UAB
Universitat Autònoma de Barcelona

2023/2024

State of the Art and Research Methods

Code: 43429
ECTS Credits: 9

Degree	Type	Year	Semester
4314939 Advanced Nanoscience and Nanotechnology	OB	0	A

Contact

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Teaching groups languages

You can check it through this link. To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

Prerequisites

Those required to study a master.

Objectives and Contextualisation

To introduce the basic concepts of nanoscience and nanotechnology research: scientific context, scientific method, documentation and bibliography, ethics, organization, etc.

Competences

- Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
- Continue the learning process, to a large extent autonomously
- Design, plan and carry out a research project in nanoscience and nanotechnology.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Seek out information in the scientific literature using appropriate channels, and use this information to formulate and contextualise a research topic.
- Show expertise in using scientific terminology and explaining research results in the context of scientific production, in order to understand and interact effectively with other professionals.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.

Learning Outcomes

1. Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
2. Contextualise a research project with regard to the state of the art on the basis of an efficient review of the literature.
3. Continue the learning process, to a large extent autonomously
4. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
5. Propose appropriate protocols and methodologies to conduct a research project related to nanoscience and nanotechnology.
6. Seek out information in the scientific literature using appropriate channels, and use this information to formulate and contextualise a research topic.
7. Show expertise in using scientific terminology and explaining research results in the context of scientific production, in order to understand and interact effectively with other professionals.
8. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
9. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.

Content

Throughout the course, several training talks will be offered within the area of Nanoscience and Nanotechnology (giving particular emphasis to the state of the art and the methodologies of different topics) together with an activity on the use of bibliographic tools for research. This training will teach students to provide a suitable context to research topics by means of the search of specialized bibliography in journals and databases, as well as the analysis of the reliability of the information collected from different sources. It will also help them to start planning and managing their research projects. With these tools, they will be able to carry out the written report which will focus on the motivation and scientific context of their research work about their Master Thesis research project.

Methodology

In the first half of the course, the students will attend several training talks within the area of Nanoscience and Nanotechnology (giving particular emphasis to the state of the art and the methodologies of different topics) together with an activity on the use of bibliographic tools for research. This will allow them to tackle the writing of the report that will be focused on explaining the motivation and scientific context of their Master Thesis research project.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Training talks	0	0	6, 2, 7, 5, 4, 8, 1, 3, 9
Type: Supervised			

| Activity on the use of bibliographic tools for research | 0 | 0 | 6, 2, 7, 5, 4, 8, 1, 3, 9 |

Assessment

The evaluation will be done by carrying out a written report and an oral defense of it in front of the coordinator of the subject (60% of the total grade). The other part of the mark (40% of the total mark) will be given by attending and completing the exercises in various training talks in Nanoscience and Nanotechnology and an activity on the use of bibliographic tools for research.

The written report will consist of a brief presentation of each student's research work and will basically focus on the motivation and scientific context of their research work. This written document must include the following sections:

- Cover that includes the title, author (name and surnames and DNI), name of the tutor, department and institution where the Master's Thesis was carried out...

- Brief introduction to the Master's Thesis topic (500 words maximum)

- State of the art and scientific context of the work

- Motivation and goals

- References

- Annexes

The maximum number of pages (not including the cover, the annexes or the references) is 8 (accepted fonts: Times, Arial or Calibri; font size of 11 or 12, maximum line spacing of 1.5 and margins not smaller than 2 cm)

The oral defense will consist of a 10 minute presentation and a 15 minute question session by the coordinator of the subject. Slides can be used and it is recommended to spend approximately one minute per slide. Avoid overloading the slides with text.

The coordinator of the subject will establish the deadlines, close to the evaluation period, to present the written document. Later, already in the evaluation period, the coordinator will schedule the day and time for the oral presentation and inform each student.

The exercises will be presented a few days after the end of the talks and the activity. The evaluation will be carried out jointly by the speakers and the coordinator of the subject.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Exercises	40 %	90	3.6	6, 2, 7, 5, 4, 8, 1, 3, 9
Oral defense	25-30 %	67.5	2.7	6, 2, 7, 5, 4, 8, 1, 3, 9
Thesis	30-35 %	67.5	2.7	6, 2, 7, 5, 4, 8, 1, 3, 9

Bibliography

No assigned bibliography.

Software

No assigned software.