ENGR 620: Renewable Energy in the Local Community and Home

COURSE INFORMATION

Instructor:
Michael Moltz, Ph.D.
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Email:
Please use the following email addresses to reach your instructor: moltzm@unr.edu.

Online Office hours:
By appointment online. Contact me to set up the appointment.

Course Description:
The course will introduce students to small-scale, bottom-up strategies of renewable energy use in the home and local community, including home and business energy auditing, off-grid utilities, and carbon-neutral workplaces.

Welcome to ENGR 620: Renewable Energy in the Community and Home. This online course is designed to provide you with the knowledge and skills to put into practice much of what you have learned or will learn in the graduate renewable energy certificate. This course will explore the economic, technical, and political feasibility of implementing renewable energy, sustainability, and energy conservation initiatives in the home and local community.

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 Prerequisite:
ENGR 600 Alternative Energy Fundamentals is the recommended pre or co-requisite for this course.

Course Objectives:
1. Students will gain hands-on experience in developing individual and community-based energy models.
2. Students will gain an interdisciplinary understanding of alternative energy with respect to the technical, economic, and political feasibility of implementing small-scale alternative energy initiatives.
3. Students will gain an awareness of different tools and methods available for local and home-based renewable energy projects.

**Student Learning Outcomes:**
At the conclusion of this course, students will be able to:
1. Develop individual and community-based energy models.
2. Apply their understanding of alternative energy to determine the technical, economic, and political feasibility of implementing small-scale alternative energy initiatives.
3. Differentiate between the different tools and methods available for local and home-based renewable energy projects and will be able to select the best tools and methods for a project.

**Required Textbooks:**


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

**Student Expectations:** As a student of this course, you have certain responsibilities:
- First, you have a primary responsibility to yourself to do the best that you can in this course.
- You also have a responsibility to me, as your instructor, to let me know if you are having problems which are interfering with the progress in this course.
- You have a responsibility to turn in your assignments on the due dates and if you are going to be late to let me know.
- If you look in the syllabus you will find information about honesty, etiquette, and civility. You are expected to have these personal characteristics while in this course setting to your fellow students, the guest speakers, and to myself.
- You should observe a sense of confidentiality in this online classroom. Things that are said by other students are to be taken with respect and in confidence.
- And, finally, I hope that you enjoy the journey.
Faculty/Instructor Expectations:
As the instructor for this course, my responsibilities include providing engaging and relevant material to discuss, direction and feedback on ideas presented in class, and treating each student with fairness and respect. I will attempt to respond to questions in a timely manner. Email questions will receive a response within a week, typically much sooner. You will typically get feedback on assignments within two weeks of the due date.

COURSE REQUIREMENTS

Online Discussion Forums:
You are required to post to the discussion forum each week. You are required to submit at least one original discussion post and reply to at least one classmate’s discussion post each week. As the instructor for this course, I will occasionally intervene to answer specific questions and steer the conversation in the right direction, but as graduate students you are expected to self-learn as much as possible.

Your original discussion post is due by Wednesday, 11:59 pm PST. Your response to classmates’ posts are due by Sunday, 11:59 pm PST.

Assignments:
There will be a few (1-3) questions posted at the end of each week’s lecture module related to the chapter reading, lecture notes, journal articles, and/or internet sources. Responses are limited to 500 words for each question. Each week’s assignments are due by 11:59PM PST every Sunday.

Submitting Your Assignments:
All assignments, except for the discussion posts, must be submitted within the assignment section corresponding to the relevant week’s content. Type your assignment answers in the embedded text editor within WebCampus. Available instructor feedback may be attached with your assigned grade. Assignment answers should be limited to 500 words.

System Advisory Model Final Project
You are required to complete a computer energy modeling analysis demonstrating your ability to use commonly accessed data and tools and present a cost effective and politically feasible energy solution that relies upon renewable energy as a significant source of electricity for a business or residential property. You will use the National Renewable Energy Laboratory’s free energy modeling software, SAM (System Advisory Model) to complete this project. There will be a good portion of time devoted to learning how to use this tool and apply it appropriately to our class readings and assignments.

