**Course Title:** Applied Renewable Energy Systems

**Department:** STEAM

**Curriculum:** Tech Studies: Energy Management Option

**Date submitted:** March 2020 (ACC: 20-18)

**Course Code:** (eg. ACC 101) NRG 130

**Course Type:** X

**Double Credits:** No

**Elective Type:** G

**Credit Hours:** 3

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<th>Developmental</th>
<th>Lecture</th>
<th>Clinical</th>
<th>Lab</th>
<th>Studio</th>
<th>Other</th>
<th>TOTAL</th>
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<td>0</td>
<td>1.5</td>
<td>0</td>
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**Class Maximum:** 24

**Semesters Offered:** Sp/F

**Prerequisites:**
- C- or higher in PHY 121 – General Physics I
- NRG 123 – Energy Efficiency Methods

**Corequisites:** None

**Other Requirements:** None

**Catalog Course Description:**
Focuses on the practical application of renewable energy technologies. Topics include energy and resource conservation and project siting, economics, financing, renewable energy and tax credits, technical and engineering aspects, regulatory issues, energy storage, monitoring and verification. Students study the advantages, limitations and potential of various energy sources. Wind, solar, small-scale hydro, ground-source heat pumps, combined heat and power, biofuels, fuel cells, and other technologies are examined. Students will learn the strategies and cost/benefit analyses employed by energy analysts to meet demand with clean energy production. Students will also complete their own study and proposal for a renewable energy project.

**Topical Outline:**
- Energy Sources and Environmental Effects
- Electrical Fundamentals
- Solar Photovoltaics
  - Solar Power Systems - Electrical
  - Solar Power Systems - Thermal
  - Solar Tracking
  - Detailed design project using commercial design methods and tools
### Outcomes:
Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.

Upon successful completion of this course, the student will be able to do the following:

1. demonstrate an ability to use critical thinking and problem-solving skills to evaluate business energy use and how and when to apply renewable energy solutions
2. demonstrate an understanding of, and assess the obstacles associated with implementation of renewable energy systems
3. evaluate the advantages, limitations and potential of various clean energy sources for buildings and businesses
4. demonstrate an understanding and familiarity with engineering and financial aspects of projects
5. demonstrate an understanding and familiarity with the regulatory aspects of renewable energy projects
6. demonstrate an understanding and familiarity with the State policies, financing and utility-led programs in CT
7. produce a clean energy project proposal

### TECH STUDIES PROGRAM, ENERGY OPTION: *(Numbering reflects Program Outcomes as they appear in the college catalog)*

2. utilize the tools, materials, techniques, and technical processes of engineering and technology when solving technical problems
6. identify energy conversion processes and their relation to engineering and technology

### GENERAL EDUCATION:
None

### Evaluation:
List how the above outcomes will be assessed.

Assessment will be based on the following criteria:

- Class Participation
- Homework Assignments
- Project Presentation(s)
- Quizzes/Tests
### Instructional Resources:
List library (e.g. books, journals, online resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.

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<tr>
<th>Required:</th>
<th>Smartboard</th>
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<td>Desired:</td>
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### Textbook(s)
Suggested:
