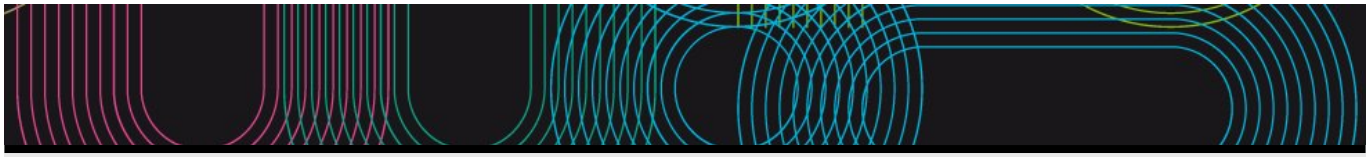

IDENTIFYING DATA				
Nanocatalysis: Concepts, materials and applications				
Subject	Nanocatalysis: Concepts, materials and applications			
Code	V11M188V01203			
Study programme	Máster Universitario en Nanociencia y Nanotecnología			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	3	Optional	1st	2nd
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Pérez Lorenzo, Moisés			
Lecturers	Hervés Beloso, Juan Pablo Pérez Lorenzo, Moisés Puértolas Lacambra, Begoña			
E-mail	moisespl@uvigo.es			
Web				
General description				

Training and Learning Results
Code

Expected results from this subject	Training and Learning Results
1) Identifying the problems stemming from the recovery and reuse of catalysts.	
2) Knowing the procedures for the preparation of nanomateriais and their use in catalysis.	
3) Understanding the reaction mechanisms for the nanocatalyzed chemical transformations.	
4) Designing nanocatalysts for their application in specific processes.	
5) Proposing nanocatalysts for sustainable catalytic processes.	

Contents	
Topic	
1) Fundamental concepts in chemical catalysis.	Basic concepts.
2) Mechanisms involved in catalytic processes and kinetic modeling.	Description of mechanisms and modeling.
3) Homogeneous catalysis vs. heterogeneous catalysis.	Basic concepts.
4) Surface catalysis.	Basic concepts.
5) Nanomaterials and catalysis: nanocatalysts.	Types and classification. Synthesis and characterization methods.
6) Nanocatalysts in homogeneous catalysis.	Examples of model reactions.
7) Nanocatalysts in heterogeneous catalysis.	Examples of model reactions.
8) Nanocatalysts in photocatalysis.	Examples of model reactions.
9) Nanocatalysts in "green" catalysis.	Examples of model reactions.
10) Technological and industrial applications of nanocatalysts.	Practical applications.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	9	9	18
Seminars	3	2	5
Laboratory practical	6	0	6
Mentored work	0	25	25
Report of practices, practicum and external practices	0	15	15
Presentation	5	0	5
Objective questions exam	1	0	1

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

Methodologies

	Description
Lecturing	Oral and direct presentation, by the teaching staff, of the fundamental topics corresponding to the contents of the subject.
Seminars	Resolution of practical problems, by the teaching staff and the students, of the fundamental topics corresponding to the contents of the subject.
Laboratory practical	Conduction, by the students, of experiments related to the contents of the subject.
Mentored work	Preparation, by the students, of a work related to the contents of the subject.

Personalized assistance

Methodologies	Description
Lecturing	Resolution of doubts, by previous appointment, through Remote Campus platform.
Seminars	Resolution of doubts, by previous appointment, through Remote Campus platform.
Mentored work	Resolution of doubts, by previous appointment, through Remote Campus platform.

Assessment

	Description	Qualification	Training and Learning Results
Seminars	Problem solving.	10	
Laboratory practical	Conduction of experiments related to the contents of the subject.	10	
Mentored work	Preparation of a multimedia file related to the contents of the presentation.	5	
Report of practices, practicum and external practices	Preparation of a lab report.	15	
Presentation	Presentation of the mentored work.	20	
Objective questions exam	Exame related to the contents of the subject.	40	

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

Karine Philippot; Alain Roucoux, **Nanoparticles in Catalysis**, Wiley-VCH, Weinheim, 2021

Bert Sels; Marcel Van de Voorde, **Nanotechnology in Catalysis**, Wiley-VCH, Weinheim, 2017

Philippe Serp; Karine Philippot, **Nanomaterials in Catalysis**, Wiley-VCH, Weinheim, 2013

Recommendations