Department of Agricultural & Biological Engineering
IFAS
UNIVERSITY of FLORIDA

AOM 3734

Irrigation Principles and Practices in Florida

Spring 2020 Course Syllabus

1. **Catalog Description:** *3 credits. Irrigation practice related to Florida agriculture. The course deals with irrigation system characteristics, management, maintenance, and economics.* (*Offered Spring*).

2. **Pre-requisites and Co-requisites:** *MAC 1147: Precalculus – Algebra and Trigonometry.*

3. **Course Objectives:**
   Through lectures, laboratory experiences, field trips, and subject matter covered, the student is expected to gain rudimentary skill proficiencies and knowledge that will enable him/her to have basic understandings of the following:
   - Introduction to the principles of plant-soil-water relation
   - Comparison of various irrigation methods and their components
   - Concepts of efficient water use in irrigation
   - State of art irrigation systems and their use
   - Principles of irrigation system management and maintenance
   - Introduction to global issues in irrigation.

4. **Contribution of course to meeting the professional component:** This course contributes three (3) credit hours toward meeting the minimum 48 credit hours of basic-level curriculum for the Bachelor of Science Degree in Agricultural Operations Management.

5. **Relationship of course to program outcomes:** From the list of (I) through (IV) program outcomes listed below, this course addresses outcomes (I) and (IV). **Of these,** (I) and (IV) will be assessed.

   Program Outcomes:
   - I. an ability to select and apply a knowledge of mathematics, science, and technology to management challenges that require the application of principles and applied procedures or methodologies;
   - II. an ability to function effectively as a member or leader on a technical team;
   - III. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
   - IV. an ability to engage in, and to understanding of the need for professional development.

6. **Instructor:** Richard V. Scholtz, III
   - Office location: 107 Rogers Hall
   - Telephone: 352-392-1864 x 107
   - E-mail address: rscholtz@ufl.edu
   - Office hours: Monday, Tuesday, Wednesday, and Friday from 11:30 AM to 12:20 PM or by appointment.

7. **Teaching Assistant:** None.

8. **Lecture Meeting Times:** Monday thru Friday - Period 5 (11:45 AM - 12:35 PM)

9. **Meeting Location:** 211 Rogers Hall.

10. **Textbooks, Materials and Software Required:** (*no required text, notes will be provided on the course's web site and UF E-learning Canvas page*)
    1. Any scientific calculator.
    2. USB Flash Drive (≥1 GB) for use in this course only.
    3. Daily Calendar (e.g. Daytimer), PDA, phone or laptop computer w/ calendar application.
    4. Access to Microsoft Office 2007 or compatible Office Suite (word processor, spreadsheet, presentation programs compatible with the **.docx*, **.xlsx* and **.pptx* formats).
    5. Large 3-ring binder for notes.

11. **Source Materials:**
    1. Butler, D. and J.W. Davies. 2004. Urban Drainage. Taylor & Francis, Inc. New York. 568 pages.
    2. Fangmeier, D.D., W.J. Elliot, S.R. Workman, R.L. Huffman, and G.O. Schwab. 2006. Soil and Water Conservation Engineering, Fifth Edition. Thomson Delmar Learning. Clifton Park, NY. 552 pages.
    3. James, L.G. 1988. Principles of Farm Irrigation System Design. John Wiley and Sons. New York. 480 pages.
    4. Jensen, M.E., Editor. 1980. Design and Operation of Farm Irrigation Systems. ASAE Monograph No. 3. Amer. Soc. Agric. Engr. St. Joseph, MI. 829 pages
    5. Hoffman, G.J., T.A. Howell and K.H. Soloman. 1990. Management of Farm Irrigation Systems. Amer. Soc. Agric. Engr. St. Joseph, MI. 1040 pages.
    6. Keller, J. and R.D. Bliesner. 1990. Sprinkle and Trickle Irrigation. Van Nostrand Reinhold. New York. 652 pages.
    7. Nakayama, F.S. and D.A. Bucks. 1986. Trickle Irrigation for Crop Production: Design, Operation and Management. Developments in Agric. Engr. 9. Elsevier Press. New York. 383 pages.
    8. Pair, C.H., Editor-in-Chief. 1983. Irrigation. 5th Edition. The Irrigation Assoc. Silver Springs, MD. 686 pages.
    9. U. S. Bureau of Reclamation. 2005. Drainage Manual: A Guide to Integrating Plant, Soil, and Water Relationships for Drainage of Irrigated Lands. University Press of the Pacific. Honolulu, HI. 308 pages.

12. **Attendance and Expectations:**

    Attendance is required – Lectures will cover material from various references, so it is imperative that students make every effort to attend classes and take good notes. Students are especially encouraged to ask questions during lectures. A part of most class periods will be used for teams to meet and coordinate their projects. Teams will maintain a record of attendance.

