

**THE UNIVERSITY OF ARIZONA**  
**Department of Agricultural and Biosystems Engineering**  
ABE/CE 455/555      **Soil and Water Resources Engineering**      Fall 2016

**Catalog Data**

**ABE/CE 455 Soil and Water Resources Engineering (3) II** Soil-water-plant relationships, soil and water chemistry, water quality and quantity, water distribution system, irrigation system design and management, pumping system, and use of reclaimed municipal wastewater for urban and agricultural irrigation. May be convened with ABE/CE 555

**ABE/CE 555 (3) II** For a description of course topics, see ABE 455. Graduate-level requirements involve critical review of a technical paper and a class presentation

**PREREQUISITES BY TOPICS**

1. Hydraulics
2. Differential and Integral Calculus
3. Soil Science or Soil Mechanics

**INSTRUCTOR and Contact information:**

Donald C. Slack  
Office: Shantz 627  
Office hours: By appointment  
Phone: (520) 621-7230  
Email Address: [slackd@email.arizona.edu](mailto:slackd@email.arizona.edu)

**OBJECTIVE:** To give upper division ABE, CE and other engineering students a basic understanding of soil, water, and plant relationships, water quality and quantity management, water distribution systems analysis, irrigation systems and pumping plant selection. It is also intended to give students basic knowledge on the use of wastewater for both agricultural and urban purposes. Emphasis is on soil and water resources development and management for sustainable production.

**TEXT:** No text required for this class. There will be class handouts for most of the topics as necessary to cover the topics as well as the supplemental references.

**SUPPLEMENTAL REFERENCES:**

Jensen, M.E. (Ed). 1980. Design and Operation of Farm Irrigation Systems. ASAE Monograph #3. American Society of Agricultural Engineers. St. Joseph, MI. 829p.

FAO Irrigation and Drainage Paper No. 56. Crop Water Requirements. UN-FAO, Rome, Italy. 1995. <http://www.fao.org/docrep/X0490E/X0490E00.htm>

FAO Irrigation and Drainage Paper No. 66. Crop Yield Response to Water. UN-FAO, Rome, Italy, 2012, <http://www.fao.org/docrep/016/i2800e/i2800e.pdf>

Arizona Irrigation Scheduling System (AZSCHED).

<http://ag.arizona.edu/crop/irrigation/azsched/azsched.html>

CROPWAT 8.0 Software for Crop Water and Irrigation Requirements. UN-FAO, Rome, Italy, 2013.

[http://www.fao.org/nr/water/infores\\_databases\\_cropwat.html](http://www.fao.org/nr/water/infores_databases_cropwat.html)

### TOPICS TO BE COVERED IN THIS COURSE:

(please refer to the topical outline for specific topics and dates)

#### Agricultural Water Use

- Plant- water relations
- Soil-water relations
- Soil Chemistry
- Water Quality
- Water Supply Systems
- Water Distribution System
- Irrigation Systems
- Pump Systems

#### Wastewater Reuses

- Effluent for agriculture and urban use
- Regulation, ordinances and legal liabilities
- Wastewater quality, treatment and delivery systems
- Wastewater on plant and soil environment

### METHODS OF TEACHING:

1. Lecture - discussion
2. Guest lectures
4. Group or individual projects.
5. Computer programs

### GENERAL PROCEDURES:

There will be reading assignment and problem assignments for each week.

The reading assignment should be carried out prior to the lectures on that unit, as listed on the course schedule. Problem assignments will be given regularly.

Assignment must be turned in class before 9:15 a.m. on the due date. **LATE HOMEWORK WILL NOT BE ACCEPTED IN ANY**

**CIRCUMSTANCES**, since graded assignments will be returned and discussed at the next class meeting following the due dates. There will be two one-hour tests, covering the topics indicated on the Course Schedule. There will be a comprehensive final examination over all the course material, at the regularly scheduled final examination time, as published in the University Schedule of Hours.

**ATTENDANCE:** Roll will be called in lecture only for the first few meetings, to determine who is in the course. After that, attendance in lecture is mandatory. If you miss

any required work because of absence, you will lose credit for that work. For good reasons, I advise you not to miss classes. Note: Excessive absences (more than four unexcused absences) may result in a student being administratively dropped at the discretion of the instructor (see University's General Catalog). If a student is administratively dropped AFTER the end of the FOURTH week of classes, it will result in a failing grade of "E" being awarded in the course.

