



## Teaching Guide

Teaching Guide				
Identifying Data				2020/21
Subject (*)	Mechanics of continuous media		Code	730495014
Study programme	Mestrado Universitario en Materiais Complexos: Análise Térmica e Reoloxía (plan 2012)			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	1st four-month period	First	Optional	4
Language	English			
Teaching method	Face-to-face			
Prerequisites				
Department				
Coordinator	Derr , Julien	E-mail	julien.derr@univ-paris-diderot.fr	
Lecturers	Derr , Julien	E-mail	julien.derr@univ-paris-diderot.fr	
Web				
General description	The course provides a thorough treatment of the continuum mechanics for liquids and solids. It is to present the different mechanical behavior of matter in the continuum limit by applying Newton's laws of motion to the solid materials (elasticity) and fluid behavior.			
Contingency plan	1. Modifications to the contents The contents are not modified  2. Methodologies *Teaching methodologies that are maintained Guest lecture/keynote speech (via Teams) Supervised projects (tutored via Teams or email)  *Teaching methodologies that are modified Laboratory practice. It is replaced by the presentation of practical cases in the Keynote sessions and the reading and discussion of scientific articles (analysis of documentary sources).  3. Mechanisms for personalized attention to students - Email: Daily. Used to make queries, request virtual meetings to resolve doubts and monitor the work being supervised. - Microsoft Teams: Personalized tutoring of students - Moodle: This will be used as a repository for documentation provided to students.  4. Modifications in the evaluation Keynote Sessions 60% Supervised projects 30% Analysis of documentary sources 10%  *Evaluation observations: -  5. Modifications to the bibliography or webgraphy No change.			

## Study programme competences

Code	Study programme competences
A5	Understanding the relationships between structure and properties of materials
A7	Knowing the different types of thermal thermo-mechanical behaviors in materials subjected to fatigue



B1	Knowledge and understanding to provide a basis or opportunity for originality in developing and / or applying ideas, often in a research context
B2	The students have the skill to apply their knowledge and their ability to solve problems in new or unfamiliar contexts within broader (or multidisciplinary) contexts related to their field of study
B4	That the students can communicate their conclusions and the knowledge and last reasons behind that conclusions to specialized and non specialized audience in a clear and unambiguous way
B8	Applying a critical, logical and creative way of thinking
B9	To work autonomously with initiative
B13	Analysis-oriented attitude
B14	Ability to find and manage the information
B21	To assess the importance of research, innovation and technological developments in the socio-economic and cultural progress of society
C2	Have a good command of spoken and writing expression and understanding of a foreign language.
C6	Critically assessing the knowledge, technology and information available to solve the problems they face with.
C7	To assume as a professional and citizen the importance of learning throughout life.
C8	To assess the importance of research, innovation and technological development in the socio-economic and cultural progress of society.

Learning outcomes			
Learning outcomes		Study programme competences	
The course provides a thorough treatment of the mechanics of continuous media for fluids and solids. The aim is to present the different mechanical behavior of matter in the continuous limit. Newton's laws of motion in media with strong performance (elasticity) and / or fluid is applied.		AR5	BR1 CR2
		AR7	BR2 CR6
			BR4 CR7
			BR8 CR8
			BR9
			BR13
			BR14
			BR21

Contents	
Topic	Sub-topic
1. Introduction to elastic modulus (Young's modulus, shear modulus, bulk modulus, ...) of a solid and a fluid viscosities	
2. Description of the displacement field in an elastic body, and velocity field in a fluid	
3. Expression of elastic energy in linear elasticity, and the rate of viscous fluid in dedispación	
4. Description of the different apparatus for measuring or viscous elastic properties (or both) of a medium.	

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A5 A7 B1 B9 B14 B21	10	18	28
Laboratory practice	B2 B4 B8 B13 C8	20	20	40
Supervised projects	B9 B13 B14 C2 C6 C7 C8	5	25	30
Personalized attention		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

Methodologies	Description
Guest lecture / keynote speech	Presentation given by the professor, on a schematic basis, focusing on the main topics, covering both theoretical and practical issues.
Laboratory practice	Performance of practical activities such as demonstrations, exercises, experiments, etc..
Supervised projects	Activities whose purpose is that the students enlarge the study of the topics presented in the program and consolidate their acquired knowledge and capabilities. These activities should also help the students learn and improve their capabilities in literature survey.

## Personalized attention

Methodologies	Description
Guest lecture / keynote speech	The personalized attention to students, understood as a support in the teaching-learning process, will take place in the hours of tutoring of the professor.  No academic dispensation is accepted.

## Assessment

Methodologies	Competencies	Description	Qualification
Guest lecture / keynote speech	A5 A7 B1 B9 B14 B21	Examination or objective test.	50
Laboratory practice	B2 B4 B8 B13 C8	Continuous assessment through monitoring of student work in the classroom, laboratory and / or tutorials.	20
Supervised projects	B9 B13 B14 C2 C6 C7 C8	Presentation (oral and written) of the supervised work.	30

## Assessment comments

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## Sources of information

Basic	Apuntes e documentación facilitada en clase ou a través do correo electrónico.
Complementary	- David J. Raymond (1999). Introduction to Continuum Mechanics. <a href="http://kestrel.nmt.edu/~raymond/classes/ph536/continuum.pdf">http://kestrel.nmt.edu/~raymond/classes/ph536/continuum.pdf</a> - Basile Audoly, Yves Pomeau (2010). Elasticity and Geometry: From hair curls to the nonlinear response of shells. Oxford University Press - GK Batchelor (2012). An Introduction to Fluid Dynamics. Cambridge University Press

## Recommendations

Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Other comments



To help achieve a sustained immediate environment and meet the objective of action number 5: "Healthy and sustainable environmental and social teaching and research" of the "Green Campus Ferrol Action Plan: The delivery of the documentary work carried out in this subject: They will be requested in virtual format and/or computer support. It will be done through Moodle, in digital format without the need to print them. If it is necessary to make them on paper: Plastics shall not be used. Double-sided printing shall be carried out. Recycled paper will be used. Printing of drafts shall be avoided. - A sustainable use of resources and the prevention of negative impacts on the natural environment must be made. - It will work to identify and change gender biases and attitudes, and influence the environment to change them and promote values of respect and equality. - Situations of discrimination should be identified and actions and measures proposed to correct them.

(\*) The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.