

**COURSE DATA****DATA SUBJECT****Code:** 33787**Name:** Hydrology**Cycle:** Undergraduate Studies**ECTS Credits:** 6**Academic year:** 2025-26**STUDY (S)**

Degree	Center	Acad. year	Period
1318 - Degree in Geography and the Environment	Facultat de Geografia i Història	3	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1318 - Degree in Geography and the Environment	Hydrology	COMPULSORY

COORDINATION

RUESCAS ORIENT ANA BELEN

SUMMARY

The course "Hydrology" presents the basic contents of the Continental Hydrology and Marina, and special emphasis on i) the role of water in the Earth system, and ii) the interaction between human activity and hydrological processes.

PREVIOUS KNOWLEDGE**RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE**

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS**COMPETENCES / LEARNING OUTCOMES****1318 - Degree in Geography and the Environment**



Analyse and value landscapes from a spatial-temporal perspective.

Be able to relate the natural environment and the social and human spheres.

Be able to work independently.

Be able to work in interdisciplinary teams.

Have capacity for analysis and synthesis.

Have oral and written communication skills in one's own language and in a foreign language.

Learn about methodology and fieldwork.

Learn about physical geography.

Learn basic techniques for fieldwork in geography and particularly for reading and interpreting the landscape in geographic terms.

Show motivation for quality, responsibility and intellectual honesty.

DESCRIPTION OF CONTENTS

1. Introduction

The hydrological cycle. The impact of societies on the water balance. Hydrological processes and reservoirs. Hydrology History. The drainage basin as a fundamental unit.

2. Precipitation

Quantification. Spatial and temporal variations. Changes in precipitation due to anthropic causes.

3. Interception

Interception, cortical runoff, transcolation. Basic measurements, methods and data.



4. Infiltration

The infiltration process. Saturated hydraulic conductivity. The unsaturated zone. Basic measurements, methods and data.

5. Percolation

Percolation and groundwater. Use and abuse of water resources

6. Evapotranspiration

Evaporation. Basic measurements, methods and data. Evapotranspiration. Measurements, methods and basic data

7. The water in the soil

Water on the ground. Seasonal evolution and spatial changes. Permanent wilting point. Field capacity. Useful water. Water to soil and water states. Basic measurements, methods and data.

8. Surface runoff

Genesis of surface runoff. The basin response: the hydrograph. The floods. Runoff generation models. Basic measurements, methods and data.

9. Ground water and aquifers

Water and rocks. Confined aquifers. Aquiclude. Underground water resources.



10. Marine hydrology

The great ocean basins: oceans and seas. Sea water characteristics. Global hydrological balances. Ocean circulation.

11. Glaciers and lakes

Glaciers. Glacier retreat and climate change. Lakes as identifiers of environmental changes.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Other activities	15,00
Computer classroom practice	15,00
Total hours	60,00

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	40,00
Preparation of lessons	30,00
Preparation for assessment activities	20,00
Resolution of case studies	0,00
Total hours	90,00

TEACHING METHODOLOGY

The teaching of the contents of the subject are based on four aspects:

- 1) Theory: the face-to-face classes will consist of 60 minutes dedicated to the presentation of the basic knowledge of the subject. Students will have to review, in the manual or recommended readings, the subject to be taught in the next class to confirm that all their questions are clarified during the teacher's explanation.
- 2) Practice: they will be taught in one-hour sessions. In these sessions the teacher will explain techniques,



methods and how to carry out the exercises. The delivery of practices is mandatory to take the final theoretical exam.

3) Complementary activities: they consist of field work. Attendance is mandatory and will be part of the evaluation.

4) Theoretical-practical final exam.

EVALUATION

The evaluation is based on three parts:

1. Written tests: there will be a written test of the theoretical and practical contents of the subject (50%).
2. Practices will be done in class in person. At the end of each class, attendance and understanding of the practice will be controlled by means of a questionnaire during the exam(40%).
3. The evaluation of the assistance to the field work (complementary activities) will be done through the "field notebook" that each student will prepare before, during and after the field practice (10%).

The second call will evaluate the theoretical and practical criteria of the subject in the same way as in the first call.

REFERENCES

Basic

- Bielza, V. 1984. Geografía general. Geografía física. Tomo I, Madrid, Taurus, 325 pp.
- Bras, R.L. 1990. Hydrology. Massachusetts, Addison, 643 pp.
- Brutsaert, W. 2005. Hydrology. Cambridge Univ. Press. Cambridge, 456 pp.
- Davie, T. 2003. Fundamentals of Hydrology. Editorial Routledge, 169 pp.
- Davis, S.N. y Wiest, R. 1971. Hidrogeografía. Editorial Ariel, 350 pp.
- Jones, J.A.A. 2001. Global hydrology processes, resources and environmental management. Editorial Longman, 399 pp.
- Llamas, J. 1993. Hidrología general. Universidad del País Vasco, Bilbao, 328 pp.
- Martínez de Azagra, A. y Navarro Hevia, J. 1996. Hidrología forestal: el ciclo hidrológico. Valladolid, Universidad de Valladolid, Secretariado, 286 pp.
- Patricio Mijares, F.J. 1999. Fundamentos de Hidrología de Superficie. Ed. Limusa. México, 324 pp.



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- Rodríguez, J. 1982. Oceanografía del Mar Mediterráneo. Madrid, Pirámide, 174 pp.
 - Todd, D. K. y Mays, L. W. 2005. Groundwater Hydrology. John Wiley, 453 pp.
 - Thurman, H. V y Trujillo, A.P. (2003) Introductory Oceanography, Pearson, 10th Edition, 624 pp.
 - Viessman, W. y Lewis, G. L. 2003. Introduction to Hydrology. Prentice Hall, 342 pp.
 - Ward, R.C. y Robinson, M. 2000. Principles of Hydrology. London, McGraw-Hill, 450 pp.

Additional

- Scientific articles