Universidad Zaragoza

Year : 2020/21

28755 - Extension of Surface Hydrology

Syllabus Information

Academic Year: 2020/21
Subject: 28755 - Extension of Surface Hydrology
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 423 - Bachelor's Degree in Civil Engineering
ECTS: 6.0
Year: 4
Semester: First semester
Subject Type: Optional
Module: ---

1.General information

1.1.Aims of the course

The main objective of the subject is to ensure that students acquire the necessary knowledge to develop hydrological engineering studies related to surface water resources.

1.2.Context and importance of this course in the degree

The subject of "Extension of Surface Hydrology" is a course of the Civil Engineering Degree of the EUPLA (University of Zaragoza). It is a semestrial optional subject of the fourth year of the degree and has 6 ECTS credits.

1.3.Recommendations to take this course

The subject of "Extension of Surface Hydrology" has not mandatory prerequisites, although it is advisable to the students of the Degree in Civil Engineering have passed the subjects of "Hydraulic Engineering: Basics" and "Extensions of Hydraulic Engineering and Hydrology".

2.Learning goals

2.1.Competences

As stated in the compulsory Specific Competence EH1 of the EUPLA Accademic Official Report of the Degree in Civil Engineering, the main competence of this subject will be to acquire knowledge of the concepts and technical aspects linked to the planning and management of surface water resources.
Finally, as generic competences, the student will acquire:
G01. Organizational and planning skills
G02. Capacity to solve problems
G03. Ability to make decisions
G04. Aptitude for oral and written communication of the native language
G05. Capacity for analysis and synthesis
G06. Ability to manage information
G07. Capacity for teamwork
G08. Capacity for critical reasoning
G09. Ability to work in an interdisciplinary team
G10. Ability to work in an international context
G11. Adaptation capacity to face new situations
G12. Leadership aptitude
G13. Positive social attitude towards social and technological innovations
G14. Ability to reason, discuss and present your own ideas
G15. Ability to communicate through words and images
G16. Ability to search, analyze and select information
G17. Capacity for independent learning

G18. Acquire and understand knowledge in an area of study that starts from the general secondary education base and isusually supported by advanced textbooks, but includes some aspects that involve cutting-edge knowledge in this field
G19. Apply their knowledge to their work or vocation in a professional way and acquire the competencies that are usually demonstrated through the elaboration and defense of arguments and problem solving within their area of study
G20. Ability to collect and interpret relevant data (usually within their area of study) to make judgments that include reflection on relevant issues of a social, scientific or ethical nature
G21. Transmit information, ideas, problems and solutions to a specialized and non-specialized audience
G22. Develop those learning skills necessary to undertake further studies with a high degree of autonomy
G23. Know and understand respect for fundamental rights, equal opportunities between women and men, universal accessibility for people with disabilities, and respect for the values of the culture of peace and democratic values.
G24. Promote entrepreneurship
G25. Knowledge in information and communication technologies.

2.2.Learning goals

The student, to pass this subject, should demonstrate having acquired the following learning outcomes:

- Knowledge and ability to develop hydrological engineering studies related to the project and the dimensioning of hydraulic structures.
- Specific knowledge on surface hydrology
- Specific knowledge about the planning and management of surface water resources.

2.3.Importance of learning goals

The subject of "Extension of Surface Hydrology" has a marked engineering character has a marked engineering character with direct and immediate application in the professional field of the civil engineering.

In particular, upon completing and passing this course, the student will acquire:

- Specific knowledge on surface hydrology related to hydrological loss models, rainfall-runoff transformation, flow propagation, etc.
- Knowledge to perform calculations and studies about hydrological engineering.

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

Assessment tasks are the basic elements in the entire teaching-learning process since it is the only mechanism that allows, at any time during an educational period, to evaluate the degree of achievement of the proposed learning results and, if appropriate, apply the necessary corrections. At the beginning of the course the student will choose one of the following two assessment methodologies:

- **Continuous assessment system**: it is an assessment system characterized by the obligation to participate in face-to-face activities of the subject and to take and pass the practical tests, partial exams and academic work proposed in the subject, within the established deadlines. In the case the student passes all the continuous assessment tests, he will be exempt from the global exam.
- **Global final evaluation exam**: it is a final and global exam on all the theoretical and practical content of the subject.

Continuous evaluation system

Following the spirit of the reform of the European Higher Education Area (EHEA), the evaluation of the subject contemplates a continuous evaluation system as the most consistent to be in line with the guidelines set by this new framework. In the continuous assessment model, the professor will assess the student's participation in face-to-face activities and their ability to solve problems and laboratory practices. Finally, the student should take and pass two partial exams ("continuous assessment exams") throughout the course.

