**AOM 3734**

**Irrigation Principles and Practices in Florida**

**Summer 2025 A Course Syllabus**

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

**Pre-requisites: (***MAC 1147:**Precalculus – Algebra and Trigonometry), or (MAC 1114: Trigonometry & MAC 1140:* *Precalculus), or (MAC 2233: Survey of Calculus I)*

**Course Objectives:** By the end of the course students are expected to gain rudimentary skill proficiencies and knowledge that will enable them to:

* Employ principles of plant-soil-water relation to estimate crop water needs,
* Differentiate various irrigation methods and irrigation system components,
* Evaluate water use efficiency and irrigation distribution uniformity,
* Recognize state of art in irrigation systems and appropriate use,
* Use irrigation principles to manage and maintain irrigation systems, and
* Select appropriate irrigation systems and components based on global, economic, environmental, and societal constraints.

**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.

**Relationship of course to program outcomes:** From the list of (1) through (4) program outcomes listed below, this course addresses outcomes (1) and (4). **Of these,**(1) will be assessed for accreditation purposes.

**Program Outcomes:**

1. 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;
2. an ability to function effectively as a member or leader on a technical team;
3. 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;
4. an ability to engage in, and to understanding of the need for professional development

**Instructor:** Richard V. Scholtz, III

* Office location: 169 Rogers Hall
* Telephone: 352-294-6704
* E-mail address: rscholtz@ufl.edu
* Web site: http://www.abe.ufl.edu/rscholtz
* Office hours: Monday thru Friday, 2:00 - 3:30 pm

**Teaching Assistant:**None.

**Lecture Meeting Times:**Monday thru Friday - Period 6 (3:30 PM - 4:45 PM)

**Meeting Location:** 110 Rogers Hall and on-line.

**Textbooks, Materials and Software Required:**(*no required text, notes will be provided on the course’s web site and UF E-learning page*)

1. Any scientific calculator.
2. Daily Calendar (e.g. Daytimer), PDA, phone or laptop computer w/ calendar application.
3. Access to Microsoft Office 365 or compatible Office Suite (word processor, spreadsheet, presentation programs compatible with the *\*.docx*, *\*.xlsx* and *\*.pptx* formats)

**Course Bibliography/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. 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.

**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

**Course Schedule:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Week | Date | Lecture Topics | Assignment | Quizzes |
| **1** | 5/12 | Historical Perspectives on Irrigation and its Importance |  |  |
|  | 5/13 | Soil Properties &  Measurement and Calibration of Soil Moisture | Assignment 1 |  |
|  | 5/14 | The Hydrologic Cycle |  |  |
|  | 5/15 | Evapotranspiration | Assignment 2 |  |
|  | 5/16 | Florida Water Resources |  | On-line Quiz & Problem Set 1 (3) |
| **2** | 5/19 | Plants & Plant Physiology |  |  |
|  | 5/20 | Basic Hydraulics | Assignment 3 |  |
|  | 5/21 | Water Measurement | Assignment 4 |  |
|  | 5/22 | Water Wells |  |  |
|  | 5/23 | Florida Irrigation Systems |  | On-line Quiz & Problem Set 2 (2) |
| **3** | 5/26 | NO CLASS |  |  |
|  | 5/27 | Sprinkler Irrigation Systems |  |  |
|  | 5/28 | Surface Irrigation Systems & Sub-surface Irrigation Systems |  |  |
|  | 5/29 | Microirrigation |  |  |
|  | 5/30 | Pumps & Pump Curves and Pump Selection | Assignment 5 | On-line Quiz & Problem Set 3 (2) |
| **4** | 6/2 | Pump Operation |  |  |
|  | 6/3 | Irrigation – Nozzles and Emitters & Valves and Valve Closure | Assignment 6 |  |
|  | 6/4 | Measures of Irrigation Application and Uniformity | Assignment 7\* |  |
|  | 6/5 | *Meet in Water Resources Lab* |  |  |
|  | 6/6 | Measures of Irrigation Efficiency | Assignment 8 | On-line Quiz & Problem Set 4 (2) |
| **5** | 6/9 | Irrigation – Purpose and Methodology & Irrigation – Scheduling |  |  |
|  | 6/10 | Chemical Injection Methods for Irrigation & Chemical Injection Concentrations and Rates |  |  |
|  | 6/11 | Salinity Control | Assignment 9 |  |
|  | 6/12 | Frost Protection | Assignment 10 |  |
|  | 6/13 | Field Trip 1 | Assignment 11 | On-line Quiz & Problem Set 5 (3) |
| **6** | 6/16 | Field Trip 2 (possible) |  |  |
|  | 6/17 | Water Quality Problems in Microirrigation & Filtration |  |  |
|  | 6/18 | Drainage |  |  |
|  | 6/19 | NO CLASS |  |  |
|  | 6/20 | Advanced Applications in Irrigation |  | On-line Quiz & Problem Set 6 (4) |

\* *Material not covered on the immediate next Exam, but the following.*

**Attendance and Expectations:**Attendance is expected – 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.

The student is expected to manage their time efficiently, and should anticipate spending three times the length of lectures studying and preparing 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.

