WWTR123 – Instrumentation and Controls

COURSE SYLLABUS for FALL 2022

Instructor: Adrian Antoo
Use **CANVAS email** to communicate with instructor (primary email)

Email: aantoo@santarosa.edu (secondary email)

Office: PC244
Office phone:
Email: aantoo@santarosa.edu
Office hours: Thursdays: 9:40 – 10:10 pm

Textbook and Required Supplies:
Instructor will provide additional lecture material
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

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 located in CANVAS
- Login to CANVAS to get instructions about assignments – homework, labs, quizzes and exams
- Use CANVAS email to communicate with instructor
- Use CANVAS email to submit 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 81/2 " 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 6 to 8 quizzes.
- The final exam for this course will be given on Thursday, December 15, 2022 from 6:00 to 9:40 pm in room PC244
- 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
Exams/Tests	= 300 points
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.

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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	8/18	Overview of WWTR123 course
		Introduction to Instrumentation and Controls, and SCADA
2	8/25	Instruments and equipment used in Wastewater Plants (part I)
3	9/1	Instruments and equipment used in Wastewater Plants (part II)
4	9/8	Introduction to Basic Electricity
5	9/15	AC/DC electrical circuits
6	9/22	Electrical power in a Treatment Plant
7	9/29	Introduction to Instrumentation electrical circuits
8	10/6	Process control and SCADA (part I)
9	10/13	Process control and Scada (part II) / Review Midterm Exam
10	10/20	**Midterm Exam**
11	10/27	Process control and SCADA (part II)
12	11/3	Introduction to Motors and motor control circuits
13	11/10	**Veterans Day Holiday** (No Classes)
14	11/17	VFD – Variable Frequency Drives
15	11/24	**Thanksgivings Day Holiday** (No Classes)
16	12/1	Introduction to Pumps, Valves, Actuators and SCADA
17	12/8	Troubleshooting for Operators/Final Exam review
18	12/15	**Final Exam**