



Teaching Guide

| Teaching Guide | | | | |
|--------------------------|---|--------|------------|--|
| Identifying Data | | | | 2019/20 |
| Subject (*) | Master Dissertation | | Code | 632844216 |
| Study programme | Mestrado Universitario en Enxeñaría da Auga (plan 2012) | | | |
| Descriptors | | | | |
| Cycle | Period | Year | Type | Credits |
| Official Master's Degree | 1st four-month period | Second | Obligatory | 15 |
| Language | English | | | |
| Teaching method | Face-to-face | | | |
| Prerequisites | | | | |
| Department | BioloxíaComputaciónEnxeñaría CivilEnxeñaría Naval e IndustrialMatemáticas | | | |
| Coordinador | | | E-mail | |
| Lecturers | Juncosa Rivera, Ricardo Vázquez González, Ana María | | E-mail | ricardo.juncosa@udc.es ana.maria.vazquez@udc.es |
| Web | http://caminos.udc.es/info/asignaturas/201/masterindex.html | | | |
| General description | The concepts learned in the developed master are developed in project | | | |

Study programme competences

| Code | Study programme competences |
|------|---|
| A1 | Knowledge, understanding and capacity to apply legislation related with water engineering during professional development. Capacity to analyse the working mechanism of the economy and public and private management of water |
| A2 | Capacity to resolve basic physical problems of water engineering and theoretic and practical Knowledge of the chemistry, physics, mechanics and technologic properties of the water |
| A3 | Capacity to apply the mechanics of the fluids and the fundamental flow equations in calculate for conductions at pressure and in free layer |
| A4 | Capacity to apply the hydrology knowledge and the principles of flow mechanics in the method of calculations about hydrology as well as surface and underground. Capacity to make the evaluation of the hydraulic resources and apply the principal tools to do the hydrologic planning and the regulation and lamination of the inputs Capacity to analyse the river hydraulics and to apply the knowledge acquired in the restauration of the river direction and other works about rivers and their surroundings |
| A5 | Knowledge of the basic concepts about ecology applied to water engineering. Capacity to act in the respectful way and enriching way about the environment contribution to the sustainable development. Capacity to analyse the ecological quality of water. Knowledge of the basic principles of the ecology and basic understanding of the working continental water systems |
| A6 | Capacity to analyse the mechanism of the economy working and the public and private management of water |
| A7 | Knowledge of the fundamentals about the evaluation of water resources and the principal tools for the hydrological planning, starting from theoretical justification and practical applications that lead to the specific problem resolution and the use of updated methodologic (programs and models) for the evaluation of the exploitation, uses, defence, and the management the combined planning of surface and underground water. Knowledge of national and hydrological plans |
| A8 | Capacity to calculate and manage of extreme avenues |
| A9 | Knowledge of geographical information systems (SIG) applied to the management of water resources. Knowledge of the basic working of the system for the analysis of the geographical data, making use of SIG tools and support management and the analysis of data regarding water resources. Knowledge of the geospatial data and his characteristics and the processes for its acquisition, storage treatment analysis, modelling and presentation |
| A10 | Understanding of the fundaments of dynamic fluid computation (CFD). Capacity to elaborate codes that can resolve non-understandable flow on the surface as well as in the porous media |
| A11 | Knowledge of numerical models applied to hydraulic engineering. Capacity to use and analyse the results of the hydraulic models. Capacity to design, develop and analyse numerical schemes used in a hydraulic models |
| A12 | Capacity to use commercial numerical models for flux in free layer, flow pressure, drainage, hydrologic calculations for avenues, sediment transport in rivers and costal zones, transport of contaminants and wave propagation |
| A13 | Knowledge of the experimental technics applied to the water engineering. Capacity to design experiments. Capacity to develop reduced models in the laboratory. Capacity to use different types of experimental instrumentation, including flowmeter, depth probes, three-dimensional speedometer, limnimeter, windlass.. |



