

[GJC101] PHYSICS

GENERAL INFORMATION

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

PROFESSORS

GANDARIAS INCHAUSTI, KEPA
URRUTIBEASCOA IRALA, IDOIA
EGUIA IBARZABAL, JOSU

REQUIRED PREVIOUS KNOWLEDGE

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

SKILLS

VERIFICA SKILLS

SPECIFIC

GJCE02 - To understand and master basic concepts from the general laws of mechanics, thermodynamics, fields and waves and electromagnetism, applying them to engineering problems.

CROSS

GJCTR - 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_CB2 - To be able to apply knowledge to occupational or professional tasks; have the necessary skills to pose and defend arguments, and to solve problems within their field of study

G_CB5 - To have developed learning abilities required to embark on subsequent studies with a high level of autonomy.

LEARNING RESULTS

RGJ131 They model, calculate and examine the static balance of solids.

LEARNING ACTIVITIES

	CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc.	3 h.	1 h.	4 h.
Relating to projects/POPBLs carried out individually or in teams			
Individual study and work, tests and evaluations and check points	3 h.	5 h.	8 h.
Practices of problem solving and real or simulated context projects	2 h.	5 h.	7 h.
Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	13 h.		13 h.
Individual and team exercises	9 h.	4 h.	13 h.

EVALUATION SYSTEM

	W
Individual written and oral tests to assess technical skills of the subject	80%
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	10%
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	10%

MAKE-UP MECHANISMS

Individual written and oral tests to assess technical skills of the subject
Comments: Final mark: written second-chance exam (75%) + exam (25%) Laboratory practices and autoevaluations will be made-up by on-going evaluation

CH - Class hours: 30 h.

NCH - Non-class hours: 15 h.

TH - Total hours: 45 h.

RGJ132 They describe, calculate and examine the characteristics of the plane motion of particles and solids.

LEARNING ACTIVITIES		CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc.		3 h.	1 h.	4 h.
Relating to projects/POPBLs carried out individually or in teams				
Individual study and work, tests and evaluations and check points		3 h.	6 h.	9 h.
Individual and team exercises		7 h.	6 h.	13 h.
Classroom presentations of relevant concepts and procedures in participatory environments		10 h.		10 h.
EVALUATION SYSTEM		W	MAKE-UP MECHANISMS	
Individual written and oral tests to assess technical skills of the subject	80%	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	10%	Comments: Final mark: written second-chance exam (75%) + exam (25%) Laboratory practices and autoevaluations will be made-up by on-going evaluation		
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	10%			

CH - Class hours: 23 h.
NCH - Non-class hours: 13 h.
TH - Total hours: 36 h.

RGJ133 They identify, calculate and examine the changes of movement created in particles and solids by force systems that are not in static equilibrium.

LEARNING ACTIVITIES		CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc.		4 h.	2 h.	6 h.
Relating to projects/POPBLs carried out individually or in teams				
Individual study and work, tests and evaluations and check points		4 h.	9 h.	13 h.
Practices of problem solving and real or simulated context projects		5 h.	3 h.	8 h.
Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects		11 h.		11 h.
Individual and team exercises		6 h.	3 h.	9 h.
Individual and/or team computer simulation practice		4 h.	3 h.	7 h.
EVALUATION SYSTEM		W	MAKE-UP MECHANISMS	
Individual written and oral tests to assess technical skills of the subject	80%	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	10%	Comments: Final mark: written second-chance exam (75%) + exam (25%) Laboratory practices and autoevaluations will be made-up by on-going evaluation		
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	10%			

CH - Class hours: 34 h.
NCH - Non-class hours: 20 h.
TH - Total hours: 54 h.

RGJ181 They communicate, search and structure written information: they write a clear and concise project report following the criteria established in the guide for written reports using the appropriate software.

LEARNING ACTIVITIES		CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc.		2 h.	2 h.	4 h.
Relating to projects/POPBLs carried out individually or in teams				
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: Revision and correction of the written report of the semester project		

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

RGJ182 They communicate, search and structure orally the information correctly: they make a clear and concise oral presentation and defense of the project, considering the aspects gathered in the oral communication guide and using the proper software approp

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams	1 h.	3 h.	4 h.

EVALUATION SYSTEM

	<i>W</i>
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	100%

MAKE-UP MECHANISMS

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence
Comments: With the oral presentation of the project of the second semester

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

RGJ191 They use the right methodology to find solutions to problems and to develop projects: analyse problems properly, look for meaningful information to face them and propose solutions.

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams		4 h.	4 h.

EVALUATION SYSTEM

	<i>W</i>
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	100%

MAKE-UP MECHANISMS

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence
Comments: With the project of the second semester

CH - Class hours: 0 h.
NCH - Non-class hours: 4 h.
TH - Total hours: 4 h.

RGJ192 They use the right methodology to find solutions to problems and to develop projects: analyse problems properly, look for meaningful information to face them and propose solutions.

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams		3 h.	3 h.

EVALUATION SYSTEM

	<i>W</i>
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	100%

MAKE-UP MECHANISMS

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence
Comments: With the project of the second semester

CH - Class hours: 0 h.

NCH - Non-class hours: 3 h.
TH - Total hours: 3 h.

CONTENTS

1. STATICS

- 1.1 Forces and moments
- 1.2 Newton's laws
- 1.3. Free Solid Diagrams
- 1.4. Centers of gravity. Distributed loads
- 1.5. Contact forces: normal and friction

2. CINEMATICS

- 2.1. Rectilinear movement
- 2.2. General movement of the particle. Tangencial and normal components
- 2.3. Practical cases: parabolic movement and circular movement
- 2.4. Composition of movements

3. DINAMICS

- 3.1. Newton's 2nd law
- 3.2. Dinamics of the rigid solid. Moment of inertia
- 3.3. Energy Methods

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Moodle Platform	F. W. Sears, M. W. Zemansky, H. D. Young, R. A. Freedman. Física Universitaria. Pearson Ed., 2004
Class presentations	P.A. Tipler, G. Mosca. Física para la ciencia y la tecnología (2º vol.). Barcelona: Reverté. 2010. ISBN: 978-84-291-4433-8
Programmes	P. M. Fishbane, S. Gasiorowicz, S. T. Thornton. Fisika zientzialari eta ingeniari entzat. EHU-ko argitalpen zerbitzua. 2008
Slides of the subject	J. L. Meriam, L. G. Kraige. Estática / Dinámica. Editorial Reverté, 1999
Lab practical training	W. F. Riley. L. D. Sturges. Estática / Dinámica. Editorial Reverté. 2005
	F. Beer, E. Johnston, P. Cornwell. Mecánica Vectorial para ingenieros Estática + Dinámica. 10 Ed. Mc Graw Hill. 2013
	http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_in_k.pl?grupo=MECATRONICA11&ejecuta=5&_ST