

Common Course Outline
AIRC 230
Alternative and Renewable Energy Sources
3 Semester Hours

The Community College of Baltimore County

Description

AIRC 230 – 3 Credits –Alternative and Renewable Energy Sources provides a comprehensive overview of renewable energies as applied to the HVAC industry. Topics are to include Solar PV, Solar HW, Geothermal HP, wind and other related technologies. Discussion covers the principles of solar home design for both heating and cooling for new and existing construction.

3 credits: 2 lecture hours; 2 lab hours per week

Prerequisites: AIRC 210, AIRC 205, ELEI 101 or approval of program coordinator

Overall Course Objectives

Upon completion of this course the student will be able to:

1. classify and describe the different types of renewable energy systems, including solar energy (PV & HW), wind power, hydropower;
2. assess renewable energy systems for their economic and environmental impacts;
3. explain the economics of combining energy conservation and renewable energy projects;
4. explain the effects of government regulations, politics, and corporate development on the renewable energies industry;
5. evaluate a solar energy system for its cost effectiveness and its quality of design;
6. design a solar energy system;
7. estimate the amount of energy available from wind, water, solar, and other renewable energy systems at a site, given the appropriate data; and
8. explore the types of job opportunities available in the renewable energies industry and investigate the skills required for these jobs.

Major Topics

- I. Overview of the Energy Situation
- II. Determine Energy Requirements
- III. Effect of Government Regulation on the Renewable Energies Industry
- IV. Solar Basics and Solar Thermal Power
- V. Wind Power
- VI. Hydropower
- VII. Photovoltaics
- VIII. State of the Industry

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member and will be provided on the first day of class.

The following will be required for this course:

1. Quizzes , Qty. - 2
2. Lab Projects , Qty.- 2
3. Homework Assignments, Qty. - 2

Written paper or suitable practical project

If a written paper is assigned, the following will apply:

Topic of the paper will be selected by the student with instructors approval and should relate to the subject material of the course.

4. Midterm exam
5. Comprehensive final.

Other Course Information

This course is a AlternativeEnergy Systems Certificate core course and an HVACR elective.

Date Revised: 2/15/11