

Syllabus for SOCR 370 Irrigation Principles

Instructor:

Dr. Allan Andales
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Office hours: M, W: 9:30 – 11:30 a.m.; or by appointment

Meeting times: M, W; 3:00 pm – 3:50 pm; 118 Shepardson

Credits: 2

Prerequisite(s): HORT 100 or SOCR 100 or BZ 120; and SOCR 240

Course Description: Determination of irrigation water requirements based on the estimation of storage and movement of water in the soil-plant-atmosphere system.

Text(s): None; Class materials will be made available through Canvas (<http://info.canvas.colostate.edu/login.aspx>). Web links will be used extensively to point students to online resources.

Course Objective(s):

- The student will understand the mechanisms of movement and storage of water in the soil-plant-atmosphere system.
- The student will learn methods of estimating irrigation water requirements and become familiar with relevant field instrumentation.

Instructional Methodology: The class will meet as a single group two hours a week for lectures, discussion, and demonstrations. The use of field instrumentation will be demonstrated in class. Computations may be done with the use of spreadsheets or simple programs provided by the instructor.

Methods of Evaluation:

Assignments/Quizzes:	20% of grade
3 Exams:	50% of grade
Final Exam:	30% of grade
Total:	100%

Grading Scale:

Lower Cutoff, %	100.0	90.0	86.7	83.3	80.0	76.7	73.3	70.0	60.0	<60.0
Grade	A+	A	A-	B+	B	B-	C+	C	D	F

Approximately 6 to 7 assignments/quizzes will be given throughout the semester. Exams will consist of multiple choice or short-answer questions and short calculations. Overall grading will be on a straight percentage basis. A make up quiz or exam will only be given if a written valid excuse is submitted immediately after the absence. Late assignments will only be accepted before the graded papers have been returned to the rest of the class. Late assignments will incur a 10% deduction per day beyond the deadline.

Academic Integrity: This course will adhere to the Academic Integrity Policy of the Colorado State University General Catalog and the Student Conduct Code. According to the policy, “academic integrity is conceptualized as doing and taking credit for one’s own work” (see <http://tilt.colostate.edu/integrity/>). To encourage an attitude of academic integrity, students will be asked to write or sign an honor pledge on specified coursework.

Course Topics
SOCR 370 – Irrigation Principles

	<u>Hours:</u>
A. Introduction of course – Scope and expectations	0.5
B. Water movement and storage	
1. Overview of the soil-plant-atmosphere system; Concept of flux	0.5
2. Conservation of energy and mass	1.0
3. Continuity of energy and mass flow in the biosphere	0.5
4. Properties of water; Soil water content	1.0
5. Water balance components	0.5
6. Soil hydraulic properties; Infiltration	1.0
7. Energy state of water in soil; Water characteristic function	1.0
8. Unsaturated and saturated water flow	1.0
9. Water content and flow measurement	1.0
10. Water quality considerations	1.0
Exam 1 date: _____	1.0
C. Evapotranspiration (ET) as the basis for irrigation	
1. Energy balance of the plant-soil surface	1.0
2. Environmental, plant, and management factors affecting ET	1.0
3. Water balance method of estimating ET	1.0
4. Reference crop ET and crop coefficients	1.0
5. Combination (aerodynamic and energy balance) method of estimating ET (Penman-Monteith equation)	2.0
6. Energy balance method (Bowen ratio)	1.0
7. Empirical method (Blaney-Criddle)	0.5
8. Other methods of estimating ET	0.5
9. Instrumentation for ET measurement	1.0
Exam 2 date: _____	1.0
D. Plant water status and uptake	
1. Plant water potential	1.0
2. Stomatal conductance and transpiration	2.0
3. Water uptake and movement	1.0
4. Water stress and plant responses	2.0
5. Water use efficiency	1.0
6. Measurement of plant water status	1.0
Exam 3 date: _____	1.0
E. Applications of irrigation principles in water management	1.0
Final Exam date: _____	

Total: 30.0