



## TECHNOLOGY & ENGINEERING EDUCATION MISSION STATEMENT

*Technology and Engineering Education is the study of the way people apply knowledge and scientific principles in the use of various tools and materials to solve problems and meet human needs. It is our mission with supportive businesses and industries to prepare all students to adapt and function in an ever-changing technological society, develop employability skills and provide the transition from school to ultimate gainful employment.*

### ADV GRAPHIC COMMUNICATION (8367)

Grade Level: 11-12  
Length: Year Credit(s): 1.0

Prerequisite: C- or higher in Graphics III

Course Fee: No

This course is designed for students who are serious about improving their expertise in the graphics field. Areas of study will be design and layout, screen, offset and photography. Any or all areas can be studied. These students will have the flexibility to design and create projects of their choice provided the project will challenge the student. Students will be expected to perform basic maintenance/repair to equipment in the lab as needed. Students will also be expected to teach one lesson to a Graphics I class.

### ADVANCED MACHINE SHOP I (8335)

Grade Level: 11-12  
Length: Semester Credit(s): 1.0

Prerequisite: Machine Shop II

Course Fee: Yes

Students are provided the opportunity of broadening their general knowledge and skills in the Machine Shop field, and if they choose, may study in a specialized area of the machine trades. Students will learn advanced machining techniques on CNC Lathes, Milling Machines, Machining Centers, Computer Measuring Machine, and Wire EDM using and CAM software. Specific instruction is given to project design, machine programming, machine setup and operations, machine control, and adjustments and project quality. Students will be involved in the machining of parts for the BotsIQ robot competition.

### ADVANCED MACHINE SHOP II (8336)

Grade Level: 11-12  
Length: Semester Credit(s): 1.0

Prerequisite: Advanced Machine Shop I

Course Fee: No

Students in this class will have the opportunity to practice their skills with individualized instruction and hands-on projects. This class will prepare students for a career in the manufacturing field. Students will use Mastercam and Milltronics software for design and programming of CNC machines. Students will practice the setup and operation of CNC machines to design and build parts for the BotsIQ robot competition including production machining techniques and quality control. Safety glasses are required daily.

### ARCHITECTURE I (8324)

Grade Level: 10-12  
Length: Semester Credit(s): 0.50

Course Fee: No

This course will introduce the basics of architectural drafting and design as well as provide the students the opportunity to learn and use the architectural drafting software. Residential house design and room planning will be discussed in detail along with having the students developing drafting skills through a series of simple drawing projects. The students will also be required to take field measurements and convert those to the computer to produce a complete floor plan of their own house.

### ARCHITECTURE II (8325)

Grade Level: 10-12  
Length: Semester Credit(s): 0.50

Prerequisite: Architecture I

Course Fee: No

This course is a continuation of Architecture I and will introduce the VISION program. Building practices and construction techniques will be discussed in detail, along with having the students learning residential planning and building code requirements. The students will be required to work collaboratively in groups to develop a complete set of house plans for the VISION project. In addition to the complete set of plans, a scale model will also be designed and built for the VISION project.

→ **ARCHITECTURE III (8326)**

Grade Level: 11-12  
Length: Year Credit(s): 1.0

Prerequisite: Architecture II

Course Fee: No

This course is the culmination of the architectural drafting program and will introduce many facets of the Architectural world. Building codes for one and two-family dwellings will be discussed in detail along with having the students designing multi-family units. The students will be required to work collaborative in groups to develop complete sets of plans. In addition to drawing, students will be required to do some field measuring, structural modeling, material estimating, and work with clients and/or an architect.

→ **AUTO TECHNOLOGY I (8312)**

Grade Level: 11-12  
Length: Semester Credit(s): 0.50

Course Fee: Yes

A course designed to give students confidence in understanding the automobile using state of the art industry equipment and techniques. Auto I covers the use of hand and power tools, fasteners, automobile lifts, engine theory, tires and suspension service, and learning how car dealers buy and sell vehicles to consumers. A career unit will cover various job opportunities and pay schedules. Students are to supply their own safety glasses.

