

## Fall 2018 - Course Syllabus

**Course number and title:** CIVE 519 - Irrigation Water Management

**Credits:** 3

### **Course Description:**

This course prepares the student to apply basic soil, plant, water, and atmospheric engineering principles for the purpose of determining the crop water need (use), or evapotranspiration (ET), both in time and amounts, to sustain agricultural production while protecting the environment. The course covers a range of methods and instrumentation available to determine ET, irrigation scheduling, and effective water use, including remote sensing techniques to estimate ET spatially.

Prerequisite: hydrology or other related classes.

**Instructors:** José L. Chávez, Ph.D.  
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**Office Hours:** M-W-F, 2-3 pm. Or by appointment.

**Course Time/Place:** 9:30 am – 10:45 pm Tuesdays and Thursdays, in room Walnut 103.

**Text(s):** 1. Hoffman, G.J., R.G. Evans, M.E. Jensen, D.L. Martin, and R.L. Elliott. (2007). **Design and Operation of Farm Irrigation Systems**. 2<sup>nd</sup> Ed., ASABE, St. Joseph, MI, 1040 pp. ISBN: 1-892769-64-6. **(Digital version available through CSU Morgan Library)**.  
2. Class Handouts and directed readings.

**Course objectives and outcomes:** The student successfully completing this course will be able to:

1. Determine the required data, apply adequate methods and design efficient solutions in regards to agricultural water management.
2. Apply methods to evaluate crop water demand and actual use with land surface energy balances, ground- and remote-based instrumentation, including proper assessment of irrigation systems efficiencies.
3. Select particular methods and instrumentation to properly design an irrigation scheduling mechanism based on specific field, crop, and environmental conditions.

### **Course Topics**

1. Irrigation relevance for agricultural production
2. Irrigation management concepts and system elements
3. Irrigation planning and data needs
4. Irrigation hydrologic balance
5. Basic soil water physics (review)

6. Measuring soil water content
7. Principles of crop water use or evapotranspiration (ET)
8. ET measurements (instrumentation), direct & indirect methods
9. Crop evapotranspiration estimation (models)
10. Irrigation scheduling
11. Spatially distributed crop evapotranspiration estimation (remote sensing-based algorithms)
12. Irrigation efficiency
13. Material review and exams

**Instructional Methodology:** The class will meet two days a week (Tuesdays and Thursdays) for lectures and discussion.

**Mode of Delivery:** Classroom instruction and CANVAS (for both resident and distance students).

**Methods of Evaluation:** Students will be evaluated on the basis of examinations, homework, and participation. There will be two mid-term exams and a final exam. The course grade will be determined based upon the following percentages:

➤ <i>Midterm Exams (2)</i>	= 30% (15% each)
➤ <i>Final Exam</i>	= 20%
➤ <i>Attendance/participation</i>	= 10%
➤ <i>Homework</i>	= 40%
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Total	=100%

Term grades for this course will use the +/- grading system as described in the CSU catalog. The following scale will be used: A+ ≥ 97; A ≥ 93; A- ≥ 90; B+ ≥ 87; B ≥ 83; B- ≥ 80; C+ ≥ 77; C ≥ 70; D ≥ 60; F < 60.

**Policies:** I will accept late homework submissions up to five days after the due date or before solutions are distributed, whichever comes first. A penalty of 20% per day late will be assessed on these assignments. Make-up exams will be given only for university-approved excuses or when you have a note from a medical professional. Students are encouraged to discuss and collaborate, however, the final work you submit should be distinctly your own. CSU policies on academic integrity will be rigorously enforced in this course. Please refer to:

[Link: Academic Honesty Policy](#)

[Link: Integrity Policy](#)