

INDUSTRIAL TECHNOLOGY EDUCATION

All students can benefit from study in an area of Industrial Technology. Classes can bring satisfying and worthy utilization of leisure and hobby time. Beyond this, many careers are founded upon knowledge and skills in the numerous technology areas. Examples of such careers are: Carpenter, plumber, electrician, welder, auto body, farmer, drafting, machinist, furniture manufacturer, auto mechanic, foundry worker, engineer, repair technician, etc.

ELECTIVE COURSES:

GRADE 9	GRADE 10	GRADE 11	GRADE 12
Basic Electricity Wood Technology I Exploring Metalworking Small Engines & Power Mechanical Design CNC Plasma Metal Cutting CNC Wood Routering	Basic Electricity Wood Technology I Wood Technology II Basic Auto for Women Small Engines & Power Exploring Metalworking Metal Technology I Metal Technology II Architectural Design Mechanical Design CNC Plasma Metal Cutting Basic Auto CNC Wood Router	Basic Electricity Wood Technology I Wood Technology II Carpentry I Basic Auto for Women Small Engines & Power Exploring Metalworking Metal Technology I Metal Technology II Architectural Design Mechanical Design CNC Plasma Metal Cutting Basic Auto CNC Wood Router Manufacturing & Engineer Electronic Core	Basic Electricity Wood Technology I Wood Technology II Carpentry I Carpentry II Basic Auto for Women Small Engines & Power Exploring Metalworking Metal Technology I Metal Technology II Architectural Design Mechanical Design CNC Plasma Metal Cutting Basic Auto CNC Wood Router Manufacturing & Engineer Electronic Core

625 **Basic Electricity**

1 term 1/4 credit

Pre: None

Grade Level: 9 - 12

Course Summary: This is a class that teaches the fundamental principles of electricity and the important things you need to know about it in your daily life at home, school and work. The class will teach you about electrical safety, how electricity is produced, measured and controlling DC and AC currents, electronic components, house wiring, motors, and more.

Lab Fee: There will be a \$10 lab fee for this class.

626 **Wood Technology I**

2 terms 1/2 credit

Pre: None

Grade Level: 9 - 12

Course Summary: This class is an introduction to machine woodworking. Basic machine skills will be taught through lab work, lecture, textbook, audio & visual presentations, demonstrations and construction of woodworking projects.

Lab Fee: Will be charged based on project

627 **Wood Technology II**

2 terms 1/2 credit

Pre: Wood Technology I

Grade Level: 10 - 12

Course Summary: This course is an advanced class in woodworking offered to students in grades 10 - 12. The lab work will involve woodworking project construction, advanced over the Wood I class. The class activities center around lab work with time devoted to lecture, textbook, video presentations and demonstrations.

Lab Fee: Will be charged based on project

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628 Carpentry I**6 terms 1 1/2 credit****Pre:** Wood Tech I**Grade Level: 11 – 12**

Course Summary: The building of a one story house is the goal of this class. This course will enable the student to learn about materials and methods for framing floors, walls, and rafters for residential and light commercial construction. This course will examine types, styles and applications of sidings, roofing treatments and finishes. This class will also cover insulation, paneling and wall board applications. The course will cover terms, techniques and layouts used. Estimating and materials used will be emphasized. Installation of doors and windows, vapor barriers, and roofing will be covered. This course will enable the student to identify, properly use and maintain carpenter hand tools, portable tools, machines and equipment. Skill development, safety, OSHA requirements and work practices will be stressed. Construction equipment is studied and utilized as lab and projects warrant. This course will enable you to develop skills in reading the IRC Building codes for residential construction and applying them to blueprints. Materials and estimating will be part of the student's studies.

Students will need to purchase their own tools belts and tape measure.

630 Carpentry II**6 terms 1 1/2 credits****Pre:** Carpentry I**Grade Level: 12**

Course Summary: The completion of a one story house is the goal of this class. This course will enable the student to learn about materials and methods of finish carpentry. This class will also cover cabinet making applications as well as interior finishes and woodwork. Students will study design and construction fundamentals and techniques. Students also learn materials, hardware and finishing skills for custom-made residential cabinetry; estimating of materials will be emphasized. The skills of a carpenter become most apparent in the interior finishing of a building. This course introduces the learner to the materials, methods and techniques used in the application of various exterior and interior finish materials including siding, cornice treatments, and interior doors and moldings. Successful completion of the course will move the student forward in their journey to master the skills necessary to be a proficient carpenter.

