

Engineering Design Technology 1  
2.5 credit College Prep A Course  
Revised March 2008

## Course Outline

### Course Description:

Engineering Design Technology 1 is a semester long course emphasizes the application of the design method to invent solutions to real world technological problems. Students will identify problems, use internet research, and design and fabricate models or prototype solutions. Problem solving and design skills are taught through a variety of activities. Hands-on themes for this level include, but are not limited to, structural, fluid powered, and robotic systems. This course provides all students with valuable skills such as: problem solving, design, creative thinking, systems thinking, team work, documentation, and computer applications.

*High Point Regional High School's curriculum and instruction are aligned to the State's Core Curriculum Content Standards and address the elimination of discrimination by narrowing the achievement gap, by providing equity in educational programs and by providing opportunities for students to interact positively with others regardless of race, creed, color, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, religion, disability or socioeconomic status.*

### Prerequisites:

Engineering Design Technology is a first level course and has no prerequisites.

### Method of Instruction

Technology engages student's minds through creative problem solving and inquiry-based approaches to learning. Further, the curriculum breaks down the barriers between subject areas and acts like a "hub" uniting the core curriculum. Technology learning activities require students to apply concepts from subjects, as well as technology content (problem solving, design, systems, history of technology, engineering, materials and processing, research and development, careers) while solving practical problems. The curriculum is delivered through an articulated series of design and problem solving activities in which students apply knowledge to solve practical problems. Activities include: Structures, Fluid Power, and Robotics.

### Content Standards:

Engineering Design Technology 1 covers Standards:

- 8.1.A Computer and Information Literacy – Basic Computer Tools and Skills
- 8.1.B Computer and Information Literacy – Application and Productivity Tools
- 8.2.A Technology Education – Nature and Impact of Technology
- 8.2.B Technology Education – Design Process and Impact Assessment
- 8.2.C Technology Education – Systems in the Designed World

## Course Outline

### Unit 1: What is Technology

Students will:

- Recognize people alone or in groups invent new ways to solve problems and get work done;
- Realize that people should figure out ahead of time how a solution to a problem will affect other people and the environment;
- Explain and give examples of how people enhance their world through technology;
- Explain how technological tools are used to extend human capabilities;
- Recognize that solutions to one problem may create another problem;
- Recognize that even good designs may fail;
- Define technology and understand the difference between technology and science.

### Unit 2: Safety

Students Will:

- Use a variety of materials and simple tools to construct simple design models;
- Apply proper and effective technical processes such as cutting, fastening, gluing to form and strengthen materials;
- Select and properly use material processing tools and equipment;
- Identify and follow safety procedures within the lab;
- Explain how common injuries can be prevented.

### **Unit 3: Design & Problem Solving; Examining the technological method**

Students will:

- Express why some solutions/ideas might be used and others rejected to solve a problem;
- Identify what information and knowledge is needed to solve a problem;
- Gather and analyze information necessary to solve simple design problems;
- Match solutions to the original need;
- Develop a willingness to take risks and experiment without fear of failure;
- Identify principals and elements of design;
- Apply problem solving/technological method;
- Identify design specifications and constraints by balancing needs, the availability of resources, and environmental impacts.

### **Unit 4: Documentation & Computer applications**

Students will:

- Create diagrams and sketches by hand and electronically to express design ideas and solutions;  
Communicate orally and in writing the results of their work;
- Create two and three dimensional technical drawings by hand and electronically to express design proposals;
- Demonstrate the proper operation of a personal computer;
- Use age appropriate computer software programs that enhance the learning of school subjects, and to communicate ideas;
- Use the internet as a resource for research;

### **Unit 5: Research and Development in Technology**

Students will:

- Research and apply existing technologies to solve problems;
- Research and combine relevant information from a variety of sources to solve problems;
- Identify design specifications and constraints by balancing needs, the availability of resources, and the environmental impacts;
- Demonstrate the principles and elements of design;
- Apply various measuring techniques.

### **Unit 6: Systems**

Students will:

- Identify systems in their immediate environment;
- Analyze simple products to determine their component parts, how they work, and their ergonomic features;
- Apply basic concepts about various systems while designing simple technological systems that solve real world problems;
- Realize that technological systems are made of parts, and that when parts are put together, they can accomplish tasks that the individual components could not;
- Realize that the parts of a system usually influence one another, and that a system will not work well, if at all, if a part is missing;
- Know that there are three basic types of technological systems; physical, informational, and biological;
- Use the System diagram to model parts of a system, input, process, output, and feedback;
- Assess the appropriateness and effectiveness of a designed solution based on predetermined design criteria;
- Realize that all technological systems depend on many resources;
- Realize that the output of a system may be an input in another system.

### **Materials**

- Tools and machines necessary for construction of the chosen project.
- Audio visual, and computer equipment with internet access.
- Expendable supplies as needed

### **Evaluation: Authentic and Traditional**

The following are items included in the evaluation of students' achievement in the Engineering Design Technology 1 program.

- |                                       |     |
|---------------------------------------|-----|
| • Design Portfolios & Presentations   | 30% |
| • Project Work                        | 30% |
| • Homework                            | 10% |
| • Tests                               | 15% |
| • Class Participation/Code of Conduct | 15% |