# Course Syllabus

## Course Information

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>EE4395/EE5380</th>
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<tbody>
<tr>
<td>Course Title:</td>
<td>Special Topic - Renewable Energy/ Energy Sustainability</td>
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<tr>
<td>Classification:</td>
<td>Special Topics Course</td>
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<td>Credits:</td>
<td>3</td>
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## Prerequisites:

## Co-requisites:

## Schedule:

Two - 80 minutes lectures per week

## Instructor:

Deidra R. Hodges, drhodges@utep.edu  
Phone: 915-747-7950

## Office and Hours:

A-304  
T & R: 10:30 AM - 12:30 PM via Blackboard ONLY

## Course Description:

Energy is a major key to industrial development and a worldwide economy. Constantly growing demand for energy that relies on a finite supply of fossil fuels, presents challenges for scientists, engineers and governments to explore and develop alternative sources of energy that are continuous, renewable and environmentally friendly.  
This course provides important knowledge about many aspects of renewable energy sources. This course assesses the current and potential future energy systems, covers resources, extraction, conversion, and end-use, and emphasizes meeting regional and global energy in the 21st century in a sustainable manner. Students will learn the fundamental and quantitative principles of the renewable energy options, as well as their potential economic and societal impact.

## Textbook:


## References:


## Course Objectives and Learning Outcomes:

This course provides students with the basic information needed to understand the principles of renewable energy and energy sustainability. Upon successful completion of this course, students should be able to:

1. Discuss the major issues and current solutions of renewable and alternative energy sources, resources and challenges.
2. Discuss and list the most widely used renewable energy sources.
3. Describe wind energy conversion systems.
4. Discuss and explain the fundamentals of Photovoltaic Energy Conversion.
5. Discuss and explain concentrated solar power and solar thermal power.
6. Discuss and explain energy storage including batteries, fuel cells, superconductors, supercapacitors, and flywheels.
7. Discuss and explain emerging renewable energy sources, including tidal power, wave power, biomass, geothermal, thermal energy conversion and satellite power.
8. List electric vehicles technologies and manufactures, and the current challenges.
9. Describe challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the environment.
10. Discuss remedies/potential solutions to the supply and environmental issues associated with fossil fuels and other energy sources.
11. Design and demonstrate a renewable energy power generation system that drives a load.
Topics Covered:

<table>
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<tr>
<th>Wk. 1</th>
<th>Introduction</th>
<th>Wk. 9</th>
<th>Photovoltaics</th>
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<tr>
<td>Wk. 2</td>
<td>Factors Promoting Renewable Energy</td>
<td>Wk. 10</td>
<td>Photovoltaics</td>
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<td>Wk. 3</td>
<td>Wind Energy Conversion Systems</td>
<td>Wk. 11</td>
<td>CSP and Solar Thermal</td>
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<tr>
<td>Wk. 4</td>
<td>Wind Energy Conversion Systems</td>
<td>Wk. 12</td>
<td>Electric Vehicles and the Smart Grid</td>
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<td>Wk. 5</td>
<td>Energy Storage</td>
<td>Wk. 13</td>
<td>Fusion Reactors and Long-Distance Power</td>
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<td>Wk. 6</td>
<td>Emerging Renewable Energy Sources</td>
<td>Wk. 14</td>
<td>Graduate Student Lectures: Nov. 5-12, 2020</td>
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<td>Wk. 7</td>
<td>Emerging Renewable Energy Sources</td>
<td>Wk. 15</td>
<td>Project Presentations and Dems: Nov. 17-19, 2020</td>
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<tr>
<td>Wk. 8</td>
<td><strong>Midterm Exam: October 15, 2020</strong></td>
<td>Wk. 16</td>
<td><strong>Final Exam: December 10, 2020</strong></td>
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Evaluation Criteria:

Instruments for course evaluation will be used to measure established course objectives.

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<thead>
<tr>
<th>EE4395</th>
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<tr>
<td>Grade Composition</td>
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<tr>
<td>10% Homework</td>
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<tr>
<td>10% Quizzes</td>
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<tr>
<td>30% Midterm Exam</td>
<td>30% Midterm Exam</td>
</tr>
<tr>
<td>20% Final Project</td>
<td>10% Final Project</td>
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<td>30% Final Exam</td>
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10% Graduate Student Lectures – 10 minutes (~10 slides)

**November 5-12, 2020**

**Homework – Late penalty:** one letter grade per day late decrease from the actual homework grade.

**Quizzes** – Several unannounced and announced quizzes will be given 5-10 minutes after the start of class.

**Exams** – A midterm exam will be given **October 15, 2020.**

**Final Project** – Design, build and demonstrate a sustainable energy system using a renewable source. The system should generate power and drive a load. Grades will be calculated based on the following:

1) demonstration of final projects, 2) PowerPoint presentation, 3) project simulation included in the final report, and 4) a project final reports that include a system schematic, photographs, and a project description, and 5) a discussion and inclusion of a related peer-reviewed journal article.

**Final Exam** – The final exam is comprehensive and is given in accordance with the University’s Final Exam schedule, **Thursday, December 10, 2020, 4:00-6:45 pm.**

**NO USE OF CELL PHONES, LAPTOPS, TABLETS OR OTHER DEVICES ON EXAMS. NO RESTROOM BREAKS DURING EXAMS.**
**Course Drop Deadline:** The deadline to drop this course with an automatic **W** is **Oct. 30th**.

