



Teaching Guidelines adapted to the New Normality (Covid-19)

Course name	Conservation Hydrology		
Course area	Natural Sciences – River Conservation & Restaoration		
Module	International Semester on Forestry		
Study Program	Degree in Forest and Natural Environment Engineering		
Plan	449	Code	42210
Teaching Period	Second Semester	Type	Elective
Level/Cycle	Bachelor´s Degree	Year	4 (8th Term)
ECTS Credits	3 (30 hours - lecture)		
Language	Official is English.		
Lecturers in charge	1) Juan Manuel Diez Hernández, PhD Forest Engineer. 2) Andrés Martínez de Azagra Paredes, PhD Forest Engineer.		
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Tutorial Timetable	http://www.uva.es/export/sites/uva/2.docencia/2.01.grados/2.01.02.ofertaforativagrados/detalle/Grado-en-Ingenieria-Forestal-y-del-Medio-Natural/ click on tab “Tutorías” and scroll down on a web.		
Department	Agricultural and Forest Engineering (Hydraulics % Hydrology Area)		

1. COURSE DESCRIPTION

1.1 Scope

This course provides theoretical bases and practical tools to design river and basin conservation and restoration measures, with an adaptive management approach. The course covers hydrologic flood modeling using HMS software. The hydraulic modeling of rivers is addressed with a practical approach using two-dimensional models such as the IBER package. Soil conservation is a main topic of the course, which focuses on the design of soil and water conservation measures. Finally, in the field of river mitigation measures, the types of fish passes, the basic design, and the strategy to evaluate their effectiveness are reviewed.

1.2 Relationship with the Study Program

The course provides a valuable complement to deepening the knowledge in the areas of Ecohydrology and Ecohydraulics applied to the Conservation and Restoration of Watersheds and Rivers.

1.3 Pre-requisites

It is assumed that the student knows the theoretical bases and the practical application of the models of Surface Hydrology, River Hydraulics, and Aquatic Ecology.

2. Learning Outcomes

The overall general competences (G1 to G27) will be addressed to some extent. Specifically, those that will be more in-depth are the following:

- G3 Be able to analyze and synthesize.
- G5 Be able to communicate effectively, orally and in writing, with both internal audiences.
- G15 To show critical reasoning.



3. Objectives

- 1) To learn useful issues related to Forest Hydrology, Ecohydrology and Ecohydraulics in Mediterranean zones (in arid and semi-arid regions).
- 2) To learn the basic use of software tools such as: HEC-HMS (flood simulation); IBER (fluvial 2D - hydraulic simulation); PHABSIM (environmental flows); ESCALAS (fishway design and modeling).

4. Contents

- Module 1. Hydrological modelling of floods.** Expanding knowledge in forest hydrology with HEC-HMS: design storms and hydrographs; reservoir and channel-flow routing.
- Module 2. Hydraulic modelling of rivers.** Simulation in 2D (mesh, depth, velocity). Hydrodynamic simulation and habitat evaluation with PHABSIM model.
- Module 3. Soil conservation.** Soil erosion and soil conservation measures, badlands restoration, wind erosion, water conservation hydrology.
- Module 4. Fish migration.** Impacts of human's modifications of river hydrology on fish migration and solutions.
- Module 5. Fishway evaluation.** Evaluation of the solutions to allow free fish migration (an excursion will be probably scheduled).

Module	Content	ECTS Credit
1	Hydrological modelling of floods	0,5 (5h)
2	Hydraulic modelling of rivers	0,5 (5h)
3	Soil conservation	1 (10h)
4	Fish migration	1 (5h)
5	Fishway evaluation	1 (5h)

Basic References

- All the lecture material will be available for the students: powerpoint, video-class, etc. via Moodle UVa.
- Specific updated resources for each module will be available on the Moodle platform of the course.
- M1: <https://www.hec.usace.army.mil/software/hec-hms/>
- M2: <https://www.iberaula.es/>
- M3: <http://www.oasification.com/>
- M4: <http://www.fao.org/3/y4454e/y4454e00.htm>
- M5: http://www.lifemedwetrivers.eu/sites/default/files/documentos/metodologia_aeps- version 1.0 0.pdf

5. Teaching Methods

- ♦ Theory: expository lessons supported by powerpoint.
- ♦ Practice: Labs using software, and practical cases to apply methodologies.

