WIND POWER SYSTEMS

NPRE 475

https://netfiles.uiuc.edu/mragheb/www
mragheb@illinois.edu

Spring 2010

Credit: 3 undergraduate hours or 4 graduate hours
Prerequisites: CS 101; MATH 241 or MATH 380; one of CHBE 421, ECE 110, ECE 205, ME 310, TAM 335

Outline

Broad and Basic coverage of wind energy systems; historical development, safety aspects, environmental considerations, wind properties and measurement, site selection and wind turbine design; transmission systems considerations; mechanical, electrical, control aerodynamic and environmental engineering of modern wind turbines; fatigue failure; annual power production; economics and environmental aspects and accident prevention and mitigation; computational fluid dynamics (CFD) analysis of wind flow and blade interactions; energy storage options; hydrogen production; electrical power transmission issues; licensing issues; alternative wind energy systems; design project involving a wind farm or the construction of a specific type of wind turbine, wind park site visit.

Recommended texts:

1. M. Ragheb, Lecture Notes on: "Wind Power Systems," Univ. of Illinois at Urbana-Champaign, 2005-2009.
2. Thomas Ackerman, Ed. "Wind Power in Power Systems," John Wiley and Sons, 2005.
3. John F. Walker and Nicholas Jenkins, "Wind Energy Technology," John Wiley and Sons, 1997.

Instructor:

Prof. M. Ragheb
O: 333-6569
L: 333-5187
H: 356-9193

Classes: MWF 11-12 am
Office: MWF 1-3 pm

Tests, Grade:

Two midterms and one final exam: 60 percent
Homeworks, quizzes, term paper or project: 40 percent
To obtain a full 4 hours credit, graduate students are expected to present a term paper or a project on an advanced topic related to the course.