

Course Description



TECHNOLOGY EDUCATION

Transcribed Classes are highlighted throughout Course Handbook

ARCHITECTURAL DRAFTING AND DESIGN

GRADE: 9, 10, 11, 12

ELECTIVE

BHS CREDITS: 1

PREREQUISITE: None

TRANSCRIBED THROUGH: NWTC (1 Credit) Revit 1 10-614-291

This course is intended for the student who is serious about a career related to architecture. A home will be designed and plans will include: all floor plans, electrical, dimensioning, wall sections, door and window schedule, elevations, and site plans. Students will go outside and do site and land surveying. AUTOCAD 2019 and AutoDesk Revit 2019 software will be used throughout the course.

INTRODUCTION TO ENGINEERING DESIGN (IED)

GRADES: 9, 10, 11, 12

ELECTIVE

BHS CREDITS: 1

PREREQUISITE: None

ADVANCED STANDING (1 CREDIT - 3D MODELING WITH INVENTOR)

Introduction to Engineering Design encourages students to be creative and apply decision-making and problem solving skills to specific design problems, using powerful computer hardware and software (Inventor) to develop 3-D models or solid renderings. Using a CAD (computer aided design) system, students explore the design process through creating, analyzing, rendering, and producing models. Rapid-Prototyping will be accomplished and experienced with the usage of a 3D printer in this class.

INTRODUCTION TO DRAFTING

GRADE: 9, 10, 11, 12

ELECTIVE

BHS CREDITS: .5

PREREQUISITE: None

TRANSCRIBED THROUGH: Not transcribed

This course is an introduction to the mechanical drafting field. Tools such as: T-squares, triangles, compasses, and templates will be used to prepare drawings needed to develop and manufacture modern day products. Students will learn the principles of orthographic projection, isometric pictorials, working drawings, geometric construction, dimensioning, and pattern development. Students will get a brief preview working with Auto CAD and residential design. This class is beneficial for all students planning to pursue a career in an engineering or technical field.

COMPUTER AIDED DRAFTING AND DESIGN (CAD) AND BLUEPRINT READING

GRADE: 10, 11, 12

ELECTIVE

BHS CREDITS: 1

PREREQUISITE: Introduction to Drafting

TRANSCRIBED THROUGH: NWTC (4 Credits) - CAD #10606113, 2 Credits; Blue Print Rdg/Sket-Machine 1 #31-421-352, 2 Credits

In this course the students will use Auto CAD/Inventor/REVIT to apply 2 and 3 dimensional principles that were taught in Intro to Drafting. The students will work on numerous mechanical and architectural self-paced individual drawings. The students will learn to use various plotting devices. In addition, career opportunities in the design and engineering fields will be explored.

RESIDENTIAL WIRING 1

GRADES: 11, 12

ELECTIVE

BHS CREDITS: .5

PREREQUISITE: None

TRANSCRIBED THROUGH: NWTC - RESIDENTIAL WIRING 1 #10-413-319, 1 Credit

This course is offered to students who are interested in receiving a basic understanding of electricity as it pertains to residential wiring. The student will learn how electricity as an energy, can be converted to perform useful functions as well as residential electrical installation, national electrical code applications, residential circuits, box selection, conductor selector, receptacles, GFCI protection and switch control.

This course is beneficial to those students who are interested in career related to becoming an Electrician. If students are planning careers electrical or mechanical engineering, construction, and electronics a good understanding of electricity is important.

WELDING

GRADE : 10, 11, 12

ELECTIVE

BHS CREDITS: 1

PREREQUISITE: None

TRANSCRIBED THROUGH: NWTC (3 Credits) - Material Cutting Applications #31-442-301, 1 Credit; GMAW 1 #31-442-348, 1 Credit; SMAW 1 #31-442-342, 1 Credit

This course will introduce students to welding principles. The student will develop skills in the areas of shielded metal arc welding, gas metal arc welding, oxy-acetylene. They will be exposed to careers in welding and will develop the basic skills needed to make a career decision in this area. They will be given safety instructions in all areas and will have to pass a safety test on all equipment.

GAS METAL ARC WELDING 2

GRADE: 11, 12

ELECTIVE

BHS CREDITS: 1

PREREQUISITE: WELDING

TRANSCRIBED THROUGH: NWTC - GAS METAL ARC WELDING #31-442-356, 2 Credits

This course provides the opportunity for the learner to develop the knowledge, skills, process and understanding of welds in the vertical and overhead positions, fillet, pipe to plate and groove welds with and without backing on plain carbon steel.

WELD SYMBOLS

GRADES: 11, 12

ELECTIVE

BHS CREDITS: .5

PREREQUISITE: Welding

TRANSCRIBED THROUGH: NWTC-Weld Symbols #31-421-336, 1 Credit

This course provides the opportunity for the learner to develop the knowledge and understanding of welding symbols AWS and ISO, weld joint nomenclature and welding joint geometry.

