RENRG 103 Course Outline as of Fall 2024

CATALOG INFORMATION

Dept and Nbr: RENRG 103 Title: GRID TIE RES PV BASICS Full Title: Basics of Grid Tie Residential Systems Last Reviewed: 11/25/2019

| Units | | Course Hours per Week |] | Nbr of Weeks | Course Hours Total | |
|---------|------|-----------------------|------|--------------|---------------------------|-------|
| Maximum | 3.00 | Lecture Scheduled | 2.00 | 17.5 | Lecture Scheduled | 35.00 |
| Minimum | 3.00 | Lab Scheduled | 3.00 | 6 | Lab Scheduled | 52.50 |
| | | Contact DHR | 0 | | Contact DHR | 0 |
| | | Contact Total | 5.00 | | Contact Total | 87.50 |
| | | Non-contact DHR | 0 | | Non-contact DHR | 0 |

Total Out of Class Hours: 70.00

Total Student Learning Hours: 157.50

| Title 5 Category: | AA Degree Applicable |
|-------------------|---|
| Grading: | Grade Only |
| Repeatability: | 00 - Two Repeats if Grade was D, F, NC, or NP |
| Also Listed As: | |
| Formerly: | |

Catalog Description:

An introductory level integrated lab-lecture course to provide knowledge and skills needed to understand the relationships between designing, installing, and selling a typical residential grid tie solar photovoltaic (PV) system.

Prerequisites/Corequisites:

Recommended Preparation:

Eligibility for ENGL 100 OR EMLS 100 (formerly ESL 100) and completion of MATH 150 or equivalent

Limits on Enrollment:

Schedule of Classes Information:

Description: An introductory level integrated lab-lecture course to provide knowledge and skills needed to understand the relationships between designing, installing, and selling a typical residential grid tie solar photovoltaic (PV) system. (Grade Only) Prerequisites/Corequisites: Recommended: Eligibility for ENGL 100 OR EMLS 100 (formerly ESL 100) and completion of

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

| AS Degree: CSU GE: | Area Transfer Area | Effective: Effective: | Inactive: Inactive: |
|-----------------------|-----------------------|--------------------------|------------------------|
| IGETC: | Transfer Area | Effective: | Inactive: |
| CSU Transfer | : Effective: | Inactive: | |
| UC Transfer: | Effective: | Inactive: | |

CID:

Certificate/Major Applicable:

Certificate Applicable Course

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

1. Determine appropriate solar technologies for a given site.

2. Utilize shade analysis and clearance requirements for optimal placement and orientation of solar arrays on roof or ground installations.

Objectives:

At the conclusion of this course, the student should be able to:

1. Describe phases of a solar PV project from initial customer contact to completion.

- 2. Analyze a site to determine the best location to install a system.
- 3. Describe mounting methods on different roofing materials and soil types.
- 4. Document how storage systems can benefit a solar project.

Topics and Scope:

- I. Utility Structures, Rate Schedules and Energy Savings
 - A. Overview of utility companies
 - B. Consumer utility rate schedules
 - C. Electric bill interpretation
 - D. Distributed-generation versus centralized-utility models
 - E. System sizing based on customer current and future use
- II. Fire Clearances and Permitting Issues
 - A. Relevant building and fire codes
 - B. The permitting process
- III. Electrical Storage System Design
 - A. Suitable applications and conditions
 - B. Battery types
- **IV. Basic Electrical Components**

- A. Conduit design
- B. Inverters and rapid shut-down devices
- C. Disconnects
- D. Monitoring components
- V. Roof-Mounted Systems
 - A. Modifications to existing roofs
 - B. Attachment components and methods
 - C. Installation for new roofs
- VI. Basics of Ground-Mounted Systems
 - A. Foundation systems
 - B. Racking systems
- VII. Electrical Loads
 - A. Determination of critical loads
 - B. Evaluation of future loads
 - C. Evaluating suitability of existing electrical system
- VIII. System Aesthetics
 - A. Ground-mounted versus roof-mounted systems
 - B. System visibility and aesthetics
- IX. Basic Site Safety and Staging
- X. Site Planning
 - A. Shade analysis
 - B. Roof tilt and orientation
 - C. Roof-mounting versus ground-mounting
- XI. Ethics and Customer Service
 - A. Responding to questions or requests from customers
 - B. Site preparation and use of tarps, furniture covers, and walkway linings
 - C. Service tips to leave a favorable, memorable impression with customers
 - D. Quality system installations
 - E. Preparation for the final departure of a project site
 - F. System monitoring

The above Topics and Scope apply to both lecture and lab course components in an integrated format.

Assignment:

- 1. Assigned readings (10-30 pages per week)
- 2. Problem sets and tasks (6-20)
- 3. Quizzes (5-10)
- 4. Midterm exam
- 5. Final exam

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course. Writing 0 - 0% Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or noncomputational problem solving skills.

Problem sets and tasks

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including performance exams.

None

Exams: All forms of formal testing, other than skill performance exams.

Quizzes, midterm and final

Other: Includes any assessment tools that do not logically fit into the above categories.

Participation

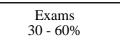
Representative Textbooks and Materials:

Photovoltaic Systems. 3rd ed. Dunlop, James. American Technical Publishers. 2012 (classic) Instructor prepared materials

| | Problem solving 30 - 60% |
|-------|-----------------------------|
| skill | |

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| Skill Demonstrations | |
|----------------------|--|
| 0 - 0% | |



Other Category 0 - 10%