

Industrial Technology

Department

DRAFTING/DESIGN ENGINEERING TECHNOLOGY STRAND

17	Computer Technology	.5 unit
16	Exploring Technology	.5 unit
	VREP	1.0 unit
	CAD 1	1.0 unit
	CAD 2	1.0 unit
	Web Design & Maintenance	1.0 unit

AUTOMOTIVE, WELDING & INDUSTRIAL TECHNOLOGY STRAND

17	Computer Technology	.5 unit
16	Exploring Technology	.5 unit
	Metals, Materials & Processes	.5 unit
	Advanced Metals, Materials, & Processes	.5 unit
	Basic Welding	.5 unit
	General Mechanics	.5 unit
	Basic Automotive	.5 unit
	Auto Technologies 1	1.0 unit
	Auto Technologies 2	1.0 unit
	Women in Industrial Technology	.5 unit
	Wood Technology	.5 unit
	Cabinet and Furniture Making	.5 unit
	General Construction 1	1.0 unit
	General Construction 2	1.0 unit

COMPLETERS:

Students are encouraged to complete a strand, 3 units in any one area listed below. This will better prepare them to continue their education in a business major or to gain the skills needed for work.

VOCATIONAL TECHNOLOGY DEPARTMENT

16-	EXPLORING TECHNOLOGY 1 (18 Weeks)		
	Credit: .5 Units	Grade Placement:	9,10,11,12
	Semesters: 1	Prerequisite:	None
17-	COMPUTER TECHNOLOGY 2 (18 Weeks)		
	Credit: .5 Units	Grade Placement:	9,10,11,12
	Semesters: 1	Prerequisite:	None
45 -	WOOD TECHNOLOGY (18 Weeks)		
	Credit: .5 Units	Grade Placement:	9, 10, 11, 12
	Semesters: 1	Prerequisite:	None
46 -	CAD 1 ARCHITECTURAL/MECHANICAL		
	Credit: 1 Unit	Grade Placement:	10, 11, 12
	Semesters: 2	Prerequisite:	Exploring Technology
72 -	CAD 2 -ENGINEERING RELATED ARCH. /MECH. TECHNOLOGY		
	Credit: 1 Unit	Grade Placement:	11, 12
	Semesters: 2	Prerequisite:	ARCH CAD/D I & Instructor's Permission
47 -	GENERAL MECHANICS (18 Weeks)		
	Credit: .5 Units	Grade Placement:	9,10,11,12
	Semesters: 1	Prerequisite:	None
48 -	GENERAL CONSTRUCTION (18 Weeks)		
	Credit: 1 Units	Grade Placement:	11, 12
	Semesters: 1	Prerequisite:	Cabinet and Furniture Making
73-	CABINET AND FURNITURE MAKING (18 Weeks)		
	Credit: .5 Units	Grade Placement:	10,11,12
	Semesters: 1	Prerequisite:	Wood Technology
74 -	METALS, MATERIALS, AND PROCESSES		
	Credit: .5 Units	Grade Placement:	9, 10, 11, 12
	Semesters: 1	Prerequisite:	None
50 -	ELECTRONICS AND ELECTRICITY (18 Weeks)		
	Credit: .5 Units	Grade Placement:	10, 11,12
	Semesters: 1	Prerequisite:	None
98-	BASIC AUTOMOTIVE (18 Weeks)		
	Credit: .5 Units	Grade Placement:	10,11,12
	Semesters: 1	Prerequisite:	General Mechanics
99 -	AUTO TECHNOLOGY 1 (18 Weeks)		
	Credit: 1 Unit	Grade Placement:	11,12
	Semesters: 1	Prerequisite:	Basic Automotive and Instructor Approval
97-	AUTO TECHNOLOGY 2 (18 Weeks)		
	Credit: 1 Unit	Grade Placement:	12
	Semesters: 1	Prerequisite:	Auto Technology 1 and Instructor Approval
131	Website Design & Computer Maintenance (36 weeks)		
	Credit: 1 Unit	Grade:	10, 11, 12
	Semesters: 2	Prerequisite:	Computer Tech
592 -	BASIC WELDING		
	Credit: .5 unit	Grade:	11,12
	Semesters: 1	Prerequisite:	Advanced Metals, Materials, & Processes (71% 'C' or better) and instructor approval
421-	WOMEN IN INDUSTRIAL TECHNOLOGY (18 Weeks)		
	Credit: .5 Unit	Grade Placement:	9,10,11,12
	Semesters: 1	Prerequisite:	NONE

