EE551, Wind Energy: Course Information

Ryan T. Elliott

Winter 2018 Department of Electrical Engineering University of Washington

Summary

Prerequisites:	EE 233, EE 351 (EE 454 is useful too)		
Time:	We dnesdays $6{:}00{-}9{:}50~\mathrm{pm}$ in EEB 037		
Instructor:	Ryan Elliott ryell24@uw.edu		
Office hours:	TBD		
Midterm exam:	Wednesday, January 31, 2018, 6:00–8:00 pm in EEB 037		
Final projects:	Wednesday, March 14, 2018, 6:00–8:00 pm in EEB 037		
Website:	Canvas, https://canvas.uw.edu/courses/1128276		
Textbook:	e: Wind Energy: An IntroductionN: 9781482263992hor: Mohamed A. El-Sharkawi		
Grading:	Homework: 32% Midterm exam: 32% Final project: 32% Participation: 4%		

Course communication

This is probably the last piece of paper that you will receive from me for this course. All further group communications will take place through the website. You must also submit all coursework through the website. Please check it regularly to stay informed. If you click the address in the table above, it will take you directly to the class website.

Tentative timetable

Week	Date	Topic	Reference
1	1/3	Fluid mechanics and turbine aerodynamics	Ch. 1, Ch. 2
2	1/10	Wind statistics and review of ac circuits	Ch. 3
3	1/17	Transformers and induction machines	Ch. 6
4	1/24	Type 1 WTG principles	Ch. 8
5	1/31	Midterm exam	_
6	2/7	Type 1 and Type 2 WTG principles	Ch. 4, Ch. 9
7	2/14	Power electronics and Type 3 WTGs	Ch. 5, Ch. 10
8	2/21	Synchronous machines and Type 4 WTGs	Ch. 7, Ch. 11
9	2/28	Fundamentals of wind integration	Ch. 12
10	3/7	Dynamics and special topics	Ch. 12
11	3/14	Final project symposium	_

Learning outcomes

Upon completing this course, the student should understand:

- How wind turbines capture kinetic energy from wind and convert it into electricity
- How wind variability affects wind power production
- The fundamental principles of operation of asynchronous and synchronous generators
- The fundamental principles of operation of the 4 wind turbine types
- The basics of wind turbine control
- The relationship between wind and photovoltaic solar
- The challenges associated with integrating renewable energy into the grid

Homework

Written homework will be assigned weekly. It will typically be due one week after it is assigned and will consist of several problems or essay questions, often with multiple parts. Homework will be assigned and submitted through the course web site. Late homework will not be accepted without pre-approval. We aim to grade and return homework assignments in a timely manner.

Exams

There will be an in-class midterm examination as listed above. If you have a conflict with the exam time listed above, please contact me as soon as possible.

Project

Instead of a final exam, we will have a class project, to be done individually. Detailed information about the project requirements will be distributed following the midterm exam. The final projects will be presented during finals week according to the schedule listed above. Depending on enrollment, we will either have individual presentations or a poster session. If you have a conflict with the presentation session time listed above, please contact me as soon as possible.

Disabled students

If you have a documented disability and wish to discuss academic accommodations, please contact me as soon as possible. I am happy to make every reasonable accommodation.

Academic integrity

We expect every member of the class to conform to the highest standards of academic integrity. The following statements set forth these standards as they apply to the EE 551 class. Because your homework has a bearing on your grade, it must be your own original work. You may compare homework answers and discuss problem solving methods with other students in the class, but the final result, the work you hand in, must consist of work that you, and you only, have performed. Copying homework done by someone else, or copying old homework or the answer key, copying the work of anyone else on examinations, the use of unauthorized notes or other unauthorized aids during examinations, and knowingly permitting your work to be copied for the purpose of cheating are all examples of cheating.