

[GJI203] ELECTROMECHANICAL SYSTEMS

GENERAL INFORMATION

Studies	DEGREE IN MECHATRONICS ENGINEERING	Subject	?
Semester	1	Course	3
Character	COMPULSORY	Mention / Field of specialisation	
Plan	2022	Modality	Face-to-face
Credits	6	Language	EUSKARA/CASTELLANO/ENGLISH
		Total hours	94 class hours + 56 non-class hours = 150 total hours

2030 AGENDA GOALS



PROFESSORS

ARANA OSTOLAZA, AITOR
UNAMUNO RUIZ, ENEKO
ELGUEZABAL LAZCANO, JON
LOPEZ RAMIREZ, IZAR

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
GRAPHIC EXPRESION	[!] Conocimientos teóricos sobre sistemas trifásicos y máquinas eléctricas
FOUNDATIONS OF ELECTRICAL ENGINEERING	
PHYSICS	
MECHANICAL SYSTEMS	
FOUNDATIONS OF ELECTRICAL ENGINEERING	

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GJR303 - To know and apply the principles of theory of machines and transmission mechanisms, electrical drives and their applications			x	5,08
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		0,44
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		0,48

Total: 6

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

SECONDARY LEARNING RESULTS

1RGJ394 (1 sem)

LEARNING ACTIVITIES

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

CH 4 h. **NCH** 2 h. **TH** 6 h.

EVALUATION SYSTEM

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

W
100%

MAKE-UP MECHANISMS

(No mechanisms)

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

CH - Class hours: 4 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 6 h.

RGJ3306 [!] *Conoce, selecciona y dimensiona elementos de transmisión partiendo de especificaciones dadas*

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
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	2,75 h.	1 h.	3,75 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.	4 h.	6 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	7,5 h.	1,25 h.	8,75 h.
Carrying out exercises and solving problems individually and/or in teams	4,75 h.	4,75 h.	9,5 h.

EVALUATION SYSTEM

W

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	65%
Observation (technical capacity, attitude and participation)	15%

MAKE-UP MECHANISMS

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

CH - Class hours: 17 h.

NCH - Non-class hours: 11 h.

TH - Total hours: 28 h.

RGJ3307 [!] *Dimensiona y selecciona el accionamiento adecuado a partir de un ciclo de trabajo*

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
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	2,75 h.	1,5 h.	4,25 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	7,25 h.	1,5 h.	8,75 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	15%
Individual written and/or oral tests or individual coding/programming tests	85%

MAKE-UP MECHANISMS

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

CH - Class hours: 10 h.

NCH - Non-class hours: 3 h.

TH - Total hours: 13 h.

1RGJ391 (1 sem)

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
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

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%
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MAKE-UP MECHANISMS

(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.

RGJ3305 [!] *Conoce y calcula parámetros para el dimensionado de elementos de transmisión en cadenas cinemáticas*

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.
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.	4 h.	6 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	7,5 h.	1,75 h.	9,25 h.
Carrying out exercises and solving problems individually and/or in teams	5,5 h.	8,25 h.	13,75 h.

EVALUATION SYSTEM

W

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	65%
Observation (technical capacity, attitude and participation)	15%

MAKE-UP MECHANISMS

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

CH - Class hours: 17 h.

NCH - Non-class hours: 16 h.

TH - Total hours: 33 h.

1RGJ393 (1 sem)

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.	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	100%
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MAKE-UP MECHANISMS

(No mechanisms)

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

CH - Class hours: 4 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 6 h.

1RGJ392 (1 sem)

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%
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MAKE-UP MECHANISMS

(No mechanisms)

CH - Class hours: 2 h.

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

RGJ3308 [1] *Analiza, modela y controla accionamientos basados en motores DC y AC*

LEARNING ACTIVITIES

	CH	NCH	TH
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning		9,5 h.	9,5 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	6 h.		6 h.
Computer simulation exercises, 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	17,5 h.		17,5 h.
Carrying out exercises and solving problems individually and/or in teams	7,5 h.	3,5 h.	11 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	20%
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	15%
Individual written and/or oral tests or individual coding/programming tests	65%

MAKE-UP MECHANISMS

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

CH - Class hours: 36 h.
NCH - Non-class hours: 17 h.
TH - Total hours: 53 h.

1RGJ390 (1 sem)

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

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%
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MAKE-UP MECHANISMS

(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.

CONTENTS

Mechanical systems1. Overview of mechanical transmission systems2. Modeling of kinematic chains3. Dimensioning of machine elementsElectrical drives1. Mechanical load types and electrical drive dimensioning2. Direct current electric drives3. Alternating current electric drives

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

[1] Consultas en páginas web relacionadas con el tema

Bibliography

Peter R.N. Childs, "Mechanical design engineering Handbook"

[!] *Plataforma Moodle*

[!] *Transparencias de la asignatura*

[!] *Realización de prácticas en ordenador*

Steven R. Schmid, Bernard J. Hamrock, Bo O. Jacobson,
"Fundamentals of Machine Elements"

J. Fraile Mora, J. Fraile Ardanuy, "Accionamientos eléctricos"

W. Leonhard, "Control of Electrical Drives"

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k.pl?grupo=MECATRONICA31&ejecuta=5&_ST](http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_in
k.pl?grupo=MECATRONICA31&ejecuta=5&_ST)