ENGR 630: Wind Energy

COURSE INFORMATION

Instructor:
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Email:
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Office Hours:
By appointment online. Contact me to set up the appointment.

Course Description:
This online course begins with an introduction to the history and development of the wind power industry. Students will learn where wind energy is used today, and the technology employed. Important issues that will be discussed are the impacts as well as the benefits of this form of environmentally sustainable energy. The course ends with an analysis of where wind energy is headed. The course will focus on the use of case studies to illustrate principles of wind energy.

Course Prerequisite:
ENGR 600 Alternative Energy Fundamentals is recommended preparation for this course.

Unique class structure:
This is a Web-based, entirely online course. It is instructor led and the content and assignments are organized into weekly topics. Online weekly discussions are a required part of the course. All quizzes and exams are online as well.

Course Objectives:
1. Students will gain an understanding of why we consider the use of wind energy to be a sustainable future energy.
2. Students will gain knowledge of how wind turbines have been improved.
3. Students will learn the historical and societal perspectives regarding the use of wind turbines for mechanical and electrical power generation for renewable energy.
4. Students will learn about the meteorological aspects of wind energy.
5. Students will develop an awareness of the significance of the environmental, political, and economics issues associated with wind power.
Student Learning Outcomes:
At the completion of this course, students will be able to:

1. " Assess the use of wind energy as a sustainable future energy in responses to online discussion questions focused on this topic and in case study assignments.
2. " Appraise and describe the improvement of wind turbines in reliability and performance by comparing today's wind turbines with earlier models.
3. " Research and discuss the historical and societal perspectives regarding the use of wind turbines for mechanical and electrical power generation for renewable energy and apply these two factors to a case study assignment.
4. " Describe the meteorological aspects of wind energy and the environmental, political, and economics issues associated with wind power, as demonstrated in responses in online discussions, quizzes, a final exam, and in the final course project.
5. " Evaluate wind power potential at particular locations based on meteorological, societal, and economic considerations as demonstrated in responses to online discussion questions focused on this topic and in case study assignments.

Required Textbooks:


Chapters from the following books will be provided to the student in PDF format within the WebCampus course and therefore do not need to be purchased:


Audio/Visual Material:
Any audio/visual material required for this course is included in individual weekly lessons.

Student Expectations
Students are expected to bring a great amount of interest and self-motivation. That is, if the student is not familiar with terms or concepts, and the book’s material seems too complicated, then the student should initiate conversations with other students and conduct the necessary work outside of class to understand the material. Students should be able to summarize the key important points from the reading material. The lecture notes will provide supplementary explanations of the material covered in the readings when
needed, but it is critical that the student has worked with the concepts from the readings first, before referring to the lecture notes.

As a graduate student you bring additional professional experiences that undergraduate students typically do not have. You are highly encouraged to draw on these experiences for understanding the course material and in discussions with fellow students.

Students have the responsibility of turning in assignments on the due dates. Late assignments will not be accepted, but students are encouraged to complete them in preparation for tests and/or quizzes.

Students should observe a sense of confidentiality in this online course. Things that are said by other students are to be taken with respect and in confidence.

Faculty/Instructor Expectations:
Among other responsibilities, as instructors we are deeply engaged to deliver germane material to facilitate discussion, direction and feedback on ideas presented in class, and to treat each student with fairness and respect. We will respond to questions in a timely manner.

COURSE REQUIREMENTS

Online Discussion Forums:
You are required to post to the discussion forum for each week associated with the readings and lecture, submitting at least one original discussion post and replying to at least one classmate’s discussion post. Your original posting should be posted by midnight on Wednesday and all other discussion, such as replies to classmates, should be posted by Sunday, midnight, when will all be graded. However continued discussion on a point of interest is encouraged throughout the class and the discussion forum will remain open for additional input. The grading rubric for the discussion forum is available in the Syllabus section of the WebCampus Course Menu.

Please keep your personal opinions out of the online discussions as only reasoned arguments and supported facts will receive credit for participation. Disagreement is encouraged, but offer logic and data to support a position, not emotion and opinion.

As the instructors for this course, we will occasionally intervene to answer specific questions and steer the conversation in the right direction, but as graduate students you are expected to be independent learners and use all the resources at your disposal, including your peers and outside resources as needed.

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ing your peers and outside resources as needed.

Late Work:  
Late work will not be accepted, except for very serious reasons to be explained to the
instructor. This being an online class, you will have to manage your time well and inform
us of any circumstances which may interfere with your progress in the course.

Course Grading:  
Your final grade will be determined by the following assignments and percentages:

- **Online Discussion and Written Assignments (25% of class grade):** This is a
class based on collaborative discourse. Your active participation in online discus-
sions will be consequently factored into your final grade for the course. Students
are expected to participate in weekly discussions forums.

- **Quizzes (25% of class grade):** There are five quizzes for this course, about one
every two weeks. The quizzes will be multiple-choice. They will be based on the
weekly lesson topics.

