



Course Outline

2026-2027 Catalog

EH 74 - Irrigation System Design

Catalog Description

Transfer Status: CSU

Unit(s): 3.00

Lecture: 51.00 Contact hours/102.00 Out of class hours/153.00 Total hours/3.00 Unit(s)

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Course Description: This course is a study of the design of irrigation and drainage systems. Emphasis will be placed on pipe sizing, friction loss calculations, pressure requirements, pumping stations, points of connection and backflow prevention devices. The students will learn mathematic equations/calculations used for proper design and installation.

Objectives

Upon successful completion of this course, the student should be able to:

1. Design irrigation and drainage systems for landscapes and agriculture.
2. Read and analyze irrigation plans, and ascertain the overall quality of those plans.
3. Locate and interpret reference data for hydraulics, pumping systems, pipe sizing, friction losses and equipment use specifications.
4. Complete a set of working drawings for an irrigation and drainage system.
5. Relate Cross Connection Codes for the State of California to clients and employees and specify the proper Backflow Prevention Device for each application.
6. Interpret the latest State of California code requirements for landscape and agriculture irrigators.

Course Content

Topic Titles / Suggested Time Topic	
	<u>Lecture</u>
<u>Topics</u>	<u>Lec Hrs</u>
Introduction-Why Irrigation and Drainage Is Necessary	2.00
Site Information-Gathering and Recording Process	3.00
Water Supplies-Points of Connection, Quantity and Quality	6.00
Hydraulics-Friction Losses, Feet of Head, GPM (Gallons Per Minute) Flow and Pipe Sizing	6.00
Cross-Connection Control and the Need for Backflow Prevention	3.00
Pumping Systems-Remotes and Boosters	3.00
Head Layout, Piping and Circuit Zoning	6.00
Irrigation System Drafting and Plot Plans	6.00
Special Systems	6.00
Control Systems	3.00
Drainage Needs and Design	3.00
Specification Writing	2.00
Plan Details	2.00
Total Hours: 51.00	

Methods of Instruction

- A. Discussion
- B. Field Trips
- C. Guest Speakers
- D. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- E. Instructor Demonstrations
- F. Lecture
- G. Problem-Solving Sessions

Methods of Evaluation

- A. Exams/Tests
- B. Quizzes
- C. Portfolios
- D. Projects

- E. Final Examination
- F. Written Assignments
- G. Short papers

Examples of Assignments

Reading Assignments

1. Read the chapter on recording site information in order to understand the necessary tools to use and information to be gathered on the first site visit. Be prepared to discuss in class.
2. Read the chapter on basic hydraulics to better understand how hydraulics affect an irrigation system. Be prepared to discuss in class.

Writing Assignments

1. Write a specifications/materials legend for an irrigation plan.
2. Write an irrigation schedule for a plan that you have drawn, considering evapotranspiration replacement during the window of operation.

Out-of-Class Assignments

1. Examine irrigation systems in your neighborhood during and after operation to discern overall effectiveness of the systems observed then report back to the class about what you have seen.
2. Interview a landscape/irrigation contractor about their experience in the trade and whether or not that individual designs the systems they build. Present your findings to the class.

Recommended Materials of Instruction

Hunter Industries. (2012). Irrigation System Design. *Hunter Technical Services, 5th.*

Rainbird Sales, Inc. (2013). Landscape Irrigation Design Manual. *Rainbird, 2013.*

Rainbird Sales, Inc. (2012). Low Volume Landscape Irrigation Design Manual. *Landscape Drip Division, 2012.*

Other Learning Materials

Student Materials:

1. Drafting equipment (as needed)
2. Three-hole binder
3. Calculator (scientific notation recommended)

Minimum Qualifications

Agriculture (Masters Required)

Ornamental Horticulture

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