

[GEK304] PRODUCTION SYSTEMS AND ELECTRONIC TECHNOLOGIES

GENERAL INFORMATION

Studies	DEGREE IN INDUSTRIAL ELECTRONICS ENGINEERING	Subject	?
Semester	2	Course	3
Character	COMPULSORY	Mention / Field of specialisation	
Plan	2022	Modality	Face-to-face
Credits	3	Language	EUSKARA/CASTELLANO
		Hours/week	2.33
		Total hours	42 class hours + 33 non-class hours = 75 total hours

2030 AGENDA GOALS



PROFESSORS

MARZO ELGUERO, IOSU

REQUIRED PREVIOUS KNOWLEDGE

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

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GER313 - To know production and manufacturing systems	x			2,56
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		0,2
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		0,24
Total:				3

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

ENAAE LEARNING RESULTS

ENA103 - Knowledge and comprehension: Awareness of the multidisciplinary context of engineering.

ENA104 - Analysis in engineering: The ability to analyse complex products, processes and systems in their field of study; choose and apply relevant analytical, calculation and experimental methods in a suitable way; and correctly interpret the results of such analyses.

ENA105 - Analysis in engineering: The ability to identify, formulate and solve engineering problems in their speciality; choose and apply adequately established analytical, calculation and experimental methods; and acknowledge the importance of social, health and safety, environmental, economic, and industrial restrictions.

ENA106 - Engineering projects: Ability to project, design and develop complex products (parts, components, finished products, etc.), processes and systems of their speciality, which meet the established requirements, including awareness of the social, health and safety, environmental, economic and industrial aspects, as well as selecting and applying appropriate project methods.

ENA107 - Engineering projects: Project capacity some state-of-the-art knowledge of their engineering speciality.

ENA108 - Research and innovation: Ability to carry out bibliographic searches and consult and use databases and other information sources with discretion, in order to carry out simulation and analysis with the aim of conducting research on technical topics of their speciality.

ENA109 - Research and innovation: Ability to consult and apply codes of good practice and security in their speciality.

ENA110 - Research and innovation: Capacity and ability to project and carry out experimental investigations, interpret results, and reach conclusions in their field of study.

ENA111 - Practical application of engineering: Understanding of the applicable techniques and methods for analysis, design and research and their limitations in the field of their speciality.

ENA113 - Practical application of engineering: Knowledge of application of materials, equipment and tools, engineering technology and processes, and their limitations in the field of their speciality.

ENA114 - Practical application of engineering: Ability to apply standards of engineering practice in their speciality.

ENA116 - Practical application of engineering: General ideas on economic, organisational and management issues (such as project, risk and change management) in the industrial and business context.

ENA118 - Preparation of judgements: Ability to manage complex technical or professional activities or projects of their speciality, taking responsibility for decision making.

ENA119 - Communication and Teamwork: Ability to effectively communicate information, ideas, problems and solutions in the field of engineering and with society in general.

ENA120 - Communication and Teamwork: Ability to operate effectively in domestic and international contexts, individually and as a team, and to cooperate with both engineers and people from other disciplines.

ENA121 - Continued training: Ability to acknowledge the need for their own continued training and to undertake this activity throughout their professional life independently.

ENA122 - Continued training: Ability to stay up to date on science and technology innovations.

SECONDARY LEARNING RESULTS

2RGE392 (2 sem)

LEARNING ACTIVITIES

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

CH

NCH

TH

1 h.

1 h.

EVALUATION SYSTEM

W

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

100%

MAKE-UP MECHANISMS

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

Comments: - Continuous assessment. - It may be asked to redo the document.

CH - Class hours: 0 h.

NCH - Non-class hours: 1 h.

TH - Total hours: 1 h.

RGE334 [!] *Analiza aplicaciones de la electrónica avanzada proponiendo mejoras y nuevas soluciones a problemas reales.*

LEARNING ACTIVITIES

Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints

CH

NCH

TH

2 h.

4 h.

6 h.

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

16 h.

16 h.

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

4 h.

6 h.

10 h.

EVALUATION SYSTEM

W

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

100%

Comments: - Control point: minimum grade 5.

MAKE-UP MECHANISMS

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

Comments: - Students with less than a 5 at the control point must retake the exam. - Final note of the control point: control point 25% and retake 75%.

CH - Class hours: 22 h.

NCH - Non-class hours: 10 h.

TH - Total hours: 32 h.

RGE332 [!] *Analiza los procesos industriales de fusión, calentamiento inductivo y capacitivo, electrólisis, etc. y optimiza el proceso.*

LEARNING ACTIVITIES

Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints

CH

NCH

TH

1 h.

2 h.

3 h.

