



Universidad de Jaén

School of Engineering of Linares

Introduction to digital factories

2024-2025

Máster Universitario en Industria Conectada



CREA



Acceso Mayores 40

Guías docentes UJA

Horarios de tutorías

Llamamientos PAU

Movilidad (Coordinador)

P.O.D.

Solicitud bilingüismo

Syllabus 2024-25 - 78412001 - Introduction to Digital Factories (Introducción a la fábrica digital)

Caption

- Level 1: Tutorial support sessions, materials and exams in this language
- Level 2: Tutorial support sessions, materials, exams and seminars in this language
- Level 3: Tutorial support sessions, materials, exams, seminars and regular lectures in this language

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Full version (Spanish)

English

DEGREE: Máster Univ. en Industria conectada
FACULTY: SCHOOL OF ENGINEERING OF LINARES
ACADEMIC YEAR: 2024-25
COURSE: Introduction to Digital Factories

SYLLABUS

1. COURSE BASIC INFORMATION

NAME: Introduction to Digital Factories
CODE: 78412001 **ACADEMIC YEAR:** 2024-25
LANGUAGE: English **LEVEL:** 2
ECTS CREDITS: 4.0 **YEAR:** 1 **SEMESTER:** PC

2. LECTURER BASIC INFORMATION

NAME: VALVERDE IBÁÑEZ, MANUEL
DEPARTMENT: U120 - INGENIERÍA ELÉCTRICA
FIELD OF STUDY: 535 - INGENIERÍA ELÉCTRICA
OFFICE NO.: D - D-147 **E-MAIL:** mvalver@ujaen.es **P:** 953648516
WEBSITE: <http://www4.ujaen.es/~mvalver/>
ORCID: <https://orcid.org/0000-0002-1189-7672>
LANGUAGE: - **LEVEL:** 2

3. CONTENT DESCRIPTION

Unit 1: Historical vision of the industry in Spain.

- 1.1.- Origins of industrial production and prefabrication
- 1.2.- Uniformity and standardization.
- 1.3.- Mass production.

Unit 2: Industry 3.0: Automation.

- 2.1.- Digital production
- 2.2.- Automation and technological convergence.
- 2.3.- Computerization of the industry.
- 2.4.- Industrial districts.

Unit 3: Evolution 3.0 to 4.0: SCADA and MES systems.

- 3.1.- Computer Manufacturing in the science of digital manufacturing.
- 3.2.- Main properties of the manufacturing information.
- 3.3.- Measurement, synthesis and materialization of computerized manufacturing
- 3.4.- Integration, shared use and security of computerized manufacturing.

Unit 4: Industry 4.0: 100% Connected Systems.

- 4.1.- Key technology in the science of digital manufacturing.
- 4.2.- Various digital technologies in the product life cycle.
- 4.3.- Resource and environment technology in digital manufacturing.
- 4.4.- Management technology in the process and digital manufacturing system.
- 4.5.- Control technology in digital manufacturing.
- 4.6.- Digital Recognition Technology and Product Integration.

This subject fully develops the **sustainable development goal No. 9 "Build resilient infrastructure, promote sustainable industrialization and foster innovation"**, in which the following issues will be taken into account:

- Develop reliable, sustainable, resilient and quality infrastructure, including regional and cross-border infrastructure.
- Promote inclusive and sustainable industrialization.
- Increase access for small industries and other businesses.
- Modernize infrastructure and reconvert industries to be sustainable, using resources more efficiently and promoting the adoption of clean and environmentally sound technologies and industrial processes.
- Significantly increase access to information and communications technology.

4. COURSE DESCRIPTION AND TEACHING METHODOLOGY

The activities to be carried out in the course development are the following:

787A_A1 - Theoretical lessons: they will be developed with the explanation of the contents of each subject of the subject, using multimedia tools (M1a methodology). Once these contents have been explained, practical cases will be developed (M1a methodology) and students will be asked to solve real projects based on the contents explained (project-based M2a methodology, ABP).

787A_A2 - Practical lessons: in these activities seminars and debates of the contents explained in the large group activities will be proposed (M2a methodology). The practical activities (M2a methodology) will be planned taking into account project-based learning (ABP). Finally, we will proceed to clarify doubts.

