[GBK201] BIOMECHANICS

GENERAL INFORMATION

Studies	DEGREE IN BIOMEDICAL ENGINEERING			**Subject**	MECHANICS
Semester	1	**Course**	2	**Mention / Field of specialisation**	
Character	COMPULSORY				
Plan	2022	**Modality**	Face-to-face	**Language**	CASTELLANO
Credits	4,5	**Hours/week**	3.87	**Total hours**	69.65 class hours + 42.85 non-class hours = **112.5 total hours**

2030 AGENDA GOALS

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		0,32
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		0,16
			Total:	4,5

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

SECONDARY LEARNING RESULTS

1RGB293 (1 sem)

LEARNING ACTIVITIES	CH	NCH	TH
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning	1 h.	1 h.	2 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 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 2 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	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	10%	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.

1RGB290 **(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	1,9 h.	1,1 h.	3 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	100%	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.

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

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	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	MAKE-UP MECHANISMS
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: 6,25 h.
NCH - Non-class hours: 3,75 h.
TH - Total hours: 10 h.

1RGB291 **(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	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
Co-assessment	25%	
Observation (technical capacity, attitude and participation)	50%	Observation (technical capacity, attitude and participation)

CH - Class hours: 1,9 h.
NCH - Non-class hours: 1,1 h.
TH - Total hours: 3 h.

1RGB292 (1 sem)

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	1 h.	1 h.	2 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	100%	*(No mechanisms)*

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

1RGB294 (1 sem)

LEARNING ACTIVITIES	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	1 h.	1 h.	2 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
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%	Observation (technical capacity, attitude and participation)

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

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

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	10,1 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	MAKE-UP MECHANISMS
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

Individual written and/or oral tests or individual coding/programming tests	85%

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

CONTENTS

1. Principles of Mechanics2. Stress and deformation3. Axial deformation4. Torsion5. Bending

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

[!] *Apuntes de la asignatura*
[!] *Presentaciones en clase*
[!] *Plataforma Moodle*
[!] *Artículos de carácter técnico*

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