

**Bachelor's Degree Final Project**

Code: 102489  
ECTS Credits: 15

Degree	Type	Year	Semester
2502444 Chemistry	OB	4	0

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.

### Errata

In the section on EVALUATION Module of methodology of the research work (10% OF THE FINAL NOTE OF THE TFG), the correct wording must be: "The evaluation system is ongoing. To pass the module it will be necessary to obtain a minimum final grade of 5 points."

### Contact

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### Use of Languages

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: Yes  
Some groups entirely in Spanish: No

### Teachers

Jordi Coello Bonilla  
Eulàlia Fuentes Pujol  
Maria Muñoz Tapia  
Angels Jimenez Lopez  
Ona Illa Soler  
Manel Alcalá Bernardez

### Prerequisites

The student must have passed at least 2/3 parts of the total of ECTS corresponding to the studies they are studying (160 ECTS for students of the Degree in Chemistry and 212 ECTS for students of the double Degree in Physics and Chemistry) and have all the first course passed to enroll in this subject (Academic Affairs Committee of the Faculty of Sciences of February 27, 2007).

The circuit for preparing the final year project begins with the course enrollment.

Prerequisites for the TFG modality via external practices:

The student must be enrolled in the course External Practices. This subject has the following prerequisites: At the time of making the application, to take the subject of external internships, the student must have an average equal to or greater than 5.0 in "barem 34" and 150 credits Approved (among which there must be those of all subjects of the first year).

## Objectives and Contextualisation

### OBJECTIVES OF THE TFG

The Final Project is an autonomous work based on topics related to any of the subjects or subjects of Chemistry.

The objectives of the Final Project are to deepen their own theme and / or apply and know how to convey knowledge acquired during the studies of Chemistry.

In general, the Work will incorporate both theoretical and practical aspects and a discussion.

The TFG must show the knowledge, abilities and skills achieved by the students in the Degree studies, demonstrating that they have achieved the maturity necessary to carry out the profession.

The TFG must show a certain degree of originality, either in the discussion of known results or in obtaining a new result.

### OBJECTIVES OF THE METHODOLOGY MODULE OF RESEARCH WORK

Understand the significance of end-of-degree work, as research work, within the context of scientific research and its contribution to development and social progress.

Acquire a methodology for the elaboration of academic research work.

Learn to communicate and defend the results of an investigation through written memory and oral presentation.

## Competences

- Be ethically committed.
- Communicate orally and in writing in ones own language.
- Develop synthesis and analyses studies in chemistry from previously established procedures.
- Learn autonomously.
- Manage the organisation and planning of tasks.
- Manage, analyse and synthesise information.
- Obtain information, including by digital means.
- Operate with a certain degree of autonomy and integrate quickly in the work setting.
- Propose creative ideas and solutions.
- Reason in a critical manner
- Resolve problems and make decisions.
- Show an understanding of the basic concepts, principles, theories and facts of the different areas of chemistry.
- Show initiative and an enterprising spirit.
- Show sensitivity for environmental issues.
- Use IT to treat and present information.
- Use the English language properly in the field of chemistry.

## Learning Outcomes

1. Adequately apply chemistry concepts and theory to produce an academic or professional study in the field of chemistry.
2. Be ethically committed.
3. Communicate orally and in writing in ones own language.
4. Learn autonomously.
5. Manage the organisation and planning of tasks.
6. Manage, analyse and synthesise information.
7. Obtain information, including by digital means.
8. Operate with a certain degree of autonomy and integrate quickly in the work setting.

9. Produce a summary in English of the work done.
10. Propose and develop protocols to perform an academic or professional study in the field of chemistry.
11. Propose creative ideas and solutions.
12. Reason in a critical manner
13. Resolve problems and make decisions.
14. Show initiative and an enterprising spirit.
15. Show sensitivity for environmental issues.
16. Use IT to treat and present information.

## Content

### CONTENTS OF THE TFG

The final year project may be one of the following types:

- a. Proposal for a research project: It will consist in the elaboration of a written basic or applied research project, so that it can be carried out subsequently by a researcher or research team.
- b. Bibliographic study: Argument discussing a type of 'bibliographic review' on the current situation of a specific issue of the scope of chemistry or aspects of basic or directed research.
- c. Dissemination: It will consist of the dissemination of a scientific topic of social interest aimed at the general public or students of non-university education levels.
- d. Industrial project: It will consist in the elaboration of an innovation project that is related to any aspect of the chemical, to carry out in a certain company.
- e. Technical-ethical-legal project: Under this modality, it is necessary to accommodate work that deals with matters related to regulations - industrial, environmental ... - or with ethical aspects related to the exercise of the profession or the experimentation, with the analysis of the sociological impact of science in a specific area, etc.
- f. Experimental project: It will consist in the elaboration of a project in a research laboratory of a university department or research center.

