

[GJI103] ELECTROMECHANICAL SYSTEMS

GENERAL INFORMATION

Studies	DEGREE IN MECHATRONICS ENGINEERING		Subject ?
Semester	1	Course	3
Character	COMPULSORY		Mention / Field of specialisation
Plan	2020	Modality	Adapted Face-to-face
Credits	6	Hours/week	5
		Language	ENGLISH
		Total hours	90 class hours + 60 non-class hours = 150 total hours

PROFESSORS

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REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
PHYSICS	(No previous knowledge required)

SKILLS

VERIFICA SKILLS

SPECIFIC

GJCE09 - Knowledge of the principles of machine theory and transmission mechanisms, electric drives and their applications

GENERAL

GJCG05 - Developing and designing products, equipment and mechatronic systems while complying with the technical, economic, quality and safety requirements established in the specifications and required by current legislation

LEARNING RESULTS

RG301 They assume responsibilities in the team, organizing and planning the tasks to be developed, dealing with contingencies and encouraging the participation of its members.

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

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.

RG302 They analyze the variables involved in the problem and propose actions for a stable situation.

LEARNING ACTIVITIES

	CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc.	1 h.	3 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

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: 1 h.
NCH - Non-class hours: 3 h.
TH - Total hours: 4 h.

RG304 They define the problem, the development of the solution, as well as the conclusions in an effective way, arguing and justifying each of them, making a correct use of the language, in writing.

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
Development, writing and presentation of memorandums, reports, audiovisual material, etc.	3 h.	1 h.	4 h.
Relating to projects/POPBLs carried out individually or in teams			

EVALUATION SYSTEM

	<i>W</i>
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: Revision and correction of the written report of the semester project

CH - Class hours: 3 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 4 h.

RG305 They define the problem, the development of the solution, as well as the conclusions in an effective way, arguing and justifying each one of them, and making a correct use of the language, orally.

LEARNING ACTIVITIES

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

	<i>W</i>
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 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.

RGJ3305 They know and calculate parameters for the design of transmission elements in powertrains

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
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			
Practices of problem solving and real or simulated context projects	2 h.	4 h.	6 h.
Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	8 h.	2 h.	10 h.
Individual and team exercises	6 h.	9 h.	15 h.

EVALUATION SYSTEM

	<i>W</i>
Individual written and oral tests to assess technical skills of the subject	65%
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	20%

MAKE-UP MECHANISMS

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

Technical skills, involvement in the project, finished work, 15%
 obtained results, handed documentation, presentation and
 technical defence

CH - Class hours: 18 h.
NCH - Non-class hours: 17 h.
TH - Total hours: 35 h.

RGJ3306 They know, selects and sizes transmission elements based on given specifications

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams	3 h.	1 h.	4 h.
Practices of problem solving and real or simulated context projects	2 h.	4 h.	6 h.
Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	8 h.	2 h.	10 h.
Individual and team exercises	5 h.	5 h.	10 h.

EVALUATION SYSTEM

W

Individual written and oral tests to assess technical skills of the subject	65%
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	20%
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	15%

MAKE-UP MECHANISMS

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

CH - Class hours: 18 h.
NCH - Non-class hours: 12 h.
TH - Total hours: 30 h.

RGJ3307 They size and select the appropriate drive from a working cycle

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams	5 h.	4 h.	9 h.
Practices of problem solving and real or simulated context projects	2 h.	4 h.	6 h.
Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	8 h.	2 h.	10 h.

EVALUATION SYSTEM

W

Individual written and oral tests to assess technical skills of the subject	85%
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	15%

MAKE-UP MECHANISMS

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

CH - Class hours: 15 h.
NCH - Non-class hours: 10 h.
TH - Total hours: 25 h.

RGJ3308 They analyse, model and control drives based on DC and AC motors

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	6 h.	3 h.	9 h.
Individual study and work, tests and evaluations and check points	22 h.	6 h.	28 h.
Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	4 h.	4 h.	8 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS	
Individual written and oral tests to assess technical skills of the subject	65%	Individual written and oral tests to assess technical skills of the subject	
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	20%		
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	15%		
CH - Class hours: 32 h.			
NCH - Non-class hours: 13 h.			
TH - Total hours: 45 h.			

CONTENTS

Mechanical systems

1. Overview of mechanical transmission systems
2. Kinematic chain modelling
3. Machine element sizing

Electric drives

1. Mechanical load types and electric drive sizing
2. DC electric drives
3. AC electric drives

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Topic related web quires Moodle Platform Slides of the subject Computer practical training	Peter R.N. Childs, "Mechanical design engineering Handbook" 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" http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_Ink.pl?grupo=MECATRONICA31&ejecuta=5&_ST