- **Course Project (25% of class grade):** A final course project is required, based
on the selection of either a case study from the textbook or a topic of the stu-
dent's own interests. You need to submit a project for our approval after you
have completed Week 4.

- **Final Exam (25% of class grade):** There will be one comprehensive proctored
final exam. It will contain multiple-choice questions and two essay questions.
Grade Scale:
Final course grades will be based on the following scale:
A  = 92<score<100
A- = 90<score<92
B+ = 88<score<90
B  = 82<score<88
B- = 80<score<82
C+ = 78<score<80
C  = 72<score<78
C- = 70<score<72
D+ = 68<score<70
D  = 62<score<68
D- = 60<score<62
F  = 0<score<60

UNIVERSITY POLICIES

Academic Dishonesty:
Cheating, plagiarism or otherwise obtaining grades under false pretenses constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include: filing a final grade of "F"; reducing the student's final course grade one or two full grade points; awarding a failing mark on the coursework in question; or requiring the student to retake or resubmit the coursework. For more details, see the University of Nevada, Reno General Catalog.

Other acts of dishonesty include, but are not limited to the following:

a. "Copying other students’ answers on assignments, online discussions, and on quizzes and the final exam.
b. "Submitting work that is not your own original work.
c. "Using unpermitted materials on quizzes and the final exam.
d. Furnishing false information to any University official, faculty member, or office.
e. "Committing forgery, alteration, misuse, theft, or using without permission, any University document, or record.

Civility:
Students are expected to conduct themselves in a civil manner at all times and in all forums. Students are responsible for contributing to the maintenance of a campus environment that fosters intellectual curiosity and diversity. This means respectful engagement with differing opinions and views. Harassment of one individual by another—in person, via e-mail or in electronic discussions—is uncivil behavior, which discourages the open expression of ideas on academic subjects. The University is committed to an orderly learning environment that protects the right of free speech, and do not tolerate personal intimidation of any kind.
Class Conduct:
With recommendation of the instructor and approval of the college dean, students may be dropped from class at any time for negligence or misconduct. Students may also be dropped for non-attendance, upon indication of the instructor. Non-attendance in an online class consists of one or more of the following: not logging into the WebCampus course at least twice a week, not submitting assignments on a weekly basis, and not participating in the discussion forum by the dates assigned.

Disability Services:
If you are a student who would normally seek accommodations in a traditional classroom, please contact Jill Wallace (jwallace@unr.edu), Coordinator of the GREC Program, as soon as possible. You may also contact the Disability Resource Center for services for online courses by emailing drc@unr.edu or calling (775) 784-6000.

Academic accommodations for online courses may be different than those for seated classrooms; it is important that you contact us as soon as possible to discuss services. The University of Nevada, Reno supports equal access for students with disabilities. For more information, visit the Disability Resource Center.

This course may leverage 3rd party web-multimedia content. If you experience any issues accessing this content, please notify Jill Wallace.

Audio and Video Recording:
Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.

The University of Nevada, Reno is committed to providing a safe learning and work environment for all. If you believe you have experienced discrimination, sexual harassment, sexual assault, domestic/dating violence, or stalking, whether on or off campus, or need information related to immigration concerns, please contact the University’s Equal Opportunity & Title IX office at (775) 784-1547. Resources and interim measures are available to assist you. For more information, please visit the Equal Opportunity and Title IX page.

Academic Success Services:
Your student fees cover usage of the Math Center (775) 784-4433, Tutoring Center (775) 784-6801, and University Writing Center (775) 784-6030. These centers support your classroom learning; it is your responsibility to take advantage of their services. Keep in mind that seeking help outside of class is the sign of a responsible and successful student.
Course Outline: Weekly course schedule

Week 1:
Topic: Introduction and Historical Perspectives of Wind Power
Reading: Rivkin and Silk: Chapter 1

Week 2:
Topic: Fundamentals of Wind Energy
Reading: Rivkin and Silk: Chapters 2 and 3

Week 3:
Topic: Wind Energy Meteorology
Reading: Rivkin and Silk: Chapter 5 and Ahrens: Chapter 9

Week 4:
Topic: Wind Power System Design and Global Perspective
Reading: Busby: Chapter 3 and Global Wind Energy Outlook 2016,

Week 5:
Topic: Measuring the Wind in the World
Reading: Rivkin and Silk: Chapter 6

Week 6:
Topic: Impact on Flora, Fauna, People, and on Land
Reading: Rivkin and Silk: Chapter 10

Week 7:
Topic: Benefits and Commercial Applications
Reading: Rivkin and Silk: Chapter 7

Week 8:
Topic: Wind’s Future
Reading: Rivkin and Silk: Chapter 8

Week 9:
Topic: Wind Turbine Costs
Reading: Rivkin and Silk: Chapter 9

Week 10:
Topic: Wind Turbine Advanced 
Reading: Rivkin and Silk: Continue Chapter 9 and some links provided in lesson.
**Week 11:**
Topic: Course Project Due

**Week 12:**
Topic: Proctored Final Exam