Universitat de Lleida

DEGREE CURRICULUM

ENTERPRISE 4.0

Coordination: BAQUERO ARMANS, GRAU

Academic year 2022-23

ENTERPRISE 4.0 2022-23

Subject's general information

<table>
<tr><td>Subject name</td><td>ENTERPRISE 4.0</td></tr>
<tr><td>Code</td><td>102491</td></tr>
<tr><td>Semester</td><td>1st Q(SEMESTER) CONTINUED EVALUATION</td></tr>
<tr><td>Typology</td><td>
<table>
<tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr>
<tr><td>Bachelor's degree in Industrial Organization and Logistics Engineering</td><td>4</td><td>OPTIONAL</td><td>Attendance-based</td></tr>
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<tr><td>Course number of credits (ECTS)</td><td>6</td></tr>
<tr><td>Type of activity, credits, and groups</td><td>
<table>
<tr><th>Activity type</th><th>PRAULA</th><th>TEORIA</th></tr>
<tr><th>Number of credits</th><td>3</td><td>3</td></tr>
<tr><th>Number of groups</th><td>1</td><td>1</td></tr>
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</td></tr>
<tr><td>Coordination</td><td>BAQUERO ARMANS, GRAU</td></tr>
<tr><td>Department</td><td>COMPUTER SCIENCE AND INDUSTRIAL ENGINEERING</td></tr>
<tr><td>Teaching load distribution between lectures and independent student work</td><td>Lectures: 40%
Independent work: 60%</td></tr>
<tr><td>Important information on data processing</td><td>Consult this link for more information.</td></tr>
<tr><td>Language</td><td>Catalan and English
Some resources in Spanish and English</td></tr>
<tr><td>Distribution of credits</td><td>Theoretical credits: 3 ECTS
Room practices credits: 3 ECTS</td></tr>
</table>

ENTERPRISE 4.0 2022-23

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
BAQUERO ARMANS, GRAU	grau.baquero@udl.cat	4,5	
VIVES COLOM, DAVID	david.vives@udl.cat	1,5	

Subject's extra information

This subject is mostly practical, based on the resolution of recommended and compulsory exercises. The personal work is fundamental to obtain the established competences and acquire the necessary skills to manage the software used during the course.

You can find educational materials on the Virtual Campus: http://cv.udl.cat

The use of the Virtual Campus is fundamental to access resources of the subject, exercises deadline notifications, practices delivery and evaluation tests.

Learning objectives

- Recognizing the concepts of embedded systems, the Internet of things and Industry 4.0.
- Knowing how cyberphysical systems develop and integrate.
- Identifying intelligent manufacturing applications and the digital transformation of the company.
- Deepening in automation solutions oriented to industry 4.0.

Competences

Basic competences

B02 That students know how to apply their knowledge to their work or vocation in a professional manner and possess the skills that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.

B05 That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

General competences

CG3. To synthesize basic and technological subjects, which enable them to learn new methods and theories, and provide them with versatility to adapt to new situations.

CG10. To work in a multilingual and multidisciplinary environment.

Specific competences

CE18. To acquire capacity for planning and developing new projects, products and processes.

CE22. To acquire capacity to design enterprise information systems.

CE28. To acquire capacity to design and optimize industrial plants and productive processes.

Transversal competences

CT3. To iImplement new technologies and technologies of information and communication.

Subject contents

- Topic 1. Introduction to the industry 4.0
- Topic 2. Applied IIoT and automation in industry 4.0
- Topic 3. Digital manufacturing
- Topic 4. Project

Methodology

This subject combines theoretical introductions with practical application through specific software and hardware, case studies and practical exercises.

Most practical activities will be developed in reduced work teams, and in some sessions group dynamics and presentations will be made. If possible, external visits and / or seminars will also be made.

The methodology used in the topics envisaged is:

Topic 1. Introduction to the industry 4.0

- Master classes where the basic concepts of the contents will be explained.
- Exercises for deepening these contents.

Topic 3. Applied IIoT and automation in industry 4.0

- Master classes where the basic concepts of the contents will be explained.
- Practical classes aimed at industrial automation and IoT applications.

Topic 2. Digital manufacturing

- Master classes where the basic concepts of the contents will be explained.
- Practical classes aimed at 3D printing, focused on the development of a model, its processing and printing.

Topic 4. Project

- Practical work in the IoT context.
- Practical work of 3D design.
- Oral presentation in English of the developed work.

Development plan

Week	Metodology	Content	Professor	Class hours	Autonomous work
1	Master class Practical exercices	Topic 1	Grau	4	3
2	Master class Practical exercices	Topic 2	Grau	4	6
3	Master class Practical exercices	Topic 2	Grau	4	6
4	Master class Practical exercices	Topic 2	Grau	4	6

5	Master class Practical exercices	Topic 2	Grau	2	6
6	Master class Practical exercices	Topic 2	Grau	4	6
7	Master class Practical exercices	Topic 2 Topic 3	Grau / David	4	6
8	Master class Practical exercices	- Topic 3	David	2	3
9	Evaluation	Exam 1	Grau	2	6
10	Master class Practical exercices	Topic 2 Topic 3	Grau / David	4	6
11	Master class Practical exercices	Topic 4 Topic 3	Grau / David	4	6
12	Practical exercices Evaluation	Topic 4 Exam 2	Grau / David	4	6
13	-	-			6
14	Practical exercices	Topic 4	Grau / David	4	6
15	Practical exercices	Topic 4	Grau / David	4	6
16-17	Evaluation Oral presentations	Oral presentations	Grau / David	2	6
18	Tutoring	Tutoring			
19	Evaluation	Recuperació	Grau	2	

Evaluation

The final grade of the subject will be the sum of the following percentages:

- Exam (Evaluation activity 1):20%
- Exam (Evaluation activity 2): 20%
- Exercises: 20%
- Project: 25%
- Oral presentation in English: 15%

Retake activity allows to re-evaluate by means of theoretical-practical exam the percentage corresponding to *Exams* (40%).

Bibliography

Check the Virtual Campus to access the information resources and the bibliography of the subject.