



Master in Water Engineering

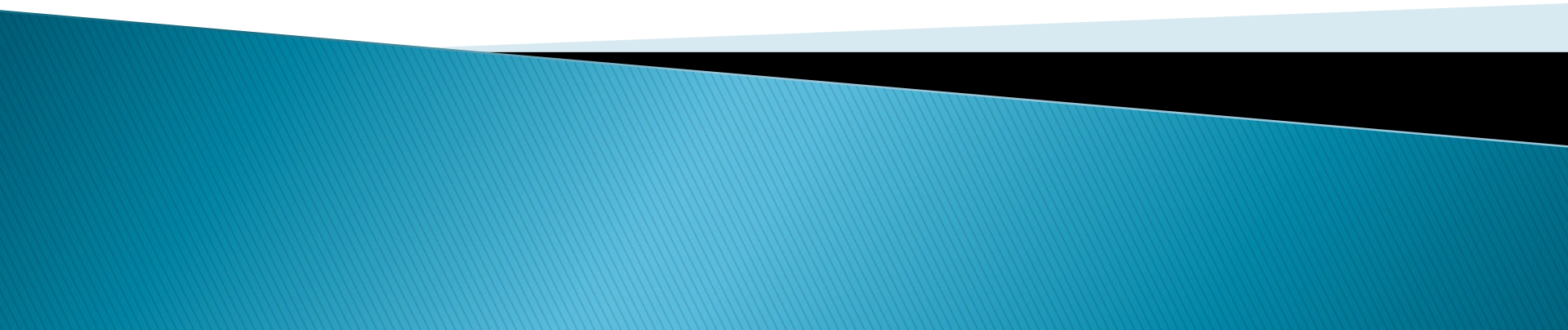
INTERNATIONAL MASTER IN WATER ENGINEERING



UNIVERSIDADE DA CORUÑA



Official Master that since 2012 has been carried out between the universities of A Coruña and Hochschule Magdeburg-Stendal (Germany), with the collaboration of other prestigious international institutions.

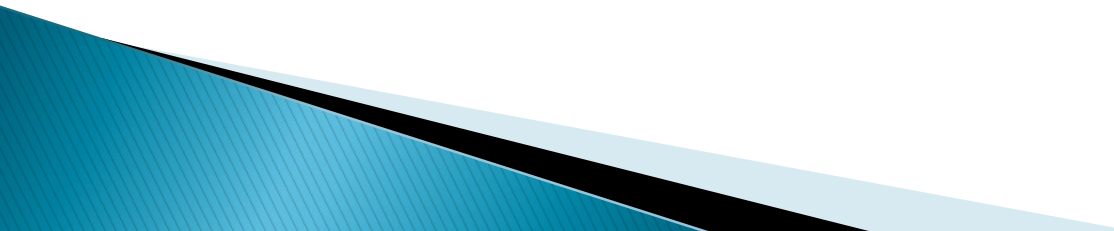


OBJECTIVE

To train professionals and researchers of water, both in its technical and engineering aspects as scientific and academic, with an international vision

OBJECTIVE

The graduates acquire experience in national and international water management:

- Management of wastewater and drinkingwater
 - Planning processes
 - Hydrology
 - Hydraulic engineer
 - hydraulic experimental
 - Ecology restitution
 - Biotechnology water
 - River morphology
 - Flow and process modelling
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PROFESSIONAL AND ACADEMIC OUTPUTS

The training acquired by the students, enable them as professionals specializing in water issues and qualified to work in companies specialized and general consulting, laboratories, service companies, construction companies

Qualified personnel for the development of activities of research and development

Teaching completely in English

Total number of ECTS: 90

The master consists of 3 terms



First Term(A Coruña)

- Dates: 1st of October to 31st of January
- Place: Civil Engineering School
- 30 ECTS



Civil Engineering
School



Building: Área Científica: Class 2.3

First Term(A Coruña)

OBLIGATORY SUBJECTS

SUBJECTS	(ECTS)
HYDROLOGICAL PLANNING AND PROJECTS	6
PHYSICO CHEMISTRY AND QUALITY OF WATER	6
WATER SUPPLY AND DRAINAGE SYSTEM	6

First term(A Coruña)

OPTIONAL SUBJECTS *(to choose 2 out of 4)*

Subjects	(ECTS)
EXPERIMENTAL HYDRAULICS I	6
COMPUTATIONAL FLUID DYNAMICS I	6
WATER TREATMENT AND ENERGY EFFICIENCY	6
GROUNDWATER ENGINEERING I	6