The student will make an application with priority of 5 works of the mentioned types, which will be chosen from among a list of proposals. Apart from that, the student may propose a topic of his own ("free project"), which he must justify appropriately.

Regardless of the typology, the work can be carried out in institutions or companies external to the UAB, as an extension of the subject 'Practices external' and within the framework of mobility programs.

The works will be done individually.

The tutors of the final year project will be professors / researchers doctors belonging to the Department of Chemistry or other departments that teach at the Chemistry Degree. Therefore, it will be necessary for the student to have a tutor who meets these requirements in the event that the TFG is carried out in a UAB department / center other than those mentioned or in an external institution. The TFGs that are carried out in the framework of the double degree of Physics and Chemistry must have a tutor of each one of the degrees involved.

### CONTENTS OF THE RESEARCH WORK METHODOLOGY MODULE

#### THEORY

TOPIC 1: Introduction to scientific research: the TFG as a research work.

TOPIC 2: Work planning.

TOPIC 3: Documentation phase: initial approach and systematic bibliographic search.

TOPIC 4: Bibliographic citation and management: the style of the American Chemical Society (ACS).

TOPIC 5: Preparation and writing of the TFG written report.

TOPIC 6: Presentation and oral defense.

## PRACTICES

Each topic is associated with a practical exercise. These exercises revolve around tasks related to the development of the TFG itself (planning, search and bibliographic review, drafting of introductory sections, etc.) and will constitute the evidence of learning that the student must deliver.

## Methodology

### METHODOLOGY OF THE TFG

Circuit of elaboration of the TFG (TFG modality without external practices)

#### 1. Enrollment

The student will enroll according to the established calendars the academic course in which he wants to realize and defend the TFG. Students will be able to enroll in three different groups: groups 1, 2 and 3. Enrollment in group 1 implies that the subject will be carried out and evaluated in its entirety during the 1st semester (February call). Enrollment in group 2 is designed so that the subject will be evaluated at the end of the 2nd semester (June call). Enrollment in group 3 implies that students want to be evaluated in September. In the case of groups 2 and 3, the work of the TFG can be developed both on an annual basis and only during the 2nd semester.

The registration of the TFG will be open throughout the academic year. Even so, there will only be two shifts in application and assignment of work: at the beginning of the 1st semester (1st turn) and at the beginning of the 2nd semester (2nd turn). Regardless of the enrollment group (1,2,3), students enrolled in the subject must make the application and assignment of work.

For students of the double degree, only enrollment applies to groups 72 and 73, since the TFG is annual and not semi-annual.

For TFG + students in business practices, only enrollment in groups 11, 12 and 13 applies.

#### 2. Proposal and allocation of the TFG

Proposed work: Prior to the beginning of each academic year, the coordination of the TFG will ask the group of professors who can act as proposed tutors of subjects for the accomplishment of the works. In these proposals, you must indicate: the name of the tutor, the title of the work, and the types that may be assigned (see section 3, you can specify more than one typology). Teachers who submit proposals will be the guardians of the work and may participate in the evaluation commissions. On the other hand, and within the established periods, students will be able to propose reasonably and justifiably to the coordination of the subject TFG projects different from those proposed by tutors ("free project"). The coordination team will manage these proposals.

Dissemination of the proposals: The TFG coordination will publish the work proposals received in the virtual space allocated to the subject. This list will be the one that will be valid throughout the course.

Application for work: The application for work by students will be done through a form on the Internet, which will be accessed through a link of the virtual space of the subject. This form will show up to 5 prioritized preferences from the list of works offered or, failing that, the proposal of "free project" with the name of the laboratory where the work will be carried out.

Assignment of work: The coordination of TFG will assign the projects requested to the students taking into account their academic records and the order of preferences. The result of the assignment will be made public through the virtual space. Next, and in a short period of time, the reassignments of work will be done for those students or professors who have not been assigned in the first round.

