**Irrigation Systems Design - Syllabus - Winter 2020**

Linn Benton Community College – Agricultural Sciences Department

**Course Numbers** AG 250 CRN: 31187

**Course Credits** 3 credits

**Meeting Time & Room:** Lectures: M W 10:00-10:50 WOH 122 Lab: M 1:00-2:50 WOH 122

**Instructor:** Angela Mestas

Office: WOH 125 E-mail address: mestasa@linnbenton.edu Website: https://moodle.linnbenton.edu/course/view.php?id=6583

**Office Hours:** Mon 9-10 or by appointment

**Course Description**: This course covers the principles and practices of basic irrigation system design and installation. Topics include soil/water/plant relationships, water conservation, basic hydraulics, crop water requirements and soil characteristics, the process of system design and plan preparation, system parts and components, installation, backflow prevention, public and personal safety, permits and licenses, and drainage systems.

**Course Materials:** Required Text: *“Principles of Irrigation”* from the Irrigation Association.

**Course Outcomes** The successful completion of this course will enable you to:

● Demonstrate an understanding of plant-water-soil relationships.

● Identify components and capacity of common horticultural and crop production irrigation systems.

● Design a basic irrigation system considering economic, environmental and crop production factors.

● Describe water conservation measures that are appropriate to the local environment and plant production system.

**Waitlist Policy** If the class is full, registered students not attending the first session without advance notice to the instructor will be dropped from the class and students from the waitlist will take their spots. Waitlisted students must get instructor approval to become registered students.

**Course Evaluation** You will be evaluated by participation and a final project presentation. Keep track of your grades on moodle.

**Grades:** The grading system for the course is “A-F”. Final grades will be based on the percentage of total points earned. A = 90% and above; B = 80 to 89%; C = 70 to 79%; D = 60 to 69%; F = 59% and below

**You will be graded on: % of final grade** Participation 75 pts (3 pts per meeting) 75% Final Project 25 pts 25%

*Incomplete Grade:* An *Incomplete* will not be issued. Notify the instructor if you are no longer able to attend class. Students may request *Audit* status in place of a letter grade before the end of the second week.

**Student Integrity:** All students are expected to work with integrity, jeopardizing neither their own honesty nor that of other students. Plagiarism will result in 0 points for the assignment and may result in further disciplinary action. Plagiarism is a turning in someone else’s work as your own or using sources without proper credit. Do not copy material from the internet or from any other source and present it as your own.

**Disabilities Services:** Students who may need accommodations due to documented disabilities, who have medical information which the instructor should know, or who need special arrangements in an emergency, should speak with the instructor during the first week of class. If you have not accessed services and think you may need them, please contact Disability Services, 917-4789. LBCC is committed to inclusiveness and equal access to higher education. If you have approved accommodations through the Center for Accessibility Resources (CFAR) and would like to use your accommodations in the class, please talk to your instructor as soon as possible to discuss your needs. If you

believe you may need accommodations but are not yet registered with CFAR, please visit the **CFAR Website** for steps on how to apply for services or call (541) 917-4789.

**Classroom Guidelines**

● This is your course. You will learn the most if you actively participate in classroom discussions and share your experience and questions. At the same time, respect other students’ desire to learn while listening attentively and appreciating other points of view.

● This is your classroom. Take responsibility for it by straightening up tables and chairs when you leave. Clean up the lab and put away equipment at the end of class. Pick up litter.

● Arrive promptly before class begins. If late, enter quietly.

● Turn off your cell phone. Let the instructor know if you need to leave the cell phone on for emergency reasons.

● Use electronic devices only as directed. Anyone who engages in rude, thoughtless, selfish behavior such as use of a cell phone or laptop for instant messages, games, email, web surfing etc., will be excused from the class. The student can return to the next class session only if he or she submits a report reflecting on the behavior and apologizes to the class.

● No food or drink is allowed in the classroom during class time. No tobacco products may be used in the classroom at any time.

● Please remove hats in the classroom. Head coverings worn for religious or medical reasons are acceptable.

● Know basic safety rules. Report any accidents, injuries, or problems immediately.

● Do not come to class when you are ill and are likely to infect others. Academic work can be made up when you return.

● Minor children will not be allowed in the classroom or lab areas for safety reasons. Check with the LBCC family resource center for child care options during in-service school days.

● Security is a primary concern on campus. Be responsible for your things and considerate of other students’ belongings.

