

VAN BUREN COMMUNITY SCHOOLS INDUSTRIAL TECHNOLOGY

SUMMER 2008

DEVELOPED BY TED NIXON

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Acknowledgement

This curriculum should assist teachers in determining the expected concept and performance level at the various grade levels. It is not designed to restrict or limit the creativity or imagination of the teachers. The guide serves as a springboard for the development of additional concepts and master of skills, depending on the ability and interests of each student.

This project was successfully completed in the summer of 2008, because of the dedication and consistent efforts of Ted Nixon.

We are grateful to Ted Nixon, and support and compliment his fine effort.

Forward

The purpose of this guide is to assist teachers in the organization and instruction of Industrial Technology classes in the Van Buren Community School District.

This guide provides direction for teachers of grades seven through twelve and is adaptable for individual and class needs. It is, however, important that teachers follow the suggested sequence and scope of lesson content to ensure systematic and comprehensive instruction concepts and skills.

This guide, prepared by Ted Nixon, for use by classroom teachers, provides a scope and sequence for instruction, which reflects a sense of wonder and appreciation for the gifts within and around us.

EDUCATIONAL PHILOSOPHY

The Board of Directors of the Van Buren Community School District is committed to the operation of schools whose purpose is to serve by assisting each learner develop into a mature individual and contributing member of society. The goals of education and the goals of democracy are fundamentally the same. The board believes the nature of learning is a continuous experience throughout the life of each individual. This experience is influenced by a variety of factors including the environment surrounding the learner. The board also believes, and recognizes, the nature of a learner requires an awareness of the unique needs of each individual and the various stages of development associated with growth. It is believed all have the capability of learning given appropriate opportunity.

The Board of Directors recognizes the guardianship of public education is a trust and an obligation. Consequently, the board believes that a desirable learning atmosphere must be provided which includes the following: (1) Appropriate facilities; (2) Competent staff; (3) Appropriate educational and instructional materials; (4) Assurance of safety; (5) Recognition of individual dignity and worth; (6) A scope of educational experiences to challenge each student; and (7) Periodic review, revision, and evaluation.

The Board further believes the scope of educational experience should meet the needs of varied learners and include experiences that encompass the intellect and associated basic and developmental skills, as well as aesthetic, physical, civic, social, vocational, multicultural, and technological awareness.

Date of Adoption: May 9, 1990
Date Reviewed: March 9, 2005
Date Revised: November 8, 1995

EDUCATIONAL EQUITY POLICY

1. It is the policy of Van Buren Community School District to provide equal educational and employment opportunities and not to illegally discriminate on the basis of sex, color, national origin, religion, marital status, race, socioeconomic status or disability in its educational programs, activities or its employment and personnel policies.
2. This district shall provide program activities, a curriculum and instructional resources which will reflect the racial and cultural diversity present in the United States and the variety of careers, roles and life styles open to both men and women in our society. One of the objectives of the district's programs, curriculum, services and teaching strategies is to reduce stereotyping and to eliminate bias on the basis of sex, race, color, religion, marital status, socioeconomic status, national origin and disability. The curriculum, programs and services shall foster respect and appreciation for the cultural diversity found in our country and an awareness of the rights, duties and responsibilities of each individual as a member of a pluralistic society.
3. It is the policy of this district to affirmatively recruit women and men, members of diverse racial/ethnic groups and persons with disabilities for job categories where they are underrepresented. A fair and supportive environment will be provided for all students and employees regardless of their sex, race, national origin, marital status, religion, socioeconomic status, color or disability. Harassment or discriminatory behavior that denies civil rights or access to equal educational opportunities included comments, name-calling, physical conduct or other expressive behavior directed at an individual or group that intentionally demeans the race, color, national origin, sex, disability, socioeconomic status, marital status or religion, made from one employee to another, from an employee to a student or vice versa, and from one student to another creating an intimidating, hostile or demeaning environment is a violation of this policy.
4. The board requires all persons, agencies, vendors, contractors and other persons and organizations doing business with or performing services for the school district to subscribe to all applicable federal and state laws, executive orders, rules and regulations pertaining to contract compliance and equal opportunity.
5. Inquiries regarding compliance of equity policies may be directed to the following:
Title IX – High School Principal; Title VI – Early Childhood Center Director; and Section 504 – Superintendent, Van Buren Jr/Sr. High School, 503 Henry Street, Keosauqua, Iowa 52565, 319-293-3333, to the Director of the Iowa Civil Rights Commission, Des Moines, Iowa, or to the Director of the Region VII Office of Civil Rights, Department of Education, Kansas City, Missouri.
6. The Affirmative Action Coordinator for the district shall be the Building Principals/Superintendent. The Educational Equity Coordinator for the district will be the Curriculum Coordinator. Inquiries concerning a grievance procedure should be addressed to either coordinator.

Federal and state regulations require that the non-discrimination policy, the identity of the designated local coordinator and notification about the existence of the grievance procedure be disseminated to employees, students and parents on an annual or ongoing basis. This notification must be included in major annual or general publications such as:

Student Handbooks

Local Newspapers

Application Forms

Program Brochures & Publications

Agreement forms with labor organizations and businesses which hold professional agreements with the school or agency.

School Newsletters

Employee (Staff) Handbooks

Registration Handbook

Teacher Handbooks

Employment

Legal Reference:

20 U.S.C 1221 et seq. (1994)

20 U.S.C 1681 et seq. (1994)

20 U.S.C. 1701 et seq. (1994)

29 U.S.C. 794 (1994)

42 U.S.C. 12101 et seq. (1994)

34 C.F.R. Pt. 100 (1999)

34 C.F.R. Pt. 104 (1999)

Iowa Code 216.9; 256.11, .11A; 280.3 (2001)

281 I.A.C. 12

Cross Reference:

100.2 District Educational Equity Policy

516 Students Educational Equity Policy

Date of Adoption: May 9, 1990

Date of Review: March 8, 2006

Date of Revision: April 12, 2006

CAREER EDUCATION

Preparing students for careers is one goal of the education program. Career education will be infused into the education program for grades kindergarten through twelve. This education shall include, but not be limited to, awareness of self in relation to others and the needs of society, exploration of employment opportunities, experiences in personal decision-making, and experiences of integrating work values and work skills into their lives.

It shall be the responsibility of the curriculum development committee assist certified personnel in finding ways to provide career education in most courses. The board, in its review of the curriculum, shall review the means in which career education is combined with other instruction programs.

Legal Reference: Iowa Code Sections 256.11, 280.9 (1989); 670 Iowa Admin. Code 3.5(9); 281 Iowa Admin Code 12.5(7) (new standards).

Cross Reference: Curriculum Study

Date of adoption: February 8, 1989

Date of Review: April 11, 2001

Date of Revision: _____

MULTICULTURAL AND GENDER FAIR EDUCATION OPPORTUNITY

Enrolled children in the school district community shall have an equal opportunity for a quality public education without discrimination regardless of their race, color, sex, marital status, national origin, religion, socioeconomic status or disability.

The education program shall be free of such discrimination and provide equal opportunity for the participants. The education program shall foster knowledge of, respect and appreciation for the historical and contemporary contributions of diverse cultural groups as well as men and women, to society. Special emphasis is placed on Asian-Americans, African-Americans, Hispanic-Americans and persons with disabilities. It shall also reflect the wide variety of roles open to both men and women and provide equal opportunity to both sexes.

Inquiries regarding compliance with equal education opportunity shall be directed to the High School Principal by writing to Central Administrative Office, Title IX Compliance Officer, 503 Henry Street, Keosauqua, Iowa 52565, or telephoning at 319-293-3334.

Date of Adoption: February 8, 1989

Date of Review: March 8, 2006

Date of Revision: April 12, 2006

PROGRAM FOR STUDENTS AT RISK

The board recognizes some students require additional assistance in order to graduate from the regular education program. The board shall provide a program to encourage and provide an opportunity for students at risk to achieve their potential and obtain their high school diploma.

It shall be the responsibility of the superintendent or his designee to develop a program for students at risk.

It shall also be the responsibility of the superintendent or his designee to develop administrative regulations for identifying students, for program evaluation and for the training of school district personnel.

Legal Reference: Iowa Code Sections 256.9, 261C, 262.71, 280.19, 442.51-.54 (1989); 670 Iowa Admin. Code 3.5(9); 281 Iowa Admin. Code 12.5(13) (new standards).

Date of Adoption: February 8, 1989

Date of Review: April 11, 2001

Date of Revision: _____

SPECIAL EDUCATION AND INTEGRATION

1. Special Education

The board recognizes special education laws change from year to year. All special education students will be identified and placed according to state and federal laws and will be maintained in the least restrictive environment. The board shall provide a free appropriate education program and related services to students identified in need of special education. The special education services will be provided from birth until the appropriate education is completed, age twenty-one or to maximum age allowable in accordance with the law. Students requiring special education shall attend general education classes, participate in nonacademic and extra curricular services and activities and receive services in a general education setting to the maximum extent appropriate to the needs to each individual student. The appropriate education for each student shall provide an appropriate education for a child in need of special education but the board is not required to provide the best possible option nor to maximize the potential of the child commensurate with the opportunity provided to nondisabled children.

Special education students shall be required to meet the requirements stated in board policy "Graduation Requirements" for graduation, or the requirements stated in their individual education plans.

It shall be the responsibility of the superintendent or his designee and the area education agency director of special education to administer the special education program. While the board secretary shall be custodian of school records, the building principal shall be responsible for maintaining the records of the children in need of special education. These records may be viewed by authorized school personnel and in accordance with the requirements of board policy, "Student Records Access."

Special education students shall be required to meet the requirements stated in board policy or in their IEP's for graduation. It shall be the responsibility of the superintendent and the area education agency director of special education to provide or make provisions for appropriate special education and related services.

2. Integration

All education programs, including those of the moderately and severely handicapped, will be integrated to the least restrictive environment. The integration shall assure that the educational program include the physical, functional, social and societal aspects of development. Such integration shall also include minority populations regardless of the race, creed, color, gender, marital status, national origin, ability or disability.

3. Provision of Special Education

In keeping with education's commitment to provide a seamless system of special education services for children from birth through twenty-one years of age, children from birth through two years of age, and children three through five years of age shall be provided

comprehensive special education services within the public education system. The district shall work in conjunction with the Are Education Agency to provide services, at the earliest appropriate time, to children with disabilities from birth through age two, and to ensure for eligible children a smooth transition from early childhood special education provided through an individualized family service plan (IFSP) to early childhood special education services provided through an individualized education program (IEP).

Legal Reference: Board of Education v. Rowley, 458 U.S. 176 (1982).
Springdale School District #50 v. Grace, 693 F. 2d 41 (8th Cir. 1982)
Southeast Warren Comm. School District v. Dept. of Public Instruction,
258 N.W. 2d 173 (Iowa 1979)
20 U.S.C. §§ 256.11(7); 256B; 273.1, .2, .5, .9(2)-(3); 280.8

Date of Adoption: August 13, 1986

Date of Review: February 21, 2001

Date of Revision: March 14, 2001

General Accreditation Standards

Preamble

The goal for the early childhood through twelfth grade educational system in Iowa is to improve the learning, achievement, and performance of all students so they become successful members of a community and workforce. It is expected that each school and school district shall continue to improve its educational system so that more students will increase their learning, achievement, and performance.

Accreditation focuses on an ongoing school improvement process for schools and school districts. However, general accreditation standards are the minimum requirements that must be met by an Iowa public school district to be accredited. A public school district that does not maintain accreditation shall be merged, by the state board of education, with one or more contiguous school districts as required by Iowa Code subsection 256.11(12). A nonpublic school must meet the general accreditation standards if it wishes to be designated as accredited for operation in Iowa.

General accreditation standards are intended to fulfill the state's responsibility for making available an appropriate educational program that has high expectations for all students in Iowa. The accreditation standards ensure that each child has access to an educational program that meets the needs and abilities of the child regardless of race, color national origin, gender, disability, religion, creed, marital status, geographic location, or socioeconomic background.

With local community input, school districts and accredited nonpublic schools shall incorporate accountability for student achievement into comprehensive school improvement plans designed to increase the learning, achievement, and performance of all students. As applicable, and to the extent possible, comprehensive school improvement plans shall consolidate federal and state program goal setting, planning, and reporting requirements. Provisions for multicultural and gender fair education, technology integration, global education, gifted and talented students, at-risk students, students with disabilities, and the professional development of all staff shall be incorporated, as applicable, into the comprehensive school improvement plan. See subrules 12.5(8) to 12.5(13), 12.7(1), and 12.8(1).

DIVISION V EDUCATION PROGRAM 281 Chapter 12

281-12.5(256) Education program. The following education program standards shall be met by schools and school districts for accreditation with the start of the 1989-1990 school year.

