ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000877 - Challenges For Accessible Computing For People With Functional Diversity

DEGREE PROGRAMME

10AZ - Master Universitario En Innovación Digital

ACADEMIC YEAR & SEMESTER

2021/22 - Semester 1

Index

Learning guide

1. Description

1.1. Subject details

Name of the subject	103000877 - Challenges For Accessible Computing For People With Functional Diversity
No of credits	4 ECTS
Type	Optional
Academic year ot the programme	First year
Semester of tuition	Semester 1
Tuition period	September-January
Tuition languages	English
Degree programme	10AZ - Master Universitario en Innovación Digital
Centre	10 - Escuela Tecnica Superior De Ingenieros Informaticos
Academic year	2021-22

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
M. Carmen Suarez De Figueroa Baonza	D-2201	mdelcarmen.suarezdefigueroa@upm.es	M - 10:00 - 12:00 M - 14:00 - 15:00 F - 12:00 - 15:00
Loic Antonio Martinez Normand	D3352	loic.mnormand@upm.es	Tu - 13:00 - 15:00 Th - 13:00 - 15:00 F - 13:00 - 15:00 Please confirm appointment via email

Jose Luis Fuertes Castro (Subject coordinator)	D4307	joseluis.fuertes@upm.es	Tu - 17:00 - 20:00 W - 12:00 - 15:00

* 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 *

3.1. Skills to be learned

CB08 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

CE-DIPO01 - Capacidad para conceptualizar, diseñar y desarrollar la interacción persona-ordenador de productos y servicios innovadores

CE-DIPO02 - Capacidad para evaluar la interacción persona-ordenador de productos y servicios de alto valor innovador

CE-DIPO03 - Habilidad para hacer conexiones entre los deseos y necesidades del consumidor o cliente y lo que la tecnología puede ofrecer

CE-DIPO04 - Capacidad para analizar las necesidades de información que se plantean en un entorno y llevar a cabo en todas sus etapas el proceso de diseño centrado en el usuario

CG02 - Que los estudiantes desarrollen la autonomía suficiente para participar en proyectos de investigación y colaboraciones científicas o tecnológicas dentro su ámbito temático explorando y generando nuevas ideas sistemáticamente, en contextos interdisciplinares y, en su caso, con una alta componente de transferencia del conocimiento.

3.2. Learning outcomes

RA22 - Understand the concept and types of assistive products

RA7 - Understand how to design an interactive system using a user-centred approach

RA20 - Evaluate the usability and accessibility of prototypes

RA36 - Understand the diversity of user requirements and the characteristics of accessibility

* 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

4.1. Brief description of the subject

This course 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 course will start with an introduction to basic ICT accessibiltiy concepts: functional diversity, design for all, 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
- Cognitive Accessibility

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. Principles of accessible design
    1.5. Introduction to Human-centred design
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. State of the art in ICT accessibility
    3.1. State of the art and future trends
4. Cognitive Accessibility
    4.1. Introduction to the Easy-to-Read Methodology

