

[GOL301] PHYSICS I

GENERAL INFORMATION

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

PROFESSORS

OROBENGOA GURIDI, DANEL	
VIDAL EZQUERRA, IKER	

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		0,28
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		0,32
Total:				6

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

ENAE LEARNING RESULTS

ENAE LEARNING RESULTS	ECTS
ENAE01 - Knowledge and understanding: Knowledge and understanding of the underlying scientific and mathematical principles in their branch of engineering.	3,96
ENAE04 - Knowledge and understanding: To be aware of the multidisciplinary context of engineering.	0,4
ENAE05 - Analysis in engineering: Ability to apply their knowledge and understanding in identifying, formulating and solving engineering problems using established methods.	0,4
ENAE08 - Engineering projects: Ability to apply their knowledge in the development and completion of projects which meet specific requirements.	0,6
ENAE17 - Transversal competences: To work effectively, both individually and in a team.	0,32
ENAE18 - Transversal competences: To use different methods to communicate effectively with the engineering community and society in general.	0,32
Total:	6

SECONDARY LEARNING RESULTS

RG0105 [!] *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	5 h.	3 h.	8 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.		2 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	15 h.		15 h.
Carrying out exercises and solving problems individually and/or in teams	5 h.	11 h.	16 h.
Self-assessment tests in a context of autonomous and continuous learning		4 h.	4 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory	20%	Individual written and/or oral tests or individual coding/programming tests

exercises, term projects, challenges and problems
 Individual written and/or oral tests or individual coding/programming tests 80%

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

RG0106 [!] *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	10 h.	6 h.	16 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	30 h.		30 h.
Carrying out exercises and solving problems individually and/or in teams	10 h.	22 h.	32 h.
Self-assessment tests in a context of autonomous and continuous learning		8 h.	8 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
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
Individual written and/or oral tests or individual coding/programming tests	80%	

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

RG0190 [!] *Conocer y aplicar las fases para desarrollar de forma guiada, con los objetivos y la planificación previamente definidos, un proyecto de complejidad técnica acorde con los conocimientos de formación básica de la ingeniería. Reflexiona sobre los cono*

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	3 h.	1 h.	4 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Observation (technical capacity, attitude and participation)	100%	(No mechanisms)

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

RG0191 [!] *Contribuir en la estrategia de funcionamiento del equipo priorizando los objetivos comunes, fomentando y valorando la participación de todas las personas y responsabilizándose de las tareas individuales, así como del cumplimiento de plazos.*

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.	1 h.	3 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS	
Self-assessment	33%	(No mechanisms)	
Co-assessment	34%		
Observation (technical capacity, attitude and participation)	33%		
CH - Class hours: 2 h.			
NCH - Non-class hours: 1 h.			
TH - Total hours: 3 h.			

RG0193 [!] *Redacta una memoria de proyecto clara y concisa utilizando las fuentes de información y estructura de memoria facilitadas, y haciendo un uso correcto, inclusivo y no discriminatorio del lenguaje.*

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	MAKE-UP MECHANISMS	
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	(No mechanisms)	
CH - Class hours: 2 h.			
NCH - Non-class hours: 2 h.			
TH - Total hours: 4 h.			

RG0194 [!] *Realiza una presentación oral y defensa del proyecto clara y concisa, haciendo uso correcto, inclusivo y no discriminatorio del lenguaje.*

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	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%	(No mechanisms)	
CH - Class hours: 2 h.			
NCH - Non-class hours: 2 h.			
TH - Total hours: 4 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

Moodle Platform
Class presentations
Subject notes
Slides of the subject

Bibliography

<https://katalogoa.mondragon.edu/janium-bin/sumario.pl?Id=20230918125147>