

[GJJ105] MATERIAL STRENGTH AND ELASTICITY

GENERAL INFORMATION

Studies	DEGREE IN MECHATRONICS ENGINEERING	Subject	?
Semester	1	Course	3
Character	COMPULSORY	Mention / Field of specialisation	
Plan	2020	Modality	Adapted Face-to-face
Credits	4,5	Hours/week	3.75
		Language	ENGLISH
		Total hours	67.5 class hours + 45 non-class hours = 112.5 total hours

PROFESSORS

URRUTIBEASCOA IRALA, IDOIA
 ARETXABALETA RAMOS, LAURENTZI

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	Use of units in Physics Statics: forces, moments and centroids calculation

SKILLS

VERIFICA SKILLS

SPECIFIC

GJCE08 - Knowledge and capacity for the application of the foundations and principles of the elasticity and resistance of materials.

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

RG301 They assume responsibilities in the team, organizing and planning the tasks to be developed, dealing with contingencies and encouraging the participation of its members.

LEARNING ACTIVITIES

	CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc.	2 h.	1 h.	3 h.
Relating to projects/POPBLs carried out individually or in teams			

EVALUATION SYSTEM

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence

W

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: 2 h.

NCH - Non-class hours: 1 h.

TH - Total hours: 3 h.

RG302 They analyze the variables involved in the problem and propose actions for a stable situation.

LEARNING ACTIVITIES

	CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc.	2 h.	1 h.	3 h.
Relating to projects/POPBLs carried out individually or in teams			

EVALUATION SYSTEM

Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence

W

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

RG304 They define the problem, the development of the solution, as well as the conclusions in an effective way, arguing and justifying each of them, making a correct use of the language, in writing.

LEARNING ACTIVITIES

Development, writing and presentation of memorandums, reports, audiovisual material, etc.
 Relating to projects/POPBLs carried out individually or in teams

CH

1 h.

NCH

2 h.

TH

3 h.

EVALUATION SYSTEM

W

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: Revision and correction of the written report of the semester project

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

RG305 They define the problem, the development of the solution, as well as the conclusions in an effective way, arguing and justifying each one of them, and making a correct use of the language, orally.

LEARNING ACTIVITIES

Development, writing and presentation of memorandums, reports, audiovisual material, etc.
 Relating to projects/POPBLs carried out individually or in teams

CH

1 h.

NCH

2 h.

TH

3 h.

EVALUATION SYSTEM

W

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

RGJ304 They determine the stresses on structural elements and they dimension them based on strength and stiffness criteria.

LEARNING ACTIVITIES

Development, writing and presentation of memorandums, reports, audiovisual material, etc.
 Relating to projects/POPBLs carried out individually or in teams

CH

12 h.

NCH

8 h.

TH

20 h.

Individual study and work, tests and evaluations and check points

4 h.

10 h.

14 h.

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

20 h.

4 h.

24 h.

Individual and team exercises

23,5 h.

13 h.

36,5 h.

Individual or team workshop and/or lab practice

2 h.

4 h.

6 h.

EVALUATION SYSTEM

W

Individual written and oral tests to assess technical skills of the subject

80%

Technical skills, involvement in the project, finished work,

20%

MAKE-UP MECHANISMS

Individual written and oral tests to assess technical skills of the subject

Comments: The last mark will be calculated, if necessary, taking the first mark times 25% and the second one times 75%

obtained results, handed documentation, presentation and technical defence

CH - Class hours: 61,5 h.

NCH - Non-class hours: 39 h.

TH - Total hours: 100,5 h.

CONTENTS

1. Introduction
2. Stress and strain. Introduction to design
3. Axial deformation
4. Equilibrium in beams
5. Stresses in beams
6. Torsion

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Slides of the subject
 Labs
 Moodle Platform
 Video projections
 Lab practical training

Bibliography

Craig Roy. R. Jr.; Mechanics of Materials; John Wiley & Sons, Inc; 3rd. Ed., 2011
 Craig Roy R. Jr.; Mecánica de Materiales; CECSA ed., 2ª ed., 2002
http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_Ink.pl?grupo=MECATRONICA31&ejecuta=10&_ST