

# Washtenaw Community College Comprehensive Report

## ELE 106 Renewable Energy Technology Effective Term: Winter 2020

### Course Cover

**Division:** Advanced Technologies and Public Service Careers  
**Department:** Advanced Manufacturing  
**Discipline:** Electricity/Electronics  
**Course Number:** 106  
**Org Number:** 14400  
**Full Course Title:** Renewable Energy Technology  
**Transcript Title:** Renewable Energy Technology  
**Is Consultation with other department(s) required:** No  
**Publish in the Following:** College Catalog , Time Schedule , Web Page  
**Reason for Submission:**  
**Change Information:**

**Consultation with all departments affected by this course is required.**

**Rationale:** three year review

**Proposed Start Semester:** Fall 2019

**Course Description:** In this course, students will receive a comprehensive introduction to the principles and practical applications of solar, wind, micro-hydro and other renewable energy technologies. Motivations for developing renewable energy will be examined and students will evaluate their personal energy footprint and create a plan to reduce it. Demonstrations, field trips and labs will provide direct contact with the technology. Students will complete a written design project to explore one technology in depth.

### Course Credit Hours

**Variable hours:** No

**Credits:** 3

**Lecture Hours: Instructor:** 45 **Student:** 45

**Lab: Instructor:** 0 **Student:** 0

**Clinical: Instructor:** 0 **Student:** 0

**Total Contact Hours: Instructor:** 45 **Student:** 45

**Repeatable for Credit:** NO

**Grading Methods:** Letter Grades

Audit

**Are lectures, labs, or clinicals offered as separate sections?:** NO (same sections)

### College-Level Reading and Writing

College-level Reading & Writing

### College-Level Math

Level 3

### Requisites

### General Education

## **Request Course Transfer**

### **Proposed For:**

## **Student Learning Outcomes**

1. Identify key components and principles of solar voltaic and solar thermal renewable energy technologies.

### **Assessment 1**

Assessment Tool: Comprehensive Final Exam

Assessment Date: Fall 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: A minimum of 70% of students will correctly answer each outcome-related question

Who will score and analyze the data: Full-time department faculty

2. Identify key components and principles of non-solar renewable energy technologies.

### **Assessment 1**

Assessment Tool: Comprehensive Final Exam

Assessment Date: Fall 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: A minimum of 70% of students will correctly answer each outcome-related question

Who will score and analyze the data: Full-time department faculty

3. Complete a simplified renewable resource assessment and design a small-scale renewable energy system.

### **Assessment 1**

Assessment Tool: Renewable Energy Design Project

Assessment Date: Fall 2021

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Rubric

Standard of success to be used for this assessment: A minimum of 70% of the students will score 70% or higher on the Design Project

Who will score and analyze the data: Full-time department faculty

## **Course Objectives**

1. Identify the rationale for implementing renewable energy technologies.
2. Analyze personal or family energy footprint using a carbon footprint calculator and identify ways to personally reduce carbon emissions.
3. Identify key components and principles of a solar photovoltaic system.
4. Identify key components and principles of a solar thermal system.
5. Identify key components and principles of a wind turbine system.
6. Identify key components and principles of a micro-hydro system.
7. Evaluate the economics of a renewable energy system.
8. Evaluate a home or small business site for suitability of solar photovoltaic, solar thermal, passive solar, wind turbine or micro-hydro energy.

9. Identify the energy potential, develop specifications, identify components, and determine costs for a renewable energy system for a home or small business.

## New Resources for Course

### Course Textbooks/Resources

Textbooks

Manuals

Periodicals

. *Home Power Magazine*, Home Power Magazine Volume 2018

Software

Solar Pathfinder Assistant. Solar Pathfinder, 5 ed.  
shade analysis software to use with Solar Pathfinder

### Equipment/Facilities

Level III classroom

Computer workstations/lab

Other: TI 143 (Industrial Electronics Lab) Equipment for weekly labs, e.g. solar panels, meters, solar pathfinders, Pathfinder Assistance software, online Apps...

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
<b>Faculty Preparer:</b> <i>Dale Petty</i>	<i>Faculty Preparer</i>	<i>Feb 17, 2019</i>
<b>Department Chair/Area Director:</b> <i>Thomas Penird</i>	<i>Recommend Approval</i>	<i>Mar 08, 2019</i>
<b>Dean:</b> <i>Brandon Tucker</i>	<i>Recommend Approval</i>	<i>Mar 11, 2019</i>
<b>Curriculum Committee Chair:</b> <i>Lisa Veasey</i>	<i>Recommend Approval</i>	<i>Jul 10, 2019</i>
<b>Assessment Committee Chair:</b> <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Jul 18, 2019</i>
<b>Vice President for Instruction:</b> <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Jul 26, 2019</i>