UNIVERSIDADE DA CORUÑA

Teaching Guide			
Identifying Data			2016/17
Subject (*)	Statistics of Polymer Physics, Light scattering techniques. Microscopy	Code	730495012
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	3

Language	English		
Teaching method	Face-to-face		
Prerequisites			
Department			
Coordinador	López Beceiro, Jorge José	E-mail	jorge.lopez.beceiro@udc.es
Lecturers	Buhler , Eric	E-mail	eric.buhler@univ-paris-diderot.fr
Web			
General description	The objective of this course is to teach the basic concepts of the architecture of the polymer chains, the fundamental aspects of the properties of polymer solutions, interactions and relationship with the chemical structure. It also provides an overview of the theory and experimental techniques of radiation scattering (light, X, neutrons), the analysis and interpretation of data relating to the characterization of polymeric materials.		

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
A2	Identify and evaluate the different types of complex materials
A5	Understanding the relationships between structure and properties of 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
B13	Analysis-oriented attitude
B17	Analyze and decompose processes
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 / results

The course offers an advanced polymer and soft matter physics and physical chemistry study: rationale and methods. The aim is to teach students the basics of architecture of the polymer chains, basic aspects of the properties of polymer solutions, interactions and relationship with the chemical structure, including phase behavior. It also aims to provide perspective on the experimental scattering techniques, analysis and interpretation of data relating to the characterization of materials. An introduction to the theory of diffraction and instrumentation is offered. In addition, selected examples of polymeric materials with a view to developing the experience and knowledge of practical aspects will be presented.	AR1 AR2 AR5	BR1 BR2 BR4 BR8 BR13 BR17 BR21	CR2 CR6 CR7 CR8

Contents	
Topic	**Sub-topic**
1. Formation of single stranded (ideal chains, real chains)	
2. mixing Thermodynamics	
3. polymer solutions (good solvents, theta solvents, poor solvents)	
4. Red and gelling	
5. Dynamic: dynamic cross-linked polymers and non-interlaced.	
6. dispersive techniques (light scattering, X-ray and neutron) STRUCTURAL	
7.Factores shape and factors	
8. Polymers and polymer systems: an example of analyzes and studies.	

Planning				
Methodologies / tests	**Competencies / Results**	**Teaching hours (in-person & virtual)**	**Student?s personal work hours**	**Total hours**
Guest lecture / keynote speech	A2 A5 B1 B13 B21 C7	15	15	30
Laboratory practice	A1 B2 B4 B8 B17	15	5	20
Supervised projects	B13 B21 C2 C6 C8	3	20	23
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 pesented 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**
Supervised projects	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.

Assessment

Methodologies	Competencies / Results	Description	Qualification
Guest lecture / keynote speech	A2 A5 B1 B13 B21 C7	Examination or objective test.	50
Laboratory practice	A1 B2 B4 B8 B17	Continuous assessment through monitoring of student work in the classroom, laboratory and / or tutorials.	20
Supervised projects	B13 B21 C2 C6 C8	Presentation (oral and written) of the supervised work.	30

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.