**Announcement Policy:**Students will be held responsible for *all* announcements made in class, which includes *any and all* changes to this syllabus to include due-date postponements and the course lecture schedule. All will be posted in Canvas. Students are expected to attend all lectures and field trips scheduled.

**Grading Policy:**Official individual grades will only be available at the end of the semester.

***450 points – On-line Nomenclature and Concept Quizzes***

*There will be six equally weighted on-line quizzes (75 points each) that cover that week’s course notes. Quizzes are untimed and course notes can be used. These quizzes will consists of True/False, Matching, Fill in the Blank and Short Answer questions; questions will test the student’s 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. Student are encouraged to read ahead and take the quizzes as soon as they populate on Canvas.*

***500 points – Online Problem Sets.***

*En lieu of in-person examinations, due to the compressed nature of the Summer Semester On-line problems sets consisting of two to four problems (that would have composed and in-person exam) will be assigned weekly. Each problem will be a calculation-based question. Problem sets are untimed and course notes can be used. Students should only need a calculator capable of exponents and logarithms. While problem sets are not timed, each weekly grouping is intended to be completed in less than one hour. Each question will be worth between 15 and 45 points (results in 1.5 to 4.5% of final grade each). Questions may consist of between two and six multiple steps; each question will focus on those concepts related to irrigation system management, in particular the key factors that influence production and performance. Full credit for each set will be awarded, must be an attached \*.pdf file showing the necessary steps and all required answers for each problem. Students must complete these Problem Sets by Friday before 11:00 PM EST, on the week they are assigned.*

***0 points – Practice Homework Assignments.***

*There will be several homework assignments that will guide students through the coursework and that will aid reinforcement. Answers are provided, but not the intermediate steps. Calculation exam problems will come from combinations of the problems on these assignments. Extra guidance on assignments is available as needed.*

***80 points – Student Field Trip Reports.***

*Each student will prepare a two-page observational report on each field trip taken. The two-page papers will be due electronically three business days by 11:00 PM EST after the date of each field trip taken and will be worth 80 points each. Papers are to have 1-inch margins, single spaced and are to be of a 12-point or smaller non-kerning font, all external references used should be cited appropriately. A bibliography must be included for outside sources and does not toward the two-page write up. AI tools may be used to improve word choice and help explanations, however observations must be true and those of each student.*

**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

**Grade Points:** For information on current UF policies for assigning grade points, see  <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>.

**Attendance and Make-Up Work:** Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>.

**Professionalism:** Students should also strive to think and act as professionals. Students should extend to all guests both professional and common courtesy.

**Academic Honesty:** As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "*On my honor, I have neither given nor received unauthorized aid in doing this assignment.*"

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

**Artificial Intelligence Use:** The use of AI software should only be used to improve clarity of the student's final work product. Be advised that many AI packages will provide invalid, and in some cases fictious results. Results may look authentic and even believable, but should not be trusted.

**Evaluation Process:** Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. 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/>.

**Accommodation for Students with Disabilities:** The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation 0001 Reid Hall, 352-392-8565, <https://disability.ufl.edu>

**UF Helping Resources:** Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university’s counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

* University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, [www.counseling.ufl.edu](http://www.counseling.ufl.edu)
* Counseling Services
* Groups and Workshops
* Outreach and Consultation
* Self-Help Library
* Wellness Coaching
* U Matter We Care, [umatter.ufl.edu/](http://www.umatter.ufl.edu/).
* Career Connections Center, First Floor JWRU, 392-1601, <https://career.ufl.edu/>.
* Student Success Initiative, <http://studentsuccess.ufl.edu>.

Student Complaints :

* Residential Course: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>.
* Online Course: <https://pfs.tnt.aa.ufl.edu/state-authorization-status/#student-complaint>

**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.

Zoom Link - Join URL: <https://ufl.zoom.us/j/99003868374?pwd=nWAR7oaDsODDoCX83W85EdJcKOocbE.1>

Student Questionnaire Link - Fill Out: <https://forms.office.com/r/HdYvVA7vxg>