Students with special educational needs should contact the Student Attention Service (Servicio de Atención y Ayudas al Estudiante) in order to receive the appropriate academic support

5. ASSESSMENT METHODOLOGY

According to article 13 " *Evaluation procedures*" of the Regulation of Academic Regime and Evaluation of Students of the University of Jaén, the evaluation of this subject will be carried out, in general, by means of a global procedure, where the students are evaluated through works, assistance, practices and exam.

The evaluation system will consist of the following items:

Attendance in face-to-face and / or virtual activities (S1): the attendance of the students to the different activities planned by means of attendance control will be taken into account. This system will suppose, at most, 10% of the overall grade of the subject.

Exam about the theoretical and practical concepts of the subject (S2): taking a written exam made up of an adequate number of theoretical questions and a practical case, with which it is intended to evaluate the student's acquisition of the knowledge developed in the objectives of the subject. This system will represent, at most, 55% of the overall grade for the course.

Carrying out works, cases or practical exercises (S3): a group work will be carried out under the project-based learning methodology (ABP) on a subject topic, in which the structure, quality of the documentation will be analyzed, originality, spelling and presentation. This system will account for a maximum of 20% of the overall grade for the course.

Participation in face-to-face and / or virtual activities (S8): active participation in the issues and activities will be taken into account. This system will account for a maximum of 15% of the overall grade for the course.

Students may request the change of assessment procedure to Single Test when supervening circumstances concur.

6. BOOKLIST [f5 WYgg'h YVjV\]c\[fUd\ mjb'h Y @VfUfmiWUJc\] Ł](#)

MAIN BOOKLIST:

- Industry 4.0: Managing The Digital Transformation [electronic resource] by Alp Ustundag, Emre Cevikcan.. Edition: 1st ed. 2018.. Author: Ustundag, Alp. author.. Publisher: Springer International Publishing ([Library](#))

7. SUSTAINABLE DEVELOPMENT GOALS

Educación de calidad
 Industria, innovación e infraestructura
 Ciudades y comunidades sostenibles
 Producción y consumo responsables

DETAILED INFORMATION

Quality education (SDG-04): it is the main task of the subject within the curriculum.

Industry, innovation and infrastructure (SDG-09): the contents highlight the existing innovation in industry 4.0, taking into account the digital transformation of infrastructures.

Sustainable cities and communities (SDG-11): one of the main objectives of the application of enabling technologies is to ensure sustainability.

Responsible production and consumption (SDG-12): the digital transformation of the industry optimizes production systems, which means that students must be trained in the responsibility they have as technicians in this SDG.

8. VIRTUAL / CLASSROOM TEACHING SCENARIO

1- TEACHING METHODOLOGY AND TRAINING ACTIVITIES

The teaching methodology and the type of activities to develop in this scenario are as follows:

Formation activities	Format (classroom / online)	Teaching methodology Description
Practical sessions	100% presential	In these activities, seminars and discussions of the contents explained in the large group activities (M2a methodology) will be proposed. The practical activities (M2a methodology) will be planned taking into account project-based learning (ABP). Finally, we will proceed to clarify doubts.
Theory sessions	100% presential	They will be developed with the explanation of the contents of each subject of the subject, using multimedia tools (M1a methodology). Once these contents have been explained, practical cases will be developed (M1a methodology) and students will be asked to solve real projects based on the contents explained (project-based M2a methodology, ABP).
Tutoring	On-site + Online	Some tutoring sessions will be done in person and others online (synchronous and asynchronous)

2- EVALUATION SYSTEM

The evaluation system proposed in the non-classroom setting is as follows:

Ordinary call

Assessment test	Format (presential / online synchronous or asynchronous)	Description	Percentage
Assistance in presential and / or virtual activities	Presential / Synchronous Online	The student's attendance to the planned activities will be taken into account through attendance control account through attendance control	10%

Exam about the theoretical and practical concepts of the subject	Presential	Taking a written exam consisting of an adequate number of theoretical questions and a practical case	50%
Carrying out work, cases or practical exercises	Presential	A group work will be carried out under the project-based learning methodology (ABP) on a subject theme	30%
Participation in presential and / or virtual activities	Presential / Synchronous Online	Active participation in the questions and activities raised	10%

Extraordinary call

Assessment test	Format (presential / online synchronous or asynchronous)	Description	Percentage
Exam about the theoretical and practical concepts of the subject	Presential	Realization of a written exam made up of an adequate number of theoretical questions and a practical case	50%
Carrying out work, cases or practical exercises	Presential	An individual work will be carried out	50%