6. Grading

- To pass the course, the student must have a grade ≥ 5 points. The maximum score is 10 points.
- Final score = Attendance (up to 3 point) + Assignments (up to 7 points).
- For those who have not achieve 5 points in the regular evaluation, they must a final exam.

Assignments

- During the course, several assignments will be requested. The assignments will be related to the course topics and they will be explained in detail at the corresponding lesson.
- The assignment submission system and deadlines will be defined also during the specific modules they are related to.
- Course lectures cannot guarantee assessing work submitted after the specific deadlines.



Face-to-Face Learning Evaluation Tool	Weight in the Final Score	Content
Dossier of Assignments	100%	Module 1: HEC-HMS modeling – 20% Module 2: IBER 2D Hydraulic Simulation – 20% Module 3: Soil and Water Conservation – 20% Module 4: Fish passes design - 20% Module 5: Fishway evaluation procedure – 20%

Exam Information

- For those who have not achieved 5 points in the regular continuous evaluation, they have to pass a final exam.
- The exam consists of a series of theoretical-practical questions about the topics mentioned above.

Regular evaluation period → Date: check out the link below.

Second eval. period (referral exam) → Date: link below.

<https://www.dropbox.com/s/v3597cbaw99n415/449-EX%C3%81MENES%20FORESTALES.pdf?dl=0>

6. Attendance Policy

The attendance is optional. However, it will be considered in the student grade if the attendance is greater than 50%. In that case, if the student has attended to the 50% of classes, he/she will get 1 point for the final score; if the attendance is 75%, he/she will get 2 points; and if the attendance is 100%, he/she will get 3 points (that is to say, the points will be interpolated).



Addendum to the Teaching Guide


4. Contents

Contents of the course will not change.

5. Teaching Methods

Tutorials: using some of the following systems on student demand.

- email
- Moodle-Forum
- Videoconference (i.e. Cisco Webex and/or any other platform licensed for UVA).

 **Video Lectures in synchronous mode** (face-to-face): online videoconference sessions following the official Timetable, using a licensed application (Cisco Webex, etc..).

- The same presentation is available for the students in PDF format.
- Also reference documents are provided to students.

 **Video Tutorials in synchronous and/or asynchronous modes** (recorded videos ad-hoc).

Videos elaborated by the professor for this specific purpose, using screen-capture technique of the explanations for theory and for Lab classes and edited to be place in the moodle repository.

- Lab guides are provided to students for their personal study work.

6. Grading

- Typology: Continuous and Summative
- Final score = 100% Dossier of Assignments.
- Every assignment must have a grade ≥ 5 . The maximum score is 10 points.
- To pass the course, the student must have a grade ≥ 5 points.

Assignments

Remote Learning Evaluation Tool	Weight in the Final Score	Content
Dossier of Assignments	100%	Module 1: HEC-HMS modeling – 20% Module 2: IBER 2D Hydraulic Simulation – 20% Module 3: Soil and Water Conservation – 20% Module 4: Fish passes design - 20% Module 5: Fishway evaluation procedure – 20%

Final Exam

- For those who have not achieve 5 points in the continuous evaluation, they must pass a final exam.
- The exam consists of a series of theoretical-practical questions about the contents of the course.

Regular evaluation period → Date: check out the link below.

Second evaluation period (referral exam) → Date: link below.

<https://www.dropbox.com/s/v3597cbaw99n415/449-X%C3%81MENES%20FORESTALES.pdf?dl=0>

 **Video – Conference in synchronous mode**

- Face-to-face videoconference using a licensed software, for instance Cisco Webex, or other.
- The exam consists in a questionnaire with about 10-15 questions that are answered within the Virtual Campus UVA – Moodle platform.