Security seminar: All students will have to attend a theoretical security course taught by the UAB OSHA. The students who carry out the TFG in the Department of Chemistry will also have to complete the practical fire extinguishing course. The students who carry out experimental TFGs in other places will have to carry out the programmed activities from the receiving center. During the theoretical security course, it will be necessary to perform a test of achievement of the associated risk and safety competencies in a chemical laboratory. We will have to overcome it to be able to present the TFG.

Calendars: The process term schedules will be published in the virtual space of the subject.

### 3. Completion and follow-up of the TFG

Each TFG tutor will set a date for a joint initial meeting with their tutored students where the tracking schedule will be defined, which will specify a minimum set of individualized meetings covering the following topics:

Preparation of the tracking calendar

Preparation of a report with the state of the art of the subject considered

Preparation of the objectives of the TFG and temporary planning of the work

Carrying out security evidence

Discussion of the results obtained and elaboration of the index of the TFG memory to be drafted

Discussion of the draft TFG memory.

From each one of these meetings, it will be generated evidence to be studied and validated by the tutor, which will be elaborated using the format and following the guidelines established by the coordination of TFG and that will be available in the virtual space of the subject. The evidences corresponding to the 0-4 meetings will be part of the portfolio of each student and will be complemented by a report by the tutor during the evaluation process (see

section 5). The resulting evidence of meeting 5 will be the corrected memory of the TFG, which must be deposited as described below. This memory will have a maximum length of 30 pages and can be written in Catalan, Spanish or English using the corresponding template. All the reports must take a summary of a maximum extension of a page written in English. Those memories that are experimental also include as an annex the safety files of the products at risk used during the experimental work.

The student can not make any diffusion of the TFG on their own without the prior consent of the tutor / director.

### 4. Deposit of written work reports

Prior to the day of oral defense, on dates that will be made public in sufficient time, the student must submit their memory written in PDF format through the virtual space. In addition, a single copy of the report must be delivered in paper format to the Department of Chemistry's Department.

### 5. Oral presentation of the TFG

The Coordination of the Degree of Chemistry will fix the dates for oral defense of the TFG that will be made public. In particular, three different periods of oral defenses will be programmed in the calendar: calls for February, June and September. In the February call, all the oral presentations corresponding to the students enrolled in group 1 of the subject must be carried out. The students of group 2 will perform the oral defense of the work in the June call, and those from group 3 to the September call. These students will have to agree this decision with their tutors and communicate it to the coordination of the TFG.

For each oral defense period, the schedule of the presentations of each student will be elaborated by the coordination of the TFG and published in the virtual space. The oral presentation will be done with support of computer support and will have a maximum duration of 15 minutes. The committee that will evaluate the exhibitions will be composed of two teachers. Following the oral presentation, the committee may ask questions.

Circuit of elaboration of the TFG (TFG modality with external practices)

### 1. Organization chart and responsibilities

## Company tutor

The Tutor of the company will be a member of the company's workforce with a bachelor or graduate degree. Its role will be to design and supervise the project. He will also take care of the student's timetable and will have to issue an evaluation of the work done by the student and the learning achieved, among other criteria.

## Tutors teachers

The tutor will be one of the curriculums or a coordinating professor of the External Practices course. This tutor will be responsible for tracking students following the guidelines indicated in the corresponding section. In addition, the tutor will participate in the evaluation of TFGs.

## The Coordination

The Coordination of the TFG via External Practices will consist of one or more professors, who will also be responsible for the Coordination of the External Practices course.

## Commission for the evaluation of the TFG

The TFG Assessment Commission will be responsible for evaluating the written memory and the oral presentation of each student. The evaluation commissions will be called by the Coordination of the modality and will be constituted by two members chosen among the professors of the course Practices External, one of which will be a Coordinator of the modality.

## 2. Preparation of the TFG

### Enrollment:

The registration is in person and will be done once it has been accepted by a company and always before the start of the project. Normally, you will enroll simultaneously with the TFG and the Practices Externes course, although you can start by enrolling in External Practices and, during its execution, enroll after the TFG. The student can defend his work in any of the calls for February, June or September of the course in which he has enrolled. The memory and defense delivery dates will be similar to those of the other TFGs and will be announced in the Moodle classroom sufficiently in advance.

