

[GJJ101] MECHANICAL TECHNOLOGY

GENERAL INFORMATION

Studies	DEGREE IN MECHATRONICS ENGINEERING		Subject ?
Semester	1	Course	1
Character	OPTIONAL	Mention / Field of specialisation	
Plan	2020	Modality	Face-to-face
Credits	6	Hours/week	5
		Language	EUSKARA/CASTELLANO
		Total hours	90 class hours + 60 non-class hours = 150 total hours

PROFESSORS

BASAURI LARRAÑAGA, IBAI
OROBENGOA GURIDI, DANIEL
AZPI-AURTENETXE, JON (SOMORROSTRO)

REQUIRED PREVIOUS KNOWLEDGE

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

SKILLS

VERIFICA SKILLS

SPECIFIC

GJCE23 - Applied knowledge of materials engineering, metrology, and industrial fluid systems

GENERAL

GJCG03 - Addressing and optimising activities of assembly, commissioning, assistance and maintenance of facilities, machinery, and industrial mechatronic systems

CROSS

GJCTR2 - To be able to understand and apply knowledge to problem solving in complex work situations or specialised and professional environments calling for creative and innovative ideas, using self-developed arguments and procedures;

BASIC

G_CB5 - To have developed learning abilities required to embark on subsequent studies with a high level of autonomy.

LEARNING RESULTS

RGJ181 They communicate, search and structure written information: they write a clear and concise project report following the criteria established in the guide for written reports using the appropriate software.

LEARNING ACTIVITIES

	CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc.	2 h.	2 h.	4 h.
Relating to projects/POPBLs carried out individually or in teams			

EVALUATION SYSTEM

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence

W

100%

MAKE-UP MECHANISMS

Individual written and oral tests to assess technical skills of the subject
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.

RGJ182 They communicate, search and structure orally the information correctly: they make a clear and concise oral presentation and defense of the project, considering the aspects gathered in the oral communication guide and using the proper software approp

LEARNING ACTIVITIES

	CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc.	1 h.	2 h.	3 h.
Relating to projects/POPBLs carried out individually or in teams			

EVALUATION SYSTEM

W

MAKE-UP MECHANISMS

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence 100%

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence

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.

RGJ191 They use the right methodology to find solutions to problems and to develop projects: analyse problems properly, look for meaningful information to face them and propose solutions.

LEARNING ACTIVITIES

CH

NCH

TH

Development, writing and presentation of memorandums, reports, audiovisual material, etc.
 Relating to projects/POPBLs carried out individually or in teams

2 h.

2 h.

4 h.

EVALUATION SYSTEM

W

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence 100%

MAKE-UP MECHANISMS

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence

Comments: With the project of the second semester

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

RGJ192 They use the right methodology to find solutions to problems and to develop projects: analyse problems properly, look for meaningful information to face them and propose solutions.

LEARNING ACTIVITIES

CH

NCH

TH

Development, writing and presentation of memorandums, reports, audiovisual material, etc.
 Relating to projects/POPBLs carried out individually or in teams

2 h.

2 h.

4 h.

EVALUATION SYSTEM

W

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence 100%

MAKE-UP MECHANISMS

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence

Comments: With the project of the second semester

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

RGJ1111 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, writing and presentation of memorandums, reports, audiovisual material, etc.
 Relating to projects/POPBLs carried out individually or in teams

3 h.

2 h.

5 h.

Individual study and work, tests and evaluations and check points

2 h.

8 h.

10 h.

Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects

19 h.

6 h.

25 h.

Individual and team exercises

4 h.

2 h.

6 h.

Individual or team workshop and/or lab practice

4 h.

2 h.

6 h.

EVALUATION SYSTEM

W

Individual written and oral tests to assess technical skills of the subject 63%

Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices 27%

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence 10%

MAKE-UP MECHANISMS

Individual written and oral tests to assess technical skills of the subject

Comments: If a retake exam is needed, the mark will be calculated 25% first exam 75% retake

CH - Class hours: 32 h.

NCH - Non-class hours: 20 h.

TH - Total hours: 52 h.

RGJ1112 They know and apply the measurement and control techniques and devices used in the manufacturing industry.

LEARNING ACTIVITIES

CH

NCH

TH

Development, writing and presentation of memorandums, reports, audiovisual material, etc. 3 h. 3 h.

Relating to projects/POPBLs carried out individually or in teams

Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects 2 h. 1 h. 3 h.

Individual or team workshop and/or lab practice 6 h. 3 h. 9 h.

EVALUATION SYSTEM

W

Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices 90%

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence 10%

MAKE-UP MECHANISMS

Individual written and oral tests to assess technical skills of the subject

Comments: If a retake exam is needed, the mark will be calculated 25% first exam 75% retake

CH - Class hours: 11 h.

NCH - Non-class hours: 4 h.

TH - Total hours: 15 h.

RGJ1113 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, writing and presentation of memorandums, reports, audiovisual material, etc. 4 h. 3 h. 7 h.

Relating to projects/POPBLs carried out individually or in teams

Individual study and work, tests and evaluations and check points 2 h. 10 h. 12 h.

Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects 16 h. 2 h. 18 h.

Individual and team exercises 8 h. 7 h. 15 h.

Individual or team workshop and/or lab practice 10 h. 6 h. 16 h.

EVALUATION SYSTEM

W

Individual written and oral tests to assess technical skills of the subject 63%

Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices 27%

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence 10%

MAKE-UP MECHANISMS

Individual written and oral tests to assess technical skills of the subject

Comments: If a retake exam is needed, the mark will be calculated 25% first exam 75% retake

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. *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 Universitari

LORIENTE, O; GONZALEZ, E., TRULL, O. 2013. *Verificación y Metrología*. Libro de Prácticas. Lulu

http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_Ink.pl?grupo=MECATRONICA11&ejecuta=30&_ST