

Program	13AD - Master Universitario en Ingeniería de Montes
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Course number and name	
Number	133000270
Name	Watersheds Management In Mediterranean Areas
Semester	S2 [(February-June)]

Credits and contact hours	
ECTS Credits	3
Contact hours	36

Coordinator's name	José L. García Rodríguez (josel.garcia@upm.es)
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Specific course information
<p>Description of course content</p> <p>This subject responds to the interest in the management of mountain river basins in the Mediterranean environment. It is a subject that aims to provide a holistic perspective on the management of river basins. The aim is to study the basic principles underpinning Hydrological Forest Restoration as a watershed management tool in Spain and which may have many similarities with other nearby regions in the Mediterranean scenario. The syllabus is a set of chapters that deal with a review of the main factors of the hydrological cycle, such as: precipitation, evapotranspiration, infiltration, runoff and stream flows. This is followed by a series of chapters on water erosion, sediment transport and associated processes such as the formation of gullies and ravines. The hydromorphology of catchment areas is studied, focusing on riparian zones and the study of riparian areas, there is a chapter on socio-economic considerations in river basin management.</p>
<p>List of topics to be covered</p> <p>Lesson 1. Introduction 1.1. Watershed Management Strategies and Responses to Problems 1.2. Watershed Management: A Global Perspective 1.3. Watersheds, Ecosystem Management, and Cumulative Effects 1.4. Preventive Strategies 1.5. Case Studies in Spain</p> <p>Lesson 2. Hydrologic Processes and Land Use 2.1. Precipitation and Interception 2.2. Evapotranspiration and Soil Water Storage 2.3. Infiltration, Runoff, and Streamflow</p> <p>Lesson 3. Erosion, Sediment Yield and Channel Processes 3.1. Surface Erosion and Control Erosion on Upland Watersheds 3.2. Gully Erosion and Soil Mass Movement 3.3. Sediment Yield and Channel Processes 3.4. Stream Channel Morphology and Stream Classification</p> <p>Lesson 4. Riparian and Wetland Management. 4.1. Introduction, 4.2. Describing Riparian Areas, 4.3. Biophysical and Functional Relationships, 4.4. Management and</p>

Rehabilitation, 4.5. Wetland Types, 4.6. Wetland Management, 4.7. Hydrologic Functions of Wetlands 4.8. Hydrologic Functions of Wetlands Drainage and Loss

Lesson 5. Snow Hydrology. 5.1. Introduction, 5.2. Measurement of the snow resource, 5.3. Snow accumulation and melt, 5.4. Forest management, 5.5. Snow Avalanches

Lesson 6. Techniques in Restoration. 5.1. Introduction, 5.2. Watershed Management, 5.3. Hydrological Forest Restoration, 5.4. Case Studies in Spain

Lesson 7. Socioeconomic Considerations in Watershed Management, 7.1. Introduction, 7.2. Policy context and processes. 7.3. Planning and implementation processes, 7.4. Economic Assessment of Watershed practices, projects and programs

Prerequisites or co-requisites

Hydrology

Course category in the program

R (required)

E (elective)

(elective courses may not be offered every year)

Specific goals for the course

Specific outcomes of instruction

RA91 - Know the basic concepts of hydrological planning.

RA76 - Design protection systems against torrential phenomena in mountain areas.

RA95 - Identify the symptoms of degradation that may occur in the different areas (dominant and dominated) of a river basin; assess their intensity and plan measures for their control.

RA75 - Know the problems of torrential rainfall in mountain areas.

Bibliography and supplementary materials

- Hewllet, J: D. (1982). Principles of Forest Hydrology. University of Georgia Press. Athens, Georgia
- Brooks K.N.; Ffolliot, P; Gregersen H and DeBano L. (2003) Hydrology and the Management of Watersheds- 3erd. Edition Blackwell Publishing Company, USA
- Chang, M. (2003) Forest Hydrology. CRC Press
- Chow. V. T.; Maidment, D.R. and Mays, L. W. (1988) Applied Hydrology. McGraw Hill Book Company.
- García-Chevesich, P. (2015) Control de la Erosion y Recuperación de Suelos Degradados. Outskirts Press, Inc. USA



POLITÉCNICA



Teaching methodology			
<u> X </u> lectures	<u> </u> problem solving sessions	<u> </u> collaborative actions	<u> X </u> laboratory sessions
Other:			