- ??- ADVANCED METALS, MATERIALS (18 Weeks)
Credit: .5 Unit Grade Placement: 9,10,11,12
Semesters: 1 Prerequisite: NONE
- ??- VREP (Computer 3D Modeling/Animation/Gaming) I, II, III, IV (36 Weeks)
Credit: 1.0 Unit Grade Placement: 9,10,11,12
Semesters: 2 Prerequisite: Determined by level of completion

VOCATIONAL TECHNOLOGY

Vocational Technology is an important part of the curriculum at Camanche High. Demands of the workplace require that our students better prepare themselves for entry into the field of work. We offer 2 or 3 years of vocational technology in the following fields:

- | | | |
|-------------------------|--------------------|--------------|
| A. Industrial Education | C. Home Economics | E. Marketing |
| B. Business | D. Medical Careers | |

By completing the vocational courses you may earn advanced standing at Eastern Iowa Community College (C.C.C.) or meet entry-level certification requirements for jobs in this area. Most programs include a three-year sequence with the 3rd year in our core Careers class.

INDUSTRIAL TECHNOLOGY DEPARTMENT

The philosophy of the Camanche High School Industrial Technology Department supports the idea that Industrial Arts education and Vocational Industrial education are compatible and are essential for preparing students for living and earning a living. All students are provided a variety of experiences with tools, materials, and procedures which are representative of most of the trades in industry.

16 - EXPLORING TECHNOLOGY (18 Weeks)
 Credit: .5 Units Grade Placement: 9,10,11,12
 Semesters: 1 Prerequisite: None

Course Description: Exploring Technology 1 will introduce students to the manufacturing and construction industries. Students will learn about components, processes, products, and the impact of manufacturing and construction systems. Approximately 40% of class time is spent in reading activities assignments while the remaining 60% will be spent in hands on activities.

AREAS OF STUDY:

- | | |
|--------------------------------|---------------------------------------|
| 1. Shop safety | 3. Draw up projects |
| 2. General tools and equipment | 4. Complete written & lab assignments |

EXPECTATIONS FROM STUDENTS:

1. Develop and maintain safe working habits
2. Develop a better understanding of our world of work

17 - COMPUTER TECHNOLOGY (18 Weeks)
 Credit: .5 Units Grade Placement: 9,10,11,12
 Semesters: 1 Prerequisite: None

Course Description: Computer Technology will introduce students to computers there different uses and their applications. Students will explore the different uses and creation of multimedia, using Windows, with graphics, sound, video, and animation. They will also have the opportunity to explore the Internet and create their own webpage. This is NOT just a Shop class, taking this class will help you understand and use today's technology in your everyday life as well as your other classes. Some of the applications that you will be using are: Microsoft Windows, Microsoft Office Suite, Adobe Creative Suites, Nero and Microsoft Video software. Create DVD's and CD's using a digital still and video camera and scanner.

AREAS OF STUDY:

1. Computer History
2. Computer Components
3. Microsoft Windows
4. Microsoft Office Products (Word, Excel, Access, PowerPoint, Publishing)
5. Microsoft Movie Maker and Photo Story
6. Multimedia (Sound, Graphics, Animation, Video – DVD's & CD's)
7. WinMorph
8. Adobe Creative Suite
9. Internet (Web Pages)

EXPECTATIONS FROM STUDENTS:

1. Develop and maintain computer skills.
2. Develop a better use of computers and technology in the world of work and school.

45 - WOOD TECHNOLOGY (18 Weeks)

Credit: .5 Units Grade Placement: 9, 10, 11, 12
 Semesters: 1 Prerequisite: None

Course Description: The fundamentals of hand tools and machine woodworking will be taught through lecture, demonstration, and activities. Students will construct and apply a finish to a small wood item to develop skill in the use of tools and techniques. Safety will receive special emphasis.

