

Clackamas Community College
Online Course/Outline Submission System

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Section #1 General Course Information

Department: Apprenticeship

Submitter

First Name: Shelly

Last Name: Tracy

Phone: 0945

Email: shellyt

Course Prefix and Number: APR - 122UW

Credits: 5

Contact hours

Lecture (# of hours): 55

Lec/lab (# of hours):

Lab (# of hours):

Total course hours: 55

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: Fundamental Substation Wireman II

Course Description:

Fundamental Substation Wireman II identifies the role that transformers play in substations and takes a closer look at on-the-job safety. Included will be information on transformer construction, connections, tap changers and protection, as well as an introduction to transformer test instruments. Safety aspects will include lock-out/tag-out procedures, transformer hazards, grounding and step and touch potentials. Safety will be covered in greater detail, focusing on protective grounding live-line tools and arc flash compliance. This course is part of the NJATC substation curriculum.

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?

Yes

Pre-reqs: Successful completion of APR-121UW

Have you consulted with the appropriate chair if the pre-req is in another program?

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?

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?

✓ **Winter**

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. describe lock-out/tag-out procedures,
2. explain how transformers are installed and connected to the system,
3. list transformer and other test instruments,
4. explain how transformer tap changers work,
5. identify the hazards of step and touch potential,
6. explain how power factor and harmonics affect the power system,
7. recall OSHA resources pertaining to substation safety,
8. describe the processes of substation safety such as, applying personal protective grounds, vehicle grounding, and applying rubber protective devices;
9. explain how to use live line tools,
10. recall substation distribution circuit operation,
11. describe substation operations and maintenance procedures.

This course does not include assessable General Education outcomes.

Major Topic Outline:

1. Safety awareness on the job.
2. Lock-out /Tag-out - substation applications.
3. Introduction to transformers.
4. Introduction to test instruments.
5. Conducting transformer load checks.
6. Transformers – three-phase
7. Specific hazards working with transformers
8. Grounding in substations.
9. Step and touch Potential.
10. OSHA 1910.269 pu) (Substations).
11. Arc Flash compliance.
12. Applying Rubber Protective Devices.
13. Live Line Tools – Introduction, Identification, and Care.
14. Substations – Operations and Maintenance.
15. Safety in Substations and Switchyards.

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:

Specify term: Winter 2015
