



Center for Advanced Technical Studies

916 Mount Vernon Church Road
Chapin, SC
<http://www.lexrich5.org/CATS.cfm>
803-476-8600



Clean Energy Applications Course Syllabus

Spring 2020

1 credit

Room 104

Planning : 6B & 8B

Instructor: Patrick L. Smallwood, NBCT

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COURSE DESCRIPTION:

This course serves as the second course in the four course sequence of the Clean Energy Technology Advanced Career program and focuses on training students in the foundational concepts of alternative energy production and natural resource efficiency not previously covered. Students should have successfully completed Clean Energy Systems (Course 1) prior to taking this course. The Clean Energy Applications course requires students to engage in authentic and realistic work assignments they might encounter in the workplace or research environment. Students will be engaged in a variety of challenging projects designed to prepare them for the workforce and for a variety of options for training and college after high school. The course will require the completion of varied learning activities that apply both technical and academic—reading, writing, mathematics and science—knowledge and skills to complete complex workplace-related projects. Students will regularly collect, interpret, and analyze data from numerous sources as well as acquire technical background information, prepare written journals, and make reflective oral presentations.

PLANNING FOR THE FUTURE:

Enrollment in Clean Energy Applications carries the expectation that you plan to continue in the Clean Energy Technology Advanced Career program of courses, the sequence for the remaining courses is as follows:

Semester 3: Clean Energy Strategies

Semester 4: Clean Energy Innovations

MATERIALS:

3 ring binder (at least 1" is recommended)

Flash drive

Composition notebook with lined pages (first one will be provided)

Calculator with scientific notation and logarithmic function

Both pencils and pens

FEES

\$50.00 per course

MAJOR CURRICULAR TOPICS & PROJECT TITLES:

- Project 1: Nuclear Power
- Project 2: Bioenergy
- Project 3: Geothermal
- Project 4: Fuel Cells or Batteries
- Project 5: Water Power (optional)

**GRADING SYSTEM:**

The **grading system** for Lexington Richland District Five:

A	90 – 100
B	80 – 89
C	70 – 79
D	60 – 69
F	0 – 59

50% Major Assignments (Projects and Portfolios)

30% Minor Assignments (Quizzes, Activities, Homework, & Engineering Notebooks)

20% Employability Evaluations

Students will primarily work in two or three member teams, but are expected to complete individual assignments related to the team's work. Just like teams in the workplace, Clean Energy Applications team members are collectively and individually responsible for the success of the overall project and for each member on the team mastering related academic and technical content. Students will be asked to participate in the evaluation of their own work as well as other's work using scoring guidelines provided by the instructor.

Parents will be informed of student achievement through graded work, interim and nine week grade reports, and periodic phone calls. I highly recommend students and their parents/guardians regularly check up-to-date student progress/grades through the PowerSchool Parent Portal system found on the district website. With this system you have the ability to register to receive regularly emailed progress notifications and the system can be accessed conveniently from any computer with an internet connection.

Since employers, customers and the public expect employees to take responsibility for doing things correctly and timely, as Clean Energy Applications students you will be held to high expectations regarding quality of work and personal behavior. You are expected to arrive to class on time with all necessary materials. You are expected to take advantage of opportunities to redo major assignments until they meet standards which may sometimes require before or after school tutoring and academic assistance sessions.

MISSED WORK:

All assignments that are missed due to illness or other reasons must be made-up with two weeks of the absence. It is the student's responsibility to obtain all missed assignments and make-up work upon return to school. Most make-up work will require students to come before or after school to get caught up. Please plan to cancel or reschedule all extra-curricular, athletic, or club-related activities and place academic make-up work as the highest priority. Any work that is not completed after two weeks of the absence will be recorded as a zero. Since many of the projects require several class days, completion due dates are FIRM and late assignments will not be accepted for credit.

REMIND:

Students and parents have the option to sign up for free text message and/or email notifications while enrolled in this course. This is optional, but notifications from the instructor will include important updates, changes, and reminders throughout the semester. You will be given a handout with instructions during the first class if you wish to utilize this free service.

THE ENGINEERING NOTEBOOK:

Students will be required to keep an updated Engineering Notebook for the duration of this course. This bound journal contains all written documentation as a student progresses through the research, design, and implementation of the course projects. The notebook will contain ideas & notes, data, observations, calculations, sources, and other relevant information concerning the experiment being conducted. A handout detailing the guidelines of the Engineering Notebook will be given to students on the first day so that it may be referenced throughout the semester.

