Course guide
250MAG002 - 250MAG002 - Integrated Management of Water Resources

Last modified: 22/05/2026

Unit in charge: Barcelona School of Civil Engineering
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.

Degree: MASTER'S DEGREE IN WATER ENGINEERING (Syllabus 2025). (Compulsory subject).

Academic year: 2026 **ECTS Credits:** 5.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Juan Pedro MARTÍN VIDE

Others: Juan Pedro MARTÍN VIDE
Marc BERENGUER FERRER
Carles FERRER BOIX
Francisco NÚÑEZ GONZÁLEZ
Allen BATEMAN PINZÓN

PRIOR SKILLS

Knowledge of Hydraulics and Hydology for Engineers are necessary. Knowledge of Hydraulic Structures or Hydraulic Works are very convenient.

TEACHING METHODOLOGY

Theoretical and practical sessions at the classroom (3 h / week)

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

Type	Hours	Percentage
Hours large group	22,5	36.00
Self study	40,0	64.00

Total learning time: 62.5 h

CONTENTS

Sylabus

Description:
1. Climate change 1 h
a. Effects of climate change on water resources and hydrological extremes
2. Droughts 3 h
a. Definitions and examples of droughts
b. Persistence statistics
3. Reservoir design and management 11 h
a. Reservoir levels and volumes, volume losses
b. Regulation, dependent and independent droughts
c. Gates and spillways, case of storm Glòria management
d. Propagation, attenuation, management and forecasting of flows in real time
e. Water supply schemes, case of ATLL,
f. Transfer and interconnection criteria
4. Integrated resource management 7 h
a. Demand study, supply guarantee criteria
b. Conventional and alternative sources (desalination, reuse). Mix of sources in the case of the Barcelona area. Infrastructures in the Llobregat River.
c. Resource management, 2022-25 drought, ATLL management
5. Aquifer recharge and use 4 h
6. Flood risk management 14 h
a. Hazard, vulnerability and risk; resilience
b. Legislation. European Directives
c. Flood propagation in rivers
d. Flood routing and attenuation, design of levees
e. Structural and non-structural measures (vulnerability reduction). Land use planning
f. Role of sediment and vegetation in hazard
g. Real-time flood management, early warning systems

Full-or-part-time: 40h
Theory classes: 40h

GRADING SYSTEM

2 exams along the semester. They may include questions on exercices previously solved and presented by the students. Part of the qualification colud be obtained from oral exams and class presentations of exercises by the estudents