

# Common Course Outline

## ENVS 168

### Advanced Energy Technologies

3 Semester Hours

## The Community College of Baltimore County

### Description

ENVS 168 - 3 Credits - Advanced Energy Technologies considers environmental, social, and economic impacts of various energy technology choices. Students explore advanced energy generation technologies such as solar, wind, geothermal, biomass, and fuel cells. Alternative energy distribution mechanisms, such as energy storage systems and off-peak production alternatives, are assessed. Students use life cycle costing methodologies to evaluate and select energy technologies, as well as develop conversion and implementation strategies.

3 credits; 3 lecture hours; Prerequisite: ENVS 101 and Math 082, or sufficient math placement score, or consent of the instructor.

### Overall Course Objectives

Upon successful completion of ENVS 168, a student will be able to:

1. explain current types and trends of advanced energy resources;
2. assess environmental impacts of energy use that alternative energy can mitigate;
3. describe unconventional energy systems;
4. specify research which may lead to as yet unidentified energy resources;
5. estimate the costs of advanced energy systems;
6. perform life cycle analyses;
7. assess potential benefits of advanced energy technology in:
  - a. construction;
  - b. transportation, and;
  - c. industry.
8. quantify environmental benefits of advanced energy use;
9. explain the relationship between conservation and advanced energy resources;
10. evaluate the role of government policy on advanced energy technology use;
11. critically evaluate alternative energy information sources, and;
12. develop informed views and perspectives on alternative energy policy.

### Major Topics

- I. Current context of advanced energy use
- II. Advanced energy generation and distribution systems
- III. Environmental impacts of energy use and how technology choice affects impacts
- IV. Costs of advanced energy alternatives, including life cycle analysis
- V. Evaluation and selection of advanced energy technologies
- VI. Use of passive and active solar radiation collection
- VII. Advanced energy in transportation and industry
- VIII. Energy efficiency and demand side management
- IX. Energy services, energy intensity, and innovative approaches to energy management
- X. Policy support for advanced energy resources
- XI. Role for advanced energy in our energy future

### Course Requirements

Instruction will include reading assignments, lectures, class discussions, demonstrations, group projects, and local experts as guest speakers. Grading will be based on written or oral exams, written assignments or papers, assigned projects, and participation in class discussions and activities.

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