

[MHI201] MECHANICAL BEHAVIOUR OF MATERIALS

GENERAL INFORMATION

Studies	UNIVERSITY MASTER IN INDUSTRIAL ENGINEERING	Subject	?
Semester	2	Course	1
Character	OPTIONAL	Mention / Field of specialisation	???
Plan	2022	Modality	Face-to-face
Credits	3	Hours/week	2.28
		Language	CASTELLANO/EUSKARA
		Total hours	41 class hours + 34 non-class hours = 75 total hours

PROFESSORS

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REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
MATERIAL ELASTICITY AND STRENGTH	(No previous knowledge required)

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
MHME01 - To design and carry out machine tests considering the mechanical behavior of the material		x		1,4
MHME03 - To demonstrate knowledge and capabilities for the calculation and design of structures using analytical and numerical methods		x		1,2
MHRA23 - To demonstrate knowledge and capabilities to carry out certifications, audits, verifications, tests and reports		x		0,32
MHRA28 - To communicate your conclusions and the knowledge and ultimate reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way		x		0,04
MHR129 - To possess the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous		x		0,04
Total:				3

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

ENAE LEARNING RESULTS

	ECTS
ENA123 - Knowledge and comprehension: Deep knowledge and comprehension of mathematics and other basic sciences inherent in their engineering speciality, allowing them to achieve the other competencies of the degree.	0,42
ENA124 - Knowledge and comprehension: Deep knowledge and comprehension of the engineering disciplines of their speciality, at the level necessary to acquire the rest of the competencies of the degree.	0,3
ENA126 - Knowledge and comprehension: Critical knowledge of the broad multidisciplinary context of engineering and the interrelations existing between the knowledge of the different fields.	0,3
ENA128 - Analysis in engineering: Ability to conceive new products, processes, and systems.	0,42
ENA133 - Research and innovation: Ability to identify, find and obtain the required data.	0,42
ENA134 - Research and innovation: Ability to carry out bibliographic searches and consult and use databases and other information sources with discretion, in order to carry out simulations with the aim of conducting research on complex topics of their speciality.	0,36
ENA136 - Research and innovation: High-level capacity and ability to project and carry out experimental investigations, interpret data with criteria, and draw conclusions.	0,18
ENA138 - Practical application of engineering: Complete knowledge of the applicable techniques and methods of analysis, project and research, as well as their limitations.	0,3
ENA139 - Practical application of engineering: Practical skills, such as the use of computer tools to solve complex problems, carry out complex engineering projects, and design and guide complex investigations.	0,3
Total:	3

SECONDARY LEARNING RESULTS

RMH159 [!] *Analiza y comprende cómo el comportamiento mecánico de los materiales influye en un sistema mecánico*

LEARNING ACTIVITIES

	CH	NCH	TH
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning		34 h.	34 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	3 h.		3 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	24 h.		24 h.

Carrying out exercises and solving problems individually and/or in teams	14 h.	14 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Individual written and/or oral tests or individual coding/programming tests	100%	(No mechanisms)
<p>Comments: All activities (control points, individual and group assignments, etc...) must have a minimum mark (5 minimum) and there will be an opportunity to retake every activity. In case of retake of the control point, the final mark will be the mark of the retake.</p>		
<p>CH - Class hours: 41 h. NCH - Non-class hours: 34 h. TH - Total hours: 75 h.</p>		

CONTENTS

1. Fundamentals of tensor calculus and continuum Mechanics
2. Fatigue of materials
3. Anisotropic behaviour of materials: Composite materials
4. Elastic-plastic behaviour of materials

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Moodle Platform	[1] X. Oliver Olivella, C. Agelet de S. Bosch, Mecánica de Medios Continuos para Ingenieros, Ed. UPC, 2000
Slides of the subject	[2] G. E. Mase, Continuum mechanics, Schaum's Outlines, Ed. McGraw-Hill, 1970
Subject notes	[3] M. E. Gurtin, An introduction to Continuum Mechanics, Academic Press, 1981
	[4] F.P: Beer, E. R. Johnston Jr., Mecánica de Materiales, 2ª Ed., McGraw-Hill 1993
	[5] D. Gay, Composites Materials: Design and Applications, Ed. CRC Press, 2003