→ **AUTO TECHNOLOGY II (8313)**

Grade Level: 11-12  
Length: Semester Credit(s): 0.50

Prerequisite: Auto Tech I

Course Fee: Yes

This course is a continuation of Auto Tech I. Same industry standards exist which will lead a student to a full understanding of automotive fundamentals which prepare the student for Auto Tech III. The learner will explore automobiles by studying electrical systems: manual and automatic transmissions, electron theory, wiring diagrams, starting systems, charging systems, and ignition systems. Students are to supply their own safety glasses.

→ **AUTO TECHNOLOGY III (8315)**

Grade Level: 12  
Length: Year Credit(s): 2.0

Prerequisite: Auto Tech II, valid driver's license

Course Fee: Yes

Application required

An intense lab oriented class using things such as hand and power tools, diagnostic aids and industrial shop equipment enhancing skills taught in Auto Tech I and II. Students are selected for the course by the instructor on the merits of grades, mechanical aptitude, desire to enter the automotive field, work ethics and ability to work with others. Students are to supply their own safety glasses.

→ **AUTOMOTIVE INTERN/APPR (8850)**

Grade Level: 12  
Length: Year Credit(s): 2.0

Prerequisite: Auto III taken concurrently

Course Fee: No

Application required

Students work an average of 15 hours per week in an automotive work-site and earn at least minimum wage. Students agree to commit to one full school year at the work-site and may be released during the school day or work after school. Supervision and evaluation are a shared responsibility of the instructor and employer. Recommendation by the instructor is required and acceptance into the program is through an interview process by the employer. Students must adhere to all attendance policies of the school and the worksite.

→ **AUTOMOTIVE SURVIVAL (8311)**

Grade Level: 11-12  
Length: Semester Credit(s): 0.50

Course Fee: Yes

This course is for students who want to understand the basic systems of the automobile and its required maintenance. The student will learn how to purchase new or used cars and purchase services through a local repair shop. No prior knowledge of the automobile is necessary. This course will also use classroom discussion, demonstrations and practical applications with hands-on lab experiences. Students are to supply their own safety glasses.

## TECHNOLOGY & ENGINEERING EDUCATION

### → CAD ARCHITECTURAL INTERNSHIP (8830)

Grade Level: 12

Length: Year Credit(s): 2.0

Prerequisite: Architecture III or taken concurrently

Course Fee: No

Application required

The Architecture Internship is part of the School-to-Work program. Students with proper prerequisites must be employed in the architecture field for an average of 15 hours per week with opportunities for extended hours. Placement is decided through the interview process of the employer, and pay is at minimum wage or above. The student is expected to remain with the employer the entire school year and will be evaluated by both the instructor and the work supervisor.

### → CAD ENGINEERING I TC (8327)

Grade Level: 10-12

Length: Year Credit(s): 1.0

Prerequisite: Technical Drawing II

Course Fee: Yes

This course offers students the ability to implement 2D and 3D design into the world of Computer Aided Manufacturing. Students will design, engineer, program and produce projects using CAD and CAM software and CNC machines. Students will operate C NC machines such as milling machines and machining centers, CNC lathes, Wire EDM, laser engraver, and laser cutting . Students will also produce parts in the rapid prototyping machine.

### → CAD ENGINEERING II (8328)

Grade Level: 11-12

Length: Year Credit(s): 1.0

Prerequisite: CAD Engineering I

Course Fee: No

This course is for the student wishing to further his/her knowledge in the area of Computer Aided Design in preparation for a career in Engineering, Mechanical Design or Tool and Die Design. In this course, students will work with advanced 3D solid modeling to design battle-bots for BotsIQ competition. Students will create detail designs for single part and assembly of multi-part projects. Students will also re-engineer 3D parts using various measurement tools and produce parts in the rapid prototyping machine.

