

[GJG303] OP S2. MANUFACTURING TECHNOLOGY LABORATORY

GENERAL INFORMATION

Studies	DEGREE IN MECHATRONICS ENGINEERING	Subject	?
Semester	2	Course	2
Character	OPTIONAL	Mention / Field of specialisation	???
Plan	2025	Modality	Face-to-face
Credits	6	Language	CASTELLANO/EUSKARA
		Total hours	90 class hours + 60 non-class hours = 150 total hours

2030 AGENDA GOALS



PROFESSORS

ORTUBAY IBABE, RAFAEL
VILLAR ANCHIA, JOSEBA ANDONI
MENDIGUREN OLAETA, JOSEBA
MASKARIANO MANZANO, JULEN
AZPI-LOPEZ, ANGEL (SOMORROSTRO)
AZPI-CALDERON, CHRISTIAN (SOMORROSTRO)

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
MANUFACTURING TECHNOLOGY	(No previous knowledge required)

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GJR126 - Knowing and applying production and manufacturing techniques, tools and systems	x			5,4
G-TR1 - To develop interdisciplinary projects specific to their specialty and of gradual complexity, - becoming aware of respect for human rights and fundamental rights, and analyzing and assessing the impact of the proposed solutions on the SDGs - to acquire and/or apply basic, advanced and/or avant-garde, demonstrating the ability to work in multidisciplinary teams and/or undertake further studies with a high degree of autonomy		x		0,36
G-TR2 - To express information, ideas and the arguments that support them in an orderly, clear and coherent manner, orally and in writing, based on quality information, self-made or obtained from different sources, using inclusive and non-discriminatory language		x		0,24

Total: 6

KC: Knowledge or Content / SK: Skills / AB: Abilities

SECONDARY LEARNING RESULTS

2RGJ291 (2 sem) Establish the responsibilities of team members using appropriate techniques to promote their efficiency in project development (sharing resources, contributing ideas, seeking consensus, evaluating results, the process, etc.).

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	2 h.	1 h.	3 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	(No mechanisms) Comments: Continuous assessment. Retake is not foreseen.

CH - Class hours: 2 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 3 h.

RGJ220 They determine manufacturing processes, analyzing and justifying the sequence and variables of the it.

LEARNING ACTIVITIES

	CH	NCH	TH
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning	2 h.		2 h.
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	3 h.	3 h.	6 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	5 h.	3 h.	8 h.
Practical work in workshops and/or laboratories, individually and/or in teams	8 h.	6 h.	14 h.

EVALUATION SYSTEM

W

Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems
Individual written and/or oral tests or individual coding/programming tests

40%

60%

MAKE-UP MECHANISMS

Individual written and/or oral tests or individual coding/programming tests
Comments: If a retake exam is needed, the final mark will be obtained 25% first mark 75% second one

CH - Class hours: 18 h.

NCH - Non-class hours: 12 h.

TH - Total hours: 30 h.

2RGJ292 (2 sem) Identify and accurately explain the SDGs addressed by the project carried out.

LEARNING ACTIVITIES

	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	1 h.	2 h.	3 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

100%

MAKE-UP MECHANISMS

(No mechanisms)

CH - Class hours: 1 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 3 h.

2RGJ293 (2 sem) Correctly draft and structure the project report, using appropriate language. To do so, search for and use the appropriate sources of information.

LEARNING ACTIVITIES

	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams	2 h.	1 h.	3 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

100%

MAKE-UP MECHANISMS

(No mechanisms)

Comments: Revision and correction of the written report of the semester project

CH - Class hours: 2 h.

NCH - Non-class hours: 1 h.

TH - Total hours: 3 h.

RGJ223 They control dimensions, geometries and surfaces of products, comparing the measures with the specifications of the product.

LEARNING ACTIVITIES	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	1 h.	1 h.	2 h.
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	2 h.	1 h.	3 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	2 h.	1 h.	3 h.
Practical work in workshops and/or laboratories, individually and/or in teams	4 h.	3 h.	7 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS	
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	60%	Individual written and/or oral tests or individual coding/programming tests	
Individual written and/or oral tests or individual coding/programming tests	40%	Comments: If a retake exam is needed, the final mark will be obtained 25% first mark 75% second one	

CH - Class hours: 9 h.
NCH - Non-class hours: 6 h.
TH - Total hours: 15 h.

