Universitat Autònoma de Barcelona

2021/2022

Master's Degree Dissertation

Code: 44416
ECTS Credits: 15

Degree	Type	Year	Semester
4313385 Industrial Chemistry and Introduction to Chemical Research	OB	0	2

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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Use of Languages

Principal working language: english (eng)

Prerequisites

No requirements neded

Objectives and Contextualisation

The student carries out a pilot project in basic or applied research in a research laboratory or in a chemical company laboratory and must demonstrate the ability to apply knowledge and skills acquired during the first part of the Master

Competences

- Analyse and use the data in autonomous fashion in complex laboratory experiments and relate them with the appropriate chemical, physical or biological theories, and including the use of primary bibliographic sources.
- Be capable of working in a team and adapting to multidisciplinary teams.
- Correctly apply new information capture and organisation technologies to solve problems in professional activity.
- Correctly evaluate the risks and environmental and socio-economic impact associated to special chemical substances.
- Evaluate responsibility in the management of information and knowledge in the field of Industrial Chemistry and Chemical Research.
- Foster innovation and entrepreneurship in chemical industry and research.
- Identify information in the scientific literature using the appropriate channels and integrating said information to approach and contextualise a research issue.
- Innovate in the spaces and environments of the field of work, showing initiative and an entrepreneurial spirit.
- Operate with advanced instrumentation for chemical evaluation and structural determination.
- Show skills in analysing, describing, organising, planning and managing projects.
- Student should possess an ability to learn that enables them to continue studying in a manner which is largely self-supervised or independent
- Students should be able to integrate knowledge and face the complexity of making judgements from information which, being incomplete or limited, include reflections on the social and ethical responsibilities linked to the application of their knowledge and judgements
- Students should know how to apply the knowledge acquired and the capacity to solve problems in new or little-known areas within broader (or multidisciplinary) contexts realted to thier area of study

- Students should know how to communicate their conclusions, knowledge and final reasoning that they hold in front of specialist and non-specialist audiences clearly and unambiguously
- Use scientific terminology in the English language to defend experimental results in the context of the chemistry profession.

Learning Outcomes

1. Analyse the results of research in order to obtain new products or processes while evaluating their quality, and industrial and commercial viability for transfer to society.
2. Apply the specific research methodology, techniques and resources to research and produce innovative results in a certain area of specialisation.
3. Be capable of working in a team and adapting to multidisciplinary teams.
4. Correctly apply new information capture and organisation technologies to solve problems in professional activity.
5. Design advanced experiments for the study of chemical systems.
6. Draft an extensive introduction based on the latest bibliography in adequate fashion for written presentation in the English language.
7. Evaluate responsibility in the management of information and knowledge in the field of Industrial Chemistry and Chemical Research.
8. Evaluate the risks and impact associated with the use of new techniques and products in the context of an experimental research project.
9. Identify information in the scientific literature using the appropriate channels and integrating said information to approach and contextualise a research issue.
10. Innovate in the spaces and environments of the field of work, showing initiative and an entrepreneurial spirit.
11. Produce a complete research report written in the English language and orally present it in English.
12. Relate the experimental results obtained with the previous bibliography and discuss their relevance in the area of specialisation.
13. Show skills in analysing, describing, organising, planning and managing projects.
14. Student should possess an ability to learn that enables them to continue studying in a manner which is largely self-supervised or independent
15. Students should be able to integrate knowledge and face the complexity of making judgements from information which, being incomplete or limited, include reflections on the social and ethical responsibilities linked to the application of their knowledge and judgements
16. Students should know how to apply the knowledge acquired and the capacity to solve problems in new or little-known areas within broader (or multidisciplinary) contexts realted to thier area of study
17. Students should know how to communicate their conclusions, knowledge and final reasoning that they hold in front of specialist and non-specialist audiences clearly and unambiguously
18. Use scientific terminology in the English language to defend experimental results in the context of the chemistry profession.
19. Use the results of an experimental research project in the area of chemistry to foster innovation and entrepreneurship.
20. Use the right instrumentation in accordance with the objectives of the proposed research project.

Content

See methodology section

Methodology

In the specialty "Advanced chemical research", these practices will be carried out in a research laboratory of the Department of Chemistry of the UAB under the supervision of a professor who will act as tutor or in a Research Institute under the supervision of a member researcher of staff with recognized experience. The supervisors will issue a report at the end of the stay that will be used by the Coordination Committee for the evaluation of students. The tasks that will be carried out by the students will be the learning and the practice of analysis and synthesis techniques in a research laboratory.

In the specialty "Chemistry in industry" these practices will be carried out in laboratories of chemical companies. Each student will have a supervisor at the company who will guarantee the progress and quality of their work and issue a report at the end of their stay. This report will be used by the Coordination Committee for the evaluation of students. Also the student will have a university supervisor who will guarantee the quality of the final written report. The tasks that the students will be carried out will be the learning and the practice of analysis and synthesis techniques in an industrial chemical laboratory.

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			
Preparation of final report and oral presentation	50	2	1, 4, 13, 11, 17, 6, 12, 19, 18, 7
Tutorials	5	0.2	1, 5, 9, 17, 3, 18
Type: Supervised			
Meetings with the thesis supervisor	14	0.56	1, 8, 13, 5, 9, 17, 12, 3, 18
Type: Autonomous			
Autonomous student research	305	12.2	1, 4, 2, 8, 5, 10, 15, 16, 14, 12, 19, 20, 7

Assessment

The ability to develop a correct activity in the laboratory, to write a correct report and to present and discuss the results will be taken into for the evaluation of the student.

The final grade will be obtained from:

- 50% The Oral presentation and discussion

- 20% The Manuscript written quality

- 30% Final report of the activities carried out by the student provided by the thesis supervisor or tutor.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Final report by thesis advisor	30%	0	0	4, 13, 14, 3
Manuscript written quality	20%	0	0	1, 8, 13, 5, 11, 9, 10, 15, 16, 17, 6, 12, 19, 20, 18, 7
Oral presentation and discussion	50%	1	0.04	1, 2, 11, 17, 12, 18

Bibliography

It will depend upon the specific student project

Software

Chem draw professional