    All deliverables will comply with the requirements and due date specified at the time of assignment (no deliverable will be made due earlier than 3 business days after assignment). **No late deliverable will be accepted.**

    The student is expected to manage their time efficiently, and should anticipate spending three times the length of lectures studying and preparing deliverables outside the classroom. The student should focus on the following: assignments, review of notes and lecture materials, and any additionally assigned readings.

This class will predominately utilize USCS units, though there is some interaction with SI units. Mastery of both systems is strongly suggested.

13. **Announcement Policy:** Students will be held responsible for *all* announcements made in class, which includes *any and all* changes to this syllabus and the course lecture schedule. Students are expected to attend all lectures and laboratory periods scheduled.

14. **Grading Policy:** Official individual grades will only be available at the end of the semester. While many project grades will be determined at the completion of each project, individual grades will be modified based on team and self-assessments conducted throughout the semester.

    450 points – In Class Examinations.

    There will be three equally weighted in class examinations throughout the semester. These examinations will consists of between four and six multiple part calculation questions; each question will focus on those concepts related to irrigation system management, in particular the key factors that influence production and performance.

    450 points – On-line Examinations

    There will be six equally weighted on-line examinations. These examinations will consists of True/False, Matching, Fill in the blank and short answer questions; questions will test the students grasp of nomenclature, ability to identify equipment and components, and ability to identify concepts related to irrigation system management, in particular the key factors that influence production and performance. Students must complete these examinations by Friday before 11:00 PM EST, on the week they are assigned.

    0 points – Homework Assignments.

    There will be several homework assignments that will guide students through the coursework and that will aid reinforcement.

    100 points – Class Attendance and Student Field Trip Report.

    Each student will prepare a two-page report on the field trips taken, and class attendance will be taken daily. The two-page paper will be due electronically three business days by 11:00 PM EST after the last field trip taken. Students unable to make scheduled fieldtrips outside of the course period will be assigned other work.

15. **Outline:**
    Lecture Topics:

    - Historical Perspectives on Irrigation and its Importance
    - The Hydrologic Cycle
    - Florida Water Resources
    - Plants
    - Plant Physiology
    - Evapotranspiration
    - Soil Properties
    - Measurement and Calibration of Soil Moisture

- Basic Hydraulics
- Water Measurement
- Water Wells
- Florida Irrigation Systems
- Sprinkler Irrigation Systems
- Surface Irrigation Systems
- Sub-surface Irrigation Systems
- Microirrigation
- Irrigation – Nozzles and Emitters
- Valves and Valve Closure
- Pumps
- Pump Curves and Pump Selection
- Pump Operation and Pump Curves
- Measures of Irrigation Application and Uniformity
- Measures of Irrigation Efficiency
- Irrigation – Purpose and Methodology
- Irrigation – Scheduling
- Chemical Injection Methods for Irrigation
- Chemical Injection Concentrations and Rates
- Salinity Control
- Frost Protection
- Water Quality Problems in Microirrigation
- Filtration
- Drainage
- Advanced Applications in Irrigation

16. Grading Scale:

A:	921-1000 Points
A-:	891-920 Points
B+:	861-890 Points
B:	821-860 Points
B-:	791-820 Points
C+:	761-790 Points
C:	721-760 Points
C-:	691-720 Points
D+:	661-690 Points
D:	621-660 Points
D-:	591-620 Points
E:	< 590 Points

17. Make-up Grade Policy: The arrangements for-make any assignments should be made before the date in question unless there is an emergency situation. In which, reviews will be on a case by case basis.

18. Professionalism and Academic Honesty: Students should also strive to think and act as professionals. Students should extend all guests both professional and common courtesy. The instructor reserves the right to assess penalty points toward the class, or toward individuals who have chosen to disregard these guidelines.

Students will be *strictly held* to the University of Florida's policy on Academic Honesty. Suspected violations will result in no points awarded (failure) for the deliverable, and the offending student will be referred to the Dean of Students Office and Office of Student Judicial Affairs. Any and all disputes regarding the suspected infraction will be handled by the Student Judicial Affairs according to Regulations of the University of Florida.

In the process of enrolling and registering for classes at the University of Florida, every student has signed and presumably understands the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this

commitment to academic honesty and understand that failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University." The following information will be placed on examinations. On my honor, I have neither given nor received unauthorized aid on this examination.

19. **Evaluation Process:** Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

20. **Accommodation for Students with Disabilities:** Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation the level and type of accommodation of required to meet the student's disability.

21. **UF Counseling Services:** Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
    - University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
    - SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
    - Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
    - Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

22. **Use of Library Materials:** These items are university property and should be utilized with other users in mind. Never remove, mark, modify nor deface resources that do not belong to you. If you're in the habit of underlining text, do it only on your personal copy. It is inconsiderate, costly to others, and dishonest to use common references otherwise.

23. **Software Use:** All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.