### → CAD MECH INTERN/APP (8854)

Grade Level: 12

Length: Year Credit(s): 2.0

Prerequisite: Cad/Engineering I or taken concurrently

Course Fee: No

Application required

In Computer-Aided Drafting, students work in local industry during early release or after school (an average of 15 hours per week) with opportunities for extended hours. Students earn at least a minimum wage and commit to one school year of employment. Supervision and evaluation is by the instructor and employer. Attendance rules of the employer may not necessarily follow those of the school. Recommendation of the instructor and application to the employer and School-to-work-Coordinator is required. Placement is decided through the interview process of the employer.

### → CARPENTRY/VISION (8345)

Grade Level: 11-12

Length: Year Credit(s): 2.0

Prerequisite: Construction II

Course Fee: No

Carpentry/VISION is a hands-on experience for students who are interested in employment in the construction trades. A partnership between the Hartford Rotary and Hartford Union High School provides an opportunity for students to participate in the construction of a single-family residence. Enrollment is limited. Acceptance into the program will be by application. This is a leading school-to-work project in the state. Safety glasses and hard hats are required daily.

### CONSTRUCTION I (8344)

Grade Level: 10-12

Length: Semester Credit(s): 0.50

Course Fee: Yes

This course will provide students the opportunity to explore the construction trades in a classroom and lab environment. Students will develop a variety of technical skills associated with residential construction. Areas of construction include but not limited to the following: safety procedures, building layout, rough construction, finish carpentry, plumbing and electrical systems, drywall, applied mathematics, communications, and career opportunities. Safety glasses are required.

→ **CONSTRUCTION II (8346)**

Grade Level: 10-12  
Length: Semester Credit(s): 0.50

Prerequisite: Construction I

Course Fee: Yes

This course is a continuation of Construction I. The content learned in Construction I will be the foundation for Construction II. The students will continue learning about the construction trades and develop skills necessary to complete basic home repairs. Safety glasses are required.

→ **CONSTRUCTION INTERNSHIP (8858)**

Grade Level: 12  
Length: Year Credit(s): 2.0

Prerequisite: VISION

Course Fee: No

Application required

Students with proper prerequisites must be employed in one of the varied construction fields for an average of 15 hours per week with opportunities for extended hours. Placement is decided through the interview process of the employer and pay is at minimum wage or above. The student is expected to remain with the employer the entire school year and will be evaluated by both the instructor and the work supervisor.

→ **CUSTOM CABINETRY INTERNSHIP (8847)**

Grade Level: 12  
Length: Year Credit(s): 2.0

Prerequisite: Manufacturing

Course Fee: No

Application required

Custom Cabinetmaking Internship is part of the work-study program. Students with proper pre-requisites must be employed in one of the local custom cabinet facilities for an average of 15 hours per week at minimum wage or above. The student is expected to remain with the employer the entire school year. Student will be evaluated by both the school and the work supervisor.

→ **GRAPHIC COMMUNICATIONS I (8364)**

Grade Level: 9-12  
Length: Semester Credit(s): 0.50

Course Fee: Yes

Students will learn the basic theory and operation of graphic arts concepts, offset printing, screen printing, and photography. Hands-on experience will be used to reinforce the operations. Career opportunities will be explored. Graphics Communications I may be taken first or second semester as offered.

→ **GRAPHIC COMMUNICATIONS II (8365)**

Grade Level: 9-12  
Length: Semester Credit(s): 0.50

Prerequisite: Graphic Communications I

Course Fee: Yes

This course will allow the student to apply the practices and skills learned in Graphic Communications I on a variety of projects. Students will experience many hands-on activities that will be completed in a specific period of time. Students will be expected to further their experiences on the computer while using desktop publishing software. Students will be exposed to the graphic communications career choices through speakers, and various teaching aids.