3.- RESOURCES

The assigned classroom teaching will be used, as well as virtual teaching tools

9. VIRTUAL TEACHING SCENARIO

1- TEACHING METHODOLOGY AND TRAINING ACTIVITIES

The teaching methodology and the type of activities to develop in this scenario are as follows:

Formation activities	Format (classroom / online)	Teaching methodology Description
Practical sessions	No presential	Substitution of practical sessions for synchronous online training activities.
Theory sessions on the contents of the program	No presential	Participatory master class sessions conducted by videoconference.
Tutoring	No presential	All tutoring sessions will be conducted online (synchronous and asynchronous)

2- EVALUATION SYSTEM

The evaluation system proposed in the non-classroom setting is as follows:

Ordinary call

Assessment test	Format (presential / online)	Description	Percentage

	synchronous or asynchronous)		
Assistance in virtual activities	Synchronous Online	Student attendance at planned activities will be taken into account through attendance control	10%
Exam about the theoretical and practical concepts of the subject	Synchronous Online	Completion of a written exam consisting of an adequate number of theoretical questions and a practical case	50%
Carrying out work, cases or practical exercises	Online asynchronous	An individual work will be carried out	40%

Extraordinary call

Assessment test	Format (presential / online synchronous or asynchronous)	Description	Percentage
Exam about the theoretical and practical concepts of the subject	Synchronous Online	Completion of a written exam consisting of an adequate number of theoretical questions and a practical case	50%
Carrying out work, cases or practical exercises	Online asynchronous	An individual work will be carried out	50%

3.- RESOURCES

All the planned activities will be carried out using the virtual teaching platform of the University of Jaén and Google Meet.

DATA PROTECTION CLAUSE (on line exams)

Institution in charge of data processing: Universidad de Jaén, Campus Las Lagunillas, s/n, 23071 Jaén

Data Protection Delegate: dpo@ujaen.es

Purpose: In accordance with the Universities Law and other national and regional regulations in force, carrying out exams and assessment tests corresponding to the courses students are registered in. In order to avoid frauds while sitting the exam, the exam will be answered using a videoconference system, being able the academic staff of the University of Jaén to compare and contrast the image of the person who is answering the exam with the student's photographic files. Likewise, in order to provide the exam with evidential content for revisions or claims, in accordance with current regulation frameworks, the exam will be recorded and stored.

Legitimacy: compliance with legal obligations (Universities Law) and other national and regional regulations currently in force.

Addressees: service providers who are the owners of the platforms where the exams are carried out and with whom the University of Jaén has signed the corresponding data access contracts.

Storage periods: those established in current in force regulations. In the specific case of exam videoconference recordings, not before the examination records and transcripts are closed or the exam can still be reviewed or challenged.

Rights: you can exercise your right of access, amendment, cancellation, opposition, suppression, limitation and portability by sending a letter to the postal or electronic address indicated above. In the event that you consider that your rights have been violated, you may submit a complaint to the Andalusian Council for Transparency and Data Protection www.ctpdandalucia.es

CLASS RECORDING CLAUSE PERSONAL DATA PROTECTION

Person in charge: Universidad de Jaén, Paraje Las Lagunillas, s/n; Tel.953 212121; www.ujaen.es

Data protection delegate (DPO): TELEFÓNICA, S.A.U. ; Email: dpo@ujaen.es

Procedure aim: To manage proper recordings of teaching sessions with the aim of facilitating learning process under a multimodal and/or online teaching

Period for record storage: Images will be kept during legal term according to regulations in force

Legitimacy: Data will be managed according to legal regulations (Organic Law 6/2001, December 21, on Universities) and given consent provided by selecting corresponding box in legal admission documents

Data recipients (transfers or assignments): Any person allowed to get access to every teaching modality

Rights: You may exercise your rights of access, rectification, cancellation, portability, limitation of processing, deletion or, where appropriate, opposition. To exercise these rights, you must submit a written request to the Information, Registration and Electronic Administration Service of the University of Jaen at the address above, or by e-mail to the address above. You must specify which of these rights you are requesting to be satisfied and, at the same time, you must attach a photocopy of your ID card or equivalent identification document. In case you act through a representative, legal or voluntary, you must also provide a document that proves this representation and identification. Likewise, if you consider that your right to personal data protection has been violated, you may file a complaint with the Andalusian Data Protection and Transparency Council www.ctpdandalucia.es

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