

[GJL102] ELECTRICAL POWER SYSTEMS

GENERAL INFORMATION

Studies	DEGREE IN MECHATRONICS ENGINEERING		Subject ?
Semester	1	Course	2
Character	OPTIONAL	Mention / Field of specialisation	
Plan	2020	Modality	Face-to-face
Credits	6	Hours/week	5
		Language	EUSKARA
		Total hours	90 class hours + 60 non-class hours = 150 total hours

PROFESSORS

CANALES SEGADE, JOSE MARIA
ZUBIETA ANSORREGUI, JON
TAVERA BAHILLO, TXABER
MITXELENA MARTIARENA, EKHI

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
FOUNDATIONS OF ELECTRICAL ENGINEERING	[!]

SKILLS

VERIFICA SKILLS

SPECIFIC

GJCE26 - Knowledge of electrical power systems and their applications.

GENERAL

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

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

GJCG06 - Implement and materialize projects of automation and control of equipment, processes and flexible industrial systems, through the integration of hardware and software in order to optimize the operation of the different units that make up the system to meet the needs of the productive sector

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

RG201 They coordinate their work with the other members of the team, contribute in their team to the development of the tasks to be carried out and the creation of a good working climate.

LEARNING ACTIVITIES

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

CH

NCH

TH

3 h.

1 h.

4 h.

Comments:

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 second semester project.

CH - Class hours: 3 h.

NCH - Non-class hours: 1 h.

TH - Total hours: 4 h.

RG202 They make decisions and assess the possible consequences of the selected alternative.

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

RG204 They define the problem, the development of the solution, as well as the conclusions in an effective way, making a correct use of the language, in writing.

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	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: Correction of draft semester written report	
CH - Class hours: 2 h. NCH - Non-class hours: 2 h. TH - Total hours: 4 h.			

RG205 They define the problem, the development of the solution, as well as the conclusions in an effective way, making a correct use of the language, orally.

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.	1 h.	3 h.
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 exposition of the second semester project.	
CH - Class hours: 2 h. NCH - Non-class hours: 1 h. TH - Total hours: 3 h.			

RGJ215 They understand and analyze three-phase AC circuits

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	14 h.	14 h.	28 h.
Individual study and work, tests and evaluations and check points	4 h.	4 h.	8 h.

Individual and team exercises	12 h.	8 h.	20 h.
Individual or team workshop and/or lab practice	18 h.	6 h.	24 h.
Classroom presentations of relevant concepts and procedures in participatory environments	8 h.	2 h.	10 h.

Comments: Designed to be approved by 100% of the students in the registration of the first period.

EVALUATION SYSTEM

W

Individual written and oral tests to assess technical skills of the subject	45%
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	35%
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	20%

Comments: Students practice in training activities: four practices for running a triphase motor.

MAKE-UP MECHANISMS

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
Comments: For each evaluation system, the final mark is determined with a weighted average of 25 of the control point and 75% of the recovery of the control point.

CH - Class hours: 56 h.

NCH - Non-class hours: 34 h.

TH - Total hours: 90 h.

RGJ216 They draw electrical power circuits using electrical CAD software

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	4 h.	2 h.	6 h.
Individual study and work, tests and evaluations and check points	4 h.	4 h.	8 h.
Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	3 h.	3 h.	6 h.
Individual or team workshop and/or lab practice	14 h.	11 h.	25 h.

EVALUATION SYSTEM

W

Individual written and oral tests to assess technical skills of the subject	20%
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	20%
Observation of student participation and attitude in the proposed training activities	60%

MAKE-UP MECHANISMS

Individual written and oral tests to assess technical skills of the subject
Comments: In case of not passing the practices, they must be repeated at the end of the semester.

CH - Class hours: 25 h.

NCH - Non-class hours: 20 h.

TH - Total hours: 45 h.

CONTENTS

1. Analysis of triphase circuits

1. Features of triphase systems
2. Star-triangle connection
3. Triphase-load potentials
4. Correction of Power Factor

2. Graphic representation of electric power systems

1. Industrial electrical elements
2. Use of catalogues
3. Born 's symbols, reference and enumeration.
4. Development of schemes: types of planes
5. Triphase motor manoeuvres.
6. Electric CAD EPLAN

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Moodle Platform
Class presentations
Video projections
Specific Master Software
Lab practical training

Bibliography

Schneider Telesquemario
[http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_Ink.pl?grupo=MECATRONICA21&ejecuta=35&_ST“Circuitos Eléctricos” 2ª Edición 2019 \(Castellano\) JESÚS FRAILE MORA. ISBN: 978-84-1622-847-8](http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_Ink.pl?grupo=MECATRONICA21&ejecuta=35&_ST“Circuitos Eléctricos” 2ª Edición 2019 (Castellano) JESÚS FRAILE MORA. ISBN: 978-84-1622-847-8)
<https://www.eplan.es/soluciones/eplan-para-centros-educativos/eplan-educacional-para-estudiantes/>