Universidad Zaragoza

Academic Year/course: 2021/22

28958 - Irrigation Networks

Syllabus Information

Academic Year: 2021/22
Subject: 28958 - Irrigation Networks
Faculty / School: 201 - Escuela Politécnica Superior
Degree: 583 - Degree in Rural and Agri-Food Engineering
ECTS: 6.0
Year: 4
Semester: Second semester
Subject Type: Optional
Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

This subject focuses on applied technological knowledge. The skills acquired in it apply to professional practice and require internalization by the students.

The theoretical contents are taught with the support of the presentation power point, animations, interactive examples, enlisting the active participation of students.

Professional contents of the subject are focused on the work with practical cases, using the tools that are supplied in the course. These tools will be available for further professional use by students. The informatics tools will be installed either in the computer room, where the subject is taught, or in the student `s personal computer.

The practical sessions will focus on training in the use of operational resources of the computer applications.

4.2. Learning tasks

The course includes the following learning tasks:

- 1 Lectures and problems (30 hours).
- 2 Troubleshooting and cases (20 hours).
- 3 Lab and computer (10 hours).
- 4 Case of study (30 hours Homework)
- 5 Study (48 hours of Homework).
- 6 Evaluation (12 hours).

In relation to goals 6.3 and 6.4 of the SDGs, in the theoretical activities of the first topic, which puts the subject in context, a description of the paradox of the irrigation modernization is included in terms of irrigation effects on the quantity and water quality, and a practical exercise to estimate the level of reduction of water use necessary to avoid increasing water consumption due to changes in the efficiency of the irrigation system.

4.3. Syllabus

The course includes the following learning tasks:

1. **Theory Programme**

- C1 Presentation and applications.
- C2 Typology of distribution networks and uses
- C3 Components, valves, and adjustment elements.
- C4 Calculating design flows per session and on-demand.
- C5 Optimal sizing for ramified networks.
- C6 Pumping equipment and pumping stations.
- C7 Hydraulic and energy analysis of distribution networks.
- C8 Managing collective networks.
- C9 Optimal sizing, analysis, and operation of plot networks (sprinkler, drip)

1. **Practical Programme**

- P1 Basic handling of network calculation IT tools
- P2 Input-output operations
- P3 Database communication.
- P4 AutoCad communication.
- P5 Programming and validating irrigation demand.

4.4. Course planning and calendar

The following table shows the weekly organization proposed for this subject. The course is divided into themes (identified as to contents C1, C2, ...) and for each themes it is specified the hours of theory, exercises, practices, and evaluation as well as hours of study and work.

In the last column reflects the total hours that students should devote to each activity

Week	1	2	3	4	5	6	7	8	9
T1 Theory	C1 2h	C2 2h	C3 2h	C3 2h	C4 2h	C5 2h	C5 2h	C6 2h	C6 2h
T2 Exercises					C4 2h	C5 2h	C5 2h	C6 2h	C6 2h
T3 Practicum	P1 2h	P2 2h	P3 2h	P4 2h					
T6 Case						C4 6h		C5 6h	
T7 Study	C1 3h	C2 4h	C3 4h	C3 4h	C4 4h	C5 2h	C5 4h	C6 2h	C6 4h
T8 Evaluation.							C4 1h		C5 1h

Week	11	12	13	14	15	16	17	18	19
T1 Theory		C7 2h		C8 2h	C8 2h	C9 2h	C9 2h		
T2 Exercises		C7 2h			C8 2h	C9 2h	C9 2h		
T3 Practicum				P5 2h					
T6 Case				C7		C8			

		6h		6h		
T7 Study	C7 4h	C8 2h	C8 4h	C9 2h	C9 4h	
T8 Evaluation.	C6 1h		C7 1h		C8 1h	6h

4.5. Bibliography and recommended resources

BB Arviza Valverde, Jaime. Problemas de hidráulica / Jaime Arviza Valverde, Iban Balbestre Peralta . Valencia : Editorial de la UPV, D. L. 2008

BB Paco López-Sánchez, José Luis de. Fundamentos del cálculo hidraúlico en los sistemas de riego y drenaje / José Luis de Paco López-Sánchez . Madrid : Mundi-Prensa : MAPA-IRYDA, D.L. 1993

BB Problemas de hidráulica para riegos / José Roldán ... [et al.] . 2ª ed. corr. Córdoba : Servicio de Publicaciones de la Universidad de Córdoba, D.L. 2004

BC Automatización y telecontrol de sistemas de riego / [coordinadores, Antonio Ruiz Canales, José Miguel Molina Martínez] . Barcelona : Marcombo ; Murcia : Colegio Oficial de Ingenieros Agrónomos de la Región de Murcia, 2010

BC Granados, A. (1986). Infraestructuras de regadíos. Redes colectivas de riego a presión. Madrid: ETS de Ingenieros de Caminos

LISTADO DE URLs:

Lamaddalena, N., Sagardoy, J.A. (2000). Performance analysis of on-demand pressurized irrigation systems. Roma: FAO [https://books.google.es/books?id=TWFaiibeFFUC&pg=PA112&lpg=PA112&dq=Lamaddalena,+N.,+Sagardoy,+J.A.+(2000)]

The updated recommended bibliography can be consulted in:
http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=28958