[GJC302] OP S1. MECHANICAL TECHNOLOGY

GENERAL INFORMATION

Studies	DEGREE IN MECHATRONICS ENGINEERING			**Subject**	?
Semester	1	**Course**	2	**Mention / Field of specialisation**	???
Character	OPTIONAL				
Plan	2025	**Modality**	Face-to-face	**Language**	EUSKARA/CASTELLANO
Credits	6	**Hours/week**	5	**Total hours**	90 class hours + 60 non-class hours = **150 total hours**

2030 AGENDA GOALS

PROFESSORS

GOMEZ SAGARZAZU, MIREN
OROBENGOA GURIDI, DANEL
LASA BASTIDA, MIKEL
AZPI-ARTETXE, MAIALEN (SOMORROSTRO)
URIBE AZKARRETA, MAITANE
DORRONSORO BALERDI, JULEN

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	*(No previous knowledge required)*

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GJR124 - To know and apply the basic principles of materials engineering, metrology and industrial fluidic 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

1RGJ291 (1 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
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: With the project of the sencond semester

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

1RGJ292 (1 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	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)*

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

1RGJ293 (1 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	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:** Revision and correction of the written report of the semester project

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

RGJ218 They know and apply the measurement and control techniques and devices used in the manufacturing industry.

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	3 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	6 h.	3 h.	9 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	40%	Individual written and/or oral tests or individual coding/programming tests **Comments:** Final mark: written second-chance exam (75%) + exam(25%)
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	20%	
Self-assessment	40%	

CH - Class hours: 11 h.
NCH - Non-class hours: 4 h.
TH - Total hours: 15 h.

RGJ219 They identify the components and describe the functions they perform in a fluid power system, understanding the circuits and diagrams in which they are displayed.

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	6 h.	4 h.	10 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.	8 h.	10 h.
Computer simulation exercises, individually and/or in teams	5 h.	3 h.	8 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	14 h.	6 h.	20 h.
Carrying out exercises and solving problems individually and/or in teams	7 h.	5 h.	12 h.
Practical work in workshops and/or laboratories, individually and/or in teams	6 h.	2 h.	8 h.

EVALUATION SYSTEM	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	30%
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	20%
Individual written and/or oral tests or individual coding/programming tests	50%

MAKE-UP MECHANISMS

Individual written and/or oral tests or individual coding/programming tests

Comments: Final mark: written second-chance exam (75%) + exam (25%)

CH - Class hours: 40 h.
NCH - Non-class hours: 28 h.
TH - Total hours: 68 h.

1RGJ290 (1 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
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: With the project of the second semester

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

1RGJ294 (1 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
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: With the oral presentation of the project of the second semester

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

TH - Total hours: 3 h.

RGJ217 They distinguish between different types of material understanding the fundamentals of science, technology and chemistry of materials, including relationship between microstructure, synthesis or processing and properties of them.

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	6 h.	4 h.	10 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.	8 h.	10 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	19 h.	7 h.	26 h.
Carrying out exercises and solving problems individually and/or in teams	4 h.	2 h.	6 h.

EVALUATION SYSTEM	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	24%
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	20%
Individual written and/or oral tests or individual coding/programming tests	56%

MAKE-UP MECHANISMS

Individual written and/or oral tests or individual coding/programming tests

Comments: Final mark: written second-chance exam (75%) + exam(25%)

CH - Class hours: 31 h.
NCH - Non-class hours: 21 h.
TH - Total hours: 52 h.

CONTENTS

In the Mechanical Technology course, three sections are distinguished:

1. MATERIALS

- Metal alloys

* Steels and cast irons and their designations.

* Heat treatments and surface treatments of steels.

* Non-ferrous metals

- Plastics

* Classification and structure

* Mechanical properties

* Physical properties

- Testing

* Mechanical tests

* Non-destructive testing

2. METROLOGY

-Accuracy

-Measuring instruments: rulers, calipers, micrometers

-Comparative clock, calipers and standards-Rugosimeters

3. FLUIDS

-Applications in industry

-Fluid power transmission (pneumatics and hydraulics)

-Actuators

-Valves and Pumps

-Pressurized air installations

-Pneumatic and hydraulic accumulators

-Hydraulic circuits in industrial machines (understanding and design)

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Topic related web quires Labs Moodle Platform Video projections Lab practical training Slides of the subject	CALLISTER Jr., W.D. 2011. Materialen Zientzia eta Ingeniaritza Hastapenak. Euskal Herriko Unibertsitateko Argitalpen Zerbitzua ILANGO, S., SOUNDARARAJAN, V. 2007. Introduction to hydraulics and pneumatics. PHI Learning Pvt. Ltd. RABIE, M. 2009. Fluid Power Engineering. McGraw-Hill. MORO, M. 2017. Fundamentos de Metrología Dimensional. Marcombo Universitaria LORIENTE, O; GONZALEZ, E., TRULL, O. 2013. Verificación y Metrología. Libro de Prácticas. Lulu. Powered by http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_lnk.pl?grupo=MECATRONICA21&ejecuta=15&_ST GALAL RABIE, M.; RABIE, M. 2009. Fluid Power Engineering. McGraw-Hill Professional Publishing DE LAS HERAS, S. 2011. Fluidos, bombas e instalaciones hidráulicas. Iniciativa Digital Politècnica Universitat Politécnica de Catalunya