**STEM--SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS**

**CONCEPTS OF ENGINEERING AND TECHNOLOGY** **Grade Level: 9-10** Prerequisite: None Credit: 1 unit This course provides an overview of the various fields of science, technology, engineering, and mathematics and their interrelationships. Students will use a variety of computer hardware and software applications to complete assignments and projects. Students will work on a design team to develop a product or system. This course does count for the technology education credit requirement.

**ENGINEERING DESIGN AND PRESENTATION 1** **Grade Level: 10-12** Prerequisite: None Credit: 1 unit Students enrolled in this course will demonstrate knowledge and skills of the process of design as it applies to engineering fields using multiple software applications and tools necessary to produce and present working drawings, solid model renderings, and prototypes. Students will use computer hardware and the Autodesk Design Academy software applications to complete assignments and projects. Through implementation of the design process, students will transfer advanced academic skills to component designs. Additionally, students explore career opportunities in engineering, technology, and drafting and what is required to gain and maintain employment in these areas. This course does count for the technology education credit requirement.

**PRINCIPLES OF TECHNOLOGY** **Grade Level: 10-12** Prerequisite: Algebra 1, Biology and Geometry or taken concurrently Credit: 1 unit In Principles of Technology, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Various systems will be described in terms of space, time, energy, and matter. Students will study a variety of topics that include laws of motion, conservation of energy, momentum, electricity, magnetism, thermodynamics, and characteristics and behavior of waves. Students will apply physics concepts and perform laboratory experimentations using safe practices. This course does count as a science credit in place of Physics on the minimum or recommended program only.

**ENGINEERING DESIGN AND PRESENTATION 2** \* **Grade Level: 11-12** Prerequisite: Engineering Design and Presentation 1 Credit: 2 units Blocked for two consecutive class periods This course will provide students the opportunity to master computer software applications in a variety of engineering and technical fields. This course further develops the process of engineering thought and application of the design process. This course does count for the technology education credit requirement.

**ENGINEERING MATHEMATICS \*** Technology Excellence Center **Grade Level: 12** Prerequisite: Geometry, Algebra 2, Chemistry & Physics or Principles of Technology Credit: 1 unit Double blocked with Engineering Design and Problem Solving Engineering Mathematics is a course where students solve and model robotic design problems. Students use a variety of mathematical methods and models to represent and analyze problems involving data acquisition, spatial applications, electrical measurement, manufacturing processes, materials engineering, mechanical drives, pneumatics, process control systems, quality control, and robotics with computer programming. This class meets the requirements for the fourth math credit. Students registering for this class need to have met the satisfactory performance level on EOC tests.

**ENGINEERING DESIGN AND PROBLEM SOLVING\*** Technology Excellence Center **Grade Level: 12** Prerequisite: Geometry, Algebra 2, Chemistry & Physics or Principles of Technology Credit: 1 unit Double blocked with Engineering Mathematics This course promotes interest in understanding of career opportunities in engineering, intending to promote ingenuity, intellectual talents, and practical skills in devising solutions to engineering design problems. Students use the engineering design process cycle to investigate, design, plan, create, and evaluate solutions. This class meets the requirements for the fourth science credit. Students registering for this class need to have met the satisfactory performance level on EOC tests.

**SCIENTIFIC RESEARCH AND DESIGN (H)** **Grade Level: 12** Prerequisite: Biology, Chemistry and Physics Credit: 1 unit This course is an independent research class in which students will conduct independent original research in basic science. This research will be exploratory in nature and be conducted under the guidance of a mentor, whether that be the teacher of the class or a researcher in a scientific institution. The results of this research will be presented and judged by an independent panel of experts at the completion of the course. Students will gain skills in various laboratory and scientific techniques. Students have the opportunity to earn one advanced measure for the Distinguished Achievement Program through this course. This course does count as a fourth science credit. Students should have strong academic skills and good task commitment to enroll in this class.