

WWTR123 – Instrumentation and Controls

COURSE SYLLABUS for FALL 2020

Instructor: Adrian Antoo

Office: Online - Zoom

Office phone:

Email: aantoo@santarosa.edu

Office hours: Thursdays: 9:40 – 10:10 pm

Textbook and Required Supplies:

Instructor will provide lecture materials in **Canvas**

Electrical Fundamentals for Water and Wastewater by Skeeter Arasmith

UGLY's Electrical Reference, George V. Hart, 2011 Edition (optional)

Three-ringed binder for syllabus, class notes and assignment

Basic calculator

All Assignments will be posted in Canvas

Course Content:

Student learning Outcomes:

1. Utilize instrumentation and controls found in water and waste water plants and other industrial systems.
2. Identify, describe and work with instrumentation and control loops.

Objectives:

Upon successful completion of this course, the student will be able to:

1. Interpret symbols used in controls and instrumentation circuits.
2. Identify various types of motor control devices.
3. Identify the main parts and function of SCADA (Supervisory Control and Data Acquisition) systems.
4. Apply the principles of electrical circuit theory.
5. Identify the principles of electronic circuit theory.
6. Describe areas of interaction between automated systems and motor controls.
7. Describe and give examples how automation is beneficial to the water or wastewater utility

Attendance:

- Attendance is required for both lab and lecture hours. Class begins on the hour and ends at ten (10) minutes before the hour or half-hour. You are responsible for your attendance. Excused absence only by contacting instructor prior to beginning of class.

Assignments:

- All assignments are to be done per instructions and due at the beginning of class on the assigned due date. Late assignments will only be accepted with instructor's prior approval. A substantial penalty (determined by the instructor) will be deducted from the grade of the approved late assignment.
- All assignments shall be done on 8 1/2 " x 11" paper, or sheets provided to you by the instructor.
- Put your name, course number, assignment parameters and due date on the first page. Staple multiple sheets together **prior** to turning in.
- Any written report, essay, or term paper shall be typed as instructed.
- Assignments are your responsibility. Failure to observe these conditions will result in papers being returned without credit.

Tests, Quizzes and Exams:

- **NO MAKE-UP EXAMS WILL BE GIVEN!**
- **Prior** instructor approval is necessary to reschedule a quiz date.
- Exams will be given on specific areas covered through the semester. Sufficient notice will be given prior to the scheduled exam. A review for an exam will be conducted during the previous class lecture.
- There will be 10-12 quizzes.
- The final exam for this course will be given on Thursday, December 17, 2020 from 6:00 to 9:40 pm in room Online
- The final exam is required. Failure to take this exam will result in a grade of **F** for the course.
- Scantrons are required for the midterm and final exams

GRADING:

- Your grade will be based on the total number of points you accumulate. Homework, Lab/Assignments and Exams are weighted accordingly:

Quizzes/Homework	= 200 points
<u>Exams/Tests</u>	<u>= 300 points</u>
Total	= 500 points

- Final grades are calculated as based on the Total Points accumulated.

A.....	450 - 500
B.....	400 - 449
C.....	350 - 399
D.....	300 - 349
F.....	349 and below

An incomplete grade "I" will only be given as prescribed by college rules and regulations.

Prior approval of the instructor is required.

WWTR123 – Instrumentation and Controls COURSE OUTLINE

The objective of this outline is to assist you in planning your schedule. Every effort will be made to stay on schedule. However, the instructor may find it necessary to make appropriate changes to the learning objectives for the entire class.

You should be familiar with the topic prior to the class lecture by reading the assigned homework. You should allow yourself a minimum of two hours per week to complete the reading and homework assignments.

Instructor will assign homework problems. See the Course work Syllabus for guidelines and specific information on course objective, homework, lab assignments, quizzes, exams and grading.

Week	Date	Topic
1	8/20	Overview of WWTR123 course Introduction to Instrumentation and Controls, and SCADA
2	8/27	Instruments and equipment used in Wastewater Plants (part I)
3	9/3	Instruments and equipment used in Wastewater Plants (part II)

4	9/10	Introduction to Basic Electricity
5	9/17	AC/DC electrical circuits
6	9/24	Fieldtrip (tentative)
7	10/1	Electrical power in a Treatment Plant
8	10/8	Introduction to Instrumentation electrical circuits and Midterm review
9	10/15	Midterm Exam
10	10/22	Process control and SCADA (part I)
11	10/29	Process control and SCADA (part II)
12	11/5	Introduction to Motors
13	11/12	Motor control circuits and SCADA
14	11/19	VFD – Variable Frequency Drives
15	11/26	Thanksgivings Day Holiday (no classes)
16	12/3	Introduction to Pumps, Valves, Actuators and SCADA
		Troubleshooting for Operators and Technicians
17	12/10	Final Exam review
18	12/17	Final Exam