12.5(5) *High school program, grades 9-12.* In grades 9 through 12, a unit is a course or equivalent related components or partial units taught throughout the academic year as defined in subrule 12.5(14). The following shall be offered and taught as the minimum program: English-language arts, six units; social studies, five units; mathematics, six units as specified in 12.5(5)"c"; science, five units; health, one unit; physical education, one unit; fine arts, three units; foreign language, four units; and vocational education, 12 units as specified in 12.5(5)"i." Beginning with the 2010-2011 school year graduating class, all students in schools and school districts shall satisfactorily complete at least four units of English-language arts, three units of mathematics, three units of science, three units of social studies, and one full unit of physical education as conditions of graduation. The three units of social studies may include the existing graduation requirements of one-half unit of United States government and one unit of United States history.

i. *Vocational education-school districts (three units each in at least four of the six service areas).* A minimum of three sequential units, of which only one may be a core unit, shall be taught in four of the following six service areas: agricultural education, business and office education, health occupations education, home economics education, industrial education, and marketing education. The instruction shall be competency-based; shall provide a base of knowledge which will prepare students for entry level employment, additional on-the-job training, and postsecondary education within their chosen field; shall be articulated with postsecondary programs of study, including apprenticeship programs; shall reinforce basic academic skills; shall include the contributions and perspectives of persons with disabilities, both men and women, and persons from diverse racial and ethnic groups. Vocational core courses may be used in more than one vocational service area. Multi-occupations may be used to complete a sequence in more than one vocational service area; however, a core course(s) and multi-occupations cannot be used in the same sequence. If a district elects to use multi-occupations to meet the requirements in more than one service area, documentation must be provided to indicate that a sufficient variety of quality training stations be available to allow students to develop occupational competencies. A district may apply for a waiver if an innovative plan for meeting the instructional requirement for the standard is submitted to and approved by the director of the department of education.

The instructional programs also shall comply with the provisions of Iowa Code chapter 258 relating to vocational education. Advisory committee/councils designed to assist vocational education planning and evaluation shall be composed of public members with emphasis on persons representing business, agriculture, industry, and labor. The membership of local advisory committees/councils will fairly represent each gender and minority residing in the school district. The accreditation status of a school district failing to comply with the provisions of this subrule shall be governed by 281-subrule 46.7(10), paragraph "g."

(6) "Industrial education programs" encompass two categories of instructional programs-industrial technology and trade and industrial. Industrial technology means an applied discipline designed to promote technological literacy which provides knowledge and understanding of the impact of technology including its organizations, techniques, tools, and skills to solve practical problems and extend human capabilities in areas such as construction, manufacturing, communication, transportation, power and energy. Trade and industrial programs prepare individuals for employment such areas as protective services, construction trades, mechanics and repairers, precision production, transportation, and graphic communications. Instruction includes regular systematic classroom activities, followed by experiential learning with the most important processes, tools, machines, management ideas, and impacts of technology.

281 Chapter 46

281-46.1(258) Standards for vocational education. Vocational education programs carried on under the provisions of Iowa Code chapter 258 shall be governed by and administered pursuant to the Acts of Congress accepted by chapter 258 and its provisions, duly-adopted rules of the federal agencies involved and the current federal-state contracts or plans approved pursuant to these statutes and rules.

281-46.6(258) Revised standards for vocational education. Vocational education programs under the provisions of Iowa Code chapter 258 shall be administered by the specific provisions of 281-subrule 12.5(4), as well as the other provisions set forth in 281-Chapter 12.

This rule is intended to implement Iowa Code section 256.11 and chapter 258.

281-46.7(258) Definitions and descriptions of procedures. The strategies for implementing the vocational education standards may be clarified by the following definition and descriptions of procedures which shall be utilized:

Vocational education means organized educational programs offering a sequence of courses which are directly related to the preparation of individuals in paid or unpaid employment in current or emerging occupations requiring other than a baccalaureate or advanced degree. Such programs shall include competency-based applied learning which contributes to an individual's academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, and the occupational-specific skills necessary for economic independence as a productive and contributing member of society. Program content shall include recognition of the contributions of individuals with disabilities, men and women in nontraditional roles and minorities. Such term also includes applied technology education.

CHAPTER 258

VOCATIONAL EDUCATION

258.9 Local advisory council.

The board of directors of a school district that maintains a school, department, or class receiving federal or state funds under this chapter shall, as a condition of approval by the state board, appoint a local advisory council for vocational education composed of public members with emphasis on persons representing business, agriculture, industry and labor. The local advisory council shall give advice and assistance to the board of directors in the establishment and maintenance of schools, departments, and classes that receive federal or state funds under this chapter. Local advisory councils may be organized according to program area, school, community, or region. The state board shall adopt rules requiring that the memberships of local advisory councils fairly represent each sex and minorities residing in the school district. Members of an advisory council shall serve without compensation.

[C24, 27, 31, 35, 39, § 3845; C46, 50, 54, 58, 62, 66, 71, 73, 75, 77, 79, 81, §258.9]
86 Acts, ch. 1245, §1431

258.10 Powers of district boards.

1. The board of directors of a school district may carry on prevocational and vocational instruction in subjects relating to agriculture, commerce, industry, and home economics, and pay the expense of such instruction in the same way as the expenses for other subjects in the public schools are paid.

2. The board of directors of a school district may establish and maintain school-to-work programs including alternative learning opportunities through which students may obtain skills or training outside the classroom. School-to-work programs include, but are not limited to, the following:

a. Short-term job shadowing opportunities for students to explore career interests by observing work at a workplace or to include a series of visits to various workplaces and time spent with individual workers to observe specific jobs.

b. Structured work experiences integrating school and work-based experiences in an internship that may be an extension of a job shadowing experience.

c. Mentoring experiences providing students with a formal relationship with a worksite role model who shares career insights and teaches students specific work-related skills.

d. Career-oriented work experiences tied to school lessons through formal or informal training agreements, formal learning plans or mentoring, by workplace personnel who may be paid or unpaid, and which may earn students credit toward graduation.

e. Structured on-the-job training or apprenticeships for students who are enrolled in a technical or professional program that leads to a high school diploma, advanced certificate of mastery, or associate degree.

f. Work experiences available to students in school and community placements directly supervised by a school district or community college staff member.

3. The board may provide workers' compensation coverage by insuring, or self-insuring as provided in section 87.4 , students participating in unpaid school-to-work programs. A school district's liability to students injured while participating in an unpaid school-to-work program is as provided in section 85.20.

[C24, 27, 31, 35, 39, § 3846; C46, 50, 54, 58, 62, 66, 71, 73, 75, 77, 79, 81, §258.10]

97 Acts, ch. 37, §6

21st Century Skills

As each Iowa student is provided access to essential concepts and meaningful learning experiences in the core academic content areas, it is imperative that we also look to 21st century skills to build capacity in students so they are prepared to lead productive, satisfying lives. According to Ken Kay, president of the Partnership for 21st Century Skills, the 21st century skills are “is the ticket to economic upward mobility in the new economy” (Gerwertz, 2007). Business and industry is providing a very clear message that students need the skills to “work comfortably with people from other cultures, solve problems creatively, write and speak well, think in a multidisciplinary way, and evaluate information critically. And they need to be punctual, dependable, and industrious.” (Gerwertz, 2007).

The Framework for 21st Century Learning stated, “We believe schools must move beyond a focus on basic competency in core subjects to promoting understanding of academic content at much higher levels by weaving 21st century interdisciplinary themes into core subjects” (2007). 21st century skills bridge the knowledge, skills, and dispositions of students from the core academic areas to real life application.

“The primary aim of education is not to enable students to do well in school, but to help them do well in the lives they lead outside of the school.”

- Ray McNulty, ICLE

Iowa High School Summit, December 10, 2007

Descriptions of the new global reality are plentiful, and the need for new, 21st century skills in an increasingly complex environment is well documented. In one form or another, authors cite (1) the globalizations of economics; (2) the explosion of scientific and technological knowledge; (3) the increasingly international dimensions of the issues we face, i.e. global warming and pandemic diseases; and (4) changing demographic as the major trends that have resulted in a future world much different from the one that many of us faced when we graduated from high school (Friedman, 2005 and Stewart, 2007). The trends are very clear that each Iowa students will need essential 21st century skills to lead satisfying lives in this current reality.

Descriptions of what constitute essential 21st century skills are plentiful as well. In the 2007 session, the Iowa Legislature established the Iowa 21st century framework as:

1. employability skills
2. financial literacy
3. health literacy
4. technology literacy

Within this 21st century skill framework are the common strands of learning and innovation; communication, information, and technology; and, life and career skills.

The development of the Iowa 21st century essential concepts and skills was a collaborative process engaging the expertise of p – 16 educators, business, and industry representatives. Sources used for this work included the 1991 SCANS report, What Work Requires of Schools, and Framework for 21st Century Learning, from the Partnership for 21st Century Skills. The committee surveyed the literature and endeavored to bring together the common elements of

these frameworks. The members have outlined the concepts, dispositions and habits of mind believed essential for success in the 21st century.

The reality of building capacity for the 21st century is that we do not know what the work of the future will be like (Darling-Hammond, 2007) or how technology will influence health and financial issues. The challenge is to prepare students to think critically, to engage in mental activity, or habits of mind, that "...if the complex questions of the future are to be determined ...by human beings...making one choice rather than another, we should educate youths – all of them – to join in the conversation about those choices and to influence that future..." (Meier, 2008)

Primary Elementary Grades – Being Developed
Intermediate Elementary Grades – Being Developed
Middle School Level – Being Developed

High School

Financial Literacy

- Demonstrate financial responsibility and planning skills to achieve financial goals for a lifetime of financial health
- Manage money effectively by developing spending plans and selecting appropriate financial instruments to maintain positive cash flow
- Make informed and responsible decisions about incurring and repaying debt to remain both creditworthy and financially secure
- Evaluate and identify appropriate risk management options, including types of insurance, non-insurance, and identity protection
- Assess the value, features, and planning processes associated with savings, investing, and asset building, and apply this knowledge to achieve long-term financial security with personal and entrepreneurial goals in a global market
- Understand human, cultural, and societal issues related to financial literacy, and practice legal and ethical behavior

Health Literacy

- Demonstrate functional health literacy skills to obtain, interpret, understand and use basic health concepts to enhance personal, family, and community health
- Synthesize interactive literacy and social skills to establish and monitor personal, family and community goals related to all aspects of health
- Apply critical literacy/thinking skills related to personal, family and community wellness
- Use media literacy skills to analyze media and other influences to effectively manage health risk situations and advocate for self and others
- Demonstrate behaviors that foster healthy, active lifestyles for individuals and the benefit of society

Technology Literacy

- Demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology
- Use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others
- Apply digital tools to gather, evaluate, and use information

- Demonstrate critical thinking skills using appropriate tools and resources to plan and conduct research, manage projects, solve problems and make informed decisions
- Understand human, cultural, and societal issues related to technology, and practice legal and ethical behavior
- Demonstrate a sound understanding of technology concepts, systems and operations

Employability

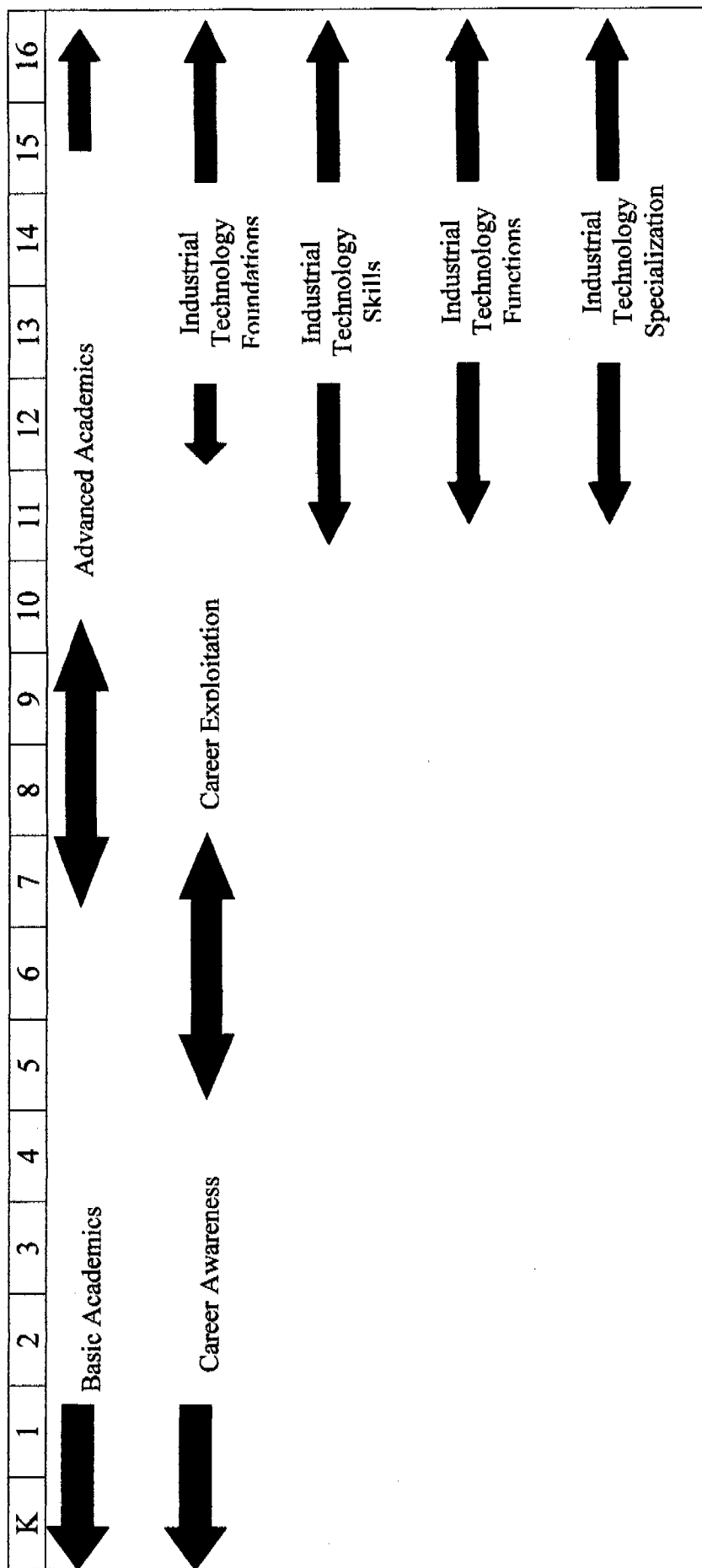
- Communicate and work productively with others, incorporating different perspectives and cross cultural understanding, to increase innovation and the quality of work
- Adapt to various roles and responsibilities and work flexibly in climates of ambiguity and changing priorities
- Demonstrate leadership skills, integrity, ethical behavior, and social responsibility while collaborating to achieve common goals
- Demonstrate initiative and self-direction through high achievement and lifelong learning while exploring the ways individual talents and skills can be used for productive outcomes in personal and professional life
- Demonstrate productivity and accountability by meeting high expectations

Engineering/Industrial/Technology Sciences Career Pathways

Illustration of Program Possibilities

Academic	Academic Knowledge and Skills (K-12)																																	
Employability	Employability Knowledge and Skills – Standards and Benchmarks (K-12)																																	
Career Area Knowledge and Skills	Content and Knowledge of Career Areas – Standards and Benchmarks (K-12)																																	
Occupational Cluster	Career and Technical Programs Specific Technical Knowledge and Skills	Communications										Construction								Manufacturing					Transportation					Power and Energy				
	Graphics Communications	Technical Drawing	Photography	Radio/TV	Printing	Telecommunications	Carpentry	HVAC	Plumbing	Building Trades	Construction Equipment Operation	Masonry	Wiring	Industrial Maintenance	Manufacturing Engineering	Production	Production Planning & Control	Sales/Marketing	Automotive Collision/Repair	Automotive Mechanics (automotive, aviation, marine, terrestrial, space)	Diesel Engine/Mechanics	Automotive Services	Small Engine Repair	Truck and Bus Driving	Electrical Technology	Electronics	Industrial Electrician	Line Worker	Aircraft Maintenance	Power Mechanics				

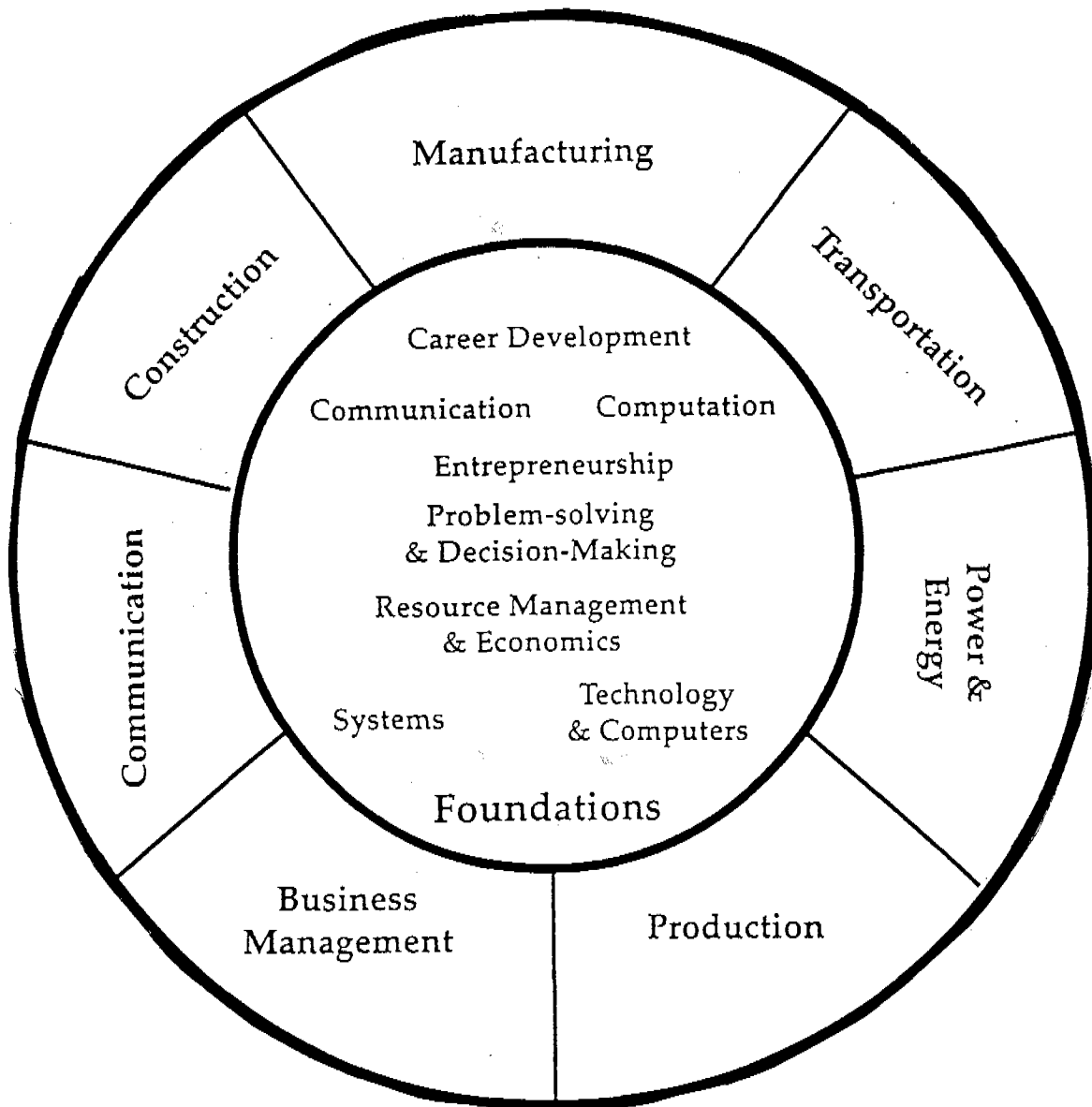
The Agriculture Occupations Curriculum



This flow chart describes how the industrial technology curriculum can be viewed as a continuum that begins in the primary grades with career awareness and exploration. The model continues through postsecondary education with the emphasis becoming more specialized to the student's individual interest in industrial technology.

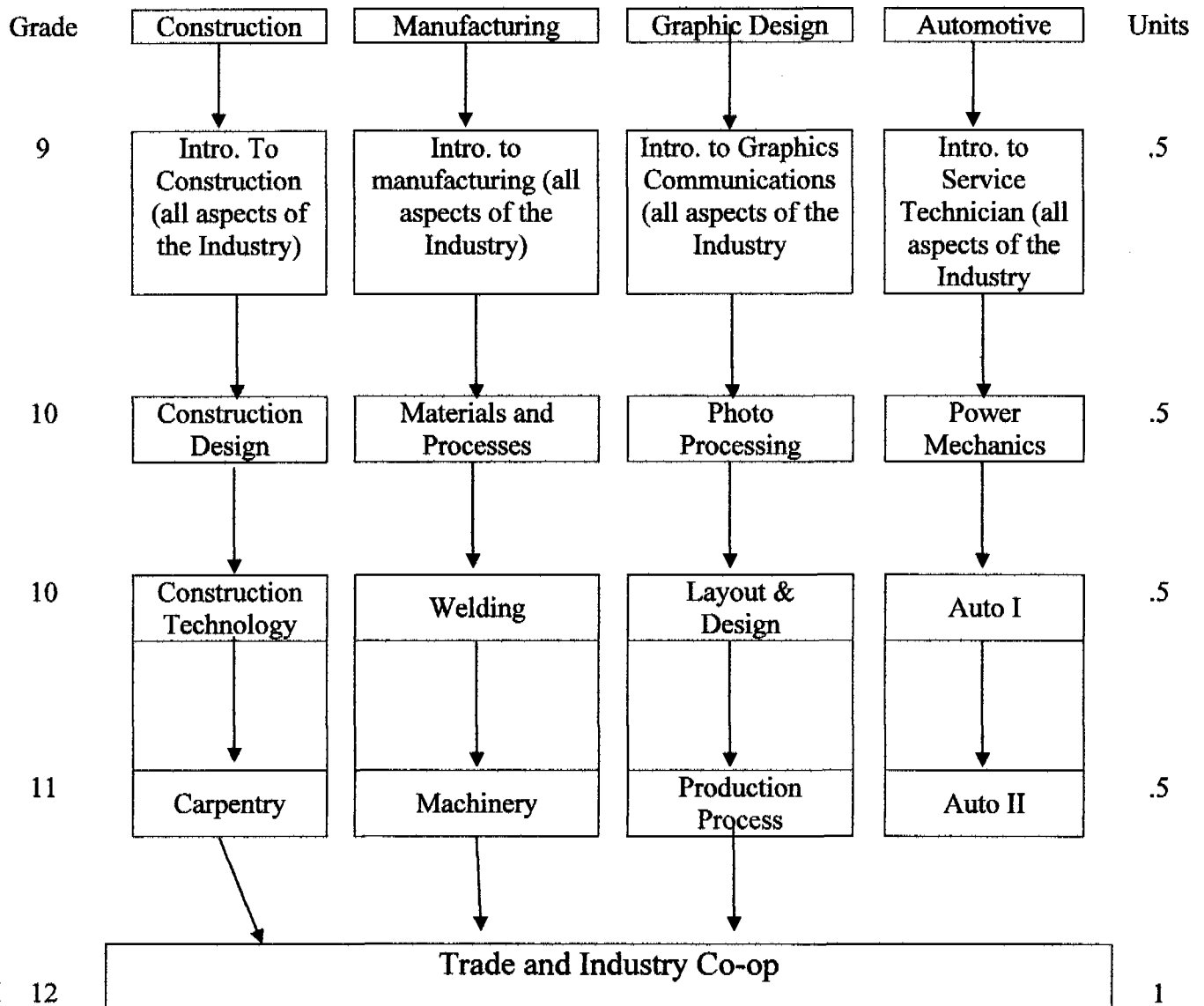
Curriculum Framework for Industrial Technology

Functions of Industrial Technology



Academic concepts – Technology

Program Sequence Designed with Work Site Experience



Philosophy of Industrial Technology

The Industrial Technology curriculum of Van Buren School District is designed to effectively prepare students for vocational and technical careers and to help students continually adapt to the changing demands of the work force. This curriculum is independent of a student's sex, ethnic origin, or socioeconomic status. It serves to help students develop occupational skills necessary to obtain meaningful entry level employment, to acquire good work habits, to develop an appreciation for quality performance and craftsmanship, to be aware of various employment opportunities, and to produce an understanding of the importance of responding to change and mobility in the job market.

An industrial Technology background for all students is essential if we are to adequately prepare youth to appreciate, understand, and participate in the activities created by the ever changing technological age characterized by the widespread use of technological media.

Participation in Industrial Technology course work allows essential opportunities for students to transfer and apply knowledge and skills they have gained in areas such as math, science, and language arts into practical working situations useful for everyday living and contribute to the skills for work in the 21st century.

The Industrial Technology curriculum is exploratory in nature with an ever increasing focus on the specifics of each discipline as the students move from the middle school through the high school levels. The curriculum provides appropriate developmental activities that give students opportunities to practice creative expression through the use of basic tools, materials, and processes. The curriculum helps students develop their organizational and problem solving skills through information collection, analysis, and communication; through logical thinking and procedures; and through the development of basic responsibilities inherent in the completion of tasks. The curriculum also emphasizes that learning is a life-long process.

Finally, the Industrial Technology curriculum provides instruction in safe practices while students work with hand tools, machine tools, and eco-sensitive chemicals. Inherent in this safety instruction is the realization that the curriculum must also address the areas of personal health and the environmental impact of using a variety of materials and processes.