First Term(A Coruña)

WATER TREATMENT AND ENERGY EFFICIENCY

To identify and assess risk factors and processes involved in water pollution and water treatment

PROFESSORS	DEPARTAMENT BELONG TO THE CENTER OF:
Ana M ^a Vázquez González	Civil Engineering School
Margarita Martínez Díaz	Civil Engineering School
Maria José Servia Garcia	Faculty of Sciences

First Term(A Coruña)

HYDROLOGICAL PLANNING AND PROJECTS

Assessment and analysis of water resources systems

Management of surface and groundwater

The extraction of water and its uses

Methods of analysis: identification, optimization, uncertainties, objectives and control of water management plans

Introduction to data management systems GIS

Design and planning of water resources systems

PROFESSORS	DEPARTAMENT BELONGING TO THE CENTER OF:
Acacia Naves García-Rendueles	Civil Engineering School
Juan Román Acinas García	Civil Engineering School
Francisco Padilla Benítez	Civil Engineering School

First Term(A Coruña)

EXPERIMENTAL HYDRAULICS I

Introduction to experimental hydraulics.

Know and understand the design and construction of scale models of hydraulic structures.

Understand the different techniques of measurements of the physical conditions in the field of hydraulics.

Instrumentation and process control water treatment

PROFESSORS	DEPARTAMENT BELONGING TO THE CENTER OF:
Juan Rabuñal Dopico	Faculty of informatic
Ana María Vázquez González	Civil Engineering School

First Term(A Coruña)

PHYSICO CHEMISTRY AND QUALITY OF WATER

Basic principles of water chemistry.

Sampling procedures and design field campaigns. analytical tools for the identification and measurement of chemical components of water and polluting techniques.

Evaluation of the quality of the analytical data.

Data analysis and interpretation

PROFESSORS	DEPARTAMENT BELONGING TO THE CENTER OF
Ana María Vázquez González	Civil Engineering School
Jordi Delgado Martín	Civil Engineering School

First Term (A Coruña)

WATER SUPPLY AND DRAINAGE SYSTEM

Historical introduction to water supply and sanitation systems

Collection systems and water purification treatments

Distribution networks: general concepts, description and design.

Sanitation networks: general concepts, description and design.

Sustainable drainage systems

Wastewater treatment prior to discharge to the receiving environment

Legal framework

PROFESSORS	DEPARTAMENT BELONGING TO THE CENTER OF
Acacia Naves Garcia-Rendueles	Civil Engineering School
Pablo Rodríguez Vellando	Civil Engineering School
Cristina Mercedes Vázquez Herrero	Civil Engineering School
Francisco Javier Sanz Larruga	Faculty of Laws
Alberto Martínez López	Faculty of Economics

First Term (A Coruña)

GROUNDWATER ENGINEERING I

Groundwater flow in porous and fractured conditions in saturated and unsaturated media

Interaction surface and underground water.

Principles of hydrochemistry and water-rock interaction (chemical hydrogeology, transport in porous media)

Hydrodynamic tests in aquifers (pulse tests, pumping tests)

Constructive aspects of wells, development and exploitation of aquifers

PROFESSORS	DEPARTAMENT BELONGING TO THE CENTER OF
Ricardo Juncosa Rivera	Civil Engineering School
Gemma Soriano Hoyuelos	Civil Engineering School
Francisco Padilla Benítez	Civil Engineering School

First Term (A Coruña)

COMPUTATIONAL FLUID DYNAMICS I

Fundamentals of open channel flow and computational fluid dynamics.

Basic equations: Saint-Venant, Navier-Stokes, potential flow, vorticity-stream, Stokes flow, water, convection-diffusion, Darcy, ...

Matlab basics of programming

Finite element programming hydrodynamics, porous media and geochemical models.

