Fall 2010 Course Syllabus & Policies – Fundamentals of Wind Power

Course: ECE 457 - Fundamentals of Wind Power, 3(3,0)
Time: TBA, Room: TBA

Instructor: Dr. D. Dawson, Professor of Electrical/Computer Engineering, ddawson@clemson.edu

Office Hours: Posted outside of office or by appointment

Textbooks: E. Hau, Wind Turbines: Fundamentals, Technologies, Applications, Economics, Springer, 2nd Edition, 2006, (ISBN: 978-3-540-24240-6).

J. Wagner and D. Dawson, Fundamentals of Wind Power, Course Notes, 2010

References: F. M. Vanek and L. D. Albright, Energy Systems Engineering – Evaluation & Implementation, McGraw Hill, 2008. (ISBN: 0-07-149593-2)

T. Ackermann, Wind Power in Power Systems, Wiley, 2005. (ISBN: 978-0470855089)

T. Burton, D. Sharpe, N. Jenkins, and E. Bossanyi, Wind Energy Handbook, Wiley, 2001. (ISBN: 978-0471489979)

Catalog Description:

Introduction to wind turbine systems including wind energy potential and application to power generation. Topics include wind energy principles, wind site assessment, wind turbine components, power generation machinery, control systems, connection to the electric grid, and maintenance. *Prerequisite*: ECE 307 or ECE 320 or consent of instructor

Course Objectives[1]:

1. To develop historical and societal perspectives regarding the demand for mechanical and electrical power generation from wind using land/offshore turbines.
2. To identify and mathematically model the wind turbine components, calculate the available wind power, estimated electrical power generation, and predict vibration concerns based on a given design.
3. To numerically simulate the wind turbine dynamic system behavior with integration of components, sensors, and control for given operational location.
4. To evaluate the environmental, political, and economic issues associated with wind energy, and communicate ideas in clear and understandable manners within team setting.

Course Grading:

Midterm Exam	= 25 %
Homework (Assignments throughout the semester)	= 20 %
Design Project with Presentation	= 30 %
Final Exam	= 25 %
Total	= 100%

Grading Policy:

All questions and problems regarding grades must be presented in writing within one week after the test, homework, or project has been returned. Grades will be assigned based on all the work you have

completed during the semester following the traditional practice of A=90-100, B=80-89, C=70-79, D=60-69, F<60.

Class Attendance, Participation, and Student Feedback:

Regular class attendance and participation in discussions is expected with attendance taken. Students are responsible for all material covered and assigned during the semester. If you anticipate not being able to attend class for a particular reason, it is best to e-mail me with the information. The classroom learning experience depends on both a professional teaching environment and student participation.

Midterm & Final Exam:

There will be one test and no final exam for the course. Absence from the tests will be excused only for medical reasons or serious immediate family problems. A student who anticipates missing these tests for legitimate university or professional activities should talk with the instructor at least one week prior and discuss a resolution.

Homework:

Homework is important in learning and understanding key principles. No late homework will be accepted. The homework should be done in a professional manner.

Academic Honesty (Clemson University Catalog):

"*As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.*"

Project:

A semester long project will be assigned during the first week of class. These projects allow students to integrate the lecture concepts in a creative and innovative manner. Please note that the project is an important aspect of the course.

Computer Usage:

The software package MATLAB (The Mathworks) may be used in the assignments and project.

Learning Disabilities:

"It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities. Students are encouraged to contact Student Disability Services to discuss their individual needs for accommodation."

Any student with an official Clemson University recognized learning disability must inform the instructor within the first week of class meetings so that arrangements can be made to meet the student's needs.