Areas of Study: 1. Apply safety in guided lab work.2. Name parts and specify operations of lab equipment.3. Know how to read project plans.4. Demonstrate ability for teamwork and work collaboratively with other students.5. Ability to identify ruler fractions.6. Ability to select wood.7. Ability to assemble projects.8. Apply a finish.9. Ability to compute the cost of projects.10 Utilize 21 Century Skills

45 - METALS, MATERIALS, AND PROCESSES (18 Weeks)

Credit: .5 Units Grade Placement: 9, 10, 11, 12
 Semesters: 1 Prerequisite: None

Course Description: This is an introductory course in the use of metal as a building material. Instructional material will be presented through lecture, demonstrations, and hands-on activities. Students will develop an understanding of metalworking design and technology.

Areas of Study

1. Apply Industrial Shop Safety
2. Read Drawings / Blueprints
3. Determine Planning, Measurement, and Layout
4. Practice Sheet Metal Processes
5. Practice Machining / Separating Processes
6. Practice Forming Processes
7. Practice Metal Combining Processes
8. Practice Boring / Drilling Processes
9. Practice CNC (Computer Numerical Control) Machining
10. Discover Metalworking Careers and Career Planning Strategies

46 - CAD 1 ARCHITECTURAL/MECHANICAL (36 Weeks)

Credit: 1 Unit Grade Placement: 10,11,12
 Semesters: 2 Prerequisite: Exploring Technology &/or Computer Technology

Course Description: This course is designed for use of both manual and computer-aided drafting and design. Developing plans, drawings, selection of materials, estimating and making mock ups (models) of residential, commercial and other structures. Concentrating on the computer-aided designs using 2D & 3D color graphics, shading, animation video imaging, walk through of 3D design and other multimedia technologies. Students earning a grade of "B" or better in both the engineering related and the other required course may earn College Credit and would not need to take the first level drafting course at Clinton Community College.

AREAS OF STUDY:

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|-----------------------------|------------------------------|--|
| 1. Equipment & Techniques | 5. Working drawings | 9. Floor Planning |
| 2. Orthographic Projections | 6. Site selection & planning | 10. Interior & Exterior styling&planning |
| 3. Shading | 7. Landscaping | 11. Careers |
| 4. Animation | 8. Estimating | 12. Others |

AREAS OF STUDY:

- | | |
|--|------------------------------------|
| 1. Equipment & Techniques | 8. Electronic and welding diagrams |
| 2. Orthographic projections | 9. Aerospace |
| 3. Shading | 10. Reproduction and duplication |
| 4. Animation | 11. Careers |
| 5. Working drawings | 12. Others |
| 6. Fasteners, bearings and seals | |
| 7. Castings, moldings and tool designs (Manufacturing processes) | |

EXPECTATIONS FROM STUDENTS:

1. Demonstrate an understanding of basic fundamentals of drafting
2. Possess above average drafting and visualization skills
3. Must be able to work independently in solving problems encountered with advanced levels of work
4. Determination to take a job from start to finish

47 -	GENERAL MECHANICS (18 Weeks)		
	Credit: .5 Units	Grade Placement:	9, 10, 11, 12
	Semesters: 1	Prerequisite:	None

Course Description: This course is designed for car owners, not necessarily future mechanics, Introductory level instruction and lab activities provide learning experiences valuable to anyone that owns, or plans to own a car. Consumer knowledge related to buying automotive products, used vehicles, insurance, and new cars is included. Many lab activities enable students to perform vehicle component maintenance, replacement, and inspection.

AREAS OF STUDY:

1. Apply safety techniques in the performance of a task.
2. Demonstrate proper use of tools in the performance of tasks
3. Evaluate and inspect tire and brake condition.
4. Change and inspect oil, oil filter, and air filter plus lubricate chassis.
5. Evaluate and service both lighting and fuse systems.
6. Test and inspect an automotive battery.
7. Identify vehicle identification (VIN) and pertinent information panels.
8. Become a knowledgeable car consumer.
9. Inspect automobiles for safety.
10. Evaluate belts and hoses.

