

# Master's Thesis (250903)

## General Information

<b>School</b>	ETSECCPB
<b>Departments</b>	Departament d'Enginyeria Civil i Ambiental (DECA)
<b>Credits</b>	30.0 ECTS
<b>Programs</b>	MÀSTER UNIVERSITARI ERASMUS MUNDUS EN GESTIÓ DEL RISC PER INUNDACIÓ (pla 2019)
<b>Course</b>	2023/24

## Main teaching language at each group

- Group 10Q2 English (Q2)

## Faculty

Responsible Faculty: Allen Bateman Pinzon  
Faculty: Allen Bateman Pinzon

## Objectives of Education

Realization, presentation and defense, of an original exercise carried out individually before a university court, consisting of a project of a professional nature in which the competences acquired in the teachings are synthesized.

Development of a complete project in the student's area of interest

## Competencies

### Especific

To place the knowledge acquired into a broader understanding of contemporary global water issues, challenges, debates and developments.

To demonstrate knowledge and understanding of hydrological, hydraulic and environmental processes and phenomena, and their inter-relationships, in natural and built environments.

To demonstrate a basic comprehensive knowledge and understanding of the current theory and practice relating to flooding and flood management.

To demonstrate understanding of advanced and appropriate information and communication technologies and data science, and their use in building technologies supporting flood risk management.

To apply a broad scientific knowledge about conservation, restoration and management measures to overcome the challenges that humans and climate change impose on water.

To conduct research independently in a scientifically sound and ethically responsible manner.

To apply appropriate modelling and data management tools related to hydrological, hydraulic, morphological and environmental processes, in order to support management and engineering interventions.

To integrate monitoring, modelling and information to support safe and reliable decision making.

To apply specific practical skills, such as identifying the major physical processes in a given river basin or coastal zone and their interaction with the associated assets and receptors.

To apply sophisticated hydroinformatics and modelling tools, best practices and information and communication technology to address the problems of flood risk management.

To identify relevant research, ideas and approaches from literature and other sources in view of their potential for helping understand or solve particular water-related problems.

To critically discuss and evaluate their own research approaches and outcomes within the context of existing knowledge and approaches.

To interpret research findings critically in order to formulate evidence-based conclusions, solutions and/or recommendations.

To apply engineering creativity and design skills, both independently and in multidisciplinary teams.

To have a sense of professionalism and an appreciation for the obligations of a professional and be aware of the professional and ethical issues encountered in scientific and engineering practice.

To identify the links between all issues related to flooding in order to apply an integrated approach using the best tools to support decision making for the sustainable management of floods.

To communicate and present effectively, both in writing and orally, making use of information and communication technologies suited for the audience and the purpose.

To debate and defend findings and insights, in a clear, systematic and convincing manner.

To communicate effectively across disciplines and cultures to enhance team collaboration.

## Generic

To have a holistic perspective of flood risk management under the natural and anthropogenic forcing in the context of global changes (climate variability, population growth, urbanisation).

To understand the main meteorological and hydrological processes that lead to floods at different space and time scales.

To be able to use advanced analytical techniques and computer-based tools based on the best practices.

To understand the social and economic perspectives of flood hazards and their risk assessment, and develop the research and applications required to support and implement the conservation and adaptation measures needed for the sustainable management.

To appreciate and creatively apply advances in the social and management sciences for flood risk management.

To develop decision support systems that will allow communities to develop policies on flood risk management.

To be able to contribute to the fulfilment of the 2015-2030 Sustainable Development Goals.

## Total hours of student work

		Hours	Percentage
Supervised Learning	Large group	0.0 h	0 %
	Medium group	0.0 h	0 %
	Laboratory classes	0.0 h	0 %
	Guided Activities	0.0 h	0 %
Self Study		0.0 h	

## Contents

### Final Master's Project

1. Objectives 2. Introduction 3. Theoretical bases 4. Experimental, numerical or theoretical development 5. Analysis of the results 6. Conclusions 7. Bibliography

### Specific Objectives

Develop a complete project presenting a writing of at least 100 pages that has approximately all the points that are presented in the description.

## Teaching Methodology

The course consists of 0 hours per week of classroom activity (large size group).

The 0 hours in the large size groups are devoted to theoretical lectures, in which the teacher presents the basic concepts and topics of the subject, shows examples and solves exercises.

Support material in the form of a detailed teaching plan is provided using the virtual campus ATENEA:

content, program of learning and assessment activities conducted and literature.

Although most of the sessions will be given in the language indicated, sessions supported by other occasional guest experts may be held in other languages.

## Grading Rules

*(\*) The evaluation calendar and grading rules will be approved before the start of the course.*

The mark of the course is obtained from the ratings of continuous assessment and their corresponding laboratories and/or classroom computers.

Continuous assessment consist in several activities, both individually and in group, of additive and training characteristics, carried out during the year (both in and out of the classroom).

The teachings of the laboratory grade is the average in such activities.

The evaluation tests consist of a part with questions about concepts associated with the learning objectives of the course with regard to knowledge or understanding, and a part with a set of application exercises.

## Bibliography

### Basic

- [Climate change 2013: the physical science basis: Working Group I contribution to the Fifth assessment report of the Intergovernmental Panel on Climate Change](#). New York: Cambridge University Press, 2014. ISBN 9781107661820.