

[GJJ201] MECHANICAL TECHNOLOGY

GENERAL INFORMATION

Studies	DEGREE IN MECHATRONICS ENGINEERING		Subject	?
Semester	1	Course	1	Mention / Field of specialisation
Character	OPTIONAL		Language	CASTELLANO/EUSKARA
Plan	2022	Modality	Face-to-face	Total hours
Credits	6	Hours/week	5	90 class hours + 60 non-class hours = 150 total hours

PROFESSORS

OROBENGOA GURIDI, DANIEL
AZPI-AURTENETXE, JON (SOMORROSTRO)
BIZKARRA LANGARA, KEPA

REQUIRED PREVIOUS KNOWLEDGE

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

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GJR104 - To know and apply the basic principles of materials engineering, metrology and industrial fluidic systems	x			5,4
G-RTR1 - 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		0,32
G-RTR2 - 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		0,28
Total:				6

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

SECONDARY LEARNING RESULTS

RGJ190 [!] *Conocer y aplicar las fases para desarrollar de forma guiada, con los objetivos y la planificación previamente definidos, un proyecto de complejidad técnica acorde con los conocimientos de formación básica de la ingeniería. Reflexiona sobre los cono*

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.	2 h.	4 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: With the project of the second semester

CH - Class hours: 2 h.
NCH - Non-class hours: 2 h.
TH - Total hours: 4 h.

RGJ191 [!] *Contribuir en la estrategia de funcionamiento del equipo priorizando los objetivos comunes, fomentando y valorando la participación de todas las personas y responsabilizándose de las tareas individuales, así como del cumplimiento de plazos.*

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.	2 h.	4 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: With the project of the second semester

CH - Class hours: 2 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 4 h.

RGJ193 [!] *Redacta una memoria de proyecto clara y concisa utilizando las fuentes de información y estructura de memoria facilitadas, y haciendo un uso correcto, inclusivo y no discriminatorio del lenguaje.*

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.

2 h.

4 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: 2 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 4 h.

RGJ194 [!] *Realiza una presentación oral y defensa del proyecto clara y concisa, haciendo un uso correcto del lenguaje*

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: With the oral presentation of the project of the second semester

CH - Class hours: 1 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 3 h.

RGJ111 [!] *Distingue entre los diferentes tipos de material entendiendo los fundamentos de ciencia, tecnología y química de materiales, comprendiendo la relación entre la microestructura, la síntesis o procesado y las propiedades de los materiales*

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.

2 h.

5 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.

6 h.

25 h.

Carrying out exercises and solving problems individually and/or in teams

4 h.

2 h.

6 h.

Practical work in workshops and/or laboratories, individually and/or in teams

4 h.

2 h.

6 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	27%	Individual written and/or oral tests or individual coding/programming tests Comments: If a retake exam is needed, the mark will be calculated 25% first exam 75% retake
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	10%	
Individual written and/or oral tests or individual coding/programming tests	63%	
CH - Class hours: 32 h. NCH - Non-class hours: 20 h. TH - Total hours: 52 h.		

RGJ112 [!] *Conoce y aplica las técnicas y aparatos de medida y control utilizados en la industria manufacturera*

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	90%	Individual written and/or oral tests or individual coding/programming tests Comments: If a retake exam is needed, the mark will be calculated 25% first exam 75% retake
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	10%	
CH - Class hours: 11 h. NCH - Non-class hours: 4 h. TH - Total hours: 15 h.		

RGJ113 [!] *Identifica los componentes y describe las funciones que cumplen en un sistema de potencia fluidica e interpreta los circuitos y diagramas en los que estos se representan*

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	4 h.	3 h.	7 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.	10 h.	12 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	16 h.	2 h.	18 h.
Carrying out exercises and solving problems individually and/or in teams	8 h.	7 h.	15 h.
Practical work in workshops and/or laboratories, individually and/or in teams	10 h.	6 h.	16 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	27%	Individual written and/or oral tests or individual coding/programming tests Comments: If a retake exam is needed, the mark will be calculated 25% first exam 75% retake
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree	10%	

project, master's thesis, challenges and problems
 Individual written and/or oral tests or individual coding/programming tests
 63%

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

CONTENTS

The subject Mechanical Technology is composed of three well-differentiated sections:

1. MATERIALS

- Metal alloys
- * Steels, cast irons and their designations
- * Heat and surface treatments for steels
- * Non ferrous metals

- Plastics
- * Clasification and structure
- * Mechanical properties
- * Physical properties

- Tests

- * Mechanical tests
- * Nondestructive testing

2. METROLOGY

- Precision
- Dimensional measuring devices: rulers, calipers, micrometers
- Dial gauge, gauges and reference patterns
- Rugosimeters

3. FLUIDS

- Industrial applications
- Fluid power transmission (pneumatics and hydraulics).
- Drives
- Valves and pumps
- Air pressure instalations
- Pneumatic and hydraulic accumulators
- Industrial machinery hydraulic circuits (interpretation and design)

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Topic related web quires
 Labs
 Moodle Platform
 Video projections
 Lab practical training
 Slides of the subject

Bibliography

CALLISTER Jr., W.D. 2011. Materiales Zientzia eta IngeniaritzaHastapenak. Euskal Herriko Unibertsitateko Argitalpen Zerbitzua
 ILANGO, S., SOUNDARARAJAN, V. 2007. Introduction to hydraulicsand pneumatics. PHI Learning Pvt. Ltd
 RABIE, M. 2009. Fluid Power Engineering. McGraw-Hill.
 MORO, M. 2017. Fundamentos de Metrología Dimensional.Marcombo Universitari
 LORIENTE, O; GONZALEZ, E., TRULL, O. 2013. Verificación yMetrología. Libro de Prácticas. Lulu
http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_in_k.pl?grupo=MECATRONICA11&ejecuta=30&_ST