





- (D) use a control in an experimental process;
- (E) design procedures to test hypothesis;
- (F) construct data tables to organize data using equipment and technology;
- (G) collect data by observing and measuring in various ways;
- (H) record observations and measurements using appropriate units and make measurements with precision and accuracy;
- (I) perform calculations using dimensional analysis, significant digits and scientific notation;
- (J) organize, analyze, evaluate, make inferences and predict trends from data; and
- (K) communicate valid conclusions using essential vocabulary and multiple modes of expression



(5) Science concepts. The student knows the different components of wind, solar, and bio-fuels energy systems, and understands that these systems may be used together to produce energy. The student is expected to:

- (A) define general wind terminology;
- (B) describe various components of wind turbines;
- (C)



(C) analyze substation development.

(9) Entrepreneurship/Business Concept. The student understands the environmental, ethical, and legal obligations of wind and solar farms. The student is expected to:

- (A) define environmental, and ethical aspects on locations of wind and solar farms; and
- (B) identify and describe the legal obligations of wind and solar farms.

(10) Entrepreneurship/Business Concept. The student knows the importance of business strategies, methodologies, policies and procedures used by wind, solar and bio-fuels manufacturers, farmers and owners/operators of wind and solar farms. The student is expected to:

- (A) Identify and demonstrate use of various tools to formulate business plans;
- (B) explain and evaluate business planning processes;
- (C) define, apply and demonstrate use of quality management tools, such as sigma-six methodologies in planning;
- (D) define, apply and demonstrate use of root-cause analysis;
- (E) identify and demonstrate use of Strength Weaknesses Opportunity Threats (SWOT) analysis methodology;
- (F) define and explain inventory control, materials and supply chain management;
- (G) define and describe the process of contract management;
- (H) describe liabilities and contract fulfillment to landowners and manufactures;
- (I) describe wind business policies related to environmental concerns; and
- (J) identify and describe business procedures and practices to include environmental safety and public relations.

Description of the specific student needs this course is designed to meet:

- Students need to be aware of the energy supply and demand and the critical role that bio-fuels, wind and solar energy play in sustaining our society.
- Students need to understand how they are both a part of the problem and also to be inspired to become a part of the solution.



- Students need to be adaptive learners who are better prepared to use their minds to solve problems about renewable energy.
- Students need to learn how to develop the skill of planning and implementing projects that will inform and contribute to larger bodies of knowledge relating to wind energy, solar energy and bio-fuels.

Major resources and materials to be used in the course:

- Access to the use of the laboratories and faculty at the Energy Institute at Houston Community College-Northeast.
- Field trips to visit sites that are traditional fossil fuel based power plants and wind/ solar farms.
- Field trips to refineries, petrochemical plants, waste water treatment facilities, metro transportation, etc.
- Published materials from the Department of Energy.
- Guest presentations by industry and business experts.

Required activities and sample optional activities to be used:

The activities of this class will fit into project based learning that will be captured in a digital portfolio. The work process for a project refers to pupils choosing a knowledge area, delimiting it, formulating a problem or posing a question. In addition, project work involves pupils investigating and describing what is required to solve a given problem, or answer a specific question through further work, materials and knowledge. Project work is an opportunity for becoming aware of and reflecting over different methods of solving problems. In project work an experienced teacher follows, discusses and assesses the work in all its different phases. Project work takes place individually or in groups.

Possible projects for this course:

- Impact of Kyoto Treaty
- Energy Consumption
- Impact of global warming on energy needs
- Potential solutions to energy problems and ethical considerations
- Air and water quality standards
- Citizenship and participation in advocacy groups
- Scientific communications versus media as a means of reporting to the public
- Global warming or solar flares
- Individual rights versus responsibilities for our society

Methods for evaluating student outcomes:



Student mastery of knowledge and skills will be evident in their digital portfolios. They will focus both on their process for developing the project, the actual results from their project work and a reflection on their learning. There will be a specially designed rubric as the basis for grading. Students will be evaluated every six weeks consistent with the district's grading cycle.

Teacher qualifications:

- Texas Teacher Composite Science Certification
- Bachelor's Degree in Science
- Microsoft Office Suite
- Use of Multi-media equipment
- Project Management
- Open to Continuous Learning
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