THE CENTER FOR
PROFESSIONAL STUDIES

Alternative Energy Technologies Overview

This course focuses on gaining a basic understanding of the various alternative energy technologies (wind, solar, biomass, geothermal) and their real-world benefits and applications. At the completion of this course the participant will have an understanding of the elements of each basic technology, its application, feasibility analysis, and the basic business elements.

- First, the basics of alternative energy technologies are discussed to gain a common understanding of the basic principles, operation, and application guidelines of each technology.

- Next, participants will acquire a more detailed understanding of each technology regarding the operating environment, strengths / weaknesses of each technology, and developing operational feasibility analysis for potential application of the technology.

- Lastly, participants will combine the operational feasibility analysis with financial / business case analysis tools to develop "real-world" applications analysis usable in the evaluation of alternative energy technology application.

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Course Syllabus

I IDENTIFYING INFORMATION

Course:	Alternative Energy Technologies Overview
Prerequisite:	None
Time Frame:	40 total contact hours
Instructor:	Bill Szuch
	BS in Mechanical Engineering and an MBA
	30 years in the product design engineering profession
Mobile:	Bill Szuch (248) 762-2281
E-mail:	wgsz@comcast.net

II REFERENCE MATERIALS

1. Relative technical articles to be discussed during class

III COURSE GOALS AND OBJECTIVES

1. Understand what the basic types of alternative energy technologies are.
2. Understand how different alternative energy technologies compare to each other and vs. current technologies.
3. Understand the basic terminologies and principles so as to be able to converse with Alternative Energy representatives in pursuing new career opportunities.
4. Understand the technological strengths and weaknesses of each technology.
5. Understand the economic strengths and weaknesses of each technology.
6. Understand the “big picture” of how alternative energy technologies fit into future economic / government scenarios to assess their relative future strength and thus the best career path.
7. Develop an awareness of the major players in each technology field and their future business direction.

IV METHODOLOGY

This course is a macro view of alternative energy technologies and their application. The material will progress from basic descriptions of the technologies to operational descriptions and finally with operational feasibility and financial analysis. A computer with Microsoft EXCEL is essential for applying the tools in this course.

Lectures

Each detailed subject will be presented in a lecture format outlining the theory and basic operation. A PDF file of the lecture material will be provided for the student's personal use as reference material. Lecture note outlines will be distributed to the students for each lecture to help the student capture personal notes.

Specific Examples

Real life examples will be covered that detail out the application of each technology to demonstrate how different technologies can be applied in differing situations. This will give the students a clear understanding of how and why these technologies are utilized in different environmental and business situations.

In-Class Assignments

Using the theory and technology examples the student will conduct several projects that outline the application of each key technology. These in-class projects (approximately 6) will be team projects and will focus on real-world examples of the application of each technology. They will require the students to research the example, assemble data, and develop business and technical analysis summaries. The students will present their work to the other teams for review and discussion. Data and conclusions from all of the projects will be summarized on an EXCEL spreadsheet file and sent to the students in electronic format at the conclusion of the course.

V COURSE OUTLINE & ASSIGNMENTS

Module 1

Introduction to Alternative Energy Technologies	PowerPoint lecture
Wind Turbine Overview	PowerPoint lecture
Wind Turbine Project (residential)	Complete & present
Wind Turbine Project (utility wind farm)	Complete & present

Module 2

Solar (Photovoltaic) Overview	PowerPoint lecture
Photovoltaic Project	Complete & present

Module 3

Solar (Concentrator) Overview	PowerPoint lecture
Solar Concentrator Project	Complete & present

Module 4

Biomass Overview	PowerPoint lecture
Biomass Project	Complete & present

Module 5

Geothermal Overview	PowerPoint lecture
Geothermal Project	Complete & present

Final Project

Project Summary	Complete & present