73 -	CABINET AND FURNITURE MAKING (18 Weeks)		
	Credit: .5 Units	Grade Placement:	10,11,12
	Semesters: 1	Prerequisite:	Wood Technology (71% 'C' or better)

Course Description: Advanced machine woodworking procedures and cabinet construction procedures will be taught by planning and building small furniture and cabinet-carcass type projects. Advanced machine woodworking procedures will be employed to construct drawers and doors through the use of dovetail joints, box joints, rail and stile, and raised panel-type operations to complete projects in small furniture and cabinet styles.

AREAS OF STUDY:

1. Ability to incorporate the fundamentals of good cabinet and furniture design.
2. Identifies a variety of cabinet and furniture styles.
3. Utilize appropriate materials.
4. Develop working plans for projects.
5. Utilizes appropriate joinery and assembly techniques.
6. Incorporates the required safety.
7. Select and use proper equipment for furniture making operations.
8. Manipulates jigs and fixtures.
9. Selects and applies appropriate finishing techniques.
10. Assesses a variety of furniture making careers.
11. Utilize 21 Century Skills

45 -	GENERAL CONSTRUCTION (18 Weeks)		
	Credit: 1 Units	Grade Placement:	11, 12
	Semesters: 1	Prerequisite:	Cabinet and Furniture Making (71% 'C' or better) and Instructor Approval

Course Description: The fundamentals of building construction will be taught through lecture, demonstration, and activities. Students will use construction models and will build a small structure to develop skill in the fundamentals of building construction.

Areas of Study

1. Describe carpenter's duties & sub-divisions within the occupation.
2. Analyze basic structural materials, names, and uses.
3. Recognize the OSHA safety regulation for the construction industry.
4. Demonstrate proper use and safety of basic hand and power tools.
5. Identify the names of the parts of a framed house.
6. Demonstrate how to read basic blueprints relating to rough framing.
7. Analyze and demonstrate proper use and installation of basic electrical, mechanical, and plumbing aspects and techniques.
8. Utilize 21 Century Skills

50 -	ELECTRONICS AND ELECTRICITY (18 Weeks)		
	Credit: .5 Units	Grade Placement:	10,11,12
	Semesters: 1	Prerequisite:	None

Course Description: This course teaches an understanding of how electronic devices work, how they are built, and how they are repaired. Students learn how electricity works by performing lab experiments, building devices, and using a computer. They also learn how computer parts work.

Areas of Study

1. Explain matter, using electron theory & law of static charges.
2. Identify components, schematic symbols.
3. Illustrate 5 ways of producing voltage.
4. Apply Ohm's Law correctly in problems.
5. Solder components using proper heat sinks.
6. Read electrical blue prints for residential wiring.
7. Determine appropriate gage wire and devices for given applications.
8. Utilize proper grounding and other electrical safety procedures.
9. Design and wire residential wiring based on given applications.
10. Explore electrical careers.

72 -	CAD 2 - ARCH. /MECH. TECHNOLOGY (36 Weeks)		
	Credit: 1 Unit	Grade Placement:	11, 12
	Semesters: 2	Prerequisite:	CAD 1 & Instructor's Permission

COURSE DESCRIPTION: This course is designed for students how want to take their CAD skills to the next level. The students will be using both Mechanical and Architectural CAD Software. Creating projects that require the selection of materials, estimating and making mock ups or models. Using CAD, modeling, shading, and rendering them into video animations. Students must be able to work independently in solving problems encountered with advanced levels of work.

AREAS OF STUDY:

1. CAD II Equipment & Techniques
2. 3D Modeling, Shading, and Rendering
3. Plotting/Printing
4. Animation/Videos
5. Careers

EXPECTATIONS FROM STUDENTS:

1. Must be able to work independently in solving problems encountered with advanced levels of work
2. Demonstrate an understanding of basic fundamentals of CAD/D
3. Develop and maintain computer skills.
4. Manage Computer file structures in a working environment
5. Determination to take a job from start to finish
6. Develop a better use of computers and technology in the world of work and school.

