

**COURSE DATA****Data Subject**

Code	44426
Name	Current issues in nanoscience and molecular nanotechnology
Cycle	Master's degree
ECTS Credits	6.0
Academic year	2021 - 2022

Study (s)

Degree	Center	Acad. year	Period
2208 - M.D. in Molecular Nanoscience and Nanotechnology	Faculty of Chemistry	1	Second term

Subject-matter

Degree	Subject-matter	Character
2208 - M.D. in Molecular Nanoscience and Nanotechnology	10 - Current issues in nanoscience and molecular nanotechnology	Obligatory

Coordination

Name	Department
CORONADO MIRALLES, EUGENIO	320 - Inorganic Chemistry

SUMMARY

Lectures and seminars given by specialists on this topic showing the state-of-the-art in this field.

PREVIOUS KNOWLEDGE**Relationship to other subjects of the same degree**

There are no specified enrollment restrictions with other subjects of the curriculum.



Other requirements

There are no specified enrollment restrictions with other subjects of the curriculum.

OUTCOMES

2208 - M.D. in Molecular Nanoscience and Nanotechnology

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.
- Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.
- Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.
- Students should demonstrate self-directed learning skills for continued academic growth.
- Students should possess and understand foundational knowledge that enables original thinking and research in the field.
- To possess the necessary knowledge and abilities to continue with future studies in the PhD program in Nanoscience and Nanotechnology.
- For students from field of knowledge (e.g. chemistry) to be able to scientifically communicate and interact with colleagues from another field (e.g. physics) in the resolution of problems laid out by the Molecular Nanoscience and Nanotechnology.
- To know the molecular nanoscience "state of the art".
- To know the state of the art in molecular nanomaterials with optical, electric and magnetic properties.
- To assess the relationships and differences between the materials macroscopic properties and those of unimolecular systems and nanomaterials.
- To assess the molecules and hybrid materials relevance in electronics, spintronics and molecular nanomagnetism.
- To know the main biological and medical application in this area.
- To know the main molecular nanomaterials technological applications and to be able to put them in the Material Science general context.
- To know the technical and conceptual problems laid out by the physical properties measurement in single molecular systems (charge transport, optical properties, magnetic properties).
- To know the main applications of nanoparticles and nanostructured materials obtained or functionalised using a molecular approach- in magnetism, molecular electronics and biomedicine.



LEARNING OUTCOMES

Presentation of the state-of-the-art in this field by talks given by specialists on this topic.

DESCRIPTION OF CONTENTS

1. European School on Molecular Nanosciencie (ESMolNa)

Lectures and seminars given by specialists on this topic showing the state-of-the-art on this field.

The European School on Molecular Nanoscience (ESMolNa) is organized annually since 2008, with the participation of the most active European research groups working on this topic.

During this school the state-of-the-art in this field is discussed from the perspective of the different disciplines that integrate the field (molecular magnetism, molecular electronics, molecular nanoscience and materials science, etc.). At the same time a discussion forum is created where young researchers (master and PhD students from all around Europe) have the opportunity to present their recent research results in front of a distinguished scientific community.

This school is essential for the cohesion of the interuniversity program and for the creation of a scientific community working in these areas, since it represents the main meeting point for students of this master program with other students, researchers and professors active in this field. Students will give an oral communication showing their results during their research activity, allowing an assessment of the activities carried out by them.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	40,00	100
Tutorials	15,00	100
Seminars	1,00	100
Development of individual work	20,00	0
Study and independent work	40,00	0
Preparing lectures	34,00	0
TOTAL	150,00	



TEACHING METHODOLOGY

Theory classes, participatory lectures

Articles discussion.

Chaired debate or discussion.

Specialized conferences.

Attendance to seminars, conferences and round tables.

EVALUATION

Attendance and active participation in seminars.	50-70%
Continuous evaluation.	10-20%
Research work oral presentation.	20%-30%

REFERENCES

Basic

- CASTELLANO

Artículos de revisión y de perspectiva aparecidos en las revistas científicas del tipo: Science, Nature, Accounts of Chemical Research, Chemical Reviews, Advanced Materials, Reviews on Modern Physics, etc.

ENGLISH

Review and perspective articles appeared in publications such as: Science, Nature, Accounts of Chemical Research, Chemical Reviews, Advanced Materials, Reviews on Modern Physics, etc.

VALENCIÀ



Articles de revisió i de perspectiva apareguts en revistes científiques del tipus: Science, Nature, Accounts of Chemical Research, Chemical Reviews, Advanced Materials, Reviews on Modern Physics, etc.

ern Physics, etc.

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

FITXA D'ADDENDA DE LA GUIA DOCENT - FICHA DE ADENDA A LA GUÍA DOCENTE TEACHING GUIDE ADDENDUM FORM	
Codi d'assignatura Código de asignatura Course code	M10 (44426)
Nom d'assignatura Nombre de asignatura Course name	M10- Current topics on Molecular Nanoscience
Titulació/Titulación/Degree	Master in Molecular Nanoscience and Nanotechnology
1. 1. Contenido/Contingut/Content	
Contents initially included in the teaching guide are maintained.	
2. Volum de treball i planificació temporal de la docència 2. Volumen de trabajo y planificación temporal de la docencia 2. Workload and teaching time planning	

**3. Metodologia docent/ Metodología docente/Teaching methodology**

The workload of different teaching activities is maintained.

The subject of M10 is to provide the students a suitable framework to show and discuss current topics in Molecular Nanoscience and Nanotechnology. So far this subject has been covered through the European School on Molecular Nanoscience (ESMolNa).

If the event cannot be held in person, the Master's Coordination Commission has decided to cancel ESMolNa2020 and to provide the students with recorded material about the subject, prepared by professors involved in the Master courses as well as by prominent researchers working in the area.

In case that the event cannot be held in person, questions and discussion about the subject of M10 is planned to be given online using the common videoconference programs available in the participating universities (Blackboard collaborate, Teams, Zoom, etc.). This includes the possibility of students to give oral communication about their research results via videoconference. This part will be recorded and uploaded in the e-learning platform. It will be tentatively scheduled during the first week of June.

Students will be informed with at least 3 weeks in advance if ESMolNa is going to be held in-person or online.

4. Avaluació/ Evaluación/ Evaluation

In case the conference need to be held online, the evaluation will be:

Research work oral communication: 20%

Exam: 80%

Given that this exam will be carried out by small groups of students in each university (maximum of 14 students in the University of Valencia) it will be attempted to do it "in



person”. If the face-to-face examination would not be possible, it will be carried out on-line using the e-learning platform videoconference.

Students will be informed with at least 10 days in advance if the exams will be done in-person or on-line.

5. Bibliografia/Bibliografía/ Bibliografy

References on all articles and reviews are available online.