

[GBK201] BIOMECHANICS

GENERAL INFORMATION

Studies	DEGREE IN BIOMEDICAL ENGINEERING		Subject	MECHANICS
Semester	1	Course	2	Mention / Field of specialisation
Character	COMPULSORY		Language	CASTELLANO
Plan	2022	Modality	Face-to-face	Total hours
Credits	4,5	Hours/week	3.91	70.45 class hours + 42.05 non-class hours = 112.5 total hours

PROFESSORS

MATEOS HEIS, MODESTO

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
PHYSICS I	(No previous knowledge required)

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GBR209 - To apply knowledge of biomechanics to problems in the field of Biomedical Engineering		x		4,02
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		0,24
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		0,24
Total:				4,5

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

SECONDARY LEARNING RESULTS

RGB290 [!] *Proponer los objetivos y la planificación de un proyecto que le permita adquirir y/o reforzar los conocimientos de tecnologías propias de su especialidad,- que en ocasiones llegan a la vanguardia del conocimiento- y definir una estrategia de aprendiz*

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	1,9 h.	1,1 h.	3 h.

EVALUATION SYSTEM

	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%

MAKE-UP MECHANISMS

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems
Observation (technical capacity, attitude and participation)

CH - Class hours: 1,9 h.

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

TH - Total hours: 3 h.

RGB291 [!] *Establecer las responsabilidades de los miembros del equipo utilizando técnicas adecuadas para fomentar la eficiencia del equipo para el desarrollo del proyecto en los plazos establecidos (compartir recursos, aportar ideas, habilidades comunicativas*

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	1,9 h.	1,1 h.	3 h.

EVALUATION SYSTEM

W

MAKE-UP MECHANISMS

Self-assessment	25%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems Observation (technical capacity, attitude and participation)
Co-assessment	25%	
Observation (technical capacity, attitude and participation)	50%	

CH - Class hours: 1,9 h.

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

TH - Total hours: 3 h.

RGB293 [!] *Redacta y estructura correctamente la memoria del proyecto, haciendo un uso correcto, inclusivo y no discriminatorio del lenguaje. Para ello, busca y hace uso de las fuentes de información adecuadas.*

LEARNING ACTIVITIES

	CH	NCH	TH
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning	1,9 h.	1,1 h.	3 h.

EVALUATION SYSTEM

	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%

MAKE-UP MECHANISMS

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems
Observation (technical capacity, attitude and participation)

CH - Class hours: 1,9 h.

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

TH - Total hours: 3 h.

RGB294 [!] *Realiza una presentación oral del proyecto con argumentos elaborados por sí mismos y haciendo un uso correcto, inclusivo y no discriminatorio del lenguaje.*

LEARNING ACTIVITIES

	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	1,9 h.	1,1 h.	3 h.

EVALUATION SYSTEM

	W
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%

MAKE-UP MECHANISMS

Observation (technical capacity, attitude and participation)

CH - Class hours: 1,9 h.

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

TH - Total hours: 3 h.

RGB218 [!] *Conoce, comprende y calcula las fuerzas presentes en las articulaciones del cuerpo humano y en el instrumental médico*

LEARNING ACTIVITIES

	CH	NCH	TH
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	10 h.	6 h.	16 h.
Carrying out exercises and solving problems individually and/or in teams	5,5 h.	3,25 h.	8,75 h.

EVALUATION SYSTEM

	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	10%

MAKE-UP MECHANISMS

Individual written and/or oral tests or individual coding/programming tests

Individual written and/or oral tests or individual coding/programming tests 90%

CH - Class hours: 15,5 h.
NCH - Non-class hours: 9,25 h.
TH - Total hours: 24,75 h.

RGB219 [!] *Conoce y analiza las propiedades mecánicas de los tejidos humanos*

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
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	3,75 h.	2,25 h.	6 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	2,5 h.	1,5 h.	4 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

100%

MAKE-UP MECHANISMS

(No mechanisms)

CH - Class hours: 6,25 h.
NCH - Non-class hours: 3,75 h.
TH - Total hours: 10 h.

RGB220 [!] *Conoce, comprende y calcula las tensiones en sólidos deformables (tejidos humanos, implantes etc.)*

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
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	10,1 h.	6,4 h.	16,5 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	13,5 h.	7,75 h.	21,25 h.
Carrying out exercises and solving problems individually and/or in teams	17,5 h.	10,5 h.	28 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

15%

Individual written and/or oral tests or individual coding/programming tests

85%

MAKE-UP MECHANISMS

Individual written and/or oral tests or individual coding/programming tests

CH - Class hours: 41,1 h.
NCH - Non-class hours: 24,65 h.
TH - Total hours: 65,75 h.

CONTENTS

1. Mechanics fundamentals
2. Stress and strain
3. Axial strain
4. Torsion
5. Bending

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Subject notes
Class presentations
Moodle Platform
Technical articles

Bibliography

Özkaya, N.; Nordin, M.; Goldsheyder, D.; Leger, D. Fundamentals of Biomechanics; Equilibrium, Motion and Deformation. Third Edition. Springer: New York, 2012.
Meriam, J.L.; Kraige, L.G. Mecánica para Ingenieros; Estática. 3ª ed. Editorial Reverté: España, 1998.
Mechanics of Materials, Roy R. Craig Jr., 3rd edition, 2011, ISBN 978-0-470-48181-3, John Wiley and Sons