

Universitat  
de Girona

Official master's  
-  
Passport to your future



# Master's in Advanced Catalysis and Molecular Modelling (MACMoM)



<https://www.udg.edu/ca/masters-en-mediambient-i-quimica/macmom>



## Presentation

Catalysis is the key to a wide range of chemical processes, from laboratory research to large-scale industrial reactors to life itself. Catalysts are involved at some stage in the manufacturing processes of over 90% of all the chemicals produced.

**The training of professionals specialised in sustainable catalysis is a growing demand of the chemical industry.** The synthesis of new catalysts and the development of better, more efficient and sustainable catalytic processes are becoming strategic differentiating factors for many companies that want to innovate their production processes and create more sustainable, economical and environmentally friendly products, thereby satisfying the demands of a market increasingly aware of and demanding about the origin and nature of the products they consume.

## Educational objectives

The primary aim of the Master's in Advanced Catalysis and Molecular Modelling is to provide students with a deep understanding of catalytic chemistry that can be applied in industry or in research. A distinctive feature of the master is that **it combines knowledge on experimental laboratory chemistry and computational chemistry to understand and optimize catalytic processes.**

This programme is **taught exclusively in English** so that students learn the terminology related to catalytic chemistry in that language and use it to their advantage in both industry and research at the international level.

Moduls	ECTS
<b>A1. Fundamentals</b>	
A1.1 Fundamentals of Catalysis	6
A1.2 Fundamentals of Computational Chemistry	6
<b>A2. Integrated Theoretical-Experimental Laboratories</b>	
A2.1 Structural and Spectroscopic Characterization	6
A2.2 Reaction Mechanisms	6
<b>A3. Scientific Communication and Technology Transfer</b>	6
<b>A4. Challenges in Modern Organic Synthesis</b>	6
<b>B. Optional (selected topics or internship in industry to choose)</b>	12
<b>C. Master's Final Project</b>	12
<b>Total</b>	<b>60</b>

## Career opportunities

The master's program offers students the option to carry out an industry placement and the master's thesis in a company of the chemical/pharmaceutical sector, through a paid internship. Graduates are prepared to assume professional activities related to tasks in R+D departments of companies in the chemical, pharmaceutical and biotechnological industries and in technology centers.

Alternatively, the master's thesis can be carried out in research laboratories of the Institute of Computational Chemistry and Catalysis (IQCC) or other European research center collaborating with the IQCC. Students who successfully complete this master's degree may be admitted to the research period of a doctoral program in both research centers and companies (the latter through Industrial Doctorate Plans).

## Master's in Advanced Catalysis and Molecular Modelling (MACMoM)

### Type

Mixed (professional and research)

### Duration

60 ECTS

### Calendar and timetable

From mid September to mid July

### System and Method of study

Full time (max 5h/day lectures/lab) until March. Face-to-face.

### Language of instruction

English 100%

### Language requirements

Students are assumed to have an intermediate level of English (B2.1 of the Council of Europe's Common European Framework for Languages).

### Fee

The academic prices of the official studies that are taught in the integrated centres of the UdG are public prices and every course the Government of Catalonia through the decree that is published fixes the month of June-July.

[www.udg.edu/fees](http://www.udg.edu/fees)

### Contact

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