The weights of the activities cited in the evaluation process are presented following. All students who do not attend a minimum of 80% of the face-to-face activities (classes, seminars, technical visits, laboratory practices, etc.) or who do not obtain the minimum thresholds required for the partial tests, practices, exams or academic work proposed in the course, should pass to the global assessment model.

Weights of the activities related to the evaluation process

Participation in face-to-face activities	5%
Work about computer lab activity	15%
I Continuous assessment exam	40%
II Continuous assessment exam	40%

Global final evaluation exam

The students must choose this modality when, due to their personal situation, they cannot adapt to the rhythm of work required in the continuous evaluation modality. In this case, the evaluation consists of a single exam on theory, problems and laboratory activity related to the content of the subject.

The final scole will be given by:

Score: MAX (80% x Exam Score + 15% x Laboratory activity score + 5% Face-to-face task score; Final Exam score)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of face-to-face teaching and learning tasks are implemented, such as lectures, practice sessions, laboratory sessions, and tutorials.

The subject is based on a strong interaction between the professor and the student. This interaction is brought into being through a division of work and responsibilities between the students and the teacher. Nevertheless, it must be taken into account that, to a certain degree, students can set their learning pace based on their own needs and availability, following the guidelines set by the teacher.

If classroom teaching were not possible due to health reasons, it would be carried out on-line.

4.2.Learning tasks

This course is organized as follows:

- **Lectures**: Theoretical activities carried out mainly through exposition by the teacher, where the theoretical supports of the subject are displayed, highlighting the fundamentals, structuring them in topics and or sections, interrelating them.
- **Practice sessions**: The teacher resolves practical problems or cases for demonstrative purposes. This type of teaching complements the theory shown in the lectures with practical aspects.
- **Laboratory sessions**: The lecture group is divided up into various groups, according to the number of registered students, but never with more than 5 students, in order to make up smaller sized groups.
- **Tutorials**: Carried out giving individual, personalized attention with a teacher from the department, they can be on-site or online.
- **Autonomous work and study**
    - Study and understanding of the theory taught in the lectures.
    - Understanding and assimilation of the problems and practical cases solved in the practice sessions.
    - Preparation of seminars, solutions to proposed problems, etc.
    - Preparation of laboratory workshops, preparation of summaries and reports.
    - Preparation of the written tests for continuous assessment and final exams.

This course has 6 ECTS credits, which represents 150 hours of student work in the subject during the trimester, in other words, 10 hours per week for 15 weeks of class.

A summary of a weekly timetable guide can be seen in the following table. These figures are obtained from the course file in the Accreditation Report of the degree, taking into account the level of experimentation considered for this course is moderate.

Activity	Weekly school hours
Lectures	3
Laboratory	1
Other Activities	6

Nevertheless, the previous table can be shown in greater detail, taking into account the following overall distribution:

- 41 hours of lectures, with 50% theoretical demonstration and 50% solving different types of problems
- 15 hours of laboratory activities
- 4 hours of written assessment tests
- 90 hours of personal study, divided up over the 15 weeks of the semester.

4.3.Syllabus

This course will address the following topics:

Theory

- Topic 1: The Hydrologic Cycle
- Topic 2: Precipitation
- Topic 3: Hydrological losses
- Topic 4: Rainfall-runoff transformation methods
- Topic 5: Flow propagation
- Topic 6: Urban hydrology

Exercises and laboratory work

Most of the issues mentioned in the previous section are related to exercises to be done during the on-site classes. Moreover, the resolution of a practice based on the HEC-HMS Software is required to be developed and presented at the end of the course.

4.4.Course planning and calendar

The dates of the two final exams (1st and 2nd calls) will be those officially published on the EUPLA website.
For students who opt for the continuous assessment system, the I continuous assessment exam will be held during the month of Novemer and its date will be communicated on the first day of class. The second exam will be held on the last day of class.

The laboratory activity will be conentrated in the last two months of the semester. The following date will be the deadline for the delivery of the report related to this activity:

- Delivery of the report about laboratory activity: date of the exam of the first call.

The I continuous evaluation exam will consist of a written exam on theoretical topics (approximately 20%) and problems (approximately 80%) related to topics 1, 2 and 3.
The II continuous evaluation exam will be held on the last day of the course and will consist of a written exam on theoretical arguments (approximately 20%) and problems (approximately 80%) related to topics 4, 5 and 6.
The global evaluation exam will take place at the end of the semester (1st call) and in September (2nd call) and will consist of a global written test.

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=28755&year=2020