5. Schedule

5.1. Subject schedule*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Distant / On-line	Assessment activities
1	**Course introduction** Duration: 00:20 **Chapter 1: 1.1- Introduction** Duration: 01:10 **Chapter 1: 1.2- Functional diversity** Duration: 00:30		**Course introduction** Duration: 00:20 **Chapter 1: 1.1- Introduction** Duration: 01:10 **Chapter 1: 1.2- Functional diversity** Duration: 00:30	
2	**Chapter 1: 1.2- Functional diversity** Duration: 01:30		**Chapter 1: 1.2- Functional diversity** Duration: 01:30	**Individual presentation of personas** Continuous assessment Presential Duration: 00:20 **Personas evaluation** Continuous assessment Presential Duration: 00:10
3	**Chapter 1: 1.3- Assistive products** Duration: 02:00		**Chapter 1: 1.3- Assistive products** Duration: 02:00	
4	**Chapter 1: 1.4- Principles of accessible design** Duration: 00:45 **Chapter 1: 1.5- Introduction to human-centred design** Duration: 00:30 **Chapter 2: 2.1- Introduction to standards** Duration: 00:20		**Chapter 1: 1.4- Principles of accessible design** Duration: 00:45 **Chapter 1: 1.5- Introduction to human-centred design** Duration: 00:30 **Chapter 2: 2.1- Introduction to standards** Duration: 00:20	**Individual presentation of principles of Design for All** Continuous assessment Presential Duration: 00:45 **Desgin for All evaluation** Continuous assessment Presential Duration: 00:10
5	**Standards overview discussion** Duration: 00:30 **Chapter 2: 2.2- Relevant ICT standards** Duration: 00:45 **Chapter 2: 2.3- Deeper study of one accessibility standard** Duration: 00:30		**Standards overview discussion** Duration: 00:30 **Chapter 2: 2.2- Relevant ICT standards** Duration: 00:45 **Chapter 2: 2.3- Deeper study of one accessibility standard** Duration: 00:30	**Standard overview evaluation** Continuous assessment Presential Duration: 00:15 **Test 1** Continuous assessment Not Presential Duration: 00:30

	Explanation of exercise 1 Duration: 00:15		**Explanation of exercise 1** Duration: 00:15	
6	**Chapter 2: 2.3- Deeper study of one accessibility standard** Duration: 01:30		**Chapter 2: 2.3- Deeper study of one accessibility standard** Duration: 01:30	**One accessibility standard evaluation (discussion)** Continuous assessment and final examination Presential Duration: 00:30
7	**Chapter 2: 2.3- Deeper study of one accessibility standard** Duration: 01:30 **Explanation of exercise 2** Duration: 00:20 **classroom tutoring. Exercise 1** Duration: 00:15		**Chapter 2: 2.3- Deeper study of one accessibility standard** Duration: 01:30 **Explanation of exercise 2** Duration: 00:20 **classroom tutoring. Exercise 1** Duration: 00:15	**One accessibility standard evaluation (discussion)** Continuous assessment and final examination Presential Duration: 00:30
8	**Chapter 2: 2.4- Conformity assesment** Duration: 01:30		**Chapter 2: 2.4- Conformity assesment** Duration: 01:30	**Delivery of exercise 1** Continuous assessment Not Presential Duration: 00:00 **Conformity assesment evaluation** Continuous assessment Presential Duration: 00:30
9				
10	**Chapter 3: 3.1- State of the art and future trends** Duration: 01:30 **Explanation of exercise 3** Duration: 00:15 **Classroom tutoring. Exercise 2** Duration: 00:15		**Chapter 3: 3.1- State of the art and future trends** Duration: 01:30 **Explanation of exercise 3** Duration: 00:15 **Classroom tutoring. Exercise 2** Duration: 00:15	**Delivery of exercise 2** Continuous assessment Not Presential Duration: 00:00 **State of the art in ICT accessibility evaluation** Continuous assessment Presential Duration: 00:10
11	**Collective revision of exercise 2** Duration: 02:00		**Collective revision of exercise 2** Duration: 02:00	**Participation in evaluation of exercise 2** Continuous assessment Not Presential Duration: 02:00
12	**Chapter 4: Cognitive Accessibility** Duration: 01:45 **Explanation of exercise 4** Duration: 00:15		**Chapter 4: Cognitive Accessibility** Duration: 01:45 **Explanation of exercise 4** Duration: 00:15	**Cognitive accessibility evaluation** Continuous assessment Presential Duration: 00:15

13				
14	**Chapter 4: Cognitive Accessibility** Duration: 02:00		**Chapter 4: Cognitive Accessibility** Duration: 02:00	**Cognitive accessibility evaluation** Continuous assessment Presential Duration: 00:15
15	**Classroom tutoring. Exercise 3** Duration: 02:00		**Classroom tutoring. Exercise 3** Duration: 02:00	**Delivery of exercise 4** Continuous assessment Not Presential Duration: 00:00
16				**Presentation of exercise 3** Continuous assessment and final examination Presential Duration: 02:00 **Delivery of exercise 3** Continuous assessment Not Presential Duration: 00:00
17				**Test 1** Final examination Not Presential Duration: 00:30 **Delivery of exercise 4** Final examination Not Presential Duration: 00:00 **Test 2** Continuous assessment and final examination Not Presential Duration: 00:30 **Delivery of exercise 1** Final examination Not Presential Duration: 00:00 **Delivery of exercise 2** Final examination Not Presential Duration: 00:00 **Delivery of exercise 3** Final examination Not Presential Duration: 00:00

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 schedule is based on an a priori planning of the subject; it might be modified during the academic year, especially considering the COVID19 evolution.