→ **GRAPHIC COMMUNICATIONS III TC (8366)**

Grade Level: 10-12  
Length: Year Credit(s): 2.0

Prerequisite: Graphic Communication II

Course Fee: No

In Graphic Communications III, students will select projects from subject areas taught in Graphic Communications I & II. Projects are expected to be more complex than previously produced projects. Another area of this class will be to provide assistance to other departments in the school. Exam-ples: the newspaper, T-shirts, program covers, etc. This operation will be run as a small business. Minimal fees will be charged for supplies and labor. The class will keep financial records. The funds raised will be used to fund a class trip and scholarships.

## TECHNOLOGY & ENGINEERING EDUCATION

### GRAPHICS INTERNSHIP (8866)

Grade Level: 12  
Length: Year Credit(s): 2.0

Prerequisite: Graphics III

Course Fee: No

Application required

Seniors work an average of 15 hours per week in the Graphics field while earning at least the minimum wage and must remain in the program one full school year. Students may be released during the school day or work after school. Supervision and evaluation is a shared responsibility of the instructor and the employer. Recommendation by the instructor is required and acceptance into the program is through an interview process by the employer.

### INDEPENDENT ADV PHOTOGRAPHY (8361)

Grade Level: 10-12  
Length: Semester Credit(s): 0.50

Prerequisite: B or better in Photography

Course Fee: Yes

This course is designed for students who are serious about improving their expertise in the photography field. Students will work independently while learning more advanced photography techniques, focusing on the use of digital cameras and taking many pictures. File management, storage and resolution will be covered, with major emphasis on photo editing, software and composition.

### INTRODUCTION TO TECHNOLOGY EDUCATION AND ENGINEERING (8302)

Grade Level: 9-10  
Length: Year Credit(s): 1.0

Course Fee: No

Intro to TEE is a year-long course covering four basic areas: communication, construction, transportation, and manufacturing. Through a series of classroom and laboratory activities, students will develop an understanding of technology's impact upon their everyday life. As a consumer, this class will prepare students for occupations which exist today, tomorrow and developing ones for the future. There will be hands-on activities in all four technology areas. This course is recommended if a student plans to take any other technology education courses.

### MACHINE INTERNSHIP (8856)

Grade Level: 12  
Length: Year Credit(s): 2.0

Prerequisite: Advanced Machine Shop I or taken concurrently

Course Fee: No

Application required

Students work in local industry during early release or after school (an average of 15 hours) with opportunities of extended hours. Students earn at least minimum wage and commit to one school year of employment. Supervision and evaluation is shared by the instructor and employer. Attendance rules of the employer may not necessarily follow those of the school. Recommendation of the instructor and application to the employer and School-to-Work Coordinator is required. Placement is decided through the interview process of the employer.

### MACHINE SHOP I (8331)

Grade Level: 10-12  
Length: Semester Credit(s): 0.50

Course Fee: Yes

Students in this course will study the operation of the lathe, milling machine, and surface grinder. Considerable emphasis will be placed upon the reading, use and care of the basic precision measuring instruments. Students will also study basic programming for CNC machining. Students will perform the required machine tool operations with the proficiency which will allow them a passing grade on assigned projects and other lab assignments. Students will read the precision measuring instruments as measured by written and/or performance tests. Safety glasses are required daily.

### MACHINE SHOP II (8332)

Grade Level: 10-12  
Length: Semester Credit(s): 0.50

Prerequisite: Machine Shop I

Course Fee: Yes

In this course, students will be provided an opportunity to select lab activities more suited to their particular needs and interests, provided such activities relate to the machine shop and build skills learned in Machine Shop Units of study will include taper turning and thread cutting operations on the lathe, reading and care of special micrometers, and speeds and feeds for the various machining operations. Students will also study advanced CNC programming including the machining of arcs, circles, and other shapes using CAM software.

→ **METAL FABRICATION I TC (8374)**

Grade Level: 11-12  
Length: Semester Credit(s): 1.0

Prerequisite: Welding II

Course Fee: Yes

Metal Fabrication is a one semester, two class period metals class that deals with the cutting, bending, welding, and assembling of sheet metal and structural steel in producing a finished product. Students will build a project from start to finish using basic CNC fabrication techniques and advanced metal joining processes. Students can design their own project or select from blueprints available. Safety glasses are required daily.