● Let faculty or staff know if you are experiencing academic difficulties. Assistance is available. The LBCC Learning Center provides students with academic support and a comfortable place to study. For available services go to http://www.linnbenton.edu/go/learning-center

● Be aware of Student Rights and Responsibilities. For more information go to http://www.linnbenton.edu/studentrights/index.html

**Course Schedule - AG 250 - Irrigation Systems**

Wk **Monday Lecture**

**Monday Lab**

**Wednesday Lecture**

**Wednesday Lecture**

**Readings:** Chapters from “Principles of Irrigation”

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**1** 01-06

Course Introduction

Ch 1 lecture Ch 1 discussion Ch 1 Irrigation

Ch 1 lecture Ch 1 discussion Ch 1 Irrigation

Systems for Landscape/Turf & Agriculture

Systems for Landscape/Turf & Agriculture

**2** 01-13

Ch 2 lecture Introduce

project

No class- NW Ag Show Salem

No class- NW Ag Show Salem

No class- NW Ag Show Salem

Ch 2 Soil, Plants & Water

Ch 2 Soil, Plants & Water

Ch 2 Soil, Plants & Water

Ch 2 Soil, Plants & Water

**3** 01-20

**Holiday Holiday** Ch 3 lecture Ch 3 Precipitation

Rates

**4** 01-27

Ch 4 lecture Work on project Ch 4 discussion Ch 4 Efficiency &

IUniformity Concepts

Ch **5** 5 lecture Work on project Guest

Ch 5 Irrigation 02-03

presentation

Sched. David Bower Irrigation Specialist for Pacific Ag systems

**6** 02-10

Ch 6 Control Valves, Specialty Valves, Controllers & Backflow Prevention

**7** 02-17

Ch 6 and 7

Field trip to

Guest lecture

Peoria Gardens

presentation 1:30-2:30

Chad Higgins 32355 Peoria Rd

Engineering SW, Albany, OR

professor for 97321

Oregon State

Ch. 7 Pipes and Fittings

**8** 02-24

**Holiday Holiday** Guest

Presentation Val Tancredi Irrigation specialist -equipment

Ch 8: Hydraulics of Irrigation Systems

**9** 03-02

Ch 8 lecture Field trip to Blue

Guest Heron Farm

presentation 1:30-2:30

Stephen Good 33180 Peoria

Remote sensing Rd, Corvallis,

of irrigation OR 97333

professor for Oregon State

Ch 9 Pumps for Irrigation

**10** 03-09

Ch 9 lecture Work on project Val Tancredi

returns to evaluate your projects

Ch 10 lecture Field Trip

Permits and

Ch 10 Wire Sizing Seven Oaks

licenses

& Electrical Native Nursery

Principles 1:30-2:30 29730 Harvest Dr SW, Albany,

OR 97321

Final s Week

**Monday March 16th 8-9:50 am**

**Dates may change depending on the progress toward learning outcomes and needs of students and the instructor.**

**Instructions for Irrigation Systems Final Project/Presentation**

**Your task** Develop an irrigation system design. Select an actual site for your project. Possible sites include gardens, agricultural fields, lawns, athletic fields, golf courses, or other sites for horticultural or agricultural purposes that you are familiar with. According to your selection, the plants/crops on this site may be ornamentals, fruit trees, turf, row crops, or any other agricultural/horticultural commodity. Select a manageable size (a “manageable” size may differ whether you choose a field crop or an ornamental garden). You may use a single or a mix of irrigation types (e.g. sprinkler, drip, or center pivot, side roll, flood, etc.).

**Element of the Project**

● Site information for the whole site and distinct sections including area dimension, slope, soil characteristics, shading (if any), crop(s), crop water use, irrigation requirements.

● Irrigation system capacity, water, and power supply.

● Irrigation system design including circuits, valves, laterals and mainlines, pipe sizes, and flow and pressure data, backflow prevention and pumps. Show your calculations for friction losses and sizing of pumps and pipe.

● Irrigation schedule - Show how your schedule meets the needs of the crops during at least three times of the growing season (early, mid and late season)

● References in proper citation format (in report only)

**Project Report Format** Submit a typed report using a 12 pt font with 1.5 line spacing. Describe the above mentioned elements of the irrigation system design. Include a sketch of the site showing the site information. Include sketches of the finished design showing the elements of the irrigation system. Also include other relevant information (for example a copy of the soil map). Properly reference all sources of information you used.

**Presentation Format** Present the above mentioned elements of the irrigation system design to the class in a 10 minute presentation. Include visuals such as photos, overheads, maps, sketches, powerpoint presentation, etc. Do not present detailed calculations of friction loss, and pump and pipe sizing.

**Evaluation** The final project represents 25% of your grade (10 % for the report and 15 % for the presentation). In both, presentation and report, the grade will be based on the completeness and accuracy of the above described elements. In addition, spelling and structure will be evaluated in the report while clarity, organization, oral presentation skill will be part of the grade in the oral presentation.