

ARIZONA WESTERN COLLEGE
SYLLABUS

PLS 220 CROP WATER USE, EVAPOTRANSPIRATION, AND IRRIGATION

Credit Hours: 3 Lec 3

PREREQUISITE: None

COURSE DESCRIPTION

To introduce the history and modern uses of irrigation, understanding of the basic concepts and definitions of the industry, utilization of soil and crop knowledge to select efficient systems, and the use of basic knowledge of water hydraulics.

1. COURSE GOAL

Develop a basic understanding of the history of irrigation and the science of crop water use.

2. OUTCOMES

Upon satisfactory completion of this course, students will be able to:

- 2.1 Discuss the history of agricultural irrigation
- 2.2 Define the basic principals in an irrigation system
 - 2.2.1 Objectives of Irrigation
 - 2.2.2 Sources of water
 - 2.2.3 Water quality and remedies
 - 2.2.4 Sediment, turbidity, color, hardness, corrosion, iron etc.
 - 2.2.5 Bacteriological impurities
- 2.3 Identify soil characteristics and possible concerns
 - 2.3.1 Identifying soil and soil characteristics
 - 2.3.2 Chemical aspects of soil
 - 2.3.3 Physical aspects of soil
 - 2.3.4 Biological aspects of soil
 - 2.3.5 Soil and Water
 - 2.3.6 Types of soil moisture
 - 2.3.7 Transpiration and wilting point
 - 2.3.8 Improving the soil
- 2.4 Estimating Plant Needs and Irrigation Scheduling
 - 2.4.1 Irrigation Schedules
 - 2.4.2 Measuring water available to plants
 - 2.4.3 Calculating field capacity
 - 2.4.4 Calculating Permanent wilting point
 - 2.4.5 Soil water budget
 - 2.4.6 Crop Water needs
 - 2.4.7 Effect of climate on crop water needs
 - 2.4.8 Measuring evapo-transpiration
 - 2.4.9 Pan evaporation method
 - 2.4.10 Theoretical method - Blaney-Criddle Method
 - 2.4.11 Influence of crop type on water needs (crop factor)
 - 2.4.12 Calculating crop water needs
 - 2.4.13 Irrigation system efficiency
 - 2.4.14 Water volumes and duration
- 2.5 Identify and Describe Different types of Irrigation Systems
 - 2.5.1 Sub-surface and surface irrigation
 - 2.5.2 Flood irrigation systems
 - 2.5.3 Pressurized irrigation systems
 - 2.5.4 Drip and sprinkler irrigation

- 2.5.5 Portable, solid and semi-permanent
- 2.5.6 Mechanized sprinkler irrigation systems
- 2.5.7 Traveling irrigators, Centre pivot, Linear move, Powered side roll
- 2.5.8 Fixed sprinkler systems
- 2.5.9 Sprinkler heads
- 2.5.10 Trickle Irrigation systems, uses, and maintenance
- 2.5.11 Mechanisms that drive rotating sprinkler heads
- 2.5.12 Design considerations
- 2.6 Design Specifications of an irrigation system
 - 2.6.1 Hydraulics
 - 2.6.2 Pressure
 - 2.6.3 Calculating discharge or flow
 - 2.6.4 Friction loss in systems
- 3. METHODS OF INSTRUCTION
 - 3.1 Lectures by the professor or invited speakers
 - 3.2 Audio-visual
 - 3.4 Discussion
 - 3.5 Blackboard learning modules
- 4. LEARNING ACTIVITIES
 - 4.1 Textbook reading assignments
 - 4.2 Participation in Blackboard class discussions
 - 4.3 Lectures, demonstrations, and visual presentations
 - 4.4 Written exercises and periodic exams
- 5. EVALUATION
 - 5.1 Written exams and quizzes
 - 5.2 Class participation
 - 5.4 Written assignments
- 6. STUDENT RESPONSIBILITIES
 - 6.1 Under AWC Policy, students are expected to attend every session of class in which they are enrolled.
 - 6.2 If a student is unable to attend the course or must drop the course for any reason, it will be the responsibility of the student to withdraw from the course. Students who are not attending as of the 45th day of the course may be withdrawn by the instructor. If the student does not withdraw from the course and fails to complete the requirements of the course, the student will receive a failing grade.
 - 6.3 Americans with Disabilities Act Accommodations: Arizona Western College provides academic accommodations to students with disabilities through AccessABILITY Resource Services (ARS). ARS provides reasonable and appropriate accommodations to students who have documented disabilities. It is the responsibility of the student to make the ARS Coordinator aware of the need for accommodations in the classroom prior to the beginning of the semester. Students should follow up with their instructors once the semester begins. To make an appointment call the ARS front desk at (928) 344-7674 or ARS Coordinator at (928) 344-7629, in the College Community Center (3C) building, next to Advising.
 - 6.4 Academic Integrity: Any student participating in acts of academic dishonesty—including, but not limited to, copying the work of other students, using unauthorized “crib notes”, plagiarism, stealing tests, or forging an instructor’s signature—will be subject to the procedures and consequences outlined in AWC’s Student Code of Conduct.
 - 6.5 Texts and Notebooks: Students are required to obtain the class materials for the course.
 - 6.6 Arizona Western College students are expected to attend every class session in which they are enrolled. To comply with Federal Financial Aid regulations (34 CFR 668.21), Arizona Western College (AWC) has established an Attendance Verification process for "No Show" reporting during the first 10 days of each semester.

Students who have enrolled but have never attended class may be issued a “No Show” (NS) grade by the professor or instructor and receive a final grade of “NS” on their official academic record. An NS grade may result in a student losing their federal financial aid. For online classes, *student attendance in an online class is defined as the following* (FSA Handbook, 2012, 5-90):

- Submitting an academic assignment
- Taking an exam, an interactive tutorial or computer-assisted instruction
- Attending a study group that is assigned by the school
- Participating in an online discussion about academic matters
- Initiating contact with a faculty member to ask a question about the academic subject studied in the course