The registration of the TFG will be open throughout the academic year. Even so, there will only be two shifts in application and allocation of companies that will coincide with those of External Practices. The 1st period is in October / November, with the beginning of the practices in the 2nd academic semester. The second period is in March / April, the beginning of the internships may be in summer (beginning of July) or in the 1st semester of the following academic year.

### Application and allocation of the TFG

The allocation and application mechanism is the same as that of the External Practices course.

### Realization and monitoring of TFG

Since this TFG modality is linked to the realization of the PE, the student's mandatory meeting with his UAB tutor to speak of the PE, the student will inform him of what will be done by TFG + PE. The student will, necessarily, have a new meeting with their UAB tutor during the writing of the memory, in which they will discuss the collapse of the document. The tutor of the company will follow the student as agreed in the agreement.

The memory of the TFG will have a limited extension, which will be indicated in the template in the moodle of the subject, and can be written in Catalan, Spanish or English using the corresponding template that is in the moodle of the subject. All the reports must carry a summary of a maximum extension of a page drawn up in each of the three languages: Catalan, Spanish and English.

### Deposit of written work reports

Prior to the day of oral defense, on dates that will be made public well in advance, the student will have to deliver a copy of the memory to the task enabled in the moodle of the subject "External Internships (PE) and TFG via PE".

#### Oral presentation of the TFG

The Coordination will set the dates for oral defense of the TFG that will be made public before the enrollment period of each academic year. In particular, three different periods of oral defenses will be programmed in the calendar: calls for February, July and September. For each oral defense period, the schedule of the presentations of each student will be prepared by the Coordination and published in the Moodle classroom in advance. In the oral presentation, which will be held behind closed doors, the student will have to use computer support and will have a maximum duration of 15 minutes. The Commission that will evaluate the exhibitions will be formed by two professors of the course Practices External. Following the oral presentation, the committee will hold a question.

#### METHODOLOGY OF THE METHODOLOGY MODULE OF RESEARCH WORK

The module includes 9 sessions, with compulsory attendance, of 2 hours each.

These are eminently practical sessions where theoretical contents will be presented, briefly, whose application will be worked out through practical exercises and classroom activities. These activities will keep, whenever possible, close relation with the tasks that the student will have to carry out in the elaboration of their TFG.

#### Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Methodology module for research work	18	0.72	4, 3, 5, 6, 7, 10, 9, 16
Type: Supervised			
Follow-up tutorials	10	0.4	1, 14, 5, 6, 15, 10, 11, 9
Type: Autonomous			
Oral presentation and public defense	0.5	0.02	1, 3, 5, 2, 15, 11, 16
Preparation of a written memory	66	2.64	1, 3, 14, 5, 6, 2, 15, 8, 11, 12, 9, 13, 16
Reading texts and finding information	40	1.6	4, 14, 5, 6, 2, 15, 7, 8, 12, 13, 16
Study and elaboration of work	240	9.6	1, 4, 14, 5, 6, 2, 15, 7, 8, 10, 11, 12, 13

#### Assessment

##### TFG ASSESSMENT:

\*\* TFG mode without external practices:

The evaluation of the TFG of each student will be carried out jointly by their teacher (s) tutor (s) and the evaluation committee. In the case of students of the double degree of Physics and Chemistry, these will be evaluated in accordance with the regulations of the degrees of Physics and Chemistry, respectively. It will include the research module methodology module, which will be equal to 10% of the final grade of the subject.

Teacher tutor: The tutors of each job will evaluate the work done and the skills acquired based on the monitoring carried out and the evidences of the meetings 1-4 prepared by their students. As a result, each tutor will have to write a valuable report of the student who will have to give to the coordination of the TFG. In this report, a follow-up note will be required that will equal 30% of the final mark of the subject. When more than one tutor takes part, the average of the different reports involved or a single joint report will be made. Security evidence is mandatory. It is the responsibility of the student and guardians of the delivery and validation of all evidences and reports.

Evaluation commission: Based on the evaluation of the written memos and oral presentations, the evaluation commissions will judge the transversal competences acquired, the content, approach, development and degree of difficulty of the work carried out and the quality of the presentation and defense carried out. As a result, each committee will elaborate a valuative report following the guidelines of a heading prepared for the coordination of the TFG. In this report, there must be a work memo note and an oral defense note, which will equate 30% of the final grade of the subject to each of them.