PLAGARISM:

The Academic Honesty Policy is being implemented to ensure that students submit credible work that is evident of their content mastery. Students should seek to be totally honest in their dealings with others. They should complete their own work and be evaluated based upon its originality. They should avoid academic dishonesty and misconduct in all its forms, including plagiarism, fabrication or falsification, cheating, and other academic misconduct.

STANDARDS:

Standards for this course are taken from *National Science Standards*, *English Language Arts Common Core College & Career-Readiness Standards*, *Mathematics Common Core College & Career-Readiness Standards*, *Career and Technical Standards*, *Standards for 21st Century Skills*, and *Standards for All Aspects of Industry Attributes* and are available upon request.

GENERAL POLICIES:

CLASSROOM/ LABORATORY RULES:

1. **Be Here!** Do what you know is right!
2. Bring all classroom materials and a **good attitude** to class with you each day.
3. **Be ready** to learn when the bell rings.
4. **Respect** yourself, your classmates, and your school.
5. Wear your **safety equipment** at all required times.
6. Do not speak out of turn - **Raise your hand** if you would like to speak.
7. **No food, drink, candy, gum, or cell phones.** You are in a lab!
8. **Display personal integrity at all times** – Be honest and do not plagiarize.
9. **Pull your own weight!** We will be doing a lot of group work – do your part as you would in a professional facility.
10. **Stay on task** when on computer!

Consequences of Non-compliance

1. Verbal Warning
2. Teacher – Student Conference after Class
3. Parent notification
4. Director/Assistant Director Involvement

Immediate parent phone call or referral to Director/Assistant Director may be needed for extreme disrespect, cheating, fighting, profanity, disruptions and for alcohol/tobacco offenses.



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LAB SAFETY POLICIES

PREPARE FOR LABORATORY WORK

- Study laboratory procedures prior to class.
- Be aware of safety factors before beginning lab activity.
- Never perform unauthorized experiments.
- Keep your lab bench organized and free of apparel, books, and other clutter.
- Know the locations of, and how to use the safety shower, eyewash, fire blanket and first aid kit.

DRESS FOR LABORATORY WORK

- Wear closed toed shoes and lab aprons/coats during all required laboratory sessions.
- Wear safety goggles/glasses during all required laboratory sessions.
- Wear gloves when using chemicals that irritate or can be absorbed through skin.

AVOID CONTACT WITH CHEMICALS

- Never taste or "sniff" chemicals.
- Never draw materials in a pipette with your mouth.
- When heating substances in a test tube, point the mouth away from people.
- Never carry dangerous chemicals or hot equipment near other people.

AVOID HAZARDS

- Never distract another student who is performing an experiment.
No roaming during a lab. Remain at your assigned lab bench.
- Keep combustibles away from open flames, Keep water away from electrical devices
- Use caution if handling hot glassware.
- When diluting acid, always add acid slowly to water. Never add water to acid.
- Use glycerin and twist slowly at the base when inserting glass tubing through stoppers.
- Turn off burners when not in use.
- Keep caps on reagent bottles. Never switch caps.
- Always read labels before using reagents.

CLEAN UP

- Leave laboratory bench clean and neat. Return goggles and aprons (folded) to cabinets.
- Consult teacher for proper disposal of chemicals.
- Wash hands thoroughly following experiments.

IN CASE OF ACCIDENT

- Report all accidents and spills immediately.
- Place broken glass in designated containers.
- Wash all acids and bases from your skin immediately with plenty of running water.
- If chemicals get in your eyes, wash them for at least 15 minutes at eyewash.



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Lab Safety Agreement

I, _____, agree to: (a) Follow the teacher instructions, (b) protect my eyes, face, hands and body during laboratory, (c) conduct myself in a responsible manner at all times in the laboratory, and (d) abide by all of the safety regulations specified above. In doing so, I also realize that failure to conduct myself in a safe manner during laboratory activities will result in the forfeiture of my laboratory privileges for that day, and result in a zero for that lab report.

Student Signature _____

Date _____

Parent/Guardian Signature _____

Date _____

Syllabus Acknowledgement

I have reviewed the attached course syllabus, classroom rules, and procedures for Clean Energy Applications. I understand that I/ my child must comply with the expectations.

Student signature _____

Date _____

Parent signature _____

Date _____

Parent email address: _____

Phone# _____