

# **ELE 176**

## **Introduction to Alternative Energy Including Hybrid Systems**

### **COURSE OUTLINE**

#### **Prerequisites:**

**Prerequisite:** MTE 1, 2 and 3. **Co-requisite:** ELE 130, ELE 133, ELE 130 or ETR 113 or approval from Program Head.

#### **Course Description:**

Introduces Alternative Energy with an emphasis on solar photovoltaic systems, small wind turbines technology, the theory of PV technology, PV applications, solar energy terminology, system components, site analysis, PV system integration and PV system connections and small wind turbine technology site analysis.

**Semester Credits: 3 Lecture Hours: 2 Lab/Recitation Hours: 2**

VIRGINIA WESTERN COMMUNITY COLLEGE  
PO Box 14007  
Roanoke, VA 24038  
(540)-857-7273



# ELE 176, Introduction to Alternative Energy Including Hybrid Systems

## Course Outcomes

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

- A. Understand the importance of energy conservation through efficient building design and energy efficient technologies.
- B. Be able to define renew energy.
- C. Understand the fundamentals of several kinds of renewable energy sources or systems.
- D. Selected topic on renewable energy and do a 10 to 15 minute presentation on the topic.
- E. Identify and major components of a hybrid renewable energy system and explain the function of each major component.

VIRGINIA WESTERN COMMUNITY COLLEGE  
PO Box 14007  
Roanoke, VA 24038  
(540)-857-7273



# ELE 176, Introduction to Alternative Energy Including Hybrid Systems

Required Materials:

None

Textbook:

1. Textbook: The Renewable Energy Handbook  
Author: Nelson  
Publisher: CRC Press  
ISBN: 978143983447
2. Laboratory Experiments -- Experiments will be distributed at appropriate times.
3. Laboratory Equipment -- Laboratory machines and instruments will be provided at appropriate times.

VIRGINIA WESTERN COMMUNITY COLLEGE  
PO Box 14007  
Roanoke, VA 24038  
(540)-857-7273



# **ELE 176, Introduction to Alternative Energy Including Hybrid Systems**

Topical Description:

- Chapter 1. Introduction to Renewable Energy Systems  
Special Topics: Small Wind turbine Technology (material provided by instructor)
- Chapter 2. Solar Thermal Energy
- Chapter 3. Solar Photo Voltaic Energy
- Chapter 4. Bio-energy Systems
- Chapter 5. Hydro Electrical Power
- Chapter 6. Tidal Power
- Chapter 7. Wind Energy
- Chapter 8. Wave Energy
- Chapter 9. Geothermal Energy

VIRGINIA WESTERN COMMUNITY COLLEGE  
PO Box 14007  
Roanoke, VA 24038  
(540)-857-7273



# **ELE 176, Introduction to Alternative Energy Including Hybrid Systems**

Notes to Instructors

1.

VIRGINIA WESTERN COMMUNITY COLLEGE  
PO Box 14007  
Roanoke, VA 24038  
(540)-857-7273