→ **METAL FABRICATION II (8376)**

Grade Level: 11-12  
Length: Semester Credit(s): 1.0

Prerequisite: Metal Fabrication I

Course Fee: Yes

Students will learn advanced metal fabrication skills using CNC fabrication equipment. Students will learn programming skills, program editing skills, mass production skills, and maintenance skills for production equipment. The machines the students will use to gain these skills are CNC Laser Cutter, CNC Plasma Cutter, CNC Brake Press and a Welding Robot. Safety glasses required daily.

→ **ORIOLE (1650)**

Grade Level: 11-12  
Length: Year Credit(s): 1.0

Course Fee: No

Application required

Oriole, the school yearbook, is another vehicle for student expression. A genuine interest in the personalities and activities of the school plus the desire to become involved in the steps of producing a yearbook are as necessary as writing ability.

Students will take photos, write copy and arrange layouts.

Students will sell advertising, assemble and perform other business functions.

Students will assist the editors/advisor in determining theme and content.

→ **PHOTOGRAPHY (8360)**

Grade Level: 9-12  
Length: Semester Credit(s): 0.50

Prerequisite: Graphics I & II

Course Fee: Yes

In this course students will learn advanced photography techniques includes special effects in the darkroom, in the camera and on the computer. Students will be working with studio lights, existing light, and painting with light. We will hand color and computer color pictures and explore some of the high tech new advances in photography.

→ **PLTW: INTRO TO ENGINEERING DESIGN (8305)**

Grade Level: 9-12  
Length: Year Credit(s): 1.0

Course Fee: No

Introduction to Engineering Design is part of the Project Lead the Way curriculum which is a national organization that promotes pre-engineering courses for high school students. This course is recommended for any student pursuing an engineering career. Students will learn team building and problem-solving skills using the design development process. Models of product solutions are created, analyzed, and communicated using solid modeling software. Math and Science concepts are taught by practical hands-on applications. Students may earn credits that are accepted in college programs.

→ **PLTW: PRINCIPLES OF ENGINEERING (8306)**

Grade level: 9-10  
Length: Year Credit(s) 1.0

Course Fee: No

This course is designed to help students understand the field of engineering and engineering technology. Exploring various technology systems and manufacturing processes help students learn how engineers and technicians use math, science and technology in an engineering problem solving process to benefit people. The course also includes concerns about social and political consequences of technological change.

## TECHNOLOGY & ENGINEERING EDUCATION

### PRINTING APPRENTICESHIP (8867)

Grade Level: 11-12  
Length: Year Credit(s): 3.0

Prerequisite: Graphics III or taken concurrently

Course Fee: No

This state-certified program is for Juniors with a sincere interest in pursuing a career in Graphics. The student attends school 4 to 5 hours per day and the remainder at the work site his/her Junior and Senior year. Students earn at least the minimum wage and must be at the work site a minimum of 15 hours per week. Supervision and evaluation are coordinated with the Graphics instructor and an on-site mentor. This class does have college credit attached. Application is required.

### TECHNICAL DRAWING I (8321)

Grade Level: 9-12  
Length: Semester Credit(s): 0.50

Course Fee: No

An introductory technical drawing course which may be taken for exploratory purposes, prerequisite for advanced courses, or for the beginning of a career in engineering, architecture, mechanical design, interior design or tool and die making or design. Content will include a study of how objects are technically designed in industry from sketching to 3D solid modeling design (CAD) software. Students will produce a project from a technical design.

### TECHNICAL DRAWING II (8322)

Grade Level: 9-12  
Length: Semester Credit(s): 0.50

Prerequisite: Technical Drawing I

Course Fee: No

Technical Drawing II is a continuation of Technical Drawing 1 with further exploration into various ways that objects are designed and expressed technically in industry. All work will be done on our 3D solid modeling CAD software. Students will produce a project from a solid modeling design.