### **Absence and Class Participation Policy**

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: <http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: <https://deanofstudents.arizona.edu/absences>

Participating in the course and attending lectures and other course events are vital to the learning process. As such, attendance is required at all lectures and discussion section meetings. Students who miss class due to illness or emergency are required to bring documentation from their health-care provider or other relevant, professional third parties. Failure to submit third-party documentation will result in unexcused absences.

### **Course Communications**

On-line communication will be via D2L and email

### **Assignments and Examinations: Schedule/Due Dates**

There will be approximately one homework assignment per week. Due dates vary and are given on each assignment which will be posted on D2L. There will be two one-hour exams plus the final as noted below under grading policy.

**GRADING:** Your grade in the course will be based on your performance on examinations and on the assigned homework problems, weighted as follows:

	Undergraduate	Graduate
Final Exam	20%	20%
Midterm Tests	40%	40%
Homework	40%	30%
Paper Review and Presentation		10%

With 40% of the total score based on homework, it is obvious that homework can have a significant effect on your final grade. Further, the test problems will generally be similar to homework problems, so that doing these problems NEATLY WITH CLEAR UNDERSTANDING is one of the best ways to prepare for tests. In general, course grades will be based on a percentage of total points possible as follows:

A	90 - 100%
B	80 - 89%
C	70 - 79%
D	60 - 69%
E	< 60%

The final grading scale for the course will be no stricter than the above scale and will be determined by the instructor after the results from all the examinations and homework have been tabulated. **Note:** Examinations will have both a closed and open book part.

**Additional Requirements for Graduate Credit (555):**

All graduate students registered for ABE/CE 555 will be required to complete a written critical review of a recent technical paper published in a relevant publication (e.g. ASCE Journal of Irrigation and Drainage Engineering, Transactions of the ASABE, etc.) The student will propose the paper the instructor no later than the fifth week of class. **The paper for review must be selected prior to the fifth week of class (NO LATER THAN SEPTEMBER 23, 2016) and formally approved by the instructor.**

**WITHDRAWALS:** You may withdraw without the permission of the instructor up to September 6- although your courtesy in notifying the instructor will be appreciated. Please refer to the academic calendar ([http://registrar.arizona.edu/dates-and-deadlines/view-dates?field\\_display\\_term\\_value=154](http://registrar.arizona.edu/dates-and-deadlines/view-dates?field_display_term_value=154)) for permissions required after this date. An incomplete will be given only if the student is doing passing work and is prevented from completing a small portion of the coursework by illness or other legitimate emergency. Note that students wishing to drop the course, AT ANY TIME, must follow the University's procedure. Ceasing attendance does not automatically drop you from the course. If you are still on the class roll at the end of the semester, you will receive 0's for any work not completed and will be graded accordingly.

**TIME AND PLACE:** 9:00 - 9:50 a.m. M,W,F Shantz 440

**ON-LINE SECTION REQUIREMENTS**

**Class meetings**

- 1 There will not be any class meetings.
- 2 The lectures will be videotaped. There may be a day or two delay in getting them posted. This is the first time this class is being offered on-line, so we will work together to make this successful.
- 3 You may schedule a Chat with the instructor if you need assistance.
- 4 If you are enrolled in ABE/CE 555 you **WILL** be expected to either attend one class at the end of the semester to present your technical paper. If you are not able to travel to Tucson to give your paper, then please contact Dr. Slack to make arrangements for you to present it remotely.

### **Information on how to use D2L**

1. Go to <http://d2l.arizona.edu/> to access D2L
2. Enter your netID login and password
3. Go to “My Academic Courses” If your course does not appear:
  - a. Click on the down arrow beside the current semester.
  - b. Click on the down arrow beside the department name, and then
  - c. Click on your course name.
  - d. You should now be at your D2L Course Home Page.

Links to the Directions for all assignments are under the content heading in the course site found in the lower tool bar.

If you have difficulty with D2L, please read the D2L Tip Sheet at <http://eebweb.arizona.edu/faculty/dornhaus/courses/d2l%20tip%20sheet%20students.pdf> .

Problems using D2L can also be reported using this Web link

<http://help.d2l.arizona.edu/node/153> .

