CTE – INDUSTRIAL TECHNOLOGY & ENGINEERING

Course Offerings

Why take Industrial Technology & Engineering classes?

- Project-based learning incorporating hands-on, real-world experiences.
- Gain experience with the practical use of tools and materials in order to better understand our technical world.
- Explore possible career options in a variety of technical and engineering-related fields.
- Develop problem solving and technical skills needed to be successful in your future career and life.

Technical Drawing & Engineering Design *(9-12) – Dual Credit*

- Gain knowledge about various types of trade and industrial occupations and the skills needed.
- Develop the ability to draw and understand drafting.
- Design and develop engineering prototypes that meet today's industry standards.
- Analyze various processes used in the world of manufacturing.
- Understand the types of materials used in manufacturing applications.

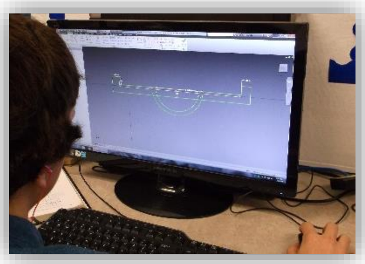
This course is a prerequisite to other Industrial Technology & Engineering classes such as Carpentry, Construction, and Drafting & Engineering Design.

Drafting & Engineering Design *(10-12) – Dual Credit*

This course introduces drafting-related occupations and the knowledge and skills needed for these occupations. Units will foster an awareness and understanding of drafting terms, drafting instruments and their uses, lettering styles and procedures, sketching and shape description, geometric construction, and multi-view projection. This class provides a foundation for students interested in engineering or architecture-related careers.

Engineering Design - CAD 1 *(11-12) – Dual Credit*

This class provides a foundation for students interested in engineering or architecture-related careers. This course is designed to provide students interested in a career in drafting with information and practical experience needed for the development of job-related competencies. The course content includes planning and organizing activities, researching information, preparing various mechanical and architectural sketches, performing basic layouts, detailing drawings such as sectional and isometric views. Computer Aided Drafting (CAD) software is used to generate various types of drawing.



Engineering Design - CAD 2 *(11-12)*

This course builds upon CAD skills obtained in Architectural Drafting (CAD) 1 emphasizing technical drawings. The areas of performing presentation techniques such as producing architectural drawings, interpreting codes and constructing structural working drawings, producing mechanical and electrical/electronic working drawings, and producing civil engineering drawings. This class provides a foundation for students interested in engineering or architecture-related careers. Computer Aided Drafting (CAD) software is used to generate various types of drawings.

Carpentry *(10-12) – Dual Credit*

This course consists of planned learning experiences designed to introduce this student to construction-related occupations and the knowledge and skills needed for these occupations. Areas of instruction include tools, materials, techniques, equipment, and processes utilized in the carpentry areas of construction.

***Note:** See OTHS Curriculum Guide for Course Prerequisites.*

Construction 1 *(11-12) – Dual Credit*

This course is designed as an introductory course with emphasis on construction industry. It is also designed to provide comprehensive groundwork for construction. Instruction covers, but is not limited to, topics of: blueprint reading, residential floor/wall roof framing, estimating/ structural computations, excavation, footings, and foundations. This course provides comprehensive background in the use of power tools.

Construction 2 – Advanced Building Trades *(11-12)*

This course is a skill-level course with emphasis on the construction industry. Instruction covers: interior walls, interior and exterior doors, window framing, roof and rafter construction and finish carpentry work. Emphasis will be placed on good work habits and practices, safety of both hand and power tools.

Beginning Welding *(10-12)*

Beginning Welding is designed to introduce the student to the basic fundamentals of all types of welding. Instructions will include safety procedures, identification of oxy-acetylene equipment, electrode identification and the making of proper settings of arc welding machines when welds are to be made.

Welding Technology 1 *(11-12) – Dual Credit*

Welding 1 will consist of planned learning experiences designed to provide the student with job entry-level skills. Areas of instruction include, but are not limited to: safety; shielded metal arc welding using various electrodes, gas metal arc welding, and flux core arc welding. Emphasis will be placed on building proper size fillet welds in the 2F welding position.

Welding Technology 2 *(11-12)*

This course further develops skills obtained in Welding Technology 1 with additional areas of instruction including: 1) all position butt welding with heavier metal; 2) Vee-groove butt joints; 3) gas metal arc welding; flat butt weld, vertical butt weld, horizontal butt weld, and overhead weld.

3D Modeling, Animation & Printing *(10-12)*

This course will be an exploration into current 3D computer modeling primarily using Blender, a free, open source software. This course applies to students interested in a variety of industries and endeavors including: Manufacturing such as 3D printed fine art, commercial product design, architecture, and machinery; Medical, forensic, aerospace, geologic, and all other scientific fields that use models for simulations, products, and research; Entertainment such as the video game industry, web developer, graphic designer, and CGI for animation and films.

3D Modeling, Animation & Printing 2 *(10-12)*

This course will be an exploration into current 3D design and software and techniques for modeling 3D objects to be used in products such as games, movies and for production with 3D printers.

Electrical Applications *(10-12)*

This course consists of planned learning experiences designed to introduce the student to electricity and electronics occupations and the knowledge and skills needed for these occupations. Areas of instruction include electron theory, energy sources, OHMS LAW, A.C. and D.C. circuits, and the equipment used in analyzing and testing.

Small Engine Repair *(10-12)*

This introductory course provides experience related to maintenance, repair, and servicing a variety of maintenance equipment such as lawn mowers, chainsaws, and rotary tillers. Areas of instruction include but are not limited to: safety principles and practices; combustion engine principles; carburetion principles; disassembly and reassembly of small gas engines; reading from technical manuals; measuring and performing mathematical calculations related to small engine mechanics.

Note: *See OTHS Curriculum Guide for Course Prerequisites.*