• The project requires you to design a renewable energy system for a residential or commercial property using one of the technologies discussed in the course lectures (e.g. solar water heating, solar PV, wind, etc.)
The project is divided into four parts.
- Part 1: Identify which renewable energy source and its related finances you will use.
- Part 2: Submit your energy analysis output for instructor review
- Part 3: Refine your analysis based on instructor feedback
- Part 4: Submit a final report detailing your analysis, including the size of the system, load analysis, financial incentives, applicable state/local policies, cost effectiveness, etc. (Detailed instructions will be provided at the beginning of the project).

You will receive further detailed instructions during Week 6.

**Final Exam (Final Project Executive Summary):**
In order to pass the course, you are required to write a brief executive summary of your final project during a proctored exam session administered by Examity. You may not use any notes, online references, or other resources to write the executive summary. The proctored exam session requires an internet connection with a webcam, microphone, and speakers. The proctored session fulfills the University's requirement to verify your identity as the student registered for this course. The executive summary is 5% of your course grade. The summary should be no more than 500 words and you will have two hours to write it. This is the only component of the final exam. Detailed instructions will be provided within the WebCampus course site.

**Lecture Notes:**
Lecture notes posted online are designed to supplement the assigned readings, not replace them. Assignment questions may be related to content from the lecture notes.

**Home Energy Audit:**
You will conduct a Home Energy Audit to assess your home's energy efficiency and identify areas to improve energy conservation. We will use the Department of Energy's *Do It Yourself Home Energy Audit* to conduct the home energy audit. After completing the audit, you will write a brief report detailing the steps involved to conduct the audit and the general results and recommendations for energy efficient improvements. The report should be no more than 800 words. Grading Rubrics:
All course work will be assessed using grading rubrics. The rubrics give you objective feedback and allow you to know what is expected of you in order to earn a particular grade. Rubrics will be viewable with each course grading component.

**Late Work:**
Late work will not be accepted. 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:

- Discussion Posts: 25%
- Assignments: 30%
- Home Energy Audit: 15%
- Final Project: 25%
- Final Project Executive Summary: 5%

Grade Scale:
Final course grades will be based on the following scale:

A = 96 – 100
A- = 90 – 95
B+ = 87 – 89
B = 84 – 86
B- = 80 – 83
C+ = 77 – 79
C = 74 – 76
C- = 70 – 73
D+ = 67 – 69
D = 64 – 66
D- = 60 – 63
F = 0 - 59

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 for- 
rums. Students are responsible for contributing to the maintenance of a campus envi-
ronment that fosters intellectual curiosity and diversity. This means respectful engage-
ment 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 class-
room, please contact Jill Wallace (jwallace@unr.edu), Coordinator of the GREC Pro-
gram, as soon as possible. You may also contact the Disability Resource Center for ser-
vices 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 is-
ues 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 au-
dio 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 com-
ments 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: Efficiency & Conservation  
Reading: Chrias Ch. 1 & 2  
Assignments: Assignment 1, Discussion 1

**Week 2:**
Topic: Energy Auditing  
Reading: Maeda Ch. 4  
Assignments: Assignment 2, Discussion 2

**Week 3:**
Topic: Solar Hot Water Systems  
Reading: Ramlow & Nusz Ch. 2, 3, 5, & 7  
Assignments: Assignment 3, Discussion 3

**Week 4:**
Topic: Solar PV Systems  
Reading: Maeda Ch. 1 (pg. 19-24 & 36-40), Ch. 2 & 3  
Assignments: Assignment 4, Discussion 4

**Week 5:**
Topic: Renewable Energy Financing  
Reading: Maeda Ch. 8  
Assignments: Assignment 5, Discussion 5

**Week 6:**
Topic: Passive Solar & Heat Pumps  
Reading: Chiras Ch. 4  
Assignments: Assignment 6, Discussion 6
**Week 7:**
Topic: Corporate Social Responsibility and Renewable Energy
Reading: Article posted to WebCampus
Assignments: Assignment 7, Discussion 7

**Week 8:**
Topic: Introduction to SAM
Reading: N/A
Assignments: Sample SAM Analysis

**Week 9:**
Topic: SAM Project Pt. 1
Reading: N/A
Assignments: N/A

**Week 10:**
Topic: SAM Project Pt. 2
Reading: N/A
Assignments: SAM Analysis Output

**Week 11:**
Topic: SAM Project Pt. 3
Reading: N/A
Assignments: N/A

**Week 12:**
Topic: SAM Project Pt. 4 and Final Exam (Project Executive Summary)
Reading: N/A
Assignments: SAM Final Report