[GEB301] PHYSICS I

GENERAL INFORMATION

Studies	DEGREE IN INDUSTRIAL ELECTRONICS ENGINEERING			**Subject**	PHYSICS
Semester	1	**Course**	1	**Mention / Field of specialisation**	
Character	BASIC TRAINING				
Plan	2022	**Modality**	Face-to-face	**Language**	EUSKARA/CASTELLANO
Credits	6	**Hours/week**	5	**Total hours**	90 class hours + 60 non-class hours = **150 total hours**

2030 AGENDA GOALS

PROFESSORS

GALFARSORO ANDUAGA, UNAI

GANDARIAS INCHAUSTI, KEPA

REQUIRED PREVIOUS KNOWLEDGE

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

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
G-RA03 - To understand and master the basic concepts of the general laws of mechanics, and their application to solve engineering problems		x		5,4
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		0,36
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:	6

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

ENAEE LEARNING RESULTS

ENA101 - Knowledge and comprehension: Knowledge and understanding of mathematics and other basic sciences inherent in them engineering speciality, at a level that allows them to acquire the other competencies of the degree.

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.

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.

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.

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.

SECONDARY LEARNING RESULTS

1RGE190 **(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
Observation (technical capacity, attitude and participation)	100%

MAKE-UP MECHANISMS

Observation (technical capacity, attitude and participation)

Comments: Continuous assessment

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

1RGE191 **(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
Observation (technical capacity, attitude and participation)	100%

MAKE-UP MECHANISMS
Observation (technical capacity, attitude and participation)
Comments: Continuous assessment.

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

RGE106 **[!]** ***Identifica, calcula y analiza el movimiento de partículas y sólidos, así como los sistemas de fuerza necesarios para producirlos***

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	9 h.	5,5 h.	14,5 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	4 h.		4 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	27 h.		27 h.
Carrying out exercises and solving problems individually and/or in teams	9 h.	20 h.	29 h.
Self-assessment tests in a context of autonomous and continuous learning		7,5 h.	7,5 h.
Carrying out work experience in real environments and writing the corresponding report	5 h.	3 h.	8 h.

EVALUATION SYSTEM	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	10%
Individual written and/or oral tests or individual coding/programming tests	80%
Prototype / Product	10%

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

MAKE-UP MECHANISMS
Individual written and/or oral tests or individual coding/programming tests
Prototype / Product
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.

CH - Class hours: 54 h.
NCH - Non-class hours: 36 h.
TH - Total hours: 90 h.

RGE105 **[!]** ***Modelizar, calcular y examinar el equilibrio estático de los sólidos***

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	4,5 h.	2,5 h.	7 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing	2 h.		2 h.

checkpoints			
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	12 h.		12 h.
Carrying out exercises and solving problems individually and/or in teams	4 h.	10 h.	14 h.
Self-assessment tests in a context of autonomous and continuous learning		3 h.	3 h.
Carrying out work experience in real environments and writing the corresponding report	4,5 h.	2,5 h.	7 h.

EVALUATION SYSTEM	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	10%
Individual written and/or oral tests or individual coding/programming tests	80%
Prototype / Product	10%

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

MAKE-UP MECHANISMS

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

Prototype / Product

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.

CH - Class hours: 27 h.
NCH - Non-class hours: 18 h.
TH - Total hours: 45 h.

1RGE192 (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
Observation (technical capacity, attitude and participation)	100%

MAKE-UP MECHANISMS

Observation (technical capacity, attitude and participation)

Comments: Continuous assessment.

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

1RGE193 (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	1,5 h.	1,5 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: 1,5 h.
NCH - Non-class hours: 1,5 h.
TH - Total hours: 3 h.

1RGE194 (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	1,5 h.	1,5 h.	3 h.

EVALUATION SYSTEM	W
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%

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

Comments: Continuous assessment.

CH - Class hours: 1,5 h.
NCH - Non-class hours: 1,5 h.
TH - Total hours: 3 h.

CONTENTS

1. STATICS

1.1. Forces and moments

Forces and components

Moments. Moment of a couple

1.2 Newton's laws

Equilibrium of a particle

Equilibrium of a rigid body

1.3. Free body diagrams in 2D and 3D

Isolating a mechanical system

Constraints

Contact forces: normal and friction

1.4. Centroid. Center of mass. Center of gravity. Distributed forces

2. KINEMATICS

2.1. Motion in one dimension of a particle

Position, speed and acceleration

2.2. Motion in two dimensions of a particle

Tangential and normal components

2.3. Case studies: parabolic motion and circular motion

2.4. Motion of connected particles

3. KINETICS

3.1. Kinetics of particles. Newton's 2nd law

3.2. Kinetics of rigid solids. Newton's 2nd law

3.3. Kinetics of particles. Energy methods

3.4. Kinetics of rigid solids. Energy methods

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Moodle Platform Class presentations Slides of the subject Subject notes	https://katalogoa.mondragon.edu/janium-bin/sumario.pl?Id=20230918125413