6. Activities and assessment criteria

6.1. Assessment activities

6.1.1. Continuous assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
2	Individual presentation of personas		Face-to-face	00:20	1%	/ 10	CE-DIPO03 CB08
2	Personas evaluation		Face-to-face	00:10	1%	/ 10	CE-DIPO03 CB08
4	Individual presentation of principles of Design for All		Face-to-face	00:45	2%	/ 10	CE-DIPO01 CB08
4	Desgin for All evaluation		Face-to-face	00:10	1%	/ 10	CE-DIPO01 CB08
5	Standard overview evaluation		Face-to-face	00:15	1%	/ 10	CE-DIPO02 CB08
5	Test 1		No Presential	00:30	10%	/ 10	CE-DIPO01 CE-DIPO02 CE-DIPO03 CB08
6	One accessibility standard evaluation (discussion)		Face-to-face	00:30	5%	/ 10	CE-DIPO02 CG02
7	One accessibility standard evaluation (discussion)		Face-to-face	00:30	5%	/ 10	CE-DIPO02 CG02
8	Delivery of exercise 1		No Presential	00:00	10%	/ 10	CE-DIPO02 CB08
8	Conformity assesment evaluation		Face-to-face	00:30	1%	/ 10	CE-DIPO02 CG02
10	Delivery of exercise 2		No Presential	00:00	15%	/ 10	CB08 CE-DIPO02
10	State of the art in ICT accessibility evaluation		Face-to-face	00:10	1%	/ 10	CE-DIPO02 CE-DIPO03 CG02
11	Participation in evaluation of exercise 2		No Presential	02:00	5%	/ 10	CB08 CG02
12	Cognitive accessibility evaluation		Face-to-face	00:15	1%	/ 10	CE-DIPO04 CB08

14	Cognitive accessibility evaluation		Face-to-face	00:15	1%	/ 10	CE-DIPO04 CB08
15	Delivery of exercise 4		No Presential	00:00	10%	/ 10	CE-DIPO02 CE-DIPO03 CB08
16	Presentation of exercise 3		Face-to-face	02:00	10%	/ 10	CE-DIPO02 CE-DIPO03 CB08 CG02
16	Delivery of exercise 3		No Presential	00:00	10%	/ 10	CB08 CG02 CE-DIPO02 CE-DIPO03
17	Test 2		No Presential	00:30	10%	/ 10	CE-DIPO02 CE-DIPO03 CE-DIPO04 CB08

6.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
6	One accessibility standard evaluation (discussion)		Face-to-face	00:30	5%	/ 10	CE-DIPO02 CG02
7	One accessibility standard evaluation (discussion)		Face-to-face	00:30	5%	/ 10	CE-DIPO02 CG02
16	Presentation of exercise 3		Face-to-face	02:00	10%	/ 10	CE-DIPO02 CE-DIPO03 CB08 CG02
17	Test 1		No Presential	00:30	10%	/ 10	CE-DIPO01 CE-DIPO02 CE-DIPO03 CB08
17	Test 2		No Presential	00:30	10%	/ 10	CE-DIPO02 CE-DIPO03 CE-DIPO04 CB08
17	Delivery of exercise 4		No Presential	00:00	15%	/ 10	CE-DIPO03 CB08 CE-DIPO02
17	Delivery of exercise 1		No Presential	00:00	10%	/ 10	CE-DIPO02 CB08
17	Delivery of exercise 2		No Presential	00:00	20%	/ 10	CB08 CE-DIPO02

