

## [GOL301] PHYSICS I

### GENERAL INFORMATION

<b>Studies</b>	DEGREE IN INDUSTRIAL ORGANIZATION ENGINEERING	<b>Subject</b>	PHYSICS
<b>Semester</b>	1	<b>Course</b>	1
<b>Character</b>	BASIC TRAINING	<b>Mention / Field of specialisation</b>	
<b>Plan</b>	2022	<b>Modality</b>	Face-to-face
<b>Credits</b>	6	<b>Language</b>	EUSKARA
		<b>Total hours</b>	91 class hours + 59 non-class hours = <b>150 total hours</b>

### 2030 AGENDA GOALS



### PROFESSORS

TORCA DE LA CONCEPCIÓN, IRENEO  
OROBENGOA GURIDI, DANIEL

### REQUIRED PREVIOUS KNOWLEDGE

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

### LEARNING RESULTS

#### LEARNING RESULTS

	KC	SK	AB	ECTS
<b>G-RA03</b> - To understand and master the basic concepts of the general laws of mechanics, and their application to solve engineering problems		x		5,4
<b>G-RTR1</b> - 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
<b>G-RTR2</b> - 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

#### ENAE LEARNING RESULTS

	ECTS
<b>ENAE01</b> - Knowledge and understanding: Knowledge and understanding of the underlying scientific and mathematical principles in their branch of engineering.	3,96
<b>ENAE04</b> - Knowledge and understanding: To be aware of the multidisciplinary context of engineering.	0,4
<b>ENAE05</b> - Analysis in engineering: Ability to apply their knowledge and understanding in identifying, formulating and solving engineering problems using established methods.	0,4
<b>ENAE08</b> - Engineering projects: Ability to apply their knowledge in the development and completion of projects which meet specific requirements.	0,6
<b>ENAE17</b> - Transversal competences: To work effectively, both individually and in a team.	0,32
<b>ENAE18</b> - 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** [I] 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 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:** 27 h.

**NCH - Non-class hours:** 18 h.

**TH - Total hours:** 45 h.

**RG0106** [I] *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.

**1RG0190** (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

2 h.

1 h.

3 h.

**EVALUATION SYSTEM**

**W**

**MAKE-UP MECHANISMS**

Observation (technical capacity, attitude and participation)

100%

(No mechanisms)

**CH - Class hours:** 2 h.

**NCH - Non-class hours:** 1 h.

**TH - Total hours:** 3 h.

**1RG0194** (1 sem)

<b>LEARNING ACTIVITIES</b>		<b>CH</b>	<b>NCH</b>	<b>TH</b>
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.
<b>EVALUATION SYSTEM</b>	<b>W</b>	<b>MAKE-UP MECHANISMS</b>		
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:** 1 h.  
**TH - Total hours:** 3 h.

<b>1RGO193 (1 sem)</b>				
<b>LEARNING ACTIVITIES</b>		<b>CH</b>	<b>NCH</b>	<b>TH</b>
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.
<b>EVALUATION SYSTEM</b>	<b>W</b>	<b>MAKE-UP MECHANISMS</b>		
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:** 1 h.  
**TH - Total hours:** 3 h.

<b>1RGO192 (1 sem)</b>				
<b>LEARNING ACTIVITIES</b>		<b>CH</b>	<b>NCH</b>	<b>TH</b>
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.
<b>EVALUATION SYSTEM</b>	<b>W</b>	<b>MAKE-UP MECHANISMS</b>		
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:** 1 h.  
**TH - Total hours:** 3 h.

<b>1RGO191 (1 sem)</b>				
<b>LEARNING ACTIVITIES</b>		<b>CH</b>	<b>NCH</b>	<b>TH</b>
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.
<b>EVALUATION SYSTEM</b>	<b>W</b>	<b>MAKE-UP MECHANISMS</b>		
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.

## CONTENTS

1. STATICS1.1 Forces and moments Forces and components Moments and torques1.2 Newton's laws Equilibrium of particles Equilibrium of solids1.3 Free solid diagrams in 2D and 3D Isolation of a mechanical system Joints Contact forces: normal and friction1.4. Centroid. Center of masses. Center of gravity. Distributed forces2. KINEMATICS2.1. Rectilinear motion of the particle. Position, velocity and acceleration2.2 . General motion of the particle Tangential and normal components2.3. Practical cases: parabolic motion and circular motion2.4. Linked motion3. KINETICS3.1. Kinetics of particles. Newton's 2nd law3.2. Rigid solid kinetics. Newton's 2nd law3.3. Particle kinetics. Energy methods3.4. Rigid solid kinetics. Energetic methods

## LEARNING RESOURCES AND BIBLIOGRAPHY

### Learning resources

- [!] *Plataforma Moodle*
- [!] *Presentaciones en clase*
- [!] *Apuntes de la asignatura*
- [!] *Transparencias de la asignatura*

### Bibliography

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