Clackamas Community College

Online Course/Outline Submission System

☑ Show changes since last approval in red

WET-245 Instrumentation & Control
General education certified: ○ Yes ◉ No

- ☐ Writing
- ☐ Oral Communication
- ☐ Arts and Letters
- ☐ Science & Computer Science
- ☐ Mathematics
- ☐ Social Science
- ☐ Cultural Literacy
- ☐ Health & Physical Education

☐ Approved Date (mm/dd/yyyy): ____ / ____ / ____

Section #1 General Course Information

Department: Engineering Science

Submitter

First Name: Matthew
Last Name: LaForce
Phone: 3148
Email: laforce

Course Prefix and Number: WET - 245

 # Credits: 4

Contact hours

Lecture (# of hours): 33
Lec/lab (# of hours):
Lab (# of hours): 33

Total course hours: 66

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

Course Title: Instrumentation & Control

Course Description:

A lab course introducing methods used to monitor and control treatment processes in wastewater, water and high purity water facilities. Advanced water analysis to include typical monitoring of high purity water treatment. Fundamentals of control loops, control system and data management.

Type of Course: Career Technical Preparatory

Is this class challengeable?

No

Can this course be repeated for credit in a degree?

No

Is general education certification being sought at this time?

No

Does this course map to any general education outcome(s)?

No

Is this course part of an AAS or related certificate of completion?

Yes

Name of degree(s) and/or certificate(s): AAS Water & Environmental Technology and 1-Year Water & Environmental Technology Certificate

Are there prerequisites to this course?

No

Are there corequisites to this course?

No

Are there any requirements or recommendations for students taken this course?

No

Are there similar courses existing in other programs or disciplines at CCC?

No

Will this class use library resources?

Yes

Have you talked with a librarian regarding that impact?

No

Is there any other potential impact on another department?

No

Does this course belong on the Related Instruction list?

No

GRADING METHOD:

A-F or Pass/No Pass

Audit: Yes

When do you plan to offer this course?

Fall

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

No

Will this course appear in the college catalog?

Yes

Will this course appear in the schedule?

Yes

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. describe the basics of "Control of Hazardous Energies (CoHE)" as applied to electrical safety as well as the legal requirements and obligations of employees and employers under federal and Oregon state law,
2. analyze basic units and techniques of measuring electrical voltage, current and power parameters and the inter-relations between voltage, current, resistance and power in simple electrical circuits. Be able to use a digital volt meter to actually measure these parameters on classroom circuits;
3. demonstrate proficiency with basic On/Off control circuits, motor starting techniques, variable speed motor control circuits. Be able to construct on/off circuits on classroom test components;
4. describe analog signal transmission and manipulation methods such as the differences between two-wire and four-wire analog instruments, signal isolation methods, signal duplication methods and common signal problems and solutions. Be able to setup test instruments and manipulate process variables in a lab setup;
5. analyze control loops as related to high purity water production.

This course does not include assessable General Education outcomes.

Major Topic Outline:

Instrument Control
Water Hydraulics
Electricity
Motors
Variable Speed Motor Control and Control Systems
Flowmeters
Process Measurements (Pressure, Level, Temperature)
Process Analyzers
Signal Standardization, Power and Transmission
Telemetry
Valves and Pumping Systems
Automatic Process Controls (Feedback and Feedforward Controls)
Digital Control and Communication Systems (SCADA)

Does the content of this class relate to job skills in any of the following areas:

1. Increased energy efficiency No
2. Produce renewable energy No
3. Prevent environmental degradation No

4. Clean up natural environment	No
5. Supports green services	No

Percent of course: 0%

First term to be offered:

Next available term after approval
:
