

Electricity, Energy, & Power

Course Description:

In this course, we will study the impact that technology has on the world around us. The students will explore the meaning of technology, and get a look at the new developments we are experiencing. Students will develop an understanding of how, and why changes in technology are being made. In this class, students will be expected to work in small groups, partners, and individually to do research and develop problem solving skills dealing with technological applications.

Electronics portion of the course will offer basic exposure of alternating current, direct current, and technical documentation. Students will analyze, design and build electronic circuits. While exposed to energy, power and electricity, students will continually hone their interpersonal skills, creative abilities and understanding of the design process.

Standards:

This course is designed in alignment with the Iowa Core Curriculum 21st century technological literacy skills, as well as the ITEA Standards for Technological Literacy.

The course of study includes:

Foundations of Electronics

- Scientific and Engineering Notations
- Electronic Component Identification
- Basic Soldering and PCB Construction
- Electron Theory & Circuit Theory Laws
- Circuit Simulation

Introduction to energy and power

- Energy Sources, Supplies, and Use
- Concepts in Power

Exploring energy technology

- Solar Energy
- Wind Energy
- Fossil Fuels
- Nuclear Fission and Fusion

Exploring power technology

- Internal Combustion Engines
- External Combustion Engines
- Fluid Power
- Pneumatics

Type of energy and power conversion systems

- Laws of Thermodynamics

Energy conservation principles

- Energy Conscious Design
- Residential, Commercial, Industrial, and Transportation Sectors

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Instructional Strategies:

The instructor of this course will use a variety of instructional strategies to deliver the appropriate materials in a manner to inform all students. These strategies will include: direct instruction, active participation, presentation/demonstration, probing questions, student projects, and just-in-time instruction.

Coursework Evaluation:

Assignments- there are periodic assignments throughout the semester. These will be evaluated on based on the total amount of points earned.

Test and quizzes- There will be test and quizzes to evaluate the understanding of students as we progress through some of the complex ideas associated with electricity, power, and energy. Some assessments will be formative. In a formative assessment I will ask students guiding questions, along with close observation of their activities in the lab in order to assess the development of their skills. This will also be the way that I assess their team work skills by observing them in the problem solving and design/development stages of their projects.

Student Engagement- Students will have a grade scale of 5 points per day based on the following criteria:

- 5 - Exceptional, present, organized, on task, engaged in activities and classroom work
- 4 - Good, present, on task and engaged in class activities most of time
- 3 - Good, tardy, on task and engaged in class activities most of the time
- 2- Poor, disorganized, not engaged in class activities
- 1 - Poor, tardy, disorganized, not engaged in class activities
- 0 - not present, no activities made up

****Credit for incomplete or missing work is available upon completion****

Behavior Expectations:

****Every student must return a signed copy of this syllabus, before beginning work in the lab area. ****

- It is the expectation of this class that students follow the expectations as outlined in the 2016-17 student handbook
- Work safely
- Report any injury to me immediately after it happens.
- You are responsible for the tools and equipment you are using. If you break something because of carelessness, you are responsible for it.
- Report anything that is missing or damaged immediately.

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- Clean up at the end of each class period.
- No food or drink are to be brought into the classroom. Individual music players cannot be worn during class without approval from the instructor. Cell phones must be kept out of sight during class or they will be put into my desk drawer for the remainder of the class period.

*****STUDENTS WHO ARE DISRUPTIVE OR POSE A THREAT TO THEMSELVES OR OTHERS MAY BE REMOVED FROM CLASS AND SENT TO THE AP OFFICE. *****

Communication:

The best way to contact me with questions or concerns is via email (joebormann@dbqschools.org). You may also reach me by telephone 563-552-5258. Messages left will be returned as soon as possible. I also update PowerSchool on a regular basis.

Parent Awareness:

Parents/guardians and students should both be aware of the requirements of the class. Remove, sign, and date below to indicate you have read this syllabus and are aware of the expectations and responsibilities of the class. Return to Mr. Bormann.

Student Name (Print): _____

Student Signature: _____ Date: _____

Parent/Guardian Signature: _____ Date: _____