Introduction finite volume

PROFESSORS	DEPARTAMENT BELONGING TO THE CENTER OF
Pablo Rodriguez Vellando	Civil Engineering School
Jaime Fe Marqués	Civil Engineering School
Acacia Naves Garcia-Rendueles	Civil Engineering School

Professors from University of A Coruña (UDC)

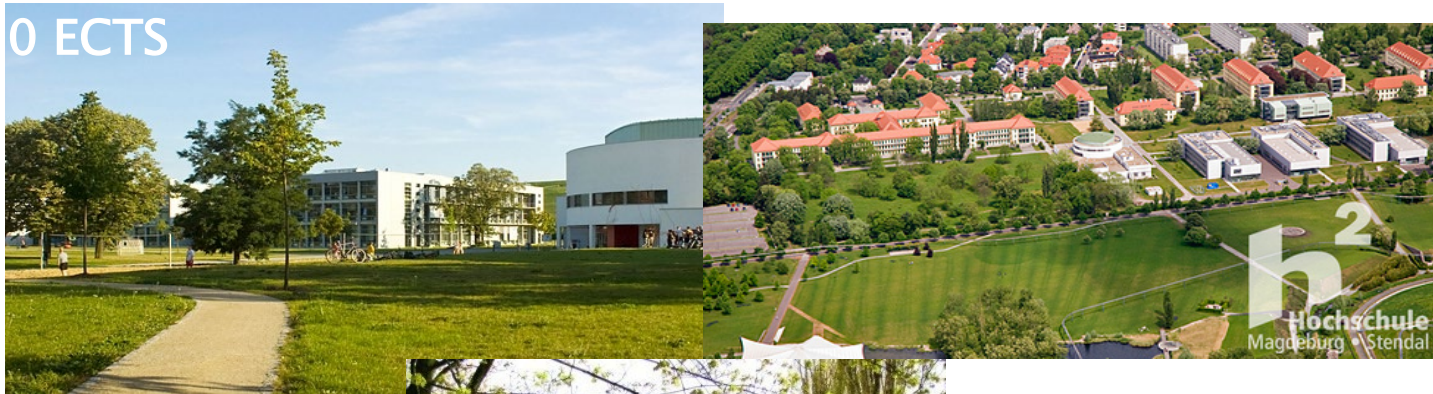
Second Term (Magdeburg)

1st of April to 30th of July 2016 – 30 Julio 2017

Place: University of Applied Science–Magdeburg– Germany

Department of the Water and Waste Management

0 ECTS



Second Term (Magdeburg)

OBLIGATORY SUBJECTS

<i>SUBJECTS</i>	ECTS
HYDRAULIC PLANNING AND PROJECTS	6
RESTORATION ECOLOGY	6
GIS AND HYDROLOGY	6

Second Term (Magdeburg)

OPTIONAL SUBJECTS *(to choose 2 out of 4)*

<i>SUBJECTS</i>	ECTS
EXPERIMENTAL HYDRAULICS II	6
COMPUTATIONAL FLUID DYNAMICS II	6
RIVER MORPHOLOGY	6
ENVIRONMENTAL BIOTECHNOLOGY	6

Second Term (Magdeburg)

HYDRAULIC PLANNING AND PROJECTS

Hydraulic design of dams and weirs in international projects

Flood control and regulation

Hydraulics porous medium

Hydraulic channel

Hydraulic and design of fishways

Second Term (Magdeburg)

GIS AND HYDROLOGY

advanced hydrology

Analysis of extreme, PMP, PDF

Climate change

numerical models

Application of GIS projects, hydrogeology

Second Term (Magdeburg)

RESTORATION ECOLOGY

Ecology of rivers and lakes

Design of experiments in ecology

Fundamentals of river restoration

Examples and field

Second Term (Magdeburg)

EXPERIMENTAL HYDRAULICS II

Hydraulic flow channels experiments with and without morphological alterations: scaling laws, measurement systems, data acquisition and analysis

Recircling sediment, sediment transport

Phenomena in hydraulic structures entrainment

Second Term (Magdeburg)

COMPUTATIONAL FLUID DYNAMICS II

Using HEC-RAS in combination with GEO HEC RAS

Advanced hydraulic projects

Transport and silting

2D hydraulic models

Advantages and disadvantages of 1D and 2D models

SSIM models3

Second Term (Magdeburg)

RIVER MORPHOLOGY

Fundamentals of river morphology

Using diagrams Shields and Hjulström

Sediment transport

Bed load and suspended load

Drag in hydraulic structures

Sedimentation in reservoirs

Recirculation sediments

Second Term (Magdeburg)

ENVIRONMENTAL BIOTECHNOLOGY

Biodiversity and species composition analysis

Determination of aquatic organisms

Hydro-biological field studies and analysis

Water chemistry

Water pollution

Water protection

Environmental microbiology

Third Term

Subject	ECTS
Training Period	15
Final Master Work	15

Third Term Training Period

- ▶ Time period: between 10 weeks and 6 months
- ▶ 15 ECTS

It takes place in any of the companies or partner universities, the student's choice (on selection through CV student of that company or university).