | 01:00 | 10% | / 10 | CE14<br>CG13 |

### 6.1.3. Referred (re-sit) examination

| Description                | Modality        | Type         | Duration | Weight | Minimum grade | Evaluated skills |
|----------------------------|-----------------|--------------|----------|--------|---------------|------------------|
| Test1                      | Written test    | Face-to-face | 01:00    | 10%    | / 10          | CE13             |
| Test 2                     | Written test    | Face-to-face | 01:00    | 10%    | / 10          | CE14<br>CG13     |
| Delivery of exercise 1     | Individual work | Face-to-face | 00:00    | 15%    | / 10          | CE14             |
| Delivery of exercise 2     | Individual work | Face-to-face | 00:00    | 20%    | / 10          | CE14             |
| Delivery of exercise 3     | Individual work | Face-to-face | 00:00    | 15%    | / 10          | CE13<br>CG13     |
| Presentation of exercise 3 | Individual work | Face-to-face | 00:00    | 20%    | / 10          | CE13<br>CG13     |

## 6.2. Assessment criteria

The assessment of this module is divided into two parts: theory and practice. Both parts have to be passed in order to pass the module. The grades obtained in theory and practice are combined as described in the section on evaluation activities.

**Theory** The theoretical part of the module contains two different assessments. First, there will be two test-based assessments. Second, there is going to be assessment of the performance of the collaborative learning sessions that will be part of the study of accessibility standards

### Practical work

The practical work consists of 3 exercises:

- Exercise 1: a document containing change proposals for an accessibility standard.
- Exercise 2: an accessibility assessment of an ICT product, using the standard studied during collaborative learning.
- Exercise 3: state of the art on one topic related to ICT accessibility. Students will make a short presentation in the classroom.

All the exercises are individual.

### **Assessment procedure**

#### *a) Continuous evaluation*

The module will be assessed in a scale of 10 points, divided into 3 points for the theory and 7 points for the practical exercises. To pass the complete module it will be necessary to obtain a minimum of 1 point in theory, 3 points in the exercises and 5 points in the addition of theory and practice.

All the practical exercises are mandatory and will be graded according to the section on evaluation activities.

The dates for the publication of grades and the ulterior exam revision will be notified as part of the corresponding exam. The exam revision will be made based on prior enquiries made by the students.

#### *b) Extraordinary evaluation period (July)*

In the extraordinary evaluation period (July) the theory tests will be repeated and the pending exercises can be delivered again. The participation in collaborative learning will not be re-assessed, so the grades received previously will be reused.

The grades obtained will apply the same weights as described for continuous evaluation.

#### *c) Non-continuous evaluation*

In the case of non-continuous evaluation, there will be a theory exam and a classroom presentation of exercise 3 in week 17. The three exercises have to be delivered in the same time period as the one defined for continuous evaluation. The student will also have to attend the two collaborative sessions (jigsaw) described above.

## 7. Teaching resources

### 7.1. Teaching resources for the subject

| Name  | Type         | Notes  |
|---|--------------|--|
| Don't make me think!: a Common Sense Approach to Web Usability  | Bibliography | Krug, S. New Riders, ISBN: 0321344758, Sept., 2005.  |
| The Principles of Universal Design  | Bibliography | Connell, B.R.; Jones, M.; Mace, R.; Mueller, J.; Mullick, A.; Ostroff, E.; Sanford, J.; Steinfeld, E.; Story, M.; Vanderheiden, G. Version 2.0. North Carolina State University. Abril 1997<br><br><a href="http://www.ncsu.edu/ncsu/design/cud/about_ud/udprinciples.htm">http://www.ncsu.edu/ncsu/design/cud/about_ud/udprinciples.htm</a> |
| Information technology -- Accessibility considerations for people with disabilities -- Part 1: User needs summary                           | Bibliography | Organización Internacional de Normalización (ISO), Comisión Internacional de Electrotecnia (IEC). ISO/IEC TR 29138-1. 2009. Disponible de forma gratuita en: <a href="http://jtc1access.org/TR29138.htm">http://jtc1access.org/TR29138.htm</a>   |
| El modelo de la diversidad. La Bioética y los Derechos Humanos como herramientas para alcanzar la plena dignidad en la diversidad funcional | Bibliography | Palacios, A.; Romañach, J. Ediciones Diversitas, ISBN: 8496474402, 2007.   |
| A Web for Everyone. Designing accessible user experiences   | Bibliography | Horton, S.; Quesenbery, W. Rosenfeld. 2014.  |
| SIDAR   | Web resource | Fundación Sidar - Acceso Universal: <a href="http://www.sidar.org">http://www.sidar.org</a> , España. 2017   |

## 8. Other information

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### 8.1. Other information about the subject

Exercises cannot be done just copying from other sources. Personal writing and analysis work by the student should be included. Failing to do this, implies plagiarism, which is not allowed at this University and will lead to not passing the exercise involved (grade will be 0).