631 Basic Auto for Women**1 term 1/4 credit****Pre:** None, driver's license preferred**Grade Level:** 10 - 12 females

Course Summary: The focus of "basic auto for young women" is to provide basic fundamental skills and knowledge related to automobile function and general maintenance. Topics may include: buying your first car, general automotive maintenance, checking and maintaining fluids, changing your flat tire, keeping service records, recognizing signs of potential car trouble, and others as time permits.

632 Small Engines and Power Tech**2 terms 1/2 credit****Pre:** None**Grade Level: 9 - 12**

Course Summary: Small Engines class activities center around lab work with time devoted to lecture, video presentations and demonstrations. The work performed in class will involve the maintenance and repair of small gas engines.

Lab Fee: There will be a \$5 lab fee for this class

633 Exploring Metal Working**2 terms 1/2 credit****Pre:** None**Grade Level: 9 – 12**

Course Summary: This class is designed to introduce students to general metal working, materials, tools, machines, processes and safety. Students will be exposed to selected hands on activities in the areas of sheet metal fabrication, foundry, forging, heat treating, welding, and machine shop as time allows. Class time is also used for lecture, videos and demonstrations.

Lab Fee: Will be charged based on project

634 Metal Technology I**2 terms 1/2 credit****Pre:** None**Grade Level:** 10 - 12

Course Summary: Metal Technology class teaches welding and machine shop skills, materials, methods and safety. The class activities center around lab work with time devoted to lecture, video presentations and demonstrations. If you sign up for this class it is recommended that you also register for Metal Tech II the same year.

Lab Fee: Will be charged based on project

635 Metal Technology II**2 terms 1/2 credit****Pre:** Metal Technology I**Grade Level:** 10 - 12

Course Summary: Metal Technology II is an advanced course for grades 10, 11 and 12. Each student will expand their skills and knowledge gained in prior metalworking classes. This class centers around lab work giving students the opportunity to design and build a project(s) of their choice. Additional class time will be devoted to lecture, video presentations and demonstrations. New areas such as MIG and TIG welding, casting metal, plasma cutting, metal finishing and CNC machining may be explored.

Lab Fee: Will be charged based on project

636 Architectural and Construction Design**1 terms 1/4 credit****Pre:** None**Grade Level:** 10 - 12

Course Summary: Architectural design is a means of describing a building or structure and how it is to be constructed. Students enrolled in the course will spend a great deal of time drawing using computer aided drafting equipment. Some of the drawing will include room design and planning, garage plans and house plans.

637 Mechanical and Manufacturing Design**1 term 1/4 credit****Pre:** None**Grade Level:** 9 -12

Course Summary: This design class will help students develop the capacity to plan in an orderly fashion, to interpret the ideas of others, and to express plans to others in an understandable manner. This class will help you develop skills and knowledge to communicate in a graphic language. The type of design will be mechanical and or manufacturing in nature as would be found in the machining and fabrication of products. Students enrolled in the course will spend a great deal of time drawing using computer aided drafting.

638 CNC Plasma Metal Cutting**1 term 1/4 credit****Pre:** None**Grade Level:** 9-12

Course Summary: CNC (computer numeric controlled) plasma cutting will introduce students to computer design and modern manufacturing processes. Students will learn to create unique projects using computer software and computer aided design techniques. Students will transfer their digital file/designs to our CNC plasma cutter to cut the project from steel or aluminum plate. Other metal working processes will be introduced and lab time given in order for students to complete the required projects. Students who are interested in learning more about metal working can take exploring metal, metal I and metal II.

Lab Fee: A fee will be charged for materials used.

641 Basic Auto Care**1 term 1/4 credit****Pre:** None**Grade Level:** 10 - 12

Course Summary: The primary emphasis of this class will be on basic auto care and maintenance. Units of study will include auto safety, tires, brakes, engine basics, cooling system, lubrication system, suspension and electrical basics. Class activities will include lab time for basic auto care and maintenance with time devoted to lecture, video presentations and demonstrations.

