

Clackamas Community College
Online Course/Outline Submission System

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Section #1 General Course Information

Department: Manufacturing

Submitter

First Name: **Abe**
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Email: **abef**

Course Prefix and Number: RET - 213

Credits: 3

Contact hours

Lecture (# of hours):
Lec/lab (# of hours): 66
Lab (# of hours):
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: Renewable Energy III: Installation & Maintenance

Course Description:

The third in a series of technical courses, Renewable Energy III: Installation and Maintenance will provide an introduction to installation and maintenance of renewable energy systems for commercial and residential installations. Students will apply their knowledge of electro-mechanical systems to the application of these systems. Topics covered will include site survey, site preparation, building codes, measurement tools, preventative maintenance and worksite safety. Includes hands-on lab exercises.

Type of Course: Career Technical Preparatory

Is this class challengeable?

Yes

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): Manufacturing Programs

Are there prerequisites to this course?

Yes

Pre-reqs: RET-211

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?

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?

- Summer
- Fall**
- Winter
- Spring
- Not every term
- Not every year

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. demonstrate site analysis, preparation, and connection;
2. describe energy system technology as it relates to installing a renewable energy system;
3. demonstrate measurements of electricity, temperature, and fluid as well as wind and solar energy;
4. demonstrate maintenance and repair of RET systems.

This course does not include assessable General Education outcomes.

Major Topic Outline:

1. Installation.
 - a. Site Survey
 - b. Structural – building mounting systems
 - c. Conversion – assembling conversion systems
 - d. Connection - wiring the system
 - e. Inverter – connecting inverters
 - f. Storage- wiring battery storage
 - g. Control – Automation basics
 - h. Monitoring – Data logging/ metering
2. Measurement Tools & Techniques
 - a. Voltage Measurement
 - b. Current Measurement
 - c. Resistance Measurement
 - d. Power Measurement
 - e. Solar Insolation Measurement
 - f. Wind Speed Measurement
 - g. Wind Direction Measurement
 - h. Temperature measurement tools/methods
 - i. Fluid flow rate measurement

- j. Heat gain/loss measurement
- 3. Maintenance/ Repair
 - a. Safe Practices
 - b. PM across the RET systems
 - c. Bearings/lubrication
 - d. Battery testing/maintaining
 - e. Impeller inspections/ cleaning
 - f. Brushes – inspection/replacement
 - g. Electrical connection testing/ inspection/cleaning
 - h. Propeller inspection/ cleaning
 - i. Barnacles
 - j. De-calcification/mineralization
 - k. Automotive PM principles
 - l. Troubleshooting principles

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

:
