



SYLLABUS

SOUTHERN POLYTECHNIC COLLEGE OF ENGINEERING AND ENGINEERING TECHNOLOGY
ENGR 3601: FUNDAMENTALS OF RENEWABLE ENERGY
FALL 2025

Course Information

Class meeting time: TBD

Modality and Location: *Face-to-Face, Location TBD.*

Instructor Information

Name: TBD.

Office Location: N/A

Office Hours: TBD

Preferred method of communication: Email

Course Description

Prerequisites: Engineering Standing for Engineering majors.

For non-engineering majors the applicable course prerequisites are listed here:

<https://engineering.kennesaw.edu/advising.php>

Corequisites: N/A

Credit Hours: 3 Class Hours 0 Laboratory Hours 3 Credit Hours (3-0-3)

Course Description:

This course reviews various renewable energy sources to meet the increasing global energy demand of the 21st century in a sustainable manner. The course introduces the fundamental energy conversion principles, energy economics, and the current status of renewable sources, such as Hydroelectric, Wind, Solar Thermal, Solar Photovoltaics, Ocean Waves, Tidal, Geothermal, and Biomass energy. The course also discusses the basic concepts of renewable energy integration to the grid and various energy storage technologies. The course integrates projects on solar thermal, wind and solar photovoltaic systems and concludes with a project where students effectively apply their knowledge to conceptualize and design an alternative energy harvesting device.

Course Materials

Required Texts:

Fundamentals of Renewable and Alternative Energy, by S. Das, J Khazaii, T. Ashuri, Y. Mahmoud and V. Sooklal. Open Access.

Course Outline:

- Introduction: Forms of Energy, Energy Conversion, Conservation and Utilization
- Energy Efficiency
- Solar Radiation and the Greenhouse Effect
- Solar Photovoltaics
- Solar Thermal Energy Harvesting
- Hydroelectric Power
- Wind Energy
- Ocean Wave and Tidal Energy Harvesting
- Geothermal Energy and Heat Pumps
- Energy from Biomass, Bio-fuels and Fuel Cells
- Grid Integration: Renewable Energy, Distributed Generation and Smart Grid
- Energy Storage Technologies
- Emerging Alternative Energy Harvesting Technologies

Technology Requirements:

Computer with Windows 10 Operating System. Some assignments in this course will require you to perform simulations and plot graphs. For this purpose, you need to use MATLAB. Download links for MATLAB is provided below. Please contact KSU IT services (UITS) in case of any difficulty with installation.

MATLAB Simulink (download version R2020a or newer).

<https://www.mathworks.com/downloads/>

Privacy policy of MATLAB can be found on MathWorks website:

https://www.mathworks.com/company/aboutus/policies_statements.html

Accessibility information for MATLAB can be found here:

[ITI: Voluntary Product Accessibility Template - Cal State LA](#)

Learning Outcomes

After successful completion of this course, students will be able to:

1. Identify the environmental impacts of fossil fuel-based energy generation, such as global warming and man-made climate change and assess the merits of renewable energy generation.
2. Demonstrate knowledge on energy economics and public policy aspects of renewable energy.
3. Explain the fundamental principles of various renewable and sustainable energy technologies, such as Hydroelectric, Wind, Solar Thermal, Solar Photovoltaic, Ocean Waves, Tidal, Geothermal, and Biomass energy.
4. Apply the basic governing equations to calculate power and energy output of various Renewable energy systems.

5. Explain various energy storage technologies and perform calculations for simple energy storage systems.
6. Develop skills for writing scientific/technical reports.

Course Requirements and Assignments

Students will meet in the classroom during the designated class hours every week. Regular and punctual attendance is essential and expected of students.

Evaluation and Grading Policies

Final grade is determined based on a weighted score with the following weight distribution:

Assessment tool	Percentage or points toward Final Grade
Homeworks (4 × 10% each)	40%
Exams (2 × 10%)	20%
Project	15%
Final Exam	25%
Total	100%

GRADING SCALE:

- >90% → A
 80% - 89.9% → B
 70% - 79.9% → C
 60% - 69.9% → D
 < 60% → F

Course Policies

Late Submission Policy:

No late submissions are accepted. In case of an emergency, such as car accidents, critical medical condition, death in the immediate family etc. with valid documented proofs, the instructor will make efforts to arrange a make-up.

Sharing of Course Materials:

Commercial use of any course materials (lecture slides, exam questions, solutions etc.) are strictly prohibited without prior written permission of the instructor.

Academic Honesty:

The high quality of education at Kennesaw State University is reflected in the credits and degrees its students earn. All assignments that take place in and out of the classroom must be your own work and original for this course. The protection of these high standards is crucial since the validity and equity of the University's grades and degrees depend upon it. Any student found to have violated any KSU

academic honesty regulation after a hearing before a university hearing panel or before the Vice President for Student Success and Enrollment Services (or his/her designee) shall be suspended for at least one semester, unless the student persuades the deciding body that the circumstances of his or her behavior substantially mitigate the gravity of the violation. These regulations are designed to assist students in (1) developing appropriate attitudes about, and (2) understanding and following the university's standards relating to academic honesty. The regulations protect students by helping them avoid committing infractions that may compromise the completion of their KSU degrees or damage their reputations.

Student Conduct Pledge/Statement:

As a member of the Kennesaw State University community of scholars, I understand that my actions are not only a reflection on myself, but also a reflection on the University and the larger body of scholars of which it is a part. Acting unethically, no matter how minor the offense, will be detrimental to my academic progress and self-image. It will also adversely affect all students, faculty, staff, the reputation of this University, and the value of the degrees it awards. Whether on campus or online, I understand that it is not only my personal responsibility, but also a duty to the entire KSU community that I act in a manner consistent with the highest level of academic integrity. Therefore, I promise that as a member of the Kennesaw State University community, I will not participate in any form of academic misconduct.

Types of Academic Misconduct:

1. **Cheating:** Receiving, attempting to receive, knowingly giving or attempting to give unauthorized assistance in the preparation of any work required to be submitted for credit (including examinations, laboratory reports, essays, themes, term papers, etc.) is considered cheating, as is engaging in any behavior that a professor prohibits as academic misconduct in the syllabus or class discussion. Unless specifically authorized, using and/or having access to unauthorized internet resources or communicating to other students during an exam, quiz, or other assessment are automatically considered cheating, regardless of the student's reason/intent.
2. **Plagiarism:** Including direct quotations from other sources into work required to be submitted for credit without indicating them as such by quotation marks, block quotes or other appropriate formatting. Incorporating the work of someone (e.g. ideas, theories, data, figures, graphs, programs, electronic based information, illustrations, etc.) into a paper or project without due acknowledgement.
3. **Self-Plagiarism:** Submitting any work for credit which was not authored specifically and originally for the assignment in question without the prior permission of the professor receiving that assignment. Most commonly, this means submitting the same, or substantially the same, paper or other assignment for credit in more than one class.
4. **Misrepresentation and/or Falsification:** Knowingly providing false information in completing University forms or applications (including admissions forms, scholarship applications, time sheets, false or counterfeit transcripts, etc.) or in any work submitted for credit. This includes providing fabricated/altered documents to substantiate an excused absence (such as to meet attendance requirements or have the chance to make-up a missed exam). Signing in for another student or having another individual sign in on a student's behalf on an attendance sheet also constitutes a violation of this code section.
5. **Unauthorized Access to University Materials:** Taking, attempting to take, stealing or in any unauthorized manner otherwise procuring, gaining access to, altering or destroying any material pertaining to the conduct of a class (including tests, examinations, grade change forms, grade rolls, roll books, laboratory equipment, University grade records in written or computerized form, etc.).
6. **Malicious/Intentional Misuse of Computer Facilities/Services:** Maliciously or intentionally misusing university-controlled computer facilities and services. This includes violations of state and

federal laws (e.g. copyright violations, unauthorized access to systems, alteration/damage/destruction, or attempted alteration/damage/destruction, use for profit, etc.) or a department's rules for computer usage (e.g. account violations, damage, or destruction of the system and/or its performance, unauthorized copying of electronic information, use of threatening or obscene language, etc.).

- 7. Malicious Removal, Retention or Destruction of University Resource Materials:** Misplacing, taking, destroying any item or part of an item belonging to or in the protection of the University (or the attempt thereof) with the intention of bringing about an undue disadvantage in the academic pursuits of other Kennesaw State University students.

The above examples of academic dishonesty shall not be construed to be comprehensive, and infractions will be dealt with on an individual basis according to university policies and procedures. It is the obligation of each student to assist in the enforcement of academic standards.

See: The KSU Student Code of Conduct visiting the following website:

<http://scai.kennesaw.edu/codes.php>

Incomplete Grade:

As per the Catalog, an incomplete grade ('I') will be awarded only when a student has done satisfactory work up to the last two weeks of the semester, but for nonacademic reasons beyond the student's control, is unable to meet the full requirements of the course. Therefore, any student who wishes to receive an 'I' for any reason must submit a request in writing no later than the last day of classes. The request must state the reason (with documented proof) and the expected date of completion of required assignments. The granting of any such request is solely at the discretion of the instructor. If the request is granted, all work must be submitted by the end of the following semester/term or the 'I' will become an 'F'.

Course Enrollment Policy:

Students are solely responsible for managing their enrollment status in a class; nonattendance does not constitute a withdrawal.

Withdrawal Policy:

Should you decide to drop this course at any time, you must do so by yourself. Instructor will not advise regarding add/drop of any course. You should see your advisor if you need help for degree progress or academic planning. Failure to drop a course and not passing will result in an 'F' at the end of the semester. To receive a grade of 'W', you must drop the course by the university mandated withdrawal date (check academic calendar published by the office of the university registrar).

Disruptive Behavior:

Any inappropriate activity in the classroom that may distract the instructor, other students in the class and/or inhibits learning process are defined as disruptive behavior. Examples of disruptive behaviors include, but are not limited to: sleeping, eating, talking to another student, leaving the classroom during the lecture etc. Disruptive behaviors are solely judged by the instructor. After one warning, if the disruption occurs second time, you will be asked to leave the classroom and a misconduct report may be filed to SCAI for appropriate disciplinary actions.

Electronic Gadgets Usage and Electronic Recording Policy:

Use of electronic gadgets (including cell phones, tablets, recording devices, cameras, laptop etc.) are strictly prohibited during the lectures and exams. Only a dedicated scientific calculator is allowed during the lecture and exams unless explicitly pre-authorized by the instructor. Students must set all cellphones in 'silent' mode during the lectures and exams. Electronic recording (sound or video) during lectures without the written permission of the instructor is strictly prohibited.

Disabled Student Support Services:

In compliance with applicable disability law, qualified students with a disability may be entitled to reasonable accommodation. Any student with a documented disability (hidden or visible) needing academic adjustments, including classroom or test accommodations is requested to notify the instructor within the first two weeks of the course. Verification from KSU Disabled Student Support Services is required. All discussions and documentation will remain confidential.

Visit the Student Disabilities Services website for more info: <https://sds.kennesaw.edu/index.php>

How to Contact the Instructor:

The best way to reach the instructor outside of the classroom is the direct email to the instructor's official KSU email address as listed in this syllabus. If you need help beyond the lectures and the classroom discussions, you can send an email to schedule a face-to-face meeting time during the designated office hours of the instructor. You may also request to arrange an online meeting.

Institutional Policies

[Federal, BOR, & KSU Course Syllabus Policies](#)

KSU Student Resources

This link contains information on help and resources available to students: [KSU Student Resources for Course Syllabus](#)