

# Clackamas Community College

## Online Course/Outline Submission System

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APR-115UW Substation Metering & Relay Overview

General education certified:  Yes  No

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

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

### Section #1 General Course Information

**Department:** Apprenticeship

**Submitter**

First Name: Shelly

Last Name: Tracy

Phone: 0945

Email: shellyt

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**Course Prefix and Number:** APR - 115UW

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**# Credits:** 2

**Contact hours**

Lecture (# of hours):

Lec/lab (# of hours): 40

Lab (# of hours):

Total course hours: 40

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.

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**Course Title:** Substation Metering & Relay Overview

**Course Description:**

This course introduces the apprentice to the duties of Substation Metering & Relay Technicians. It outlines how to perform testing, calibration, maintenance, installation and trouble shooting on new or existing equipment and circuit installation. It also details how to obtain line fault data and investigate equipment outages throughout the system on substations and/or switch yard equipment. In addition, this course provides the student with one-on-one time spent in the field with a Substation Metering & Relay Technician.

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**Type of Course:** Career Technical Apprenticeship

Can this course be repeated for credit in a degree?

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):** Electrical Apprenticeship AAS

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?

Yes

**Recommendations:** None

**Requirements:** Apprentices must attend all required days to be eligible for program credits.

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 Only

**Audit:** No

When do you plan to offer this course?

Not every term

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?

No

Will this course appear in the schedule?

No

**Student Learning Outcomes:**

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

1. list and describe the daily functions performed by Substation Metering & Relay Technicians, including work done under the supervision of a manager, and discuss common work environments and expectations,
2. outline substation entry prerequisites, including system controls, signing the log book, observing security protocols and using personal protective equipment (PPE),
3. describe how Substation Metering & Relay Technicians maintain and test transformers, meters and protective relays, both electromechanical and solid state,
4. explain the relevance of electrical, mechanical, and electronic component prints and schematics, technical instructions and diagrams, and personal computers,
5. review how technicians perform intricate and complex tests and calibrations on equipment, how they assess and interpret the test results, and how they use the information for further monitoring or to make improvement recommendations,
6. summarize the methods technicians use to analyze electrical, mechanical, and electronic component prints, schematics, and technical instructions and diagrams to resolve problems and improve equipment operation,
7. discuss relevant technical literature and current issues in technology improvement and electrical theory,
8. describe communication protocols between technicians and other groups and explain the importance of clear communication and the maintenance of accurate testing records,
9. outline the process for assessing and reviewing equipment and working with engineers to make installation, reliability, maintenance and design recommendations,
10. list the steps technicians take to prepare information and instruction materials to support and train peers,
11. describe how technicians identify and resolve equipment outages to rapidly restore power to customers.

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This course does not include assessable General Education outcomes.

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**Major Topic Outline:**

1. Accurate, timely Meter Data Collection (MDC) data gathering and maintenance of energy usage information through operations of the MDC.
2. Troubleshoot existing and new meter communication installations.
3. Analyze energy consumption patterns to identify metering discrepancies.
4. Ensure data used for billing and retail products.
5. Provide support to Metermen for the installation of Automated Meter Infrastructure (AMI) meters.

**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

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