

**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

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**Course Prefix and Number:**APR - 237IE

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**# Credits:**3**Contact hours**

Lecture (# of hours): 36

Lec/lab (# of hours):

Lab (# of hours):

Total course hours: 36

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:**Electrical Design II**Course Description:**

Provides design criteria for commercial and industrial electrical, by using the National Electric Code (NEC) and Oregon Specialty Code (OESC). To design and calculate service as well as other aspects of commercial and industrial electrical installations.

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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):**Electrician Apprenticeship Technologies AAS and CC

Are there prerequisites to this course?

**Yes**

**Pre-reqs:**APR-136IE

**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?

**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. identify proper service size for commercial projects,
2. identify proper service size for industrial projects,
3. apply proper demand to restaurant kitchen equipment,
4. determine grounding and bonding requirements,
5. compare standard versus optional calculations,
6. understand voltage drop in branch circuits,
7. understand HVAC and other air handling systems,
8. understand freezers and coolers and other compressor loads,
9. design circuits for industrial equipment,
10. determine equipment load and NEC requirements for disconnect and overcurrent protection,
11. design service and distribution systems for a commercial as well as industrial building.

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***This course does not include assessable General Education outcomes.***

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**Major Topic Outline:**

1. Commercial calculations using NEC and OESC.
2. Industrial calculations using NEC and OESC.
3. Standard versus optional calculation.
4. Proper grounding and bonding in commercial and industrial.
5. HVAC and other air handling systems.
6. Welders circuits.
7. Restaurant design.
8. Manufacturing plants-design and layout.

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

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |
| 4. Clean up natural environment      | <b>No</b> |
| 5. Supports green services           | <b>No</b> |

Percent of course:0%

**First term to be offered:**

**Next available term after approval**

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