Based on the notes given by the tutors and assessment commissions, the TFG coordination will calculate the final grade of the subject and make it public in the virtual space. In addition, you will select a number of jobs among the best qualifications in order to grant the honorable registration. In case of doubt, individual interviews will be made with the candidates for this qualification.

Those students who do not complete the 0-4 encounters of the follow-up process and do not carry out the evidence will not be able to present the TFG. Students who conduct these meetings and evidences, but do not deposit the memory written in the established calendar, do not do the oral defense, or their result is deficient will be described as "Suspense." In addition, cases of work plagiarism will also imply the automatic suspense of the TFG. In any of these cases, this will entail a new enrollment and complete and / or restart the TFG production circuit.

The follow-up of the TFG will have common guidelines for all students that facilitate the awarding mechanics and briefly describe the contents of the tutorial sessions. To this end, the teachers will have the evaluation headings and forms of the student's portfolio, which will contain guidelines on indicators to evaluate, number of follow-up actions, and their updating, memory evaluation or other, in order to establish a unified reference framework that allows a transparent evaluation.

\*\* TFG modality with external practices:

The evaluation of the TFG of each student will be carried out jointly by their Tutor in the company and the Evaluation Committee. It will include the research module methodology module, which will be equal to 10% of the final grade of the subject.

Tutor in the company: Will emit a report / evaluation based on the student's follow-up, with a qualification that will be equivalent to 30% of the final grade of the subject.

Evaluation Committee: Through the written report and the oral presentation, the Commission will evaluate the transversal competences acquired, the content, approach, development and degree of difficulty of the work carried out, as well as the quality of the presentation and defense of the work in response to the Commission's questions. As a result of this evaluation, the Commission will draw up a valuation report following the guidelines of a heading prepared by the Coordination. This report must include a work memo note (30% of the final mark of the subject) and a note of oral presentation and defense (30% of the final mark of the subject).

\*\*\* TFG modalities without or with external practices:

To make the weighted average, a minimum score of 4 out of 10 points is required, both from the Professor Tutor or from the Tutor to the company as well as from the Court or Evaluation Committee.

If the grade of Professor Tutor or Tutor in the company is less than 4, the subject will have a final note of "Suspense."

If the grade of the Court or Evaluation Committee is less than 4, the subject will have a "Not evaluable" note and the student will have to rewrite the memory, present it and defend it orally in the following call



of the academic year.

The cases of plagiarism of the work will entail a qualification of "Suspense" with a note of 0 [1]. This will entail a new enrollment and complete and / or restart the TFG production circuit.

[1] It will be considered as plagiarism (<http://www.plagiarism.org/>):

- present the work of others as their own;
- adopt words or ideas from other authors without due recognition (that is, without citing);
- Do not use quotation marks on a literal date;
- give incorrect information about the true source of an appointment;
- the paraphrase of a source without mentioning the source (that is, unquoted);
- the abusive paraphrase, even if the source is mentioned.

EVALUATION Module of methodology of the research work (10% OF THE FINAL NOTE OF THE TFG)

The evaluation system is ongoing. To pass the module it will be necessary to obtain a minimum final grade of 4 points. The evaluation elements that are contemplated are:

- Delivery of evidence (85%): three deliveries will be made (dates and contents will be reported at the beginning of the module). Its values are as follows:

First: 15%

Second: 35%

Third: 35%

- Follow-up of the module (15%): Includes the realization and / or participation in the face-to-face and / or virtual activities proposed by the teachers (eg: forums, readings, scheduled face-to-face sessions, etc.). Each unjustified breach will be penalized with 0.5 points (to be deducted from the percentage corresponding to this concept).

Reassessment: Only people who, having met the requirements of the continuous assessment, have not reached the required minimum qualification (5 points) will be eligible. The mark obtained in the re-evaluation will be a maximum of 5 points.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Methodology module for research work	10	0	0	3, 6, 7, 10, 9
Note of the oral presentation and defense	30	0.5	0.02	3, 14, 2, 15, 11, 12, 16
Note of the report of the end of degree project	30	0	0	1, 3, 14, 5, 6, 2, 15, 7, 10, 11, 12, 9, 13, 16
Note of the tracking	30	0	0	1, 4, 14, 5, 6, 2, 15, 7, 8, 10, 11, 12, 13, 16

## Bibliography

The basic bibliography will be suggested by the director of each Degree Project according to the subject matter, regardless of the bibliographical research that the student does.