Industrial Technology Curriculum Overview

I. Career Awareness

7th & 8th Grade Explore

Materials used:

Text:

Wright and Smith, Understanding Technology, 1993, Goodheart-Wilcox

Supplementary:

Student activity sheets, reinforcement activities

Evaluations:

Participation in discussion, quizzes, chapter problems, unit test, projects, homework

II. Communication Technology

9th - 12th Grade Classes

A. Mechanical Drafting I

Materials used:

Text:

Walker, Exploring Drafting, 2007, Goodheart-Wilcox

Supplementary:

Student activity sheets, overhead transparencies, examples of completed jobs, reference books

Evaluation:

Class participation, quizzes, test, activity sheets, chapter questions, homework, drawings

B. Computer Drafting II

Materials used:

Text:

Stellman and Krishana, Harnessing Auto CAD 2000, 2000, AutoDesk

Supplementary:

Student activity sheets, computer programs, overhead transparencies

Evaluation:

Class participation, quizzes, test, chapter questions, daily work on drawings, research assignments

III. Construction Technology

A. Wood I

Materials used:

Text:

Feirer, Wood Technology and Processes, 1994, Glencoe

Supplementary:

Student activity sheets, overhead transparencies, project plans

Evaluations:

Class participation, chapter questions, quizzes, tests, project

B. Wood II

Materials used:

Text:

Feirer, Wood Technology and Processes, 1994, Glencoe

Supplementary:

Student activity sheets, overhead transparencies project plans

Evaluation:

Class participation, chapter – questions, quizzes, tests, project

C. Construction I

Materials used:

Text:

Wagner and Smith, Modern Carpentry, 2008 Goodheart-Wilcox

Supplementary:

Student activity sheets, overhead transparencies, house plans and specifications, project plans

Evaluations:

Class participation, quizzes, tests, chapter questions, worksheets, activity sheets

D. Residential Wiring

Materials used:

Text:

Holzman, Modern Residential Wiring, 2008, Goodheart-Wilcox

Supplementary:

Student activity sheets, overhead transparencies, national electric codebook, house plan sets, wiring mockups.

Evaluation: Class participation, quizzes, tests, chapter questions, worksheets, activity sheets

IV. Energy and Power Technology

A. Energy, Power, and Transportation Technology

Materials used:

Text:

Litowitz and Brown, Energy, Power and Transportation Technology, 2007, Goodheart-Wilcox

Supplementary:

Student activity sheets, overhead transparencies, mockups, and simulators

Evaluations:

Class participation, quizzes, tests, worksheets and text questions, project

B. General Auto

Materials used:

Text:

Stockel, Stockel, Johnson, Auto Fundamentals, 2005, Goodheart-Wilcox

Supplementary:

Student activity sheets, overhead transparencies, filmstrips, projects

Evaluations:

Class participation, quizzes, tests, worksheets and text questions, projects

C. Welding

Materials used:

Text: Cary, Modern Welding Technology, 2002, Prentice Hall

Supplementary:

Student activity sheets, overhead transparencies, filmstrips, example welds, projects

Evaluations:

Class participation, quizzes, tests, worksheets and text questions, test welds, projects

Standards and Benchmarks for Industrial Technology

Energy, Power and Transportation Technology

Standard 1: Students will demonstrate problem-solving skills analysis and decision making in Industrial technology

Benchmarks: 1. Problem Solving
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning

Standard 2: Students will demonstrate effective communication skills

Benchmarks: 1. Communication
2. Computers and technological skills (standard)

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks: 1. Knowledge and skills of content areas (standard)
2. Demonstrate technical skills (standard)
3. Acknowledgement of entrepreneurship
4. Safety

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks: 1. Careers
2. Global and diversity issues

General Auto

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology

Benchmarks: 1. Problem solving
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning.

Standard 2: Students will demonstrate effective communication skills

Benchmarks: 1. Communication
2. Computers and technological skills

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks: 1. Knowledge and skills of content areas (standard)
2. Demonstrate technical skills (standard)
3. Apply principles of entrepreneurship
4. Safety

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks: 1. Careers
2. Global and diversity issues

Welding

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technical

Benchmarks: 1. Problem-solving
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning

Standard 2: Students will demonstrate effective communication skills

Benchmarks: 1. Communication
2. Computers and technological skills

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks: 1. Knowledge and skills of content areas (standard)
2. Demonstrate technical skills (standard)
3. Apply principles of entrepreneurship
4. Safety

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks: 1. Careers
2. Cooperation and community service
3. Global and diversity issues

Construction I

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology

Benchmarks: 1. Problem-solving (standard II)
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning
4. Planning (standard III from construction)

Standard 2: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology

Benchmarks: 1. Problem-solving (standard II)
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning
4. Planning (standard III from construction)

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks: 1. Knowledge and skills of content area (standard II construction)
2. Demonstrate technical skills (standard II construction)
3. Apply principles of entrepreneurship
4. Safety (standard I construction)

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks: 1. Careers

Residential Wiring

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology

Benchmarks: 1. Problem-solving
2. Understand leadership and ethics development
3. Demonstrate principles of goal settings, personal and organizational planning
4. Planning (standard III construction)

Standard 2: Students will demonstrate effective communication skills

Benchmarks: 1. Communication
2. Computers and technological skills

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks: 1. Knowledge and skills of content areas (standard II construction)

2. Demonstrate technical skills (standard II construction)
3. Apply principles of entrepreneurship
4. Safety (standard I construction)

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology
 Benchmarks: 1. Careers

Drafting I

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in agriculture

- Benchmarks:
1. Problem solving (standard II)
 2. Understand leadership and ethics development
 3. Demonstrate principles of goal setting, personal and organizational planning

Standard 2: Students will demonstrate effective communication skills

- Benchmarks:
1. Communication
 2. Computers and technological skills

Standard 3: Students will demonstrate knowledge and skills of subject area

- Benchmarks:
1. Knowledge and skills of content areas (standard II construction)
 2. Demonstrate technical skills (standard)
 3. Apply principles of entrepreneurship
 4. Safety

Standard 4: Students will demonstrate knowledge of careers in agriculture

- Benchmarks:
1. Careers
 2. Cooperation and community service
 3. Adapt to change
 4. Global and diversity issues

Drafting II

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in agriculture

- Benchmarks:
1. Problem solving
 2. Understand leadership and ethics development
 3. Demonstrate principles of goal setting, personal and organizational planning

Standard 2: Students will demonstrate effective communication skills

- Benchmarks:
1. Communication
 2. Computers and technological skills

Standard 3: Students will demonstrate knowledge and skills of subject area

- Benchmarks:
1. Knowledge and skills of content areas (standard)
 2. Demonstrate technical skills (standard)

Standard 4: Students will demonstrate knowledge of careers in agriculture

- Benchmarks:
1. Careers
 2. Cooperation and community service
 3. Adapt to change

Woods I

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in industrial technology

Benchmarks:

1. Problem solving
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computers and technological skills (standard)

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks:

1. Knowledge and skills of content areas (standard)
2. Demonstrate technical skills (standard)
3. Apply principles of entrepreneurship
4. Safety

Standard 4: Students will demonstrate knowledge of careers in agriculture

Benchmarks:

1. Careers
2. Cooperation and community service
3. Adapt to change
4. Global and diversity issue

Woods II

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in industrial technology

Benchmarks:

1. Problem solving
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computers and technological skills (standard)

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks:

1. Knowledge and skills of content areas (standard)
2. Demonstrate technical skills (standard)
3. Apply principles of entrepreneurship
4. Safety

Standard 4: Students will demonstrate knowledge of careers in agriculture

Benchmarks:

1. Careers
2. Cooperation and community service
3. Global and diversity issues

Seventh Grade Explore

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in industrial technology

Benchmarks:

1. Problem Solving
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning

Standard 2: Students will demonstrate effective communication skills

- Benchmarks:
1. Communication
 2. Computers and technological skills (standard)

Standard 3: Students will demonstrate knowledge and skills of subject area

- Benchmarks:
1. Knowledge and skills of content areas (standard)
 2. Demonstrate technical skills (standard)
 3. Safety

Standard 4: Students will demonstrate knowledge of careers in agriculture

- Benchmarks:
1. Careers
 2. Cooperation and community service
 3. Global and diversity

Eighth Grade Explore

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in industrial technology

- Benchmarks:
1. Problem solving
 2. Understand leadership and ethics development
 3. Demonstrate principles of goal setting, personal and organizational planning

Standard 2: Students will demonstrate effective communication skills

- Benchmarks:
1. Communication
 2. Technological skills (standard)

Standard 3: Students will demonstrate knowledge and skills of subject area

- Benchmarks:
1. Knowledge of content areas (standard)
 2. Demonstrate technical skills (standard)
 3. Safety

Standard 4: Students will demonstrate knowledge of careers in agriculture

- Benchmarks:
1. Careers
 2. Cooperation and community service
 3. Global and diversity

Career Awareness

Scope and Sequence for Seventh Grade Explore

Day	Activity
One	Class overview, seating chart, intro of teacher, job skills (responsibility, respect, integrity, concern for others, perseverance, resourcefulness, self-discipline, cooperation, service)
Two	Intro of student themselves
Three	Read "What is Technology" (pages 7-12)
Four	Technology as a system (pages 11-16) ; apply to different models
Five	Measuring tools
Six	Drafting Projects-complete views
Seven	Drafting projects-draw three views
Eight	Drafting project - multi-view drawing
Nine	Drafting project - multi-view drawing 1-2
Ten	Drafting project - multi-view drawing 3-5
Eleven	Drafting project - multi-view drawing 6-8
Twelve	Drafting project - multi-view drawing 9-12
Thirteen	Measure worksheet (general shop safety)
Fourteen	Measure Board (layout, bird house)
Fifteen	Cut board (first cut)
Sixteen	Safety table saw (cut board)
Seventeen	Safety drill press (cut and drill hole)
Eighteen	Assemble bird house
Nineteen	Assemble bird house
Twenty	Read "What is Technology" (pages 7-18)
Twenty-one	Discuss technology as a system (inputs, processes, outputs, feedback goals)
Twenty-two	Design – Marshmallow and spaghetti tower
Twenty-three	Construct - Marshmallow and spaghetti tower
Twenty-four	Construct - Marshmallow and spaghetti tower

Length of Unit: 24 days

Subject Area: 7TH Grade Explore

Instructor: Ted Nixon

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology

Benchmarks:

1. Problem-solving (standard II)
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning.

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Read a plan for a project (build bird house)	Student will justify orally their project	HGD, HOTS, CS
2		1. delegate duties & manage conflict, facilitating group interaction (teamwork) Building bird house as a partner, tower with group 2. Recognize relevant, ethical issues- and take responsibility for own mistakes	Student -peer helper rubric See building trades	HGD, HOTS, CS, MCGF LS, HGD, CS
3		1. Plan a project given the textbook's or teacher's model		HOTS, LS, CS,

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Length of Unit: 24 days

Subject Area: 7TH Grade Explore

Instructor: Ted Nixon

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computer and technological skills (standard)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Speak, listen and write clearly 2. Demonstrate courtesy skills (tactful, clear) being aware of human relation factors 3. Develop visual- promotional display using correct vocational terminology	Teacher observation checklist Class project	CS, GUID, HGD
2		1. Operate technology related equipment correctly (office machines, www, email) 2. Use measurements correctly including metrics	MOC Teacher observation of student use of measuring devices correctly	CE, LS, CS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: 7TH Grade Explore

Length of Unit: 24 days

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks:

1. Knowledge and skills of content areas
2. Demonstrate technical skills
3. Apply principles of entrepreneurship
4. Safety

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Students will demonstrate knowledge and demonstration of basic building design	Rubric, students in groups to complete a marshmallow & spaghetti tower.	HGD, LS, CS
2		1. Students will know and demonstrate use of materials (glue, wood, etc.)	Class project	MCGF, LS
3		1. Safety is infused into each content and process standard and benchmark	Students will know and apply safe techniques	LS, HOTS, MCGF, CS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: 7TH Grade Enrichments

Length of Unit: 24 days

Instructor: Ted Nixon

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks:

1. Careers
2. Cooperation and community service
3. Adapt to change
4. Global and diversity issues

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Infused in MOC & in class	1. Demonstrate job skills: initiative, effective time management, personal hygiene 2. Demonstrate job application skills: write a resume & application letter, identify career options related to woods, and evaluate job offers	Teacher student rubric of student behavior in class MOC assessments in class and on the job	LS, CS, HGD, CE
2, 3		1. Exhibit dependability, responsibility, punctuality, follow directions well, accept supervision, ask for help, respect property and cooperate with others, accept new challenges, adapt to change	Teacher student rubric of student behavior in class	CE, LS
4		1. Identify monetary & measurement systems of selected countries & impact on U.S. (metric customary) 2. Identify where raw materials and finished products are in the world	Student can use standard measure to the 1/4 inch	LS, GS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Career Awareness

Scope and Sequence for Eighth Grade Explore

Day	Activity
One	Class overview, seating chart, intro of teacher, job skills (responsibility, respect, integrity, concern for others, perseverance, resourcefulness, self discipline, cooperation, service)
Two	Introduction of student (themselves)
Three	Read "What is Technology" (pages 7-18)
Four	Discuss technology as a system (inputs, processes, outputs, feedback goals)
Five	Measuring tools
Six