

RENRG 103 Course Outline as of Fall 2020**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 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 ESL 100 and completion of MATH 150 or equivalent

Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree: **Area** Effective: Inactive:

CSU GE: **Transfer Area** Effective: 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 non-computational problem solving skills.

Problem sets and tasks

Problem solving
30 - 60%

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

None

Skill Demonstrations
0 - 0%

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

Quizzes, midterm and final

Exams
30 - 60%

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

Participation

Other Category
0 - 10%

Representative Textbooks and Materials:

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