**Attendance:** Attendance is mandatory. When absent, the student is responsible for obtaining notes, handouts, and assignments and for meeting the same deadlines as the rest of the class. Excused absences are limited to documented medical emergencies, religious holidays and UTEP sponsored and/or required activities.

**Cell Phone and Laptop Policy:** Cell phones are not permitted during the lecture. Laptops may be used during assignments as specified by instructor. Students are required to turn off cell phones before entering the classroom. Cell phones should be placed out of sight (like in a purse or backpack). Students should NOT receive or make any calls/text messages during class. Students using cell phones during class will be asked to leave and will receive a zero for attendance and on all group assignments completed that day.

**Academic Dishonesty:**
As an entity of The University of Texas at El Paso, the Department of Electrical and Computer Engineering is committed to the development of its students and to the promotion of personal integrity and self-responsibility. Acts of scholastic dishonesty such as cheating, plagiarism, collusion, the submission for credit of any work or material that are attributable in the whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student, or the attempt to commit such acts will not be tolerated. Any case involving academic dishonesty will be referred to the Engineering Dean’s Office and the Office of the Dean of Students. The Dean of Students will assign a Student Judicial Affairs Coordinator who will investigate the charge and alert the student as to its disposition. Consequences of academic dishonesty may be as severe as dismissal from the University. See the Office of the Dean of Students' home page at [www.utep.edu/dos/acadintg.htm](http://www.utep.edu/dos/acadintg.htm) for more information.
Course models

Most ECE courses will follow either fully-online or hybrid models. Hybrid models will provide a virtual off-campus component and an in-person on-campus component. To follow social distancing guidelines on campus, faculty will arrange staggered attendance schedules. Laboratory classes will be offered online and/or in-person, in small groups and in spaces adequate to health and safety guidelines. For additional details, read the syllabus and consult your professor.

The ECE Department recognizes that students with health conditions or international students facing travel restrictions may encounter difficult situations. Virtual classes may be recorded to offer needed study flexibility and to allow students to review course material if it’s helpful.

Required COVID-19 Training

Before the semester starts, the ECE Department requires all its students to complete a training module, which includes a video developed in large part by students and hosted by the President of the Student Government Association. Follow the link to this module:

https://covidfstraining.questionpro.com/

Before you come to campus

Before coming to campus all ECE students should conduct a daily self-screening to ensure that they are symptom-free before coming to campus. The screening includes taking your temperature and assessing for the following symptoms:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea
If you have any of these symptoms, you must stay at home, seek medical attention, and report to your professor. If you show any of the following signs, seek emergency medical care immediately:

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion
- Inability to wake or stay awake
- Bluish lips or face

In addition, everyone MUST complete a COVID-19 screening before coming to campus. The link for reporting is

https://screening.utep.edu

This screening includes three required questions:

- In the last 5 days have you (or someone you live with) experienced any one of the COVID-19 symptoms above?
- If you have been tested for COVID-19 in the past 2 weeks, was the result positive?
- In the last 2 weeks, have you spent 15 minutes or more within 6 feet of anybody that you know has tested positive for COVID-19?

Before coming to campus, wash your hands, and pack a hand sanitizer bottle and a clean face mask.

While on campus

UTEP is now requiring that everyone on the campus wear a CDC-approved face covering over the mouth and nose in all public spaces. This requirement includes classrooms, building entrances and exits, lobbies and lounges, as well as in hallways, stairwells, restrooms and elevators. UTEP will maintain and adjust its face-covering requirement as the pandemic evolves.

While on campus, ECE faculty will wear a face mask when giving in-person instruction. Likewise, students on campus will wear face masks in classrooms and laboratories and maintain social distancing (6 feet). Anyone refusing to face covering or to social distance themselves will be asked to leave the premises. Any escalation situations will be considered a public disruption and may require actions such as calling the UTEP campus police department and reporting the case to the Chair of the ECE Department and the Office of Student Conduct and Conflict Resolution (OSCCR).

One of the most effective ways of avoiding catching the corona virus, flu, or common cold is to wash your hands thoroughly after touching surfaces in common areas of places with high traffic. If this is not possible, use hand sanitizer as often as needed.

COVID-19 Testing on Campus

UTEP will test for COVID-19 in the fall. This will help us to rapidly identify individuals who have COVID-19 and do not have symptoms so they can isolate and avoid spreading it to others. The testing will focus on faculty, staff, and students who are on campus. Help us stop the spread of the corona virus and agree to participate in this voluntary testing program. Get tested when invited for testing at one of several on-campus locations.

Resources

UTEP Return to Campus Presentation https://www.utep.edu/resuming-campus-operations/_Files/docs/COVID_Return_to_Campus_Safety_Training_8-7-20.pdf
UTEP Counseling and Psychological Services: 747-5302 or CAPS@utep.edu

UTEP Student Health and Wellness Center: https://www.utep.edu/chs/shc/

UTEP COVID-19 website: https://www.utep.edu/ehs/COVID-19/


Ciudad Juarez COVID-19 resources website: https://www.juarezcovid19.com/

US Centers for Disease Control and Prevention website: https://www.cdc.gov/