| | |
|-----|---|
| A14 | Knowledge and understanding for design and construction of scale-models of hydraulic structures. Understanding of different technics that exist in the measurement of physical conditions (pressure, temperature, speed?) in the field of hydraulic knowledge of computing systems and electronic control and the acquisition of hydraulic data (monitoring and control of the river basin, hydraulic circuit, etc) |
| A15 | General vision and balanced of the basic aspects and application of underground hydrologic from the needs of civil engineering. Capacity to Project or interpret the different hydraulic trials of hydrodynamic characterization, interpret hydrogeological maps and know the constructive aspects of the water uptake |
| A16 | Knowledge of the chemical basis of water which totally condition its behaviour in nature and its uses. Understanding and knowledge of the different water regulations for quality at local, national and European level |
| A17 | A global vision of water supply by the distinct elements which form it, at the same time having the necessary knowledge for its basis dimensioning and technological aspects related to its management and constructive implementation |
| A18 | Capacity to realize an integral use and efficient use of water resource. Knowledge of the working of the basin organisms and general analysis of water engineering projects in the area of cooperation and development and humanitarian aid. |
| A19 | Knowledge of advanced water treatment with different conclusions: depuration, re-use, purification, elimination of nutrients and regeneration treatments |
| A20 | Use and management of measuring equipment in the field and in the laboratory. Knowledge of the methodology of control process and the determination of design parameters for water treatment processes |
| A21 | Knowledge of water quality control models. Capacity to analyse and propose solutions to problems in water quality control |
| A22 | Capacity to plan, to Project, to measure and to direct the constructions and exploitation of water conducts, reservoirs, hydroelectric installations, river regulations systems, water channels, river works, and other hydrologic and hydraulics Works |
| A23 | Fundamental knowledge of energy consumption and its environmental implications inside a development sustainable |
| A24 | Capacity to design and manage the water supply and treatment in a population area, including design and Project for solutions regarding water treatment, drainage, and advanced management of residual waters in the city. Knowledge regarding advanced processes for the water treatment, elimination of nutrients, and management strategy in times of rainwater |
| A25 | Knowledge and understanding of water in different situations: the working of ecosystems, environmental factors with the purpose of to make an inventory of medium, applying the methodology to value the impact and its use in studies and evaluations of the environmental impact. |
| B1 | To resolve problems effectively |
| B2 | To apply critical thinking, logic and creativity |
| B3 | To work individually with initiative |
| B4 | To communicate effectively in work surroundings |
| B5 | Continuous recycling of knowledge in a general perspective in a global situation of water engineering |
| B6 | Understanding of the need to analyse history to understand the present |
| B7 | Facility to integrate in multidiscipline teams |
| B8 | Capacity to organize and plan |
| B9 | Capacity for analysis, synthesis and structure of information and ideas |
| C1 | To understand the importance of the enterprising culture and to know the means at the reach of the enterprising people |
| C2 | To value knowledge critically, technology and available information to resolve problems that they will face |
| C3 | To assume as a professional and citizen the importance of learning throughout life |
| C4 | To value the importance of the investigation, innovation and technology development in the social ?economic advance and cultural in society |
| C5 | To posses and understand knowledge that gives a base or oportunity to be original in the development and for applications of ideas, often in the context of investigation |
| C6 | The students must be able to apply the acquired knowledge and their capacity to resolve problems in new surrandings or not well known within wider contexts (or multidiscipline) related with the study area |
| C7 | The students must be able to integrate knowledge and to affront the complexity to formulate judgements from information that, been incomplete or limited, include reflexions about social responsibilities and ethics related to the application of the knowledge and judgments |
| C8 | The students must be able to comunicate their conclusions, knowledge and the last reasons that support them, to spezialated publics and not spezialated in a clear and unambiguous way. |
| C9 | The student must possess the learning ability with permits them to continues to study in a manner wich will be in a great measure self directed and individual |



Learning outcomes

| Learning outcomes | Study programme competences | | |
|---|-----------------------------|-----|-----|
| Students must write a final master thesis as a mandatory requirement for obtaining the Master Degree in Water Engineering | AC1 | BC1 | CC1 |
| | AC2 | BC2 | CC2 |
| | AC3 | BC3 | CC3 |
| | AC4 | BC4 | CC4 |
| | AC5 | BC5 | CC5 |
| | AC6 | BC6 | CC6 |
| | AC7 | BC7 | CC7 |
| | AC8 | BC8 | CC8 |
| | AC9 | BC9 | CC9 |
| | AC10 | | |
| | AC11 | | |
| | AC12 | | |
| | AC13 | | |
| | AC14 | | |
| | AC15 | | |
| | AC16 | | |
| | AC17 | | |
| | AC18 | | |
| | AC19 | | |
| | AC20 | | |
| | AC21 | | |
| | AC22 | | |
| | AC23 | | |
| | AC24 | | |
| | AC25 | | |

Contents

| Topic | Sub-topic |
|-------|-----------|
|-------|-----------|



The students should write a final master work as an obligatory requirement to obtain the title of Master in Water Engineering.

In order to do so, the coordinator of the host university will appoint a tutor being an expert on the subjects that students might choose as the object of their dissertations. The purpose of the dissertation is a research/practical work in any field related to Water Engineering. The dissertation can be developed at the Universities of A Coruña, Magdeburg or other universities with which they have bilateral agreements. Upon completion of the work, the tutor will receive a report which will be assessed by a examination board with three members, to be established at the host university. There will be a normalized format for all the students that will be adjusted to this. The students will have to give a copy to each member of the tribunal at least, one week before the presentation.

The language in which it is written and presented will be in English

There are no subtopics

| Planning | | | | |
|---|--|----------------------|-------------------------------|-------------|
| Methodologies / tests | Competencies | Ordinary class hours | Student's personal work hours | Total hours |
| Supervised projects | A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20 A21 A22 A23 A24 A25 B1 B2 B3 B4 B5 B6 B7 B8 B9 C1 C2 C3 C4 C5 C6 C7 C8 C9 | 0 | 355 | 355 |
| 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 |
| Supervised projects | Depending on the supervisor |

| Personalized attention | |
|------------------------|-----------------------------|
| Methodologies | Description |
| Supervised projects | Depending on the supervisor |

| Assessment | | | |
|---------------|--------------|-------------|---------------|
| Methodologies | Competencies | Description | Qualification |



| | | | |
|---------------------|--|--|-----|
| Supervised projects | A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20 A21 A22 A23 A24 A25 B1 B2 B3 B4 B5 B6 B7 B8 B9 C1 C2 C3 C4 C5 C6 C7 C8 C9 | Development of the memory report as a final work of master. Oral and written presentation of this memory which will be evaluated by a tribunal constituted in the receiving university Quality of the report and dissertation will be evaluated. | 100 |
|---------------------|--|--|-----|

Assessment comments

Examination board constituted by three lecturers, including the supervisor and the coordinator of the master degree. 20 minutes talk plus questions.
Report submission (one week prior to the dissertation)

Sources of information

| | |
|---------------|--|
| Basic | |
| Complementary | |

Recommendations

Subjects that it is recommended to have taken before

Hydrological planning and projects/632844201
Water supply and drainage systems/632844202
Physico-chemistry and quality of water/632844203
Hydraulic planning and projects/632844208
GIS and hydrology/632844209
Restoration ecology/632844210
Internships/632844215

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.