

IKASTURTEA/ ACADEMIC YEAR 2026/27

IKASGAIA/SUBJECT:	INTRODUCTION TO SMART INDUSTRY	KURTSOA/COURSE:	4th
MODULUA/MODULE:	Automation Technology	KOKAPENA/LOCATION:	7th semesterand
ESPARRUA/SCOPE:	---	IRAUPENA/DURATION:	150 h
IZAERA/CHARACTER:	Optional course	KREDITUAK/CREDITS:	5 ECTS
KODEA/CODE:	28475	HIZKUNTZA/LANGUAGE:	English
FLAT/PLAN:	2024	IRAKASLEA/TEACHER:	Beñat Gallastegi
AIPAMENA/MENTION:	---		

HELBURUA/AIM:	By the end of the course, students will be able to understand the evolution of industry from classical automation towards Industry 4.0 and Industry 5.0 models, identifying, at an introductory level, the main enabling technologies of smart industry —such as robotics, artificial vision, IIoT, additive manufacturing, simulation, virtual and augmented reality, cyber-physical systems, digital twins, artificial intelligence, and generative artificial intelligence— and analysing their role in the improvement of industrial and organisational processes. Likewise, students will be able to identify opportunities for digitalisation and intelligent automation in simple use cases, design conceptual solutions based on generative AI, and develop, as a team, small agents or assistants capable of supporting processes such as budgeting, planning, document management, report generation, or technical assistance. They will also critically assess their usefulness, limitations, associated risks, and potential impact on productivity, sustainability, traceability, and the improvement of human work.
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IKAS-PROCESSING EMAILS/LEARNING OUTCOMES

RC2 - Innovate in engineering processes and products through a reflective process that utilizes relevant variables governing system behavior to optimize solutions. TYPE: Competencies

RCO2 - Understand the basic principles of programming applied to engineering, as well as to statistics and probability calculus. TYPE: Knowledge or contents

RCO4 - Understand the fundamentals of automation engineering, and the main characteristics of a control system and modeling techniques. TYPE: Knowledge or contents

RHT3 - Analyze and design automated solutions for industrial processes, implementing modeling techniques, and critically evaluating the obtained conclusions. TYPE: Skills or abilities

EDUKIAK/SYLLABUS

1. Introduction
2. Enabling Technologies
3. Use Cases

IRISH ENGINEERING/TYPE OF TEACHING

	M	CP	PL	PO	SP	D
In person (hours)	20	20	0	0	20	0
Personal work (hours)	25	30	0	0	35	0

M: Master class / CP: Classroom problem-solving class / PL: Laboratory practices / PO: Computer practices / SP: Project seminars / D: Dual

BALIABIDE DIDAKTIKOAK/TEACHING METHODS

- X Explanatory and/or demonstrative sessions by the teacher.
- X Exercises carried out in the classroom with the help of the teacher.
- X Practical application through exercises, simulations, and experimentation, either individually or in groups.

An integrative case study representative of the skills to be acquired through the module.

LITERATURE/LITERATURE

Kagermann, H., Wahlster, W., Helbig, J. (eds.). *Recommendations for implementing the strategic initiative INDUSTRIE 4.0*. (Documento fundacional; disponible en abierto).

Guías introductorias a Industria 4.0: “Guía Industria 4.0” (Spanish Ceramic Technology)

Breque, M., De Nul, L., & Petridis, A. (2021). Industry 5.0: Towards a sustainable, human-centric and resilient European industry. European Commission, Directorate-General for Research and Innovation.

Bommasani, R., Hudson, D. A., Adeli, E., Altman, R., Arora, S., von Arx, S., Bernstein, M. S., Bohg, J., Bosselut, A., Brunskill, E., et al. (2021). On the opportunities and risks of foundation models. arXiv:2108.07258.

EBALUAZIO METHOD ETA IRIZPIDEAK/EVALUATION METHODS AND CRITERIA

The assessment tests and activities for this subject will be carried out in accordance with the principles of academic integrity, honesty, and ethical behavior established in the regulations of the Elgoibar Dual Engineering School and the EHU. Upon entering the University, students signed the Declaration of Commitment to Ethical Behavior and Academic Honesty, pledging not to engage in plagiarism, academic fraud, or the use of unauthorized materials or devices (including artificial intelligence tools when not expressly permitted) in academic tests and assignments. Failure to comply with these obligations may lead to the academic and disciplinary consequences provided for in the university regulations in force.

Continuous Evaluation System

X Final Evaluation System

OHIKO DEIALDIA/ ORDINARY CALL

40 % Written and/or oral test

Completion and/or reporting of internships

60 % Report/Deliverables/Oral Presentations/Projects

Carrying out activities and/or projects in the dual entity

Argibideak/Clarifications:

FINAL assessment criteria:

Assessment activity	Period	Score	Observations
Report / Deliverables / Oral presentations / Projects (Group–individual)	Throughout the semester	60 % 0-60 points	If the assignment is not submitted when requested, it will receive 0 points. In order to average this mark with the other sections, a minimum score of 5 out of 10 must be obtained.
Final exam (individual)	Examination period	40 % 0-40 points	In order to average this mark with the other sections, a minimum score of 5 out of 10 must be obtained.

The assessment system will be the same for all enrolled students, as the course will involve different types of activities in addition to the exam, which will be compulsory.

All activities included in the assessment system are equally important. Students who take part in any assessment activity of the course, even if they do not complete all of them, will receive a final grade. Any activities not completed will be awarded a mark of 0, and the corresponding average will be calculated. In order to pass the course, students must meet the defined minimum requirements and obtain a grade equal to or higher than 5 out of 10 when calculating the average of the different sections.

If the minimum required score has not been obtained in any section, the final grade will be calculated as follows: the average will be calculated using all marks, and if the mark obtained in the average:

Average $\geq 4 \rightarrow$ the final grade will be 4.

Average $< 4 \rightarrow$ the final grade will be the mark obtained in the average.

EZOHIAK DEIALDIA/ CALLEXTAORDINARY

40 % Written and/or oral test

Completion and/or reporting of internships

60% Report/Deliverables/Oral Presentations/Projects

Carrying out activities and/or projects in the dual entity

Argibideak/Clarifications:

FINAL assessment criteria:

The assessment criteria are the same as those applied in the ordinary examination session.

Students who still need to meet the minimum requirement in one or more sections will retain the mark obtained in the section(s) in which the minimum requirement was met, and will only have to retake the part(s) in which they did not achieve the minimum in the ordinary examination session.