

# HORT 60C: LANDSCAPE DESIGN: IRRIGATION

## Foothill College Course Outline of Record

Heading	Value
<b>Effective Term:</b>	Summer 2022
<b>Units:</b>	3
<b>Hours:</b>	2.5 lecture, 1.5 laboratory per week (48 total per quarter)
<b>Advisory:</b>	HORT 54C strongly recommended.
<b>Degree &amp; Credit Status:</b>	Degree-Applicable Credit Course
<b>Foothill GE:</b>	Non-GE
<b>Transferable:</b>	CSU
<b>Grade Type:</b>	Letter Grade (Request for Pass/No Pass)
<b>Repeatability:</b>	Not Repeatable

## Student Learning Outcomes

- Develop an irrigation plan for a residential or small commercial irrigation system.
- Interpret irrigation drawings, details, and specifications.

## Description

Principles of irrigation design for ornamental landscapes. Includes history of irrigation, advanced site analysis, irrigation design theory, equipment selection and layout, controller scheduling, long-term maintenance, and water conservation issues. Process of producing irrigation plans, details, and specifications.

## Course Objectives

The student will be able to:

1. Demonstrate knowledge of irrigation theory (including hydraulics), integration of system components, and scheduling.
2. Develop an irrigation plan for a residential or small commercial irrigation system.
3. Write irrigation notes and demonstrate knowledge of specifications utilized on irrigation plans.
4. Interpret irrigation drawings, details, and specifications.
5. Demonstrate an understanding of irrigation system scheduling.
6. Compare and contrast the differences between various types of irrigation systems.
7. Describe water conservation measures for irrigation systems including state, county, and city water use ordinances (AB 325).
8. Exhibit an understanding of cost estimates for irrigation systems including parts used and labor costs.
9. Identify the global applications of irrigation systems and the cultural implications of using different systems.

## Course Content

1. History and design of irrigation systems around the world
2. Site analysis procedures and irrigation audits
3. Design considerations

- a. Principles of hydraulics (GPM, PSI, static water pressure, etc.)
  - b. Selection of spray heads and rotors for different circuits
  - c. Drip irrigation
  - d. Water conservation techniques (hydrozones, product selection, etc.)
  - e. Regulatory factors (AB 325)
  - f. Innovations in irrigation design
4. Irrigation system design and layout
    - a. Rough, preliminary, and final working drawings
    - b. Details
    - c. Specifications
    - d. Irrigation symbols and legends
    - e. Cost estimates
  5. Selection of equipment and materials
    - a. Sprinkler systems (sprays, impact heads, and rotors)
    - b. Drip systems (surface drip systems, subsurface drip systems, fixed line drip systems)
    - c. Backflow preventers
    - d. Pressure reducing valves
    - e. Circuit valves
    - f. Controllers
  6. Planning for long-term project maintenance
  7. Scheduling controllers
    - a. Calculating and scheduling circuit run times
    - b. Selection of features to suit design
  8. Observation process during installation

## Lab Content

1. Hydraulics lab: In this lab each student will look at two or more sites to collect information on site hydraulics
2. Irrigation design labs: A series of labs with short exercises and term projects. Students will work both individually and in teams to solve irrigation design problems
3. Sprinkler spacing lab: Multiple labs designed to assist student with the proper placement of sprinklers
4. Drip irrigation design lab: Multiple labs designed to assist student with the proper placement and application of drip products
5. Valve and line circuit layout lab: Labs to assist students with the techniques for placing irrigation lines, sizing the lines, and locating and sizing the valves.
6. Scheduling lab: Lab provides instruction on how to calculate run times for individual irrigation circuits.

## Special Facilities and/or Equipment

1. Design lab, horticultural facilities and equipment.
2. Students provide architect's and engineer's scales, drafting supplies (including irrigation template), term project base sheet, and small calculator.

## Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Midterm exam  
Weekly exercises  
Term project

Participation in class activities

## **Method(s) of Instruction**

Methods of Instruction may include but are not limited to the following:

Lecture

Lab

Demonstrations

Discussions

Oral presentations

## **Representative Text(s) and Other Materials**

Irrigation Association. Irrigation, 6th ed.. 2011.

This text is a standard in the irrigation industry, even though it is over five years old. The new edition was stalled by COVID.

## **Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments**

1. Reading assignments will include reading approximately 35 pages per week from the assigned texts with supplemental reading from a course reader. Out of class reading/assignments is approximately five hours per week
2. Lectures will address reading topics and experiences of the instructor. Classroom discussion and demonstrations in support of lecture topics will be provided

## **Discipline(s)**

Ornamental Horticulture