642 CNC Wood Router**1 term 1/4 credit****Pre:** None**Grade Level:** 9 -12

Course Summary: CNC (computer numeric controlled) router will teach students to use a CNC machine to produce various routed wood products. Students will start out with engraving in order to make a nameplate and then continue to do logos, cutting boards, games, etc. Other woodworking skills will be introduced in order to complete the projects such as cutting, sanding and finishing woods. This one term class will enable students that want to further their expertise with CNC machines to do so in both Wood Tech I and Wood Tech II.

Four local school districts will partner with Coldspring (Granite Company) to deliver introductory coursework for high school juniors and seniors interested in learning more about manufacturing and engineering. Classes will take place on the Coldspring campus and will be taught by a SCTCC instructor. **Students will be registering for a full year commitment and must provide their own transportation.** These courses do transfer directly to the Robotics & Automation, Mechatronics, Instrumentation & Process Control, and Energy Technical Specialist at SCTCC. **Another component of these classes includes A.M. work place at Coldspring for both classes, unless you take both manufacturing and Electronics.**

468 & 469 Manufacturing & Engineering Development I & II (Discovery Academy CIHS)**6 terms 1 1/2 credit 8 College Credit (4 each fall & spring semester)****Pre:** Accuplacer**Grade Level:** 11 – 12

Course Summary: The first college semester of this course includes **Safety Awareness:** This course design aligns with the Manufacturing Skill Standards Council's (MSSC) assessment and certification system for Safety. The course curriculum follows federally endorsed national standards for production workers. This course will introduce OSHA standards relating to personal protective equipment, HAZMAT, tool safety, confined spaces, and others. The second portion includes **Maintenance Process and Production:** This course is designed to align with the Manufacturing Skill Standards Council's (MSSC) assessment and certification system for Manufacturing Processes. The course curriculum is based upon federally-endorsed national standards for production workers. This course emphasized, Just-In-Time (JIT) manufacturing principles, basic supply chain management, communication skills, and customer service.

Spring semester includes **Quality Practice:** This course is designed to align with the National Skills Standard assessment and certification system for Quality Practices. The course curriculum is based upon federally-endorsed national standards for production workers. Emphasis is placed on Continuous Improvement concepts and how they relate to a quality management system. Students will be introduced to a quality management system and its components. These include corrective actions, preventative actions, control of documents, control of quality records, internal auditing of processes, and control of non-conforming product. **Maintenance Awareness:** This course is designed to align with the National Skills Standard assessment and certification system for Maintenance Awareness. The course curriculum is based upon federally-endorsed national standards for production workers. The Maintenance Awareness course introduces the concepts of Total Productive Maintenance and preventative maintenance. Students will be introduced to lubrication, electricity, hydraulics, pneumatics, and power transmission systems.

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470 Electronics Core**(Discovery Academy CIHS)****6 terms 1 1/2 credit 11 College Credits****Pre:** Accuplacer**Grade Level:** 11-12

Course Summary: The first half of the college semester of this course is **DC Electronics**: This is a foundational course in direct current (DC) electricity. This course is designed for students who have no previous experience with electricity. The primary goals of this course are to help individuals acquire a solid foundation in the theories and laws of direct current (DC) electricity, and to apply their knowledge and skills through problem solving, simulation, and practical projects. The second portion of fall semester is **AC Electronics**: This fundamental course in alternating current (AC) electricity. This course is designed for students who have a fundamental knowledge and understanding of the theory and laws of direct current (DC) electricity. The primary goals of this course are to help individuals gain the knowledge and skills necessary to troubleshoot and repair single and three phase AC powered systems and equipment. Individuals will apply these skills through problem solving, simulation, and practical projects.

Spring semester includes **Print Reading & Design**: This is a foundational course in industrial print reading. This course is designed for students who have no previous experience with print reading. The primary goals of this course are to help individuals acquire a solid foundation in print reading, mechanical drafting concepts, and machine layout tools to transfer measurements from drawing to stock. Student will be able to understand and read piping and instrumentation diagrams (P&ID). **Digital Electronics**: The primary goals of this course are to help individuals acquire a fundamental knowledge of digital electronics, Boolean algebra, digital devices, analog to digital conversion and digital to analog conversion, and how to apply their knowledge and skills through problem solving, simulation and practical projects.

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