98 -	BASIC AUTOMOTIVE		
	Credit: .5 Units	Grade Placement:	10, 11, 12
	Semesters: 1	Prerequisite:	General Mechanics

Course Description: This is an introductory course dealing with the importance of construction and operating principles of the modern automobile. Operating systems such as brakes, electrical, and basic engine construction and operation will be covered in both textbook (theory) and lab (practical) instruction.

AREAS OF STUDY:

1. Identify, Remove, & Repair Worn Belts & Hoses
2. Identify, Remove, & Replace Engine Thermostat and Antifreeze
3. Check and/or Replace Engine Oil and Filter, Grease (lubricate) Vehicle per Manufacturers Specs
4. Minor Engine tune-up
5. Inspect Tires & Wheels for Damage and Irregular Wear
6. Perform Brake Inspections and Replace Components as Needed
7. Disassemble and Reassemble an Automotive Lower Engine Block.
8. Identify the Parts to and Test Automotive Starting and Charging Systems
9. Demonstrate the Proper Care and Use of Hand Tools and Power Tools
10. Apply Shop and Equipment Safety Rules Including Hazmat

99 - AUTO TECHNOLOGY 1 (18 Weeks) Meets in a double period

Credit: 1 Units
Semesters: 1

Grade Placement 11, 12
Prerequisite: Basic Automotive and Instructor approval

Course Description: Upon completion of this course, students will demonstrate an understanding of the skills necessary to be a successful entry-level auto technician. This is the first of a two course series that is designed to prepare students for working in the automotive service industry.

Areas of Study

1. Apply shop and equipment safety rules including hazmat.
2. Evaluate the condition of the automotive steering and suspension systems and repair as needed.
3. Evaluate the condition of the automotive cooling/heating system and repair as needed.
4. Shop equipment maintenance and repair
5. Evaluate the automotive emissions and power train management systems and repair as needed.
6. Rapid use of printed and computer diagnostic manuals
7. Basic auto body techniques and procedures. Make up any missed work.

97 - AUTO TECHNOLOGY 2 (18 Weeks)

Meets in a double period

Credit: 1 Units
Semesters: 1

Grade Placement 12
Prerequisite: Auto Technology 1 and Instructor approval

Course Description: This course will focus on the practical application of skills learned in Auto Technology I. They will also operate the auto lab as a dealership service area scheduling all repair work and work schedules of the others in the class. An application must be completed. A screening process that takes into consideration attendance, Auto Technology I grades and a recommendation from a teacher and counselor will be used to determine final participants. Auto Technology I is a prerequisite.

Areas of Study:

1. Effective use of computer diagnostic systems and equipment
2. Evaluate the automotive AC systems based upon industry identified standards and repair as needed.
3. Overhaul an automotive engine.
4. Manage repair costs and estimates.
5. Evaluate an automatic transmission/transaxle.
6. Demonstrate the ability to interact with others in a professional, courteous and tactful manner.
7. Advanced auto body techniques and procedures.

131 - WEBSITE DESIGN AND COMPUTER MAINTENANCE (36 weeks)

Credit: 1 Unit Grade: 10, 11, 12
Semesters: 2 Prerequisite: Computer Tech

Course Description: Website Design & Computer Maintenance is a comprehensive course that will teach each you how to design websites and maintain computers.

Web Site Design:

The student will use design techniques, artwork, photos, virtual realities/surround videos (VRs) and sound to add punch to Home Pages. The student will learn HTML (the universal "language" of Web-site builders), Adobe GoLive (Adobe Creative Suite) and Flash for web authoring. Use digital cameras, scan in photos, create animation (Gif's), videos and include sound files. The student will work on and maintain the CCSD Website and design his/her personal webpage.

Computer Maintenance:

Students in this program will also learn the technology of computer repair by working hand-on with the maintenance, repair and upgrades of the High Schools Computers and Networks. This course of study will provide troubleshooting on computer hardware, software and network activities for staff and students in the CHS district.

