Center for Advanced Technical Studies

916 Mount Vernon Church Road
Chapin, SC
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Honors Clean Energy Strategies Course Syllabus

Fall 2019
1 credit

Instructor: Patrick L. Smallwood
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Room 104
Planning : 6B & 8B

COURSE DESCRIPTION:

This course will utilize the skills learned from the foundational courses to research, design, build, and evaluate solutions to some of the most prominent problems encountered when implementing clean energy technologies. Students will define problems related to clean energy technologies, conduct extensive research, find potential solutions, implement necessary programming applications, and present findings publicly. Hands-on projects encountered during this course focus on solving challenging problems such as solar concentration, using waste biomass as a fuel source, developing new energy storage systems, increasing the efficiency of the modern home, and designing more energy efficient buildings and homes.

PLANNING FOR THE FUTURE:

Enrollment in the Clean Energy Strategies course carries the expectation that you plan to continue in the Advanced Career Clean Energy Technology sequence of courses by enrolling in the final course:

Semester 4: Clean Energy Innovations

*Students must earn a passing grade in Clean Energy Strategies to continue to 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 credit

MAJOR CURRICULAR TOPICS & PROJECT TITLES:

Project 1: *Solar Concentrators*- How can concentrated sunlight improve our ability to provide heat and power?
Project 2: *Building Energy Management*- How can existing buildings become more more energy efficient?
Project 3: *Reducing the Carbon Footprint*- Can an existing/new structure be made "net-zero?"
Project 4: *Energy Storage*- How can we store energy now for future use?

***Proposal Poster Symposium (Attendance Mandatory): Thursday, Nov 14 from 6:00-7:30pm**

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 (Project Reports & Presentations)
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 Strategies 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 weeks 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 Strategies 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.

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.

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. The Center does not offer any type of attendance make-up for extensive absences.

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! **Be ready** to learn when the bell rings.
2. Bring all classroom materials and a **good attitude** to class with you each day.
3. **Respect** yourself, your classmates, and your school.
4. Wear your **safety equipment** at all required times. This includes correct shoes, labcoat, & eye protection
5. Do not speak out of turn - **Raise your hand** if you would like to speak.
6. **No food, drink, candy, gum, or cell phones**. This includes the classroom & laboratory.
7. **Display personal integrity at all times –** Be honest and do not plagiarize.
8. **Pull your own weight**! In all group work – do your part as you would in a professional facility.
9. **Stay on task** when using district laptop computer or iPad!

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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Clean Energy Strategies

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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 or use lab equipment inappropriately.
- Keep your lab table 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-toe shoes and lab aprons/coats during all required laboratory sessions.
- Wear safety goggles 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.
- Food or drink should never be around lab substances or equipment.
- 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 table.
- Keep combustibles away from open flames.
- Use caution if handling hot glassware.
- Soldering irons should remain in stands when not in use.
- Keep water away from all electronics and power equipment.
- Turn off electrical equipment 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, aprons, & labcoats to proper area.
- Consult teacher for proper disposal of chemicals & other waste laboratory material.
- 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 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 activity without recourse.

Student Signature _____ Date _____

Parent/Guardian Signature _____ Date _____

Syllabus Acknowledgement

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

Student signature _____ Date _____

Parent signature _____ Date _____

Parent email address: _____ Phone# _____