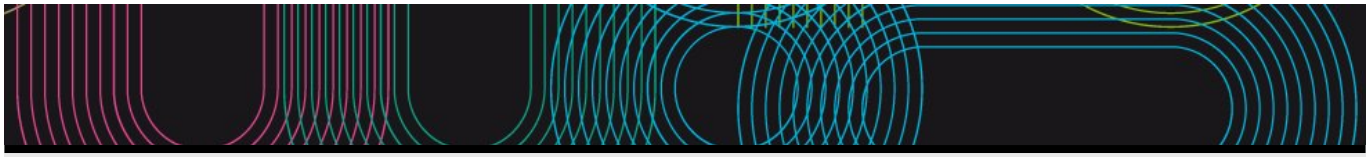

IDENTIFYING DATA				
Solid mechanics in biomedical engineering				
Subject	Solid mechanics in biomedical engineering			
Code	V12G420V01503			
Study programme	Grado en Ingeniería Biomédica			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	3rd	1st
Teaching language	Spanish			
Department				
Coordinator	Comesaña Piñeiro, Rafael			
Lecturers	Comesaña Piñeiro, Rafael Riveiro Rodríguez, Antonio			
E-mail	racomesana@uvigo.es			
Web				
General description	In this subject will study the basic concepts of the mechanics of continuous means for the analysis of elastic solids and *viscoelásticos in devices, machines, structures or fabrics. They will enter the states of tensions and of deformations in a solid *deformable and will analyse his relations with the different types of *solicitaciones internal.			

Training and Learning Results	
Code	
B3	CG3 Knowledge in basic and technological subjects that will enable students to learn new methods and theories, and provide them the versatility to adapt to new situations.
B4	CG2 Ability to direct activities related to the CG1 competence
C14	CE14 Knowledge and use of the principles of strength of materials.
D1	CT1 Analysis and synthesis.
D2	CT2 Problems resolution.
D9	CT9 Apply knowledge.
D10	CT10 Self learning and work.
D16	CT16 Critical thinking.
D17	CT17 Working as a team.

Expected results from this subject			
Expected results from this subject	Training and Learning Results		
New	B3 B4	C14	D1 D2 D9 D10 D16 D17

Contents	
Topic	
Introduction to Elasticity and Mechanics of Materials applied to inert and biological materials.	- Fundamentals of Elasticity. - Fundamentals of Viscoelasticity. - Introduction to Failure Criteria.
Internal forces in biomedical devices and biomaterials. Stress and strain analysis.	- Axial load - Bending - Torsion - Buckling

Planning

	Class hours	Hours outside the classroom	Total hours
Problem solving	15.5	32.5	48
Autonomous problem solving	0	18	18
Lecturing	17	34	51
Laboratory practical	17	13	30
Essay questions exam	1	0	1
Problem and/or exercise solving	2	0	2

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Problem solving	Each week, time will be devoted to the resolution of exercises or proposed problems by the student (contents related to the scheduled units).
Autonomous problem solving	Exercises and/or problems will be proposed to solve autonomously, giving the results of the same, which will allow the student to evaluate the degree of achievement of the competences of the subject.
Lecturing	The general aspects of the subject will be presented in a structured way, making special emphasis on the fundamentals and aspects that are most important or most difficult to understand for the students.
Laboratory practical	Cooperative laboratory practices with which the theoretical concepts will be put into practice seen in the classroom.

Personalized assistance

Methodologies	Description
Autonomous problem solving	Time dedicated by the teacher to attend to the needs and queries of the students related to the content of the course. Personalized attention is recommended for that the student can verify that the work done autonomously is correct or, in the case contrary, so that you can identify the reasons why it is not. The teacher will report on the schedule available at the beginning of the course on the Moovi platform. Any alteration in the The same will be communicated in the Announcements section of the platform.

Assessment

	Description	Qualification	Training and Learning Results		
Autonomous problem solving	Resolution of problems and/or study of cases / analysis of situations to be addressed individually or in group.	10	B3 B4	C14	D1 D2 D9 D10 D16 D17
Laboratory practical	It will assess the active participation in all the classes and, where appropriate, the delivery of the reports of the practices and his content according to the guidelines given before his realisation. The qualification obtained will be the same in the 1ª and in the 2ª opportunity of the announcement of the course.	5	B4	C14	D1 D2 D9 D10 D16 D17
Essay questions exam	Question of concept development, integrated in the final examination of the subject.	5			
Problem and/or exercise solving	Exams about the subject, comprising the resolution by part of the student of problems and/or brief theoretical questions. The length of the examns, as well as the weight of each question, will be known in the moment of realisation of them. Several continuous evaluation tests will be implement in to avoid a weight higher than the 40% in the time/dates approved by the School	80	B3 B4	C14	D1 D2 D9 D16

Other comments on the Evaluation

To pass the subject it will be necessary to obtain a minimum score of 5 out of 10. The students in the global assessment modality may take the final exam, which will have a weight of 100% of the note. In this test the skills of the whole subject will be assessed. The date and places of the exams for all calls will be set by the center before the start of the exam. course and will make them public.

Ethical commitment: The student is expected to present appropriate ethical behavior. In case of detecting unethical behavior (copying, plagiarism, use of unauthorized electronic devices, etc.), it will be considered that The student does not meet the necessary requirements to pass the subject. In that case, the overall rating in the present academic course will be failed (0.0). The use of any electronic device during the evaluation tests will not be allowed, unless expressly authorized. The fact of introducing an unauthorized electronic device in the examination room will be considered grounds for Failure to pass the subject in the current academic year and the overall grade will be a fail (0.0).

Sources of information

Basic Bibliography

Russell C. Hibbeler, **Mecánica de Materiales**, 10a Edición, ADDISON-WESLEY,

Complementary Bibliography

Lisa A. Pruitt; Ayyana M. Chakravartula, **Mechanics of Biomaterials**, Cambridge University Press,
Luis Ortiz Berrocal, **Elasticidad**, 3ra Edición, MCGRAW-HILL,
José Antonio González, **Taboada, Tensiones y deformaciones en materiales elásticos**, Tórculo,

Recommendations

Other comments

To enrol in this matter is necessary to have passed or enrol of all the subjects of the previous courses.

The original educational guide is written in Spanish.

In case of discrepancies, will prevail the version in Spanish to this guide.