The completion of this course will provide lifelong learning and employment opportunities.

AREAS OF STUDY:

1. HTML
2. JavaScript
3. Java
4. Flash
5. VR (Virtual Realities - Surround Video)
6. Multimedia (Sound, Graphics, Animation, Video)
7. Others
8. Troubleshoot Software & Hardware
9. Upgrade computers
10. Repair & maintain computers and networks

EXPECTATIONS FROM STUDENTS:

1. Develop and maintain computer skills.
2. Develop a better use of computers and technology in the world of work and school.
3. Maintain computer functionality.
4. Develop and maintain personal webpage
5. Develop and maintain the school districts Internet/Intranet.
6. Develop and maintain the school districts website.

Course Number

NEW

Course Basic Welding**Credit:** 0.5**Semesters:** 1**Grade****Placement:** 11th grade and up**Prerequisite:** Advanced Metals, Materials, & Processes (71% 'C' or better) and Camanche High School instructor approval**Course Description:** This course covers basic shielded metal arc welding procedures in the flat position. Variety of hands-on projects/experiments integrates and reinforces theoretical concepts in the laboratory setting. Students will work toward certifying in the G3 test**Areas of Study:**

1. Work within the safety rules associated with all phases of welding.
2. Adjust the power source settings, strike and control the arc, manipulate the electrode and read the puddle in order to make sound welds.
3. Produce a quality single V-groove weld on 3/8" mild steel plate in the vertical (3G) position that passes a visual inspection and standard AWS Guided Bend Test.
4. Provide visual inspection criteria and to perform a standard AWS Guided Bend Test on single V-groove welds that have been welded in the 2G and #G positions on 3/8" mild steel plate.
5. Utilize 21 Century Skills

??? - VREP (Computer 3D Modeling/Animation/Gaming) I, II, III, IV (36 weeks)

Credit: 1 Unit Grade: 9,10,11,12

Semesters: 2 Prerequisite: determined by your level of completion

Course Description: In VREP (Virtual Reality Education Pathfinder) students would complete 3D and/or Virtual Reality projects that have personal and educational relevance / importance. Students would explore topics of interest related to them in Virtual Reality Education Pathfinder (VREP) course.

This course would serve as an opportunity for students to expand their expertise with the Blender software, to explore 3D animation and game creation in greater detail, or to develop more advanced skills related to the program.

421 - WOMEN IN INDUSTRIAL TECHNOLOGY (18 Weeks)

Credit: .5 Units Grade Placement: 9,10,11,12
 Semesters: 1 Prerequisite: None

Course Description: This course will look at all of the trade and Technology courses. The students will get a sampling of construction, metals and welding, electricity, woodworking and manufacturing, and the automotive industry. This "Ladies Only" course provides a non-threatening environment for students to work with their hands and try other areas of interest.

AREAS OF STUDY:

1. Apply safety in guided lab work.
2. Name parts and specify operations of lab equipment.
3. Know how to read project plans.
4. Demonstrate ability for teamwork.
5. Work collaboratively with other students.
6. Ability to identify ruler fractions.
7. Ability to select appropriate materials for projects
8. Ability to assemble/carry out projects.
9. Show responsibility in the work environment
10. Utilize 21 Century Skills

?? Advanced Metals, Materials, & Processes

Credit: 0.5

Semesters: 1

Grade Placement: 10th grade and up

Prerequisite: Metals, Materials, & Processes (71% 'C' or better)

Course Description: "The student will gain skills by building personal projects utilizing the skills acquired from the basic course. The occupations associated with the various areas and their requirements for entrance will be studied, as well as the technologies of the modern metalworking industries."

Areas of Study:

1. Recognize Metalworking History and Research Technique
2. Investigate the make-up of Metals
3. Apply Shop Mathematics / Precision Measurement
4. Recognize Quality Control and Inspection Tasks
5. Demonstrate Advanced Metalworking Skills / Techniques
6. Identify Metalworking Careers and Career Planning Strategies
7. Practice Computer Numerical Control (CNC)
8. Utilize 21 Century Skills"