2RGJ290 (2 sem) Propose the objectives and planning of a project that will enable you to acquire and/or reinforce your knowledge of technologies—which are sometimes at the cutting edge of knowledge—and define an effective learning strategy.

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	1 h.	2 h.	3 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS	
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	(No mechanisms)	
		Comments: Continuous assessment. Retake is not foreseen.	

CH - Class hours: 1 h.
NCH - Non-class hours: 2 h.
TH - Total hours: 3 h.

RGJ221 They operate the tools, machines and equipment involved in the manufacturing process, relating their operation to the process conditions and the characteristics of the final product.

LEARNING ACTIVITIES	CH	NCH	TH
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning	2 h.	3 h.	5 h.
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	5 h.	4 h.	9 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	8 h.	4 h.	12 h.
Practical work in workshops and/or laboratories, individually and/or in teams	12 h.	7 h.	19 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS	
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	20%	Individual written and/or oral tests or individual coding/programming tests	
Individual written and/or oral tests or individual coding/programming tests	80%	Comments: If a retake exam is needed, the final mark will be obtained 25% first mark 75% second one	

CH - Class hours: 27 h.
NCH - Non-class hours: 18 h.
TH - Total hours: 45 h.

RGJ222 They prepare numerical control (CNC) machines, selecting the tools and applying the required techniques or procedures.

LEARNING ACTIVITIES	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.	3 h.	5 h.
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	6 h.	3 h.	9 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	8 h.	4 h.	12 h.
Practical work in workshops and/or laboratories, individually and/or in teams	12 h.	7 h.	19 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	80%	Individual written and/or oral tests or individual coding/programming tests
Individual written and/or oral tests or individual coding/programming tests	20%	Comments: If a retake exam is needed, the final mark will be obtained 25% first mark 75% second one

CH - Class hours: 28 h.
NCH - Non-class hours: 17 h.
TH - Total hours: 45 h.

2RGJ294 (2 sem) Give an oral presentation of the project, arguing effectively and using language correctly.

LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams	2 h.	1 h.	3 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	(No mechanisms)
		Comments: Continuous assessment. Retake is not foreseen.

CH - Class hours: 2 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 3 h.

CONTENTS

SELECTION OF MACHINING MATERIALS- Commercial forms of materials.- Materials and their machining conditions. MACHINING WITH HAND TOOLS- Filing, drilling, sawing, reaming, threading, riveting, punching... PREPARATION OF MACHINES, EQUIPMENT, TOOLING AND TOOLS.- Forming machines and equipment- Machines and equipment for manufacturing by machining.- Elements and controls of the machines.- Adjustment of process parameters. OPERATIONS WITH METAL REMOVAL MACHINE TOOLS.- Operation of machine tools.- Cutting tools.- Chip removal operating techniques. NUMERICAL CONTROL PROGRAMMING- Workpiece clamping tools.- Machining strategies.- CNC-ISO programming. FORMING OPERATIONS- Machine operation- Tools and fixtures- Forming operating techniques. WELDING IN NATURAL ATMOSPHERE AND PROJECTION- Operation of welding and projection machines.- Welding and projection techniques. CONTROL OF DIMENSIONS, GEOMETRIES AND SURFACES OF PRODUCTS.- Measurement, comparison and verification processes- Geometric and surface measurement and verification techniques in the manufacturing process.

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Bibliography

Moodle Platform
Class presentations
Labs
Lab practical training
Topic related web quires

CRUZ, T. 2010. Control Numérico y Programación II. Marcombo Formación
KALPAKJIAN, S. SCHMID, S.R. 2009. Manufactura, ingeniería y tecnología. Prentice Hall
GROOVER, M. 1997. Fundamentos de manufactura moderna: Materiales, procesos y sistemas. Prentice Hall
HERNÁNDEZ, G. 2016. Manual del soldador. Cesol
http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_in k.pl?grupo=MECATRONICA22&ejecuta=15&_ST