



## Teaching Guide

| Teaching Guide           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Identifying Data         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        | 2019/20                                                                                                                                                                                                                                                                                                                                                                                                                                                    |           |
| Subject (*)              | Master Thesis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        | Code                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 610509139 |
| Study programme          | Mestrado Universitario en Investigación Química e Química Industrial (Plan 2017)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |
| Descriptors              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |
| Cycle                    | Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Year   | Type                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Credits   |
| Official Master's Degree | 2nd four-month period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | First  | Obligatory                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 18        |
| Language                 | SpanishGalicianEnglish                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |
| Teaching method          | Face-to-face                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |
| Prerequisites            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |
| Department               | Química                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |
| Coordinador              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | E-mail |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |
| Lecturers                | Avecilla Porto, Fernando Francisco<br>Blas Varela, Andrés M. de<br>Castro Garcia, Socorro<br>Esteban Gomez, David<br>Fernandez Lopez, Alberto A.<br>Fernandez Sanchez, Jesus Jose<br>García Romero, Marcos Daniel<br>Jimenez Gonzalez, Carlos<br>Pazos Chantrero, Elena<br>Peinador Veira, Carlos<br>Perez Sestelo, Jose<br>Platas Iglesias, Carlos<br>Riveiros Santiago, Ricardo<br>Rodriguez Gonzalez, Jaime<br>Sanchez Andujar, Manuel<br>Valdiglesias García, Vanessa<br>Vazquez Garcia, Digna                                                                                                                                                                                                                                          | E-mail | fernando.avecilla@udc.es<br>andres.blas@udc.es<br>socorro.castro.garcia@udc.es<br>david.esteban@udc.es<br>alberto.fernandez@udc.es<br>jesus.fernandezs@udc.es<br>marcos.garcia1@udc.es<br>carlos.jimenez@udc.es<br>elena.pazos@udc.es<br>carlos.peinador@udc.es<br>jose.perez.sestelo@udc.es<br>carlos.platas.iglesias@udc.es<br>ricardo.riveiros@udc.es<br>jaime.rodriguez@udc.es<br>m.andujar@udc.es<br>vanessa.valdiglesias@udc.es<br>d.vazquezg@udc.es |           |
| Web                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |
| General description      | The Master Thesis (TFM, rea"Trabajo de Fin de Máster") will involve the developement of a work plan supervised by a lecturer. The project will have the following parts: literature search and current state of the subject; objectives; experimental work; data analysis. Preparation, public presentation and defence of a memory of results and conclusions.<br><br>The Master Thesis will have either a professional or an academic character, according to the itinerary chosen by the student:<br><br>1. Professional: the project will be developed at a company that has a collaboration agreement with the university.<br>2. Academic research: the project will be developed at an academic research laboratory of the university |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |

## Study programme competences

| Code | Study programme competences                                                                                                                                                                                           |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A1   | Define concepts, principles, theories and specialized facts of different areas of chemistry.                                                                                                                          |
| A2   | Suggest alternatives for solving complex chemical problems related to the different areas of chemistry.                                                                                                               |
| A3   | Innovate in the methods of synthesis and chemical analysis related to the different areas of chemistry                                                                                                                |
| A4   | Apply materials and biomolecules in innovative fields of industry and chemical engineering.                                                                                                                           |
| A5   | Properly assess risks and environmental and socioeconomic impacts associated with special chemicals                                                                                                                   |
| A6   | Design processes involving the treatment or disposal of hazardous chemicals                                                                                                                                           |
| A7   | Operate with advanced instrumentation for chemical analysis and structural determination.                                                                                                                             |
| A8   | Analyze and use the data obtained independently in complex laboratory experiments and relating them with the chemical, physical or biological appropriate techniques, including the use of primary literature sources |
| A9   | Promote innovation and entrepreneurship in the chemical industry and in research.                                                                                                                                     |



|     |                                                                                                                                                                                                                                                                          |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B1  | Possess knowledge and understanding to provide a basis or opportunity for originality in developing and / or applying ideas, often within a research context                                                                                                             |
| B2  | Students should apply their knowledge and ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study.                                                                                    |
| B3  | Students should be able to integrate knowledge and handle complexity, and formulate judgments based on information that was incomplete or limited, include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgments. |
| B4  | Students should be able to communicate their conclusions, and the knowledge and the reasons that support them to specialists and non-specialists in a clear and unambiguous manner                                                                                       |
| B5  | Students must possess learning skills to allow them to continue studying in a way that will have to be largely self-directed or autonomous.                                                                                                                              |
| B6  | Innovate in the different areas of chemistry, demonstrating initiative and entrepreneurship                                                                                                                                                                              |
| B7  | Identify information from scientific literature by using appropriate channels and integrate such information to raise and contextualize a research topic                                                                                                                 |
| B8  | Evaluate responsibility in the management of information and knowledge in the field of Industrial Chemistry and Chemical Research                                                                                                                                        |
| B9  | Demonstrate ability to analyze, describe, organize, plan and manage projects                                                                                                                                                                                             |
| B10 | Use of scientific terminology in English to explain the experimental results in the context of the chemical profession                                                                                                                                                   |
| B11 | Apply correctly the new technologies to gather and organize the information to solve problems in the professional activity.                                                                                                                                              |
| B12 | Being able to work in a team and adapt to multidisciplinary teams.                                                                                                                                                                                                       |
| C1  | CT1 - Elaborar, escribir e defender publicamente informes de carácter científico e técnico                                                                                                                                                                               |
| C2  | CT2 - Traballar en equipo e adaptarse a equipos multidisciplinares.                                                                                                                                                                                                      |
| C3  | CT3 - Traballar con autonomía e eficiencia na práctica diaria da investigación ou da actividade profesional.                                                                                                                                                             |
| C4  | CT4 - Apreciar o valor da calidade e mellora continua, actuando con rigor, responsabilidade e ética profesional.                                                                                                                                                         |
| C5  | CT5 - Demostrar unha actitude de respecto polas opinións, valores, comportamentos e prácticas doutros                                                                                                                                                                    |

| Learning outcomes                                                                                                                                                                                                                                                                 |                                                             |                                          |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------|------------|
| Learning outcomes                                                                                                                                                                                                                                                                 | Study programme competences                                 |                                          |            |
| Saber aplicar a capacidade de coñecemento e resolución de problemas adquiridos nos distintos ramos da química. Saber comunicar as súas conclusións e os coñecementos adquiridos.                                                                                                  | AC1<br>AC2<br>AC3<br>AC4<br>AC5<br>AC6<br>AC7<br>AC8<br>AC9 | BC3<br>BC4<br>BC5<br>BC12                | CC1<br>CC2 |
| Saber identificar a información da literatura científica, valorando a responsabilidade na xestión da información e do coñecemento no campo da Química Industrial e na Investigación Química, usando a terminoloxía científica e apreciando o valor da calidade e mellora continua |                                                             | BC6<br>BC7<br>BC8<br>BC9<br>BC10<br>BC11 | CC3        |
| Ser capaz de comprender coñecementos que acheguen unha base ou oportunidade de ser orixinais no desenvolvemento e/ou aplicación de ideas, a miúdo nun contexto de investigación                                                                                                   |                                                             | BC1<br>BC2                               | CC4<br>CC5 |
| Poder aplicar os coñecementos adquiridos e a súa capacidade de resolución de problemas en contornos novos ou pouco coñecidos dentro de contextos máis amplos (ou multidisciplinares) relacionados coa súa área de estudo                                                          |                                                             |                                          |            |
| Poder apreciar o valor da calidade e mellora continua, actuando con rigor, responsabilidade e ética profesional                                                                                                                                                                   |                                                             |                                          |            |
| Ser capaz de demostrar unha actitude de respecto polas opinións, valores, comportamentos e prácticas doutros                                                                                                                                                                      |                                                             |                                          |            |



| Contents                  |                                                                                                                                                                                                                                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Topic                     | Sub-topic                                                                                                                                                                                                                                                                                  |
| Traballo de Fin de Master | 1.- Documentación bibliográfica e estado actual como un tema do proxecto proposto.<br>2. Desenvolvemento dun obxectivo da proposta.<br>3.- Realizar experimentos.<br>4. Procesamento de Datos.<br>5. Preparación, presentación pública e defensa dun informe dos resultados e conclusións. |
|                           | 1. Itinerario profesionalizante: suporá a realización dun proxecto profesional nunha empresa coa que ten asinaron un acordo.<br>2. Itinerario investigador: implicar a realización dunha investigación dentro dun grupo de investigación                                                   |

| Planning                                                                                                                        |                                       |                      |                               |             |
|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|----------------------|-------------------------------|-------------|
| Methodologies / tests                                                                                                           | Competencies                          | Ordinary class hours | Student?s personal work hours | Total hours |
| Laboratory practice                                                                                                             | B8                                    | 66                   | 9                             | 75          |
| Oral presentation                                                                                                               | A4 A5 B1 B2 B3 B4<br>B9 B10 B11 C1 C5 | 1                    | 1                             | 2           |
| Supervised projects                                                                                                             | A1 A2 A3 A6                           | 24                   | 49                            | 73          |
| Research (Research project)                                                                                                     | A7 A8 A9 B5 B6 B7<br>B12 C2 C3 C4     | 300                  | 0                             | 300         |
| Personalized attention                                                                                                          |                                       | 0                    |                               | 0           |
| (*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. |                                       |                      |                               |             |

| Methodologies               |                                                                                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Methodologies               | Description                                                                                                                                         |
| Laboratory practice         | Traballar nun laboratorio ou nunha empresa para realizar prácticas avanzadas e / ou traballo de fin de mestrado                                     |
| Oral presentation           | Presentación oral de traballos, informes, etc., incluíndo debates con profesores e alumnos                                                          |
| Supervised projects         | Traballos en grupo individual ou pequeno.                                                                                                           |
| Research (Research project) | Traballo práctico individual baixo a supervisión dun titor persoal, infraestrutura adecuada e doutros medios necesarios para alcanzar os obxectivos |

| Personalized attention |             |
|------------------------|-------------|
| Methodologies          | Description |
| Supervised projects    |             |

| Assessment                  |                                       |             |               |
|-----------------------------|---------------------------------------|-------------|---------------|
| Methodologies               | Competencies                          | Description | Qualification |
| Research (Research project) | A7 A8 A9 B5 B6 B7<br>B12 C2 C3 C4     |             | 50            |
| Oral presentation           | A4 A5 B1 B2 B3 B4<br>B9 B10 B11 C1 C5 |             | 50            |

| Assessment comments |
|---------------------|
|                     |



## Sources of information

|               |                                                                       |
|---------------|-----------------------------------------------------------------------|
| Basic         | Cada alumno recibirá as indicacions no proxecto concreto seleccionado |
| Complementary |                                                                       |

## Recommendations

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments

(\*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.