Additionally you can contact UITS 24/7 at: <http://uits.arizona.edu/departments/the247> or directly at - (520) 626-TECH (8324)

### **General course policies and requirements**

1. To participate in this online course, students must have daily, reliable access to D2L.
2. Assignments must be turned in by the required date and time. 5% will be deducted from the grade for each day the assignment is late including weekends.
3. **Students are expected to spend 2 to 3 hours per week on work related to this course.**
4. You should check D2L announcements daily for new information related to the course.
5. E-mails will be answered within 24 hours on week.
6. Work turned in early will be held until the due date and graded with the rest of the papers or assignments, unless the student asks for feedback prior to submitting a final draft.
7. Weekly announcements will be posted every Sunday for the upcoming week.
8. The two mid-term exams and the final exam will need to be proctored. We will make arrangements with personnel in Yuma to proctor the exams.

### **Online Student Interaction Guidelines:**

- 1) The Arizona Board of Regents' Student Code of Conduct  
<http://deanofstudents.arizona.edu/student-code-conduct-student-faqs> , ABOR policy

- 5-308, prohibits threats of physical harm to any member of the University community, including one's self. See: <http://policy.arizona.edu/threatening-behavior-students> .
- 2) It is expected that students may disagree with the research presented or the opinions of their fellow classmates. To disagree is fine but to disparage others views is unacceptable. All comments should be kept civil and thoughtful.
  - 3) **This Class runs under university policies regarding disruptive behavior.** <http://policy.arizona.edu/disruptive-behavior-instructional> .

### **Classroom Behavior Policy**

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).

Students are asked to refrain from disruptive conversations with people sitting around them during lecture. Students observed engaging in disruptive activity will be asked to cease this behavior. Those who continue to disrupt the class will be asked to leave lecture or discussion and may be reported to the Dean of Students.

### **Threatening Behavior Policy**

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See <http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>.

### **Accessibility and Accommodations**

Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact the Disability Resource Center (520-621-3268) to establish reasonable accommodations. For additional information on the Disability Resource Center and reasonable accommodations, please visit <http://drc.arizona.edu>.

If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.

Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

### **Code of Academic Integrity**

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: <http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>.

The University Libraries have some excellent tips for avoiding plagiarism, available at <http://www.library.arizona.edu/help/tutorials/plagiarism/index.html>.

*Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent.* Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA e-mail to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student e-mail addresses. This conduct may also constitute copyright infringement.

### **UA Nondiscrimination and Anti-harassment Policy**

The University is committed to creating and maintaining an environment free of discrimination; see <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others.

### **Additional Resources for Students**

UA Academic policies and procedures are available at <http://catalog.arizona.edu/policies>

Student Assistance and Advocacy information is available at <http://deanofstudents.arizona.edu/student-assistance/students/student-assistance>

### **Confidentiality of Student Records**

<http://www.registrar.arizona.edu/personal-information/family-educational-rights-and-privacy-act-1974-ferpa?topic=ferpa>

### **Subject to Change Statement**

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.

### **Statement of Copyrighted materials:**

Students are advised that all lecture notes, lectures, study guides and other course materials disseminated by the instructor to the students, whether in class or online, are original materials and as such reflect intellectual property of the instructor or author of those works. All readings, study guides, lecture notes and handouts are intended for individual use by the student. Students may not distribute or reproduce these materials for commercial purposes without the express written consent of the instructor. Students who sell or distribute these materials for any use other than their own are in violation of the University's Intellectual Property Policy (available at <http://techlaunch.arizona.edu/university-arizona-intellectual-property-policy>). Violations of the instructors copyright may result in course sanctions and violate the Code of Academic Integrity.

**Confidentiality of Student Records:**

<http://www.registrar.arizona.edu/ferpa/default.htm> . Students should have read and be aware of federal regulations regarding the privacy of their academic records.

**Special Needs Policy:**

Students needing special accommodations or special services should contact the Disability Resources Center, 1224 East Lowell Street, Tucson AZ 85721, (520)621-3268, FAX (520)621-9423, email: [uadrc@email.arizona.edu](mailto:uadrc@email.arizona.edu) , <http://drc.arizona.edu/> . Resources/CDRR (621-5227). You must register and request that the center or DRC send the instructor official notification of your needs as soon as possible. Please plan to meet with via phone or office hours to discuss accommodations and how this course's requirements may impact your ability to fully participate. **The need for accommodations must be documented by the appropriate office.**

**Subject to Change Statement**

Information contained in the course syllabus, other than the grade policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.