

WE 3310.001– Wind Energy Economics and Finance Fall 2014

Instructor: Travis Roach
Place and Time: Livermore Center 104, MWF 9:00-1:50
Office: National Wind Institute 104
Office Hours: MWF 2:00-3:00, or by appointment
Skype Handle: travisroach1
Email, and Website: travis.roach@ttu.edu, www.travisroach.com

Reading Material

- *Required:* Creativity Inc.: Overcoming the Unseen Forces That Stand in the Way of True Inspiration
 - Authors: Ed Catmull and Amy Wallace
- *Recommended:* Economics of Regulation and Antitrust
 - Authors: Viscusi, Harrington, and Vernon

Course Description

The objective of this course is to give students an in-depth understanding of the economic and financial concepts involved in both the large-scale development of wind energy and in evaluating small-scale wind energy for home, farm, ranch, or business use. To achieve this goal, this course focuses on the market forces and natural forces that affect the development and deployment of wind energy.

Learning Outcomes

Upon completion of this course, students should be able to:

- a) Identify the cost components of developing, constructing, and operating a wind energy project and be able to produce estimates of each cost component.
- b) Produce a pro forma financial analysis for a wind energy project and determine the cost of energy necessary to produce a desired rate of return on investment.
- c) Compare and contrast the cost of energy from wind energy projects to that from traditional or competing sources of electricity generation.
- d) Understand economic concepts relative to operation of the electric grid including economic dispatch, environmental or renewable energy credits, nodal or zonal pricing, and marginal pricing.

- e) Appraise the risk factors or variables that will affect actual returns on investment and understand the sensitivity of returns to the potential range of such variables.
- f) Identify and understand the capital structures and data requirements for financing a wind energy project.
- g) Evaluate the economic impact of wind energy on landowners, rural areas, communities, and school districts.
- h) Analyze how federal, state, and community tax incentives and regulations affect the cost of energy from wind energy projects, and contrast such incentives to those received by competing forms of electric generation.
- i) Evaluate the benefits of and potential for green marketing for businesses.
- j) Appraise the opportunities for the U.S. to lead in development and manufacturing of wind and other renewable energy technologies.

Methods of Assessing the Expected Learning Outcomes

The expected learning outcomes for the course will be assessed through exams, in-class application activities, graded and non-graded quizzes, class discussion and participation, daily writing activities, and an end of the year project.

Description of How Grades are Determined

Exams

There will be two midterm exams and a cumulative optional exam during the final exam period at the end of the semester. Each exam will include 4-5 short answer questions. The optional exam at the end of the semester can be taken to lower the weighting of the other midterms. In the case that a student takes the optional test the grade will be calculated following “Grading Track 2.” Otherwise, “Grading Track 1” will be used to determine the final grade.

Business Development Project

This large-scale empirical project will take the place of the traditional final exam. In this project you will develop and analyze a potential wind project and assess its viability using a pro forma analysis. Details will be discussed as the semester progresses.

Quizzes, Homework

Your quizzes and homework account for 10% of the final grade, regardless of the grading option you choose. Thus, performance on quizzes and homework are critical factors in making an A instead of a B, and so on for C's and D's. Though it differs per person, a good rule of thumb for any class is to invest 3 hours per credit hour of time on preparation and homework. Keep in mind that working hard and "investing" early will pave the way for a comfortable retirement in the future.

<i>Grading Track 1</i>	<i>Grading Track 2</i>
10% - Quizzes, Homework	10% - Quizzes, Homework
30% - Business Development Project	30% - Business Development Project
25% - Lowest Midterm	15% - Low Midterm Test
35% - Highest Midterm	20% - High Midterm Test
	25% - Optional Cumulative Exam

Grading Scale

A = 100.00% - 89.50%

B = 89.49% - 79.50%

C = 79.49% - 69.50%

D = 69.49% - 59.50%

F = 59.49% - 0.00%

Examination Calendar

First Exam: Friday October 10th

Second Exam: Friday, November 21st

Optional Exam: ***Cumulative***: Tuesday 12/10 from 4:30-7:00 pm

Notes

Students are expected to assist in maintaining a classroom environment which is conducive to learning. In order to assure that all students have an opportunity to gain from time spent in class, unless otherwise approved by the instructor, **students are prohibited from using cellular phones, eating or drinking in class, making offensive remarks, using laptops for nonrelated class activities, reading newspapers, sleeping or engaging in any other form of distraction.** Inappropriate behavior in the classroom shall result in, minimally, a request to leave class.

Attendance is REQUIRED and will be MONITORED throughout the semester. Incidences of excessive absence will be dealt with in a manner consistent with University policy and procedures.

American with Disability ACT. Any student who, because of a disabling condition, may require special arrangements in order to meet course requirements should contact the instructor as soon as possible to make necessary accommodations. Students should present appropriate verification for Disabled Students Services during the instructor's office hours. Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in West Hall 335 or by phone at 806-742-2405.

Student Absence for Observation of Religious Holy Days. A student who is absent from classes for the observation of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence if, not later than the fifteenth day after the first day of the semester, the student had notified the instructor of each scheduled class that the student would be absent for a religious holy day.

Students are expected to have their ID's with them in class. The instructor reserves the right to ask a student to show his/her ID, especially during exams.

Any instance of cheating will result in an (F) for the course. The instructor reserves the right to pursue the matter further.