Exploring Technology

Meets Expectation for Students Learning: 1,2,3,4,7,8,9

Elective Semester or Full Year Grades: 9 -12 A Level

This course is designed to offer the student an exploratory experience in general technology. Students rotate through ten different modular workstations where they gain technological knowledge by performing hands-on activities in the fields of: construction, basic electricity, electronic communications, hydraulics, pneumatics, materials and processes, lasers, fiber optics, mechanisms, research and design, aerodynamics, and alternative energy. Students will also use the engineering design process to identify a design problem within constraints, evaluate ideas, build and test prototypes. Can be taken for one semester or a full year. This course can fulfill part of the science credit requirement for graduation.

Robotics/Electronics

Meets Expectation for Students Learning: 1,2,3,4,7,8,9

Elective Semester Grades: 9-12 A Level

Robots are devices that have the intelligence to interpret information, make decisions, and then effect their environment. The fundamentals of electrical circuits (i.e. components and configurations) will be examined through class-work and hands-on activities, including circuit construction. Students in this class will also explore the relationship between humans, computers and machines by utilizing the engineering design process to design and fabricate robotic devices. No previous background is required.

Architecture and Graphic Design

Meets Expectation for Students Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 9-12 A Level

The course will emphasize the design process necessary for the planning and graphic presentation of an efficient home by learning about the relationship between various rooms and spaces. Acting as if they were architects working for a client, and using computer aided design equipment, students will draw floor plans, three-dimensional models and elevations of a house in an American architectural style of their choice. The history of architecture will be explored. Custom scale models of students' house designs will be constructed. An understanding of the elements and principles of design will become clear to students as they practice these techniques throughout the course. Students who wish to explore the fields of architecture, and /or interior design will benefit greatly from the class. Honors credit can be arranged through a written agreement with the instructor for additional independent work. This course fulfills the semester arts graduation requirement.

Consumer Auto

Meets Expectation for Students Learning: 1,2,3,4,7,8,9

Elective Semester Grades: 9-12 A Level

This course is designed for the student who generally will not further his or her education in the auto industry, but who realizes the importance of auto knowledge. The student will be instructed in the everyday operation and maintenance of the car, and will learn what to look for when purchasing a vehicle. Excluding housing, the vast majority of people will spend more money on automobiles than anything else during their lifetime. It makes a great deal of sense to know as much as you can about them.

Automobile Systems

Meets Expectation for Students Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 10-12 A Level

Prerequisite: Internal Combustion Engine

Students will solve problems and gain a fundamental understanding of the automobile by working on the common major systems, engine, lubrication, cooling, fuel, emission, exhaust, transmission, suspension, brake, steering, heating & air conditioning, electrical, and body. Students will have the opportunity to explore the relationship between computers and the integrated electronic systems of automobiles. In the class, the student will become familiar with

many of the different positions that are available in the field of automotive technology, and will learn to provide automotive services. The educational and training opportunities available to the students after high school will be stressed. Students who wish to explore the field of automotive tech should enroll in this class. Successful completion of this course with a grade of B or better will qualify the student for college credit at New England Institute of Technology.

Transportation and Power

Meets Expectation for Students Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 11-12 A Level

Prerequisite: Auto Systems

In addition to working on the major automobile systems, students will be involved with activities that include the construction of: 1. various power and energy systems such as wind and solar, 2. various transportation systems such as electric and marine vehicles, 3. systems that deal with recycling and waste disposal. Students will have the opportunity to explore the relationship between computers and the integrated electronic systems of automobiles. In the class, the student will become familiar with many of the different positions that are available in the fields of automotive technology, transportation, and power and will learn to produce goods and provide services related to these fields. Students who wish to explore the field of automotive technology should enroll in this class. Successful completion of this course with a grade of B or better will qualify the student for college credit at New England Institute of Technology.

Internal Combustion Engine

Meets Expectation for Students Learning: 1,2,3,4,7,8,9

Elective Semester Grades: 9-12 A Level

In this course, students will work with the two and four-cycle internal combustion engine in order to gain an understanding of fuel systems, carburetion, ignition systems, engine lubrication, engine cooling, measuring engine performance, tune-ups, cylinder reconditioning, piston rings, rods, bearings, valves, and pollution control.

Exploring Engineering

Meets Expectation for Students Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 9-12 Honors or A Level

This course is a year-long implementation of the *Engineering the Future* curriculum developed by the Boston Museum of Science and provides students with an introduction to engineering and technology through hands-on activities , cooperative learning and problem solving. Students will use the engineering design process to design and build projects in the following units: design and manufacturing, thermal and fluid systems, electricity and communications, and construction and integrated systems. To obtain honors credit, the student must execute a written agreement with the instructor for additional work. This course can fulfill part of the science credit requirement for graduation.

Introduction to Engineering

Meets Expectation for Students Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 9-12 Honors or A Level

Prerequisite: Algebra I or Algebra/Geometry I

Using the nationally recognized *Project Lead the Way* hands-on curriculum, students will explore the Engineering Design Cycle in problem-based projects. They will also learn to use sophisticated three-dimensional modeling software to create and communicate the details of their products. Emphasis is placed on analyzing potential solutions and communicating ideas to others. This pre-engineering course is designed to enable students to explore the field as a career choice and provides the rigorous, relevant training required to excel in any related post-secondary program. To obtain honors credit, the student must execute a written agreement with the instructor for additional work. This course is recommended as the first course in the *Project Lead the Way* engineering sequence and can fulfill part of the science credit requirement for graduation.

Principles of Engineering

Meets Expectation for Students Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 10-12 Honors or A Level

Prerequisite: Algebra/Geometry II

Using the nationally recognized *Project Lead the Way* hands-on curriculum, students explore the wide variety of engineering and technology principles in the areas such as mechanisms, thermodynamics, electrical systems and materials testing. Using activities, projects and problem -solving, students investigate the integration of math, science and technology in engineering applications . This pre-engineering course is designed to enable students to explore the field as a career choice and provides the rigorous, relevant training required to excel in any related post-secondary program. To obtain honors credit, the student must execute a written agreement with the instructor for additional work. This course is recommended as the second course in the *Project Lead the Way* sequence and can fulfill part of the science credit requirement for graduation.

Digital Electronics

Meets Expectation for Students Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 11-12 Honors or A-Level

Prerequisite: Algebra/Geometry II

Using the nationally recognized *Project Lead the Way* hands-on curriculum, students use problem-solving models to investigate applied logic and the applications of electronic circuits and devices. Projects focus on the investigation of basic analog and digital circuitry. Computer simulation software is used to design and test digital circuitry prior to the actual construction of circuits and devices. This pre-engineering course is designed to enable students to explore the field as a career choice and provides the rigorous, relevant training required to excel in any related post-secondary program. To obtain honors credit, the student must execute a written agreement with the instructor for additional work. This course is recommended as the third course in the *Project Lead the Way* sequence and can fulfill part of the science credit requirement for graduation.