17	Delivery of exercise 3		No Presential	00:00	15%	/ 10	CE-DIPO02 CE-DIPO03 CB08 CG02

6.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Test 1		Face-to-face	01:00	10%	/ 10	CE-DIPO01 CE-DIPO02 CE-DIPO03 CB08
Test 2		Face-to-face	01:00	10%	/ 10	CE-DIPO02 CE-DIPO03 CE-DIPO04 CB08
Delivery of exercise 1		Face-to-face	00:00	15%	/ 10	CE-DIPO02 CB08
Delivery of exercise 2		Face-to-face	00:00	20%	/ 10	CE-DIPO02 CB08
Delivery of exercise 3		Face-to-face	00:00	20%	/ 10	CE-DIPO02 CE-DIPO03 CB08 CG02
Presentation of exercise 3		Face-to-face	02:00	10%	/ 10	CE-DIPO02 CE-DIPO03 CG02
Delivery of exercise 4		Face-to-face	00:00	15%	/ 10	CE-DIPO02 CE-DIPO03 CB08

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 different assessments: there will be two test-based assessments; there is going to be assessment of the performance of the collaborative learning sessions that will be part of the study of accessibility standards; there will be also short in-class evaluations during the semester

Practical work

The practical work consists of 4 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 and deliver a report.
- Exercise 4: checking cognitive accessibility

Assessment procedure

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

a) Continuous evaluation

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

b) Non-continuous evaluation

In the case of non-continuous evaluation, there will be two theory exams in the same time period as the one defined for continuous evaluation. The four 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 (One accessibility standard evaluation) described.

c) Extraordinary evaluation period (July)

In the extraordinary evaluation period the theory tests will be repeated and the pending exercises can be delivered again. The participation in collaborative learning and in-class activities 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.

7. Teaching resources

7.1. Teaching resources for the subject

Name	Type	Notes
Don't make me think!: Revisited. A Common Sense Approach to Web Usability	Bibliography	Krug, S. New Riders, 3rd edition ISBN: 978-0321965516, Jan. 2014
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. http://www.ncsu.edu/ncsu/design/cud/about_ud/udprinciples.htm
Information technology -- User interface accessibility -- Part 1: User accessibility needs	Bibliography	International Organization for Standardization (ISO), International Electrotechnical Commission (IEC). ISO/IEC 29138-1:2018. (Technical report ISO/IEC TR 29138-1, 2009, can be accessed at http://jtc1access.org/TR29138.htm)

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: http://www.sidar.org, España. 2019

8. Other information

8.1. Other information about the subject

Exercises cannot been 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).

Classroom activities in academic year 2021-22

The current COVID-19 pandemic situation restricts the capacity of the classrooms in the School. Depending on the number of enrolled students it might be necessary to split the class in two groups that will come to the School in alternate days. The School classrooms have teleconference equipment that enables remote participation in the class. In this situation some students will be in the classroom (column "Distant / On-line" in the schedule) and other students will connect remotely (column "face-to-face" in the schedule).

If the pandemic situation improves and the University is allowed to use the classrooms at their full capacity, then all students will be able to attend the face to face sessions together.

And in the improbable situation of a worsening of the pandemic situation, all classes would be online.

Sustainable development goals (SDGs)

The goal of this course is to learn about assistive products, that enable access of persons with disabilities to ICT, increasing their inclusion possibilities. Taking this into account, and considering the recommendations from the United Nations on the relationship between the SDGs and accessibility, this course is related to the following sustainable development goals:

Goal 4 quality education - to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. In today's education, interactive learning systems are essential, and they need to be accessible and to be compatible with assistive products to enable the education of persons with disabilities. Goal 8 decent work and economy growth - to promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Today there are many job-related activities that rely on information and communication technology. This technology needs to be accessible and compatible with assistive products to enable inclusion in the workplace. Goal 10 reduced inequalities - to reduce inequality within and among countries. To increase inclusion of all persons in society, all interactive systems designed for citizen participation need to be accessible and be compatible with assistive products.