

## TECHNOLOGY EDUCATION PROGRAMS

Electives in the area of Technology Education consist of four years of broad-based programs incorporating subject matter from many different fields and disciplines. Emphasis is directed toward hands-on learning activities. Students will develop practical skills, create products and learn about the systems, resources and materials involved in our technological world. Woodworking, computer systems, computer laser systems, mechanical drawing, CNC programming, digital graphics and audio/video production will be the primary mediums used for product development.

Students will experience areas in communications, construction, manufacturing and transportation technology through individual and group assignments.

### **Manufacturing/Production Technology I**

**Eligible Grade Level: 9, 10, 11, 12**

#### **1 Unit**

Students enrolled in Manufacturing/Production Technology I will receive both theory instruction and laboratory experience as they custom manufacture products. This course is designed to introduce students to tools, machines, materials, and processes. Students will also be exposed to technologically advanced equipment that will be used for design and layout. Student will learn about manufacturing technology, technical systems, and the historical evolution of manufacturing. Tool safety, machine operation, and applied mathematics are all emphasized throughout the course.

### **Manufacturing/Production Technology II**

**Eligible Grade Level: Grade 10, 11, 12**

#### **1 Unit**

*Prerequisite: C or better in Manufacturing/Production Technology I*

This course is a continuation of Manufacturing/Production Technology I. Students will examine the organization and management of manufacturing endeavors. The class culminates in the design and production of a product in a manufacturing enterprise situation, which closely parallels the functions of a manufacturing corporation. CAM software and CNC equipment including a CNC router & lathe are introduced and utilized in the production process. Primary goals are to improve ability to reason about design, material, and process alternatives. A continual emphasis of safety, applied mathematics, problem solving skills, and technology are further developed in Manufacturing/Production Technology II.

### **\*Robotics Engineering I (Scholar)**

**Eligible Grade Level: Grades 10, 11, 12**

#### **1 Unit**

*Prerequisite: C or Better in Algebra II*

This course introduces students to agile robotics and their basic programming. Students participate in activities that integrate STEM (Science, Technology, Engineering, and Mathematics) while they design, build, program, and test LegoMindstorms NXT and VEX robots that utilize light, sound, ultrasonic, touch sensors and many more. Students will use several software applications to program autonomous robots. Throughout the course, students will learn about the history of robotics and the terminology used in robotics engineering and programming.

### **\*Robotics Engineering II (Scholar)**

**Eligible Grade Level: Grades 11, 12**

#### **1 Unit**

*Prerequisite: C or Better in Robotics Engineering I*

In Robotics Engineering II students will expand on the engineering, building and programming skills developed in the Robotics Engineering I course. Students increase their engineering acumen as they refine their understanding of the potential of robotic development. Students will have the opportunity to participate in robotics engineering design challenges by competing among each other, as well as students from other schools by joining TSA (Technology Student Association).

### **Communication Technology I**

**Eligible Grade Level: Grade 9, 10, 11, 12**

#### **1 Unit**

This Technology Education course introduces the student to the areas of communication and manufacturing technologies. Units covered are: instruments and their use, sketching, orthographic views, pictorial drawings, dimensioning, manufacturing process and related math. Students will have the opportunity to apply their technical skills in the areas of desktop publishing, digital photography and audio production. Software package includes, but is not limited to, Microsoft Publisher and Adobe Photoshop.

**Communication Technology II****Eligible Grade Level: Grade 10, 11, 12****1 Unit**

This course offers a continuation of Communication Technology I, with additional emphasis on advanced drawing areas, model design, digital photography, video and audio production. Students will be given the opportunity to work within groups as well as individually on technology related projects. Students will further their knowledge of Adobe Photoshop and include the use of Adobe Illustrator and InDesign.

**Communication Technology III****Eligible Grade Level: Grade 11, 12****1 Unit**

This course as a continuation of Communication Technology II is a lab based communication course focusing on desktop publishing, graphical design, photography, printing, and other means of communication. Students will utilize industry software suites in the creation of different printed media. Students will learn the basics of layouts for magazine, newspaper poster, displays and others. The use of mechanical and computerized publishing is emphasized. Digital photography and computer image manipulation is highlighted. Students will fulfill an in-depth study of shot composition, selection, lighting, posing, capturing, and different publishing outlets for photography. Students will complete media and photography works for district and local community use.

**Television Production I****Eligible Grade Level: 9, 10, 11, 12****1 Unit**

Television Production is a course for students who have an interest in learning video and audio production skills. This course is designed to give selected students a chance to explore video and audio production principles and apply them to the on-site operations of WOWL-TV. Students will utilize the Adobe Publishing software suite.

