Teaching Guide				
Identifying Data				2017/18
Subject (*)	Rheophysics of complex fluids		Code	730495009
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	Obligatoria	5
Language	English			
Teaching method	Face-to-face			
Prerequisites				
Department				
Coordinador	López Beceiro, Jorge José	E-mail	jorge.lopez.beceiro@udc.es	
Lecturers	Ponton , Alain	E-mail	alain.ponton@univ-paris-diderot.fr	
Web				
General description	This course introduces recent strategies for structuring hard materials (nanoparticles, nanocomposites and porous monoliths hierarchically) by complex fluids. Complex fluids that are typically considered: solutions of large molecules (eg polymers.) Or supramolecular structures (eg micelles..) In ordinary liquids, foams or emulsions. The aim of this course is to illustrate how physical concepts of complex fluids can be applied to the rational design of advanced materials. For each system, the emphasis will be on: structure / properties of the final solid materials; the structure and stability of complex fluids. some specific characterization techniques are presented.			

Study programme competences / results	
Code	Study programme competences / results
A1	Set up and conduct tests using the techniques of thermal analysis and rheology most appropriate in each case, within the scope of complex materials
A3	Knowing the different types of thermal and rheological behaviors of the materials
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
B12	Communicate effectively in the work environment
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
B22	Understand the importance of protecting the environment
C2	Have a good command of spoken and writing expression and understanding of a foreign language.
C4	Developing for the exercise of an open, educated, critical, committed, democratic and solidary citicenship, able to analyze reality, diagnose problems, formulate and implement solutions based on knowledge and oriented to the common good.
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.

Learning outcomes	
Learning outcomes	Study programme competences / results

This course provides a unified educational introduction of the central aspects of the flow and deformation of complex fluids (eg., Fluid materials structured at different scales). The course objective is to develop a physical understanding of the rheology of complex fluids by teaching conceptual points important basic data analysis and experimental practices.	AR1 AR3	BR1 BR2 BR4 BR8 BR12 BR13 BR14 BR21 BR22	CR2 CR4 CR6 CR7

Contents	
Topic	**Sub-topic**
1. Fundamentals of rheology and viscoelasticity.	Rheology Viscoelasticity
2. Rheometry	Rheometry
3. Rheology of dispersed media	Rheology of dispersed media
4. Industrial applications of complex materials.	Industrial applications of complex materials.

Planning				
Methodologies / tests	**Competencies / Results**	**Teaching hours (in-person & virtual)**	**Student?s personal work hours**	**Total hours**
Guest lecture / keynote speech	A3 B1 B21 B22 C6 C7	18	18	36
Laboratory practice	A1 B2 B4 B8 B13	20	10	30
Supervised projects	B12 B14 B21 B22 C2 C4	5	50	55
Objective test	A3 B4 B8 B13 B14 C2	2	0	2
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	Oral presentation (using audiovisual material and student interaction) designed to transmit knowledge and encourage learning. Presentations of this type are variously referred to as ?expository method?, ?guest lectures? or ?keynote speeches?. (The term ?keynote? refers only to a type of speech delivered on special occasions, for which the lecture sets the tone or establishes the underlying theme; it is characterised by its distinctive content, structure and purpose, and relies almost exclusively on the spoken word to communicate its ideas.)
Laboratory practice	Practice-based learning method involving activities such as demonstrations, exercises, experiments and research.
Supervised projects	Supervised learning process aimed at helping students to work independently in a range of contexts (academic and professional). Focused primarily on learning ?how to do things? and on encouraging students to become responsible for their own learning.
Objective test	Written learning progress test, characterised by pre-determined answers. Well-designed tests offer objectively quantifiable results in relation to student knowledge, capacities, skills, performance, aptitudes, attitude, intelligence, etc. Used for diagnostic, formative and summative assessment. May consist of all or any of the following types of questions: multiple choice, ordering and sequencing, short answer, binary, completion, multiple matching.

Personalized attention	
Methodologies	**Description**

Guest lecture / keynote speech Laboratory practice Supervised projects Objective test	The personalized attention to students, understood as a support in the teaching-learning process, will take place in the hours of tutoring of the teacher.

Assessment			
Methodologies	Competencies / Results	Description	Qualification
Guest lecture / keynote speech	A3 B1 B21 B22 C6 C7	Continuous assessment through monitoring of student work in the classroom, laboratory and / or tutorials	10
Laboratory practice	A1 B2 B4 B8 B13	Continuous assessment through monitoring of student work in the classroom, laboratory and / or tutorials	10
Supervised projects	B12 B14 B21 B22 C2 C4	Activities whose purpose is that the students enlarge the study of ther topics pesented in each theme and consolidate their acquired knowledge and capabilities. These activities should also help the students learn and improve their capabilities in literature survey.	30
Objective test	A3 B4 B8 B13 B14 C2	Examination or objective test.	50

Assessment comments

Sources of information	
Basic	
Complementary	

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

(*)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.