METAL FABRICATION

GRADE: 11, 12

ELECTIVE

BHS CREDITS: 1

PREREQUISITE: None

TRANSCRIBED THROUGH: NWTC – Metal Fabrication I #31-457-337, 1 Credit

This course will introduce students to machining and metal fabrication principles. The student will develop skills in the areas of lathe, vertical mill, welding, CNC plasma cutting and other fabrication techniques. They will be exposed to careers in machining and fabrication and will develop the basic skills needed to make a career decision in this area. They will be given safety instructions in all areas and will have to pass a safety test on all equipment.

SMALL ENGINES

GRADES: 9, 10, 11, 12

ELECTIVE

BHS CREDITS: .5

PREREQUISITE: None

TRANSCRIBED THROUGH: Not transcribed

The students will learn how gasoline engines function. They will also be introduced to several other engines including: diesel, rotary, and turbine engines. Most of the hands on activities are geared toward the small gasoline engines. Students will learn how the knowledge gained on small engines can also be applied to larger engines. The basic units covered in the course includes: basic engine operation, engine tests and measurements, ignition systems, carburetion, cooling, lubrication, engine reconditioning, and troubleshooting. A considerable amount of time is spent on measuring the engine components using micrometers, vernier calipers, dial indicators, and a host of other measuring tools. After successfully completing this course, the student will have measuring skills that can be applied to many different manufacturing careers, also students should be able to tune-up many types of small engine such as lawnmowers, rototillers, etc. He/she will be able to perform minor maintenance procedures such as changing oil, sharpening blades, adjusting carburetors, repairing recoil mechanisms, ignition tune-ups, etc. The student will have basic troubleshooting skills, which can be applied to many types of engines.

CAR CARE

GRADES: 11, 12

ELECTIVE

BHS CREDITS: .5

PREREQUISITE: None

TRANSCRIBED THROUGH: Not transcribed

The Car Care course is designed to teach the student how to take better care of his/her automobile. Each unit will include an explanation of the basic theory of operation. The theory will help the student to realize why certain service procedures are necessary. Units will include guidelines on maintenance to be performed routinely on a vehicle. Servicing techniques will be thoroughly demonstrated to the class and then students will be given an opportunity to perform the same procedure on their own vehicle. The amount of hands on tasks will depend on each individual student. Some students may feel comfortable completing all of the procedures and others may want to select certain jobs to be performed on their own vehicle. If a student does not have a vehicle of their own, they can work together with other students who do have vehicles. The more hands-on activities the student performs, the more he/she will learn. This course will cover many different units. These units include: rust prevention, cooling systems, tires and tire wear, wheel alignment, lubrication systems, ignition systems, fuel systems, brakes, and buying a used car.

MATERIALS AND PROCESSES

GRADES: 9, 10 11, 12

ELECTIVE

BHS CREDITS: 1

PREREQUISITE: None

TRANSCRIBED THROUGH: Not transcribed

This course deals with the materials and processes used in the woodworking industry today with wood products being the major emphasis. Students will be given extensive background on the safe operation of all the machines used in the lab. Lab safety and machine safety tests must be completed with 100% accuracy before a student will be given the opportunity to work in the lab. Several projects will be constructed during the semester which will give the student an opportunity to use new technologies such as our CNC Router and our Laser Engraver as well as many other machines in the lab such as: the Planer, Jointer, Table Saw, Band Saw, Scroll Saw, Drill Press, Disc Sander, Radial Arm Saw, Sliding Compound Miter Saw, Pneumatic Disc Sanders, Random Orbital Disc Sanders, Kreg Jig, Hollow Mortising Chisel, and the Router. Students will have units in Measurement, Squaring of stock, and Calculation of Board Feet. Students will also be planning for projects such as creating a *Bill of Materials List* and a *Plan of Procedures* will also be done. Class fees may be applied.

FURNITURE DESIGN/LAYOUT & SAWING OPERATIONS

GRADES: 11, 12

ELECTIVE

BHS CREDITS: 1

PREREQUISITE: Materials and Processes, Introduction to Drafting, CADD Or IED

TRANSCRIBED THROUGH: Not Transcribed

This course is designed to allow students to design, engineer, and build furniture. Throughout the class, students also get exposure to different woodworking machines specifically designed for sawing with a strong emphasis given to machining to exact specifications. Students are encouraged to design pieces of furniture that are new, furniture that is designed and is different from everyday furniture is greatly encouraged. Students will take the knowledge and skills that were obtained in Design Drafting and CAD to design and draw the piece of furniture that the student is going to develop. Once students have designed a piece of furniture they will be required to develop the furniture out in the lab using the knowledge and abilities that they have obtained from the Materials and Processes classes. Safety test will be given on lab and machine safety and will be completed with 100% accuracy before a student will be allowed to participate in lab activities. Students will also be taught safe and proper use of tools, machines, and equipment used in industry. Class fees may be applied.



