

NEW COURSE DEVELOPMENT OR EXISTING COURSE ASSESSMENT REPORT

PREPARED BY: Glen D. Martin

DATE: ____

COURSE TITLE: Alternate Energy Sources for Residential Construction

New course: or Existing course: Department: Carpentry Technology

Credit Hours: 2 Lecture Hours Per Week: 22 Lab Hours Per Week: ____

Is this course required for a Degree or Certificate? Yes if so, list which ones below.

Course will be included Carpentry Technology AAS Degree, but will also be offered as a Cont. Ed class for the general public as an informational no credit class.

COURSE DESCRIPTION:

Introduction to alternative energy sources, (solar, wind, geothermal) , their principles and applications for residential construction. Mode of instruction will include lectures, guest speakers, field trips and practical lab/shop applications

PREREQUISITES:

Required:

- None

RESOURCES USED TO PREPARE THIS COURSE:

Material and concepts from:

Green from the Ground Up; David Johnston, Scott Gibson
Green Building Fundamentals: Michael Montoya
Your role in the Green Environment; NCCER
Profit from Building Green; Jeannie Sikora, NAHB
Built Green, King and Snohomish Master Builders Assoc.
Geothermal Heat Pump Consortium; www.geoexchange.org
Solar Washington: www.solarwa.org

TEXTBOOKS USED BY STUDENTS

Toward a Zero Energy Home. Johnston and Gibson

GENERAL COURSE GOAL:

To make students aware of the various types and application of Alternate Energy for residential homes.

COURSE OUTCOMES:

At the conclusion of this course, students will be able to:

- a) Explain solar power and wind power principles
- b) Identify components and their installation considerations of wind and solar power
- c) Describe principles of geo-thermal heating and cooling systems
- d) List various career opportunities associated with alternative energy

METHODS OF ASSESSMENT:

1. Weekly research assignments
2. Final Group presentation on a assigned topic
3. Practical lab situations developed by instructor(s) (Lab-Volt sytems if approved by Dean)

METHODS OF INSTRUCTION MAY INCLUDE:

- a) Lecture
- b) Lab
- c) Field trips/guest speakers

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TOPICAL OUTLINE:

INSTRUCTIONS: In the spaces below, develop instructional units and show the topics that support each unit. Note: For each topic, indicate which industry-derived skills are addressed by the topic. To do this, you must first choose which skill set you are using. The choices are below. Please place an "x" by the skill set you will use. (Choose only one.)

Energy Project/Program Management. Section D Educate and Train focusing on conducting outreach and advocacy for energy conservation

Commercial Building Analyst

Cite the code number for each skill from the Skill sheet. Put it AFTER each topic description.

Unit 1: Conventional Energy resources and economic impact. PM-D3

1. Coal, hydro, oil and nuclear energy sources
 - a. Economic and Environmental cost and effect
2. Current and future energy demands in residential/multifamily homes

Unit 2: Passive Solar Design principles. PM-D3

1. Orientation, shading, thermal mass
 - a. Glazing, overhangs, back up heating/cooling

Unit 3: Solar Energy Principles. PM-D3, PM-D8, PM-D6

1. Photovoltaic Principles
 - a. Types of cells
 - b. Orientation
2. Types of Photovoltaic systems
 - a. Grid Tied Systems
 - b. Battery backup systems
 - c. Stand along (Off the grid) systems
3. Installation principles New Construction
 - a. Roof Mount, Rack mount, roof integrated
4. Installation principles Existing Structures
 - a. Roof Mount, Rack mount, roof integrated
5. Solar Hot water systems
 - a. Active systems
 - b. Passive systems

Unit 4: Wind Energy Principles. PM-D3, PM-D8, PM-D6

1. Utility Wind Farms

2. Residential Wind Turbines
3. Wind vs Solar

Unit 5: Geothermal Principles and Systems. PM-D3, PM-D8, PM-D6

1. Horizontal Ground Linked Systems
2. Open Loop Systems
3. Closed loop systems

Unit 6: Net Zero Home Principles and Practices

1. Local Projects and Contractors

Unit 7: Career Opportunities in Residential Alternative Energy PM-D3

1. Training programs
2. Income potential
3. Employment outlook

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