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

2 h.

2 h.

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

2 h.

2 h.

Carrying out work experience in real environments and writing the corresponding report

3 h.

6 h.

9 h.

Comments: *The structure of a conventional electrical system, current and future, is addressed, using advanced technologies such as converters and droop control.

EVALUATION SYSTEM

W

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

11%

MAKE-UP MECHANISMS

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

Prototype / Product

Individual written and/or oral tests or individual coding/programming tests 72%
Prototype / Product 17%
Comments: - Control point: minimum grade 5. - PBL project grade: 30% product, 20% technical content of the report and 50% individual technical defense.

CH - Class hours: 8 h.
NCH - Non-class hours: 8 h.
TH - Total hours: 16 h.

Comments: - Students with less than a 5 at the control point must retake the exam. - Final note of the control point: control point 25% and retake 75%. - In the project / PBL there will not be any retake of the individual defense.

RGE333 [!] *Analiza centros de mecanizado (elementos de las líneas de corte de chapa, desbobinadoras y cizallas volantes).*

LEARNING ACTIVITIES

Computer simulation exercises, individually and/or in teams

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

Carrying out work experience in real environments and writing the corresponding report

CH

NCH

TH

2 h.

2 h.

4 h.

4 h.

4 h.

6 h.

10 h.

EVALUATION SYSTEM

W

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

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

Prototype / Product

72%

17%

Comments: - Courseworks: minimum grade 5. - PBL project grade: 30% product, 20% technical content of the report and 50% individual technical defense.

MAKE-UP MECHANISMS

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

Prototype / Product

Comments: - For the courseworks, their correction will be asked. The maximum mark for the corrected courseworks will be 5.0. - In the project / PBL there will not be any retake of the individual defense.

CH - Class hours: 8 h.
NCH - Non-class hours: 8 h.
TH - Total hours: 16 h.

2RGE393 (2 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

NCH

TH

1 h.

2 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%

MAKE-UP MECHANISMS

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

Comments: - Continuous assessment. - It may be asked to redo the document.

CH - Class hours: 1 h.
NCH - Non-class hours: 2 h.
TH - Total hours: 3 h.

2RGE390 (2 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		1 h.	1 h.	2 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS		
Observation (technical capacity, attitude and participation)	100%	Observation (technical capacity, attitude and participation)		
Comments: Continuous assessment.				
CH - Class hours: 1 h.				
NCH - Non-class hours: 1 h.				
TH - Total hours: 2 h.				

2RGE394 (2 sem)				
LEARNING ACTIVITIES		CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints		1 h.	2 h.	3 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS		
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	100%	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		
Comments: - Continuous assessment.				
CH - Class hours: 1 h.				
NCH - Non-class hours: 2 h.				
TH - Total hours: 3 h.				

2RGE391 (2 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		1 h.	1 h.	2 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS		
Observation (technical capacity, attitude and participation)	100%	Observation (technical capacity, attitude and participation) Comments: Continuous assessment.		
CH - Class hours: 1 h. NCH - Non-class hours: 1 h. TH - Total hours: 2 h.				

CONTENTS

I. Electrical Power Systems

1. Introduction to Electrical Power Systems

2. Electrical System

3. Representation of the Electrical System

4. Parameterization of Transmission Lines
5. Representation of Transmission Lines
6. Network Calculations
7. Operation and Control of Electrical Systems
8. Active and Reactive Power Control
9. Applications of Electronic Power Converters
- II. Analysis of an Alternating Current Arc Furnace
- III. Modeling of a Winder
- IV. Control of Rotary Flying Shears

The contents taught in this subject and the academic activities developed for the acquisition of the defined learning outcomes require students to be aware of the following Sustainable Development Goals of the 2030 Agenda:

- 8. Decent Work and Economic Growth:** Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- 9. Industry, Innovation, and Infrastructure:** Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
- 12. Responsible Consumption and Production:** Ensure sustainable consumption and production patterns.

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Subject notes	Barrero, Fermin. Sistemas de energía eléctrica. Madrid: Paraninfo. 2004. ISBN: 978 8497322836
Moodle Platform	Guirado Torres, Rafael. Tecnología Eléctrica. Mc Graw Hill interamericana. 2006. ISBN: 978 8448148072
Slides of the subject	D. Das, Electrical Power System Analysis, New Age International Publishers, 2006
	John J. Grainger, William D. Stevenson, Power System Analysis, McGraw-Hill, 1994
	Syed A. Nasar, Schaum's Outline of Theory and Problems of Electric Power Systems, McGraw-Hill, 1990.
	A. Gómez Expósito, Análisis y Operación de Sistemas de Energía Eléctrica, McGraw-Hill, 2002