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| **Name of the module (English):**<br>End of Master's work / Dissertation | | | | | |
| **Module code (UP):**<br>M41 (provisional) | | **Name of the module (Portuguese):**<br>Fim do trabalho de mestrado / Dissertação | | | |
| **Module code (THM):**<br>M41 (provisional) | | **Name of the module (German):**<br>Ende der Masterarbeit / Dissertation | | | |
| **Module code (UC):**<br>M41 (provisional) | | **Name of the module (Spanish):**<br>Trabajo de Fin de Master / Disertación | | | |
| **Credits:**<br>30 ECTS | **Module status:**<br>Obligatory | **Duration:**<br>1 semester | **Semester:**<br>2 | **Year:**<br>1 | **Frequency:**<br>Every year |
| **Type of tuition:**<br>Classroom-based | | **Workload:**<br>900 h | **Attendance time:**<br>750 h | **Self-study time:**<br>150 h | |
| **Usability:**<br>Master<br>(Degree in Sustainable Design, Construction and Management of the Built Environment) | | | **Classification:**<br>Engineering / Architecture | **Teaching language:**<br>English | |
| **Module responsibility:** | | **Lecturers:** | | | |

**Description / Observations:**

The contents are intended to complement the teaching in the scientific area of the program, allowing the student to choose the development of a more in-depth work.

Therefore, the Final Master's Work can acquire the profile of a traditional academic research, in which current topics will be proposed, integrated in topics that have received special attention from the national and international scientific community, tending to the proposal of the resolution of a specific problem or the presentation of relevant advances for its study and better understanding.

In the same way, the work can have a profile more connected to the resolution of a specific operational situation (if possible, proposed by a company), in which the solution will have to be framed in a deep investigation that includes the state of the art, relevant scientific principles and validation of the proposals.

These possibilities will have the tutors and moderators indicated by the participating institutions, depending on the scope of the work to be done. The control of the activities will be done through regular meetings, attended by the student and an assigned tutor(s) and moderator(s). As this is the module that culminates the academic career of the program's students, we seek to ensure that emerging professionals are highly qualified, possessing knowledge, skills and competencies that they will need in their area of work. Therefore, these professionals should be able to solve challenges and problems in a structured way, assume multidisciplinary issues from the main scientific areas that are related to the construction industry, placing them in their respective technical, scientific, economic, social and environmental contexts. They will also be able to logically communicate the results of their work to the technical community and to society in general, having improved their leadership, entrepreneurial and teamwork skills, taking into account the economic contexts and international competitiveness.

**Recommended Requirements:**

Basic knowledge about sustainable concepts in design, construction and managements of buildings and infrastructures.

**Basic competences:**

- Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context.
- Students are able to apply their acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.
- Students are able to integrate knowledge and deal with the complexity of making judgments based on information that is incomplete or limited, including reflections on the social and ethical responsibilities associated with applying their knowledge and judgments.
- Students are able to communicate their findings and the ultimate knowledge and reasons behind them to specialist and non-specialist audiences in a clear and unambiguous manner.
- Students possess the learning skills to enable them to continue studying in a largely self-directed or autonomous manner.

**Transverse competences:**
Developing the skills needed to be able to effectively communicate technical information.
Be able to communicate effectively under pressure to potential customers or auditors.
Being able to work under pressure to meet tight deadlines.
Be able to make decisions with limited available information.
To know and be able to apply creative techniques for project management.

**Specific competences:**

- To write and defend scientific and technical documents through different means and in different formats related to the field of the construction sector in Europe.
- Sustainable strategies: To know and understand the multiple concepts and approaches related to the fulfilment of the SDGs - Sustainable Design Goals - in the construction sector; to use existing tools to evaluate the degree of performance in sustainability.
- Sustainable Design: To understand the requirements and be able to develop design solutions that seek a balance between the needs of the different disciplines involved under sustainability criteria, using digital tools in the project (BIM 3D-7D).
- Sustainable construction: To understand the restrictions that arise when executing sustainable buildings and infrastructures, both in the selection of the material and in the methods of execution, and to be able to apply, in addition, the existing methodologies for the evaluation of technical and economic aspects.
- Sustainable Management: To know and apply work approaches that pursue the implementation of sustainable coordinated options under different disciplines, applying IPD - Integrated Project Development - models as well as ICTs (Information and Communication Technologies) for an effective management of the information flow and monitoring.

**Learning outcomes:**
At the end of the module, students will be able to:

- Acquire knowledge in a specific area of Civil Engineering and/or Architecture, using research techniques, innovation or other professional developments or skills.
- Integrate knowledge, dealing with complex issues, develop solutions or make judgments in situations of limited or incomplete information, including reflections on ethical and social implications and responsibilities arising from those solutions and those judgments.
- Report their conclusions, resulting from such knowledge and the reasoning behind it, clearly and unambiguously.

**Content:**
The development of the End of Master's Work lasts approximately 20 weeks (30 ECTS - 810 hrs) which involves, in a general way and adapted to the profile of the work chosen by the student, the following tasks:

- Detailed definition of the problem(s) to be investigated or analysed.
- Bibliographic search of support
- Development and implementation of the research strategy and/or proposed solutions to the problem(s) identified.
- Achievement, quantification and definition in the process of interpreting the results.
- Elaboration of the Final Master's Work
- Public presentation in court

**Teaching methodology:**
Development of individual work, in an academic or academic/company environment This work will be supported by tutors, with an agenda and frequency adjusted to the profile.
The first part of the work will involve, in general (i) definition of the theme, objectives and work plan; (ii) research on the state of the art, difficulties encountered and strategies to overcome them; (iii) presentation of preliminary outline to tutors and colleagues, to obtain relevant contributions for the subsequent development of the work.
The second phase, with a methodology defined by the tutors and taking into account the conclusions of the previous phase, will be carried out until the end of the semester, ending with their argument before a panel.
The final mark of this module will be the one awarded during the public discussion of the work developed, its presentation and its argumentation.

**Training activities:**

| | Number of hours | % Attendance |
|---|---|---|
| Tutorials | 45 | 100 |
| Evaluation | 5 | 0 |
| Self-directed work | 700 | 0 |

**Assessment method:**

| | Minimum weighting | Maximum weight |
|---|---|---|
| Final written work | 50% | 100% |
| Oral presentation | 0% | 50% |

**Grading system:**

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U.PORTO | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | ... | 0 |
| Portugal | Very Good with distinction | | | Good with distinction | | Good | | Sufficient | | | | Fail | | |
| U.CANTABRIA | 10.0 | 9.9 | 9.0 | 8.9 | ... | | 7.0 | 6.9 | ... | | 5.0 | 4.9 | ... | 0.0 |
| Spain | Sobresaliente | | | Notable | | | | Aprobado | | | | Suspenso | | |
| THM | 100 | ... | 88 | 87 | 73 | 72 | 58 | 57 | ... | | 50 | 49 | ... | 0 |
| Germany | Excellent | | | Good with distinction | | Satisfactory | | Sufficient | | | | Fail | | |

**Bibliography:**

Current Status: 20200717