CONSTRUCTION TECHNOLOGY 1 & 2

GRADES: 10, 11, 12

ELECTIVE

BHS CREDITS: 1

PREREQUISITE: Materials and Processes

TRANSCRIBED THROUGH: NWTC - Floor Framing Systems #10-410-104, 3 Credits

This course will be an introduction to many of the tools and processes used in the construction industry today. Besides basic review of lab and machine safety, which the students will be tested on until 100% accuracy is achieved, there will be safety discussions and demonstrations on the uses of different equipment in the lab. Students will be introduced to the following units: House blueprints reading, use of the architects' scale, floor framing, wall and ceiling framing, and roof construction. Students will build a house to a one-inch scale concentrating on using standard framing methods. Students will also learn concepts such as: stairs layout, rafter layout, and estimating materials. The second half of the course may again involve the construction of small modular buildings such as garden and tool sheds, however advanced construction techniques such as soffit and fascia construction will be stressed. More individual effort and teamwork will also be stressed, making the student a more efficient and self-reliant "worker". Class field trips may also be taken to local technical colleges, which offer Building Trades or Construction as career training opportunities. **FLOOR FRAMING SYSTEMS:** This course teaches all aspects of floor construction and flooring system construction. Any student interested in a career in the field of construction or architecture should consider taking this course.

ENGINEERING, RESEARCH AND DEVELOPMENT

GRADES: 11, 12

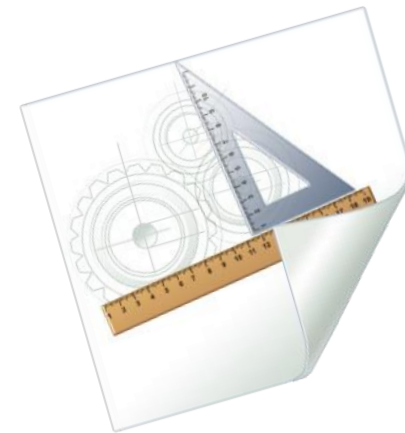
ELECTIVE

BHS CREDITS: 1

PREREQUISITE: Intro to Drafting, Welding

TRANSCRIBED THROUGH: Not transcribed

This course will teach the engineering approach to solving today's problems. Students can look forward to taking on a project (problem) and generate a solution. The major project problem will be the development of an Electrathon Race Vehicle that students will design/build/race against other schools in the state. Many activities will be team based. Students will learn how to be creative, innovative, and express their knowledge through, brainstorming, and other problem solving approaches. Topics that will be stressed are: research of intellectual properties (patents & trademarks), multistage designing (modeling, prototyping, CADD imaging), and developing (surveying, examining, & producing.) A strong math and drafting background will be necessary due to the designing techniques used. This is an excellent course for anyone who is planning to attend a technical or four-year college. This is also a good introductory course into the fields of engineering and technology.



CNC FUNDAMENTALS

GRADES: 12

ELECTIVE

BHS CREDITS: 1

PREREQUISITE: None

TRANSCRIBED THROUGH: NWTC (4 Credits) - Intro to CNC Milling Operations #31-420-336, 1 Credit; Intro to CNC Turning Operations #31-420-339, 1 Credit; Intro to G-Code and CAM 1 #31-420-337, 2 Credits

In this class students will learn to operate computer controlled lathes and milling machines, basic programming operations on computer aided manufacturing (CAM) systems, and fundamental programming of computer numerically controlled (CNC) machines.

ELECTRO-MECHANICAL TECHNOLOGY (Classes are in the NWTC

Electro-Mech Trailer)

GRADES: 11, 12

ELECTIVE

BHS CREDITS: 1

PREREQUISITE: None

TRANSCRIBED THROUGH: NWTC (4 Credits) - Automation 1: Control Logic #10-664-100, 1 Credit; Automation 2: Motor Control #10-664-101, 1 Credit
Fluids 1: Basic Pneumatics #10-620-100, 1 Credit; DC 1 #10-660-104, 1 Credit

Electro-Mechanical Technology prepares students for employment as plant-floor and field service technicians who assemble, install, troubleshoot, repair and modify mechanical, electrical systems; including programmable controllers found on industrial machinery. AUTOMATION 1: CONTROL LOGIC – Electric motor control components such as switches, relays, starters, transformers; and safely mount and install motor and motor control components and perform related wiring and troubleshooting of motor control circuits. AUTOMATION 2: MOTOR CONTROL – Electric motor control components such as sensors, timers and counters. FLUIDS 1: BASIC PNEUMATICS: What fluid power is, differentiate between hydraulics and pneumatics, implement basic pneumatic circuits, utilize schematics, apply Pascal's Law, define properties of fluids, implement airflow control and hydraulics cylinder circuits. DC 1: INTRODUCTION – Introduction to the concepts of DC electricity and simple series circuits. Voltage, current, resistance, Ohm's Law, power and Kirchoff's Voltage Law are defined. MACHINE WIRING AND SAFETY: Introduction to machine wiring, including basic documentation, labeling, and wiring practices; an overview of NFPA 70 machinery, safety and installation standards.