### VISION LEADERSHIP (8349)

Grade Level: 12  
Length: Year Credit(s): 1.0

Prerequisite: Consent of instructor

Course Fee: No

Application required

This class will allow the students to have the VISION experience again. This class is for the students that would like to further their construction experience and leadership skills. Students will be expected to take a leadership role.

### WELDING I (8371)

Grade Level: 10-12  
Length: Semester Credit(s): 0.50

Course Fee: Yes

Welding I is a course designed to give hands on experience in different types of welding processes. Students will emphasize on Stick, MIG and Resistance Welding. Students will also develop their technical knowledge on blue print reading, layout and metal fabrication. Safety glasses are required daily.

### WELDING II (8372)

Grade Level: 10-12  
Length: Semester Credit(s): 0.50

Prerequisite: Welding I

Course Fee: Yes

With the successful completion of Welding I, students in Welding II will be introduced to more advanced types of welding processes. Students will emphasize on Stick, MIG and TIG welding as well as an introduction to oxy-fuel cutting. Students will also develop their technical knowledge in the areas of blueprint reading, industry terminology and mass production. Safety glasses required daily.

→ **WELDING INTERN/APPRENT TC (8875)**

Grade Level: 12  
Length: Year Credit(s): 2.0

Prerequisite: Successful completion of Welding II

Course Fee: No

Application required

Students work in local industry during early release or after school (an average of 15 hours per week) with opportunities for extended hours. Students earn at least minimum wage and commit to one school year of employment. Students should have a job lined up for the start of the school year, that is welding related. If they do not, they will be asked to drop and add other classes in place of the apprenticeship. Apprenticeship certificate can be awarded upon successful completion of designated competencies and the student must be enrolled in a welding related class.

→ **WOOD PRODUCTS-CUSTOM CABINETMAKING (8343)**

Grade Level : 11-12  
Length: Semester Credit(s): 1.0

Prerequisite: Wood Products-Manufacturing

Course Fee: No  
Application required

Students will be involved with building residential cabinetry. The focus will be placed on custom cabinetry for the HUHS VISION house, in an attempt to develop proficiency in the cabinet shop. A highly technical approach will be taken by using the CNC milling center to produce quality custom cabinetry. Students will use knowledge from previous Wood Products classes to design and complete individual projects. Students will pay for material used in personal projects. Safety glasses are required daily. (2 hour block)

→ **WOOD PRODUCTS-MANUFACTURING (8342)**

Grade Level: 10-12  
Length: Semester Credit(s): 1.0

Prerequisite: Wood Products Manufacturing II

Course Fee: No  
Application required

A continuation of Wood Products-Millwork II. More emphasis will be placed on design theory and practice. The course will attempt to emulate current trends in industry. Students will utilize team dynamics to solve problems and make decisions. Students will develop contacts with and tour the wood products industry in an effort to create awareness and future employment opportunities. Safety glasses are required daily. Students will pay for material used in required projects.

→ **WOOD PRODUCTS-MANUFACTURING I (8340)**

Grade Level: 9-12  
Length: Semester Credit(s): 0.50

Course Fee: Yes

Students taking Millwork I will be introduced to the wood products industry with a hands-on approach. Class work will include development of part drawings, bill of materials, and precise measurement. Student projects are designed to teach proper use of the table saw, radial arm saw, jointer, planer, wide belt, disc sander, edge sander, and band saw along with an assortment of hand tools. Safety glasses are required daily.

→ **WOOD PRODUCTS-MANUFACTURING II (8341)**

Grade Level: 9-12  
Length: Semester Credit(s): 0.50

Prerequisite: Wood Products Manufacturing I

Course Fee: Yes

A comprehensive action-based study of the modern materials and processes associated with production of modern cabinet-making and millwork. Coursework includes learning how to safely and productively utilize production and cabinetmaking equipment, and technique. This is in an effort to create awareness of the industry and possible future employment opportunities. Students will also program basic operations on the CNC milling center to demonstrate technological advances in the wood products industry.