

TECHNOLOGY EDUCATION AND ENGINEERING

Course Name	9	10	11	12
Woodworking 1	E	E	E	E
Woodworking 2	E	E	E	E
Metalworking 1	E	E	E	E
Metalworking 2	E	E	E	E
Small Engines	E	E	E	E
Building Construction		E	E	E
Intro to 3D Design and Engineering	E	E	E	E
Principles of Engineering		E	E	E
Design and Build for Engineering		E	E	E
Youth Apprenticeship			E	E
E = Elective Course R= Required Course * = Honors Course				

Woodworking 1

0.5 Credit: Semester

Prerequisite: None

Projects are used to incorporate as many tools and woodworking techniques as possible. Interesting projects are used to maintain a high level of interest. Learning involves extensive sawing, jointing, planing, lathe work, gluing and finishing. Students will create wood products using CNC (Computer Numerically-Controlled) machines. Students will learn to use power and hand tools safely.

Woodworking 2

0.5 Credit: Semester

Prerequisite: Woodworking 1

More intricate projects are used to incorporate as many tools and woodworking techniques as possible. Interesting projects are used to maintain a high level of interest. Learning involves extensive sawing, jointing, planing, lathe work, gluing and finishing. Students will create wood products using CNC (Computer Numerically-Controlled) machines. Students will be required to use power and hand tools safely.

Metalworking 1

0.5 Credit: Semester

Prerequisite: None

The metals course introduces students to the broad area of metalworking with a primary emphasis on these basic fields: bench metal, machining of metal, foundry, welding, sheet metal and CNC (Computer Numerically-Controlled Machines). Students can expect to learn basic welding, basic lathe operations, CNC milling, grinding, drill press and power hacksaw. Students will learn to read blueprints and become more proficient in practical math. They will also learn to construct a project properly and safely following a suggested sequence.

Metalworking 2

0.5 Credit: Semester

Prerequisite: Metalworking 1

This metals course expands on the students' knowledge and skills from Metalworking 1 with an additional emphasis on these basic fields: bench metal, machining of metal, foundry, and CNC (Computer Numerically-Controlled Machines). They will also incorporate their knowledge of welding and sheet metal to create more complex projects. Students can expect to learn basic lathe operations and CNC milling. They will also learn to construct a project properly and safely following a suggested sequence.

Small Engines

0.5 Credit: Semester

Prerequisite: None

The Small Engines course introduces the student to the theory and practices of small gasoline engine operation and maintenance. Students will learn basic fundamentals involving four-stroke cycle engines and two-stroke cycle engines. Students will disassemble and reassemble engines learning proper assembly techniques and functions of corresponding components.

Building Construction

1.0 Credit: Yearlong

Prerequisite: Woodworking 2

After completing this course, students will be able to frame a complete structure from the ground up. Students will build a structure which will include roofing, siding, foundation, windows, doors, electrical wiring, switches and outlets. This course will also teach basic tile setting, flooring installation, and trim work. Students will complete practical projects that can be used whether they are going into the construction industry or just maintaining a home.

Intro to 3D Design and Engineering

0.5 Credit: Semester

Prerequisite: None

This class sequence will introduce students to the exciting world of 3D Printing, digital design, and digital manufacturing. 3D printing is a process where objects are built up from plastic filament, liquid resin, layers of powder, or even bio-compatible and edible materials. Desktop 3D printing is today's printing press, putting rapid prototyping, customizable products, and individualized medical appliances within reach of the general public. Literacy in basic 3D modeling, design, and manufacturing are essential skills for future Science, Technology, Engineering, and Math (STEM) success in this country. Students will learn basic functionality in 3D modeling software. 3D printers will be used to design, create, and test prototype products. Students will learn to program computerized machinery; computer-controlled routers, vinyl cutters, and laser engravers to create projects they have designed. Digital electronics concepts will be explored through fun, challenging hands-on activities. Students who are interested in careers in product design, engineering, computer controlled manufacturing, hi-technology applications, or who just want to explore these new, cutting-edge technologies will enjoy this class

Principles of Engineering

0.5 Credit: Semester

Prerequisite: Intro to 3D Design and Engineering

Are you interested in engineering and also enjoy project-based learning? This is a fun, challenging course with numerous problem-solving, skill building and cooperative activities all centered around various disciplines within engineering. Students will work in engineering teams, develop presentation skills centered around describing their projects and explaining the development process, and will also work on building critical thinking skills with each new project. Students will be encouraged to use practical assessment models and apply them to real-world engineering ideas as we learn about new concepts. Students will develop a more comprehensive use of basic manufacturing vocabulary and technology required to complete various projects.

Design and Build for Engineering

1.0 Credit: Yearlong

Prerequisite: Intro to 3D Design and Engineering and Principles of Engineering

Upon completion of the Design Build course, students will be able to properly use manufacturing technology vocabulary. They will understand the historical, environmental, psychological, institutional/political, social, technological, legal and economic impacts of manufacturing technology. The students will practice teamwork, networking and communication to safely and efficiently complete any manufacturing project, as well as apply manufacturing activities as a system consisting of want/needs, inputs, processes, outputs and feedback (Systems Thinking Model). Some of the computer programs utilized in this course are for product design, inventory control, and advertising. Students will be able to apply and build upon manufacturing concepts and associated skills learned from hands-on experience. They will apply the concepts of manufacturing systems to design, produce, package and distribute goods and explore different opportunities and careers in the manufacturing field.