**Television Production II****Eligible Grade Level: 10, 11, 12****1 Unit**

This is the second course in the series of Television Production courses. Students will refine their skills in digital video and audio production. Students will study lighting, audio, set design, production techniques and other aspects of digital production and live television broadcasting.

**Television Production III****Eligible Grade Level: 11, 12****1 Unit**

This third year course of Television Production will offer students the opportunity to expand their knowledge base and to pursue work of a more complex nature. Students will work on remote taping and live broadcast by utilizing their skills from the Television Production I and II courses. Students will propose and pitch a large-scale production for development.

**Television Production IV****Eligible Grade Level: 12****1 Unit**

This final year of the Television Production class series is the capstone of the Television Production curriculum. Students will be responsible for the daily operation of WOWL-TV and the School and Community Message Channel. Students will undertake productions on a larger scale and be in charge of every aspect of these productions.

**Transportation Technology****Eligible Grade Level: 10, 11, 12****1 Unit**

*Prerequisite: Manufacturing and Production Technology I (Industrial Ed. Technology I) or Communication Technology I*

The content covered in this course will offer interested students an opportunity to explore several areas of transportation, involving applications and developments. Individual and group assigned activities will require model building, scaled layouts, variable testing and researching the past, present and future trends in the area of transportation technology.

**Computer Aided Design (CAD)**

**Eligible Grade Level: 11, 12 (F and/or S)**

**.50 or 1 Unit**

*Prerequisite: Passed Math Topics II, Algebra IC or Algebra IB*

CAD training prepares students to make typical mechanical drawings with the aid of the computer using state-of-the-art software that is used in many local industries. A background in Algebra is required before entering this program.

# CAREER AWARENESS

## Career Exploration – Grade 9 - 1 Unit

Career Exploration is a ninth grade program designed to introduce a ninth grade student to the vocational world of work. A student in this course will be introduced to a cluster of career and technical programs. The cluster may include any of the career and technical and business areas. The class will meet one period per day. Those who successfully complete the course will receive one (1) Unit.

In our wide diverse society, choosing a career path can be a very important step in one's lifelong learning plan. This program will allow each student to explore, through hands-on experience, the various career areas within the Career and Technical Department before selecting a preferred career and technical program. It is believed that these experiences will allow students to better understand the world of work and relate more effectively to their career choice. Following is a list of the Career Exploration courses that could be offered:

### **Automotive Mechanic**

During the Automotive section of the Careers in Technology rotation, students will be introduced to the basic operation of the car's major systems, use and care of basic hand tools, and the many varied occupational opportunities available to them in this exciting and diversified industry.

### **Carpentry Technology**

In this introduction to the area of carpentry, students will learn the safe use of woodworking tools and machines while building a wall shelf project.

### **Computer Maintenance Technology**

Students will be introduced to the major parts of the computer, how to remove and install Hard Drives, CD-ROMs, RAM and various expansion cards. Students will be introduced to file management along with drive specification and basic networking drive mapping. Students will also be introduced to basic trouble shooting and work place readiness skills.

### **Business Education**

Students will learn how to: 1) maintain and balance a checking account; 2) properly complete an employment application; 3) complete a simple federal tax return for themselves; and 4) read a paycheck.

### **Drafting Technology**

Instruction includes introduction to engineering drafting using state-of-the-art computer software programs.

### **Electrical Occupations**

Students will receive an overview of the different careers in the electrical occupation field. Students learn safety procedures with an emphasis on Lock/Out Tag/Out. Students will install a lighting circuit while using basic hand tools.

### **Natural Resources Management Electives**

Students will study the areas of agriculture and become aware of careers in this field. Students will learn about oil production and the forest industry in McKean County, forest dynamics, and timber measurement. Students will also perform woodworking, build a birdhouse, study welding and welding safety and do basic welding.

### **Machine Technology**

The students will receive instructions in various machine related activities. With the use of different machines and hands-on training, the students will make a useable product. At the end of the course the students should be able to evaluate the occupational outlook, places of employment, and personal traits needed for working in the numerous machining career trades.

### **Marketing/Distributive Education**

Students are introduced to the world of marketing, management, and entrepreneurship. Students explore the many challenges facing business owners of today.

### **Communication Technology**

The first half involves working on a transportation activity. Students apply mechanical drawing skills to the design and development of the activity. The second half covers communication technology. Students will be designing and producing desktop publishing and graphical design projects. Students will follow the design process during completion of activities. They will also be learning different aspects of communication technology and how it applies to their everyday world.