



## Course guide

### 340265 - DIDU-D7P32 - Inclusive and User-Centred Design

**Last modified:** 03/04/2024

**Unit in charge:** Vilanova i la Geltrú School of Engineering  
**Teaching unit:** 744 - ENTEL - Department of Network Engineering.

**Degree:** BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2009). (Optional subject).

**Academic year:** 2024    **ECTS Credits:** 6.0    **Languages:** Catalan

#### LECTURER

---

**Coordinating lecturer:** Guasch Murillo, Daniel

**Others:** Guasch Murillo, Daniel

#### PRIOR SKILLS

---

No previous skills are required to take the subject.

#### REQUIREMENTS

---

The student must have completed the subject of Sustainability and Accessibility (SOAC), or Accessibility and Innovation (ACIN).

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

---

**Generical:**

1. Accessibility: Know and apply criteria of universal design in different products, environment and services.

**Transversal:**

2. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.
3. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
4. 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.
5. 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.
6. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
7. 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.
8. 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.
9. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
10. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
11. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
12. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.
13. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
14. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.
15. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.
16. 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.
17. 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.

## TEACHING METHODOLOGY

---

The subject is organized around a project that will be carried out throughout the course. The project is a real case that is carried out in collaboration with entities external to the UPC that specialize in the chosen subject. The students are organized into work teams to develop the project. External entities provide the necessary information and co-evaluate the results obtained.

## LEARNING OBJECTIVES OF THE SUBJECT

---

In the previous subjects of the degree, the student has received the necessary training to carry out professional activities in industrial design and product development. The subject of Inclusive Design and User-centered Design (DIDU) aims to expand the skills acquired by the student with those necessary to ensure that, as a designer, he is able to understand, plan and execute the design process of 'a product, environment or service incorporating the user as the core of this process. Therefore, the subject is developed around a conceptual design model that incorporates accessibility and the inclusion of users, both in the design phases and in the final result.

A second objective is to provide the student with the concepts and techniques necessary to communicate to the users of the product or service all the information necessary for its use, management or maintenance; while using both explicit resources - such as the documentation provided -, as well as implicit resources - incorporated in the product itself - and complementary resources - all using augmentative and alternative techniques -.

Once the student has been able to analyze the needs, skills and aspirations of all users of the product or service to be designed, the subject provides resources and guidelines to ensure that the principles of universal design are met, a fundamental basis for achieve equal opportunities among all users of the product or service.



## STUDY LOAD

---

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

**Total learning time:** 150 h

## CONTENTS

### Inclusive Design and User-Centered Design

#### Description:

The subject is structured through four complementary conceptual axes: the person, the design, the physical environment that surrounds it and a use case. A conceptual design model is proposed that incorporates the necessary aspects, methodologies, tools and concepts to be able to guarantee that, both throughout the design process and in the final result, accessibility and user participation has been achieved. The contents relating to the physical environment include the fundamental aspects of lighting, acoustics and multimedia materials. While the contents corresponding to the person incorporate the biological factors that affect the perception and understanding of this physical environment; namely vision, hearing and cognition. Finally, the subject incorporates specific contents of a use case, while offering the student the opportunity to deepen the application of their knowledge in a real case.

#### Specific objectives:

- Design: definition and modeling of a design process that incorporates the concepts of accessibility and inclusion.
- Acoustics: definitions and formulation of sound, acoustic phenomena, parameterization of effects, signal-noise ratio, materials and characteristics of speech.
- Lighting: definitions and formulation, optical phenomena, lighting and color.
- Multimedia material: fundamentals and coding of text, audio, image and video.
- Augmentative and alternative communication techniques: definitions and main techniques.

#### Related activities:

The subject is organized around a real project. The students are organized into work teams to carry out the project. The professor performs the role of interlocutor with an entity external to the university specializing in the subject of the project. This entity provides the requirements of the project and actively participates in the development of the subject from time to time. To carry out this project, students will have to work with graphic, audio and web editing tools. As well as researching the best design alternatives and validating the results obtained.

#### Related competencies :

- . Accessibility: Know and apply criteria of universal design in different products, environment and services.

05 TEQ N1. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.

05 TEQ N2. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.

05 TEQ N3. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.

06 URI N1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

06 URI N2. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.

06 URI N3. 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.

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 N1. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.

07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

07 AAT N3. 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.

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.

04 COE N1. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.

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.

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.

04 COE. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.

**Full-or-part-time:** 75h

Theory classes: 30h

Self study : 45h

## ACTIVITIES

### Subject practices

#### Description:

Subject practices.

- The characterization.
- The representation.
- The knowledge.
- Augmentative and Alternative Communication systems.
- The documentation.

#### Related competencies :

. Accessibility: Know and apply criteria of universal design in different products, environment and services.

- 07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
- 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 N2. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.
- 06 URI N3. 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.
- 05 TEQ N1. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
- 04 COE. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
- 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.
- 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.
- 07 AAT N3. 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.
- 06 URI N1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.
- 05 TEQ N2. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
- 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.
- 04 COE N1. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
- 07 AAT N1. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.
- 05 TEQ N3. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.
- 05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.

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

Laboratory classes: 10h

Self study: 15h

**Description:**

**Specific objectives:**

**Full-or-part-time:** 50h

Laboratory classes: 20h

Self study: 30h

## GRADING SYSTEM

The subject is evaluated according to the results of the activities carried out, both inside and outside the classroom. The activities to be evaluated will be the practices (25%), the subject project (65%) and participation in the sessions (10%). External entities may intervene in the evaluation process, to provide the user's perspective, and the responsible teacher, to determine the degree of achievement of the subject's objectives. An orientation of the criteria to be followed in the evaluation is: work methodology (40%), suitability to the user (25%), results obtained (25%) and presentation (10%). As the evaluation is carried out in accordance with activities and there is no exam, the completion of a re-evaluation test is not contemplated.

## EXAMINATION RULES.

The works presented by each group must be original. They must contain a technical report and the designed material, which is delivered in digital format via the subject's intranet. The oral defense of the project is carried out publicly in front of the class to a panel made up of the subject's teacher and, where appropriate, a representative of the collaborating external entity.

## BIBLIOGRAPHY

**Complementary:**

- Accesibilidad y supresión de barreras arquitectónicas donde obtener información [on line]. Madrid: CEAPAT, 2013 [Consultation: 18/02/2022]. Available on: [http://www.construmecum.com/docsnormativa/4026\\_397.pdf](http://www.construmecum.com/docsnormativa/4026_397.pdf).
- Sebastián Herranz, Margarita; Noya Amáiz, Reyes. Adaptación de puestos de trabajo : guía de referencia [on line]. Madrid: CEAPAT, 2009 [Consultation: 02/04/2024]. Available on: <https://biblioteca.fundaciononce.es/publicaciones/otras-editoriales/adaptacion-de-puestos-de-trabajo-guia-de-referencia>.
- Como elaborar textos de fácil lectura [on line]. Albacete: Ayuntamiento de Albacete, 2013 [Consultation: 06/02/2024]. Available on: <https://repositori.lecturafacil.net/sites/default/files/2007%20C%C3%B3mo%20elaborar%20textos%20de%20f%C3%A1cil%20lectura%20Ayuntamiento%20Albacete.pdf>.
- Carrión Isbert, Antoni. Diseño acústico de espacios arquitectónicos [on line]. Barcelona: Edicions UPC, 1998 [Consultation: 08/03/2022]. Available on: <https://upcommons.upc.edu/handle/2099.3/36341>. ISBN 8483012529.
- Guia de contingut digital accessible [on line]. Lleida: Edicions de la Universitat de Lleida, 2011 [Consultation: 23/03/2022]. Available on: <http://diposit.ub.edu/dspace/handle/2445/29018>. ISBN 9788484093701.
- Manual para alcanzar la inclusión en el aula universitaria [Recurs electrònic] : pautas de accesibilidad arquitectónica, tecnológica y pedagógica para garantizar la igualdad de oportunidades en la docencia universitaria [on line]. Barcelona: Observatorio Universidad y Discapacidad, 2012 [Consultation: 28/03/2022]. Available on: <https://upcommons.upc.edu/handle/2117/15006>. ISBN 9788476539026.
- ¡Pregúntame sobre accesibilidad y ayudas técnicas! [Recurs electrònic] [on line]. Madrid: IMSERSO, 2005 [Consultation: 06/02/2024]. Available on: [https://www.ujen.es/servicios/neduespeciales/sites/servicio\\_neduespeciales/files/uploads/preguntame.pdf](https://www.ujen.es/servicios/neduespeciales/sites/servicio_neduespeciales/files/uploads/preguntame.pdf). ISBN 8495448114.

## RESOURCES

---

### Hyperlink:

- Apunts d'accessibilitat: L'usuari. Accessibility notes: The user - <http://hdl.handle.net/2117/358320>- Apunts d'accessibilitat: Conceptes bàsics. Accessibility notes: Basic concepts - <http://hdl.handle.net/2117/358321>- Apunts d'accessibilitat: Estratègies de disseny. Accessibility notes: Design strategies - <http://hdl.handle.net/2117/358323>- Apunts d'accessibilitat: Normativa. Accessibility notes: Standards - <http://hdl.handle.net/2117/358334>- Apunts d'accessibilitat: Arquitectura. Accessibility notes: Architecture - <http://hdl.handle.net/2117/358335>- Apunts d'accessibilitat: Servei de transport. Accessibility notes: Transport service - <http://hdl.handle.net/2117/358338>- Apunts d'accessibilitat: Comunicació. Accessibility notes: Communication - <http://hdl.handle.net/2117/358341>- Apunts d'accessibilitat: Comunicació auditiva. Accessibility notes: Auditory communication - <http://hdl.handle.net/2117/358342>- Apunts d'accessibilitat: Comunicació visual . Accessibility notes: Visual communication - <http://hdl.handle.net/2117/358347>- Apunts d'accessibilitat: Documentació. Accessibility notes: Documentation - <http://hdl.handle.net/2117/358350>- Apunts d'accessibilitat: Educació. Accessibility notes: Education - <http://hdl.handle.net/2117/358354>- Apunts d'accessibilitat: Les emocions. Accessibility notes: Emotions - <http://hdl.handle.net/2117/358358>- Apunts d'accessibilitat: El joc. Accessibility notes: The game - <http://hdl.handle.net/2117/358360>- Apunts d'accessibilitat: Bibliografia. Accessibility notes: Bibliography - <http://hdl.handle.net/2117/358362>