



## Teaching Guide

| Teaching Guide           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |                                                                                                                                          |           |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Identifying Data         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        | 2022/23                                                                                                                                  |           |
| Subject (*)              | Master Thesis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        | Code                                                                                                                                     | 730495016 |
| Study programme          | Mestrado Universitario en Materiais Complexos: Análise Térmica e Reoloxía (plan 2012)                                                                                                                                                                                                                                                                                                                                                                                                                    |        |                                                                                                                                          |           |
| Descriptors              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |                                                                                                                                          |           |
| Cycle                    | Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Year   | Type                                                                                                                                     | Credits   |
| Official Master's Degree | 2nd four-month period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | First  | Obligatory                                                                                                                               | 18        |
| Language                 | English                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                                                                                                                                          |           |
| Teaching method          | Face-to-face                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |                                                                                                                                          |           |
| Prerequisites            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |                                                                                                                                          |           |
| Department               | Ciencias da Computación e Tecnoloxías da InformaciónEnxeñaría Naval e IndustrialMatemáticasQuímica                                                                                                                                                                                                                                                                                                                                                                                                       |        |                                                                                                                                          |           |
| Coordinador              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | E-mail |                                                                                                                                          |           |
| Lecturers                | Artiaga Diaz, Ramon Pedro<br>Castro Garcia, Socorro<br>López Beceiro, Jorge José<br>Moret Bonillo, Vicente<br>Señaris Rodriguez, Maria Antonia                                                                                                                                                                                                                                                                                                                                                           | E-mail | ramon.artiaga@udc.es<br>socorro.castro.garcia@udc.es<br>jorge.lopez.beceiro@udc.es<br>vicente.moret@udc.es<br>m.senaris.rodriguez@udc.es |           |
| Web                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |                                                                                                                                          |           |
| General description      | The students will do a research project using the knowledge acquired in the Rheology and Thermomechanical modules. The Master Thesis is conducted, under the joint guidance of a teacher of the UDC and one of the UParis7, at the UDC, at UParis7 or at any public research organization or industry. It is possible to combine the stay in various centres if the director considers it appropriate. Whenever possible, the stay of the French students in Spain and Spanish in France is recommended. |        |                                                                                                                                          |           |

## Study programme competences

| Code | Study programme competences                                                                                                                                                                                                                                                      |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A1   | Set up and conduct tests using the techniques of thermal analysis and rheology most appropriate in each case, within the scope of complex materials                                                                                                                              |
| A2   | Identify and evaluate the different types of complex materials                                                                                                                                                                                                                   |
| A3   | Knowing the different types of thermal and rheological behaviors of the materials                                                                                                                                                                                                |
| A4   | Knowing and applying statistical methods to analyze data from complex material testing                                                                                                                                                                                           |
| A5   | Understanding the relationships between structure and properties of materials                                                                                                                                                                                                    |
| A6   | Understanding the importance of the environment and of the research focused on the elimination/minimization of final or process wastes                                                                                                                                           |
| A7   | Knowing the different types of thermal thermo-mechanical behaviors in materials subjected to fatigue                                                                                                                                                                             |
| A8   | Understand and quantify the damage caused by thermomechanical fatigue in materials                                                                                                                                                                                               |
| B1   | Knowledge and understanding to provide a basis or opportunity for originality in developing and / or applying ideas, often in a research context                                                                                                                                 |
| B2   | The students have the skill to apply their knowledge and their ability to solve problems in new or unfamiliar contexts within broader (or multidisciplinary) contexts related to their field of study                                                                            |
| B3   | That students are able to integrate knowledge and handle complexity, and formulate judgments from an information that, being limited or not complete, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments |
| B4   | That the students can communicate their conclusions and the knowledge and last reasons behind that conclusions to specialized and non specialized audience in a clear and unambiguous way                                                                                        |
| B7   | Solving problems effectively                                                                                                                                                                                                                                                     |
| B8   | Applying a critical, logical and creative way of thinking                                                                                                                                                                                                                        |
| B9   | To work autonomously with initiative                                                                                                                                                                                                                                             |
| B10  | Working in a collaborative way                                                                                                                                                                                                                                                   |
| B11  | Behave with ethics and social responsibility as a citizen and as a professional                                                                                                                                                                                                  |
| B12  | Communicate effectively in the work environment                                                                                                                                                                                                                                  |
| B13  | Analysis-oriented attitude                                                                                                                                                                                                                                                       |



|     |                                                                                                                                                                                                                                               |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B14 | Ability to find and manage the information                                                                                                                                                                                                    |
| B17 | Analyze and decompose processes                                                                                                                                                                                                               |
| B18 | Ability for abstraction, understanding and simplification of complex problems                                                                                                                                                                 |
| B19 | Will of continuous improvement                                                                                                                                                                                                                |
| B21 | To assess the importance of research, innovation and technological developments in the socio-economic and cultural progress of society                                                                                                        |
| B22 | Understand the importance of protecting the environment                                                                                                                                                                                       |
| C2  | Have a good command of spoken and writing expression and understanding of a foreign language.                                                                                                                                                 |
| C4  | Developing for the exercise of an open, educated, critical, committed, democratic and solidary citizenship, able to analyze reality, diagnose problems, formulate and implement solutions based on knowledge and oriented to the common good. |
| C6  | Critically assessing the knowledge, technology and information available to solve the problems they face with.                                                                                                                                |
| C7  | To assume as a professional and citizen the importance of learning throughout life.                                                                                                                                                           |
| C8  | To assess the importance of research, innovation and technological development in the socio-economic and cultural progress of society.                                                                                                        |
| C9  | Appreciate the importance of research in environmental protection                                                                                                                                                                             |

| Learning outcomes                                                                                      |  |                             |         |
|--------------------------------------------------------------------------------------------------------|--|-----------------------------|---------|
| Learning outcomes                                                                                      |  | Study programme competences |         |
| To be able to develop a research project based on the acquired knowledge in all modules of the master. |  | AR1                         | BR1 CR2 |
|                                                                                                        |  | AR2                         | BR2 CR4 |
|                                                                                                        |  | AR3                         | BR3 CR6 |
|                                                                                                        |  | AR4                         | BR4 CR7 |
|                                                                                                        |  | AR5                         | BR7 CR8 |
|                                                                                                        |  | AR6                         | BR8 CR9 |
|                                                                                                        |  | AR7                         | BR9     |
|                                                                                                        |  | AR8                         | BR10    |
|                                                                                                        |  |                             | BR11    |
|                                                                                                        |  |                             | BR12    |
|                                                                                                        |  |                             | BR13    |
|                                                                                                        |  |                             | BR14    |
|                                                                                                        |  |                             | BR17    |
|                                                                                                        |  |                             | BR18    |
|                                                                                                        |  |                             | BR19    |
|                                                                                                        |  |                             | BR21    |
|                                                                                                        |  |                             | BR22    |

| Contents                                                                                   |                                         |
|--------------------------------------------------------------------------------------------|-----------------------------------------|
| Topic                                                                                      | Sub-topic                               |
| Research project applying the acquired knowledge in Rheology and thermomechanical modules. | Development and presentation of the TFM |

| Planning                    |                                                                                                                       |                      |                               |             |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------|-------------|
| Methodologies / tests       | Competencies                                                                                                          | Ordinary class hours | Student?s personal work hours | Total hours |
| Research (Research project) | A1 A2 A3 A4 A5 A6<br>A7 A8 B1 B2 B3 B4<br>B7 B8 B9 B10 B11<br>B12 B13 B14 B17<br>B18 B19 B21 B22 C2<br>C4 C6 C7 C8 C9 | 265                  | 157                           | 422         |
| Oral presentation           | B4 C2 C6 C8                                                                                                           | 8                    | 0                             | 8           |



|                                                                                                                                 |  |    |   |    |
|---------------------------------------------------------------------------------------------------------------------------------|--|----|---|----|
| Personalized attention                                                                                                          |  | 20 | 0 | 20 |
| (*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. |  |    |   |    |

| Methodologies               |                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Methodologies               | Description                                                                                                                                                                                                                                                                                                                                |
| Research (Research project) | Students apply the skills acquired (knowledge and techniques) throughout the program to solve specific problems in the field of research. Moreover, the translation of the results into a document, allows students to structure the information obtained, and compare with bibliographic data and be able to cross check and evaluate it. |
| Oral presentation           | The presentation of Master's Thesis before a court gives the student the ability to prepare the defense of a project, public display in a clear and concise way and defend on the basis of the expertise or the experience of others.                                                                                                      |

| Personalized attention                           |                                                                              |
|--------------------------------------------------|------------------------------------------------------------------------------|
| Methodologies                                    | Description                                                                  |
| Oral presentation<br>Research (Research project) | Guidelines and answering questions that arise during the preparation of TFM. |

| Assessment                  |                                                                                                                       |                                                                                                                                                                              |               |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Methodologies               | Competencies                                                                                                          | Description                                                                                                                                                                  | Qualification |
| Oral presentation           | B4 C2 C6 C8                                                                                                           | The student will defend his work before the court and will answer the questions that the court do. Also tutor's opinion will be taken into account for the final evaluation. | 70            |
| Research (Research project) | A1 A2 A3 A4 A5 A6<br>A7 A8 B1 B2 B3 B4<br>B7 B8 B9 B10 B11<br>B12 B13 B14 B17<br>B18 B19 B21 B22 C2<br>C4 C6 C7 C8 C9 | The student will deliver a written report of his project.                                                                                                                    | 30            |

| Assessment comments                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| In the epigraph Oral presentation, besides the defense of the TFM (30%) and answer of the questions (30%), it is included the valuation on the part of the tutors, with a weight of 10 % of the qualification.<br>The evaluation criteria are the same for each opportunity. |

| Sources of information |                                                                                                                      |
|------------------------|----------------------------------------------------------------------------------------------------------------------|
| Basic                  | Todas as recomendadas no resto de materias do Máster, así como artigos científicos relacionados coa temática do TFM. |
| 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                                           |



To help achieve a sustained immediate environment and meet the objective of action number 5: "Healthy and sustainable environmental and social teaching and research" of the "Green Campus Ferrol Action Plan": The delivery of the documentary work carried out in this subject: They will be requested in virtual format and/or computer support. It will be done through Moodle, in digital format without the need to print them. If it is necessary to make them on paper: Plastics shall not be used. Recycled paper will be used. Printing of drafts shall be avoided. A sustainable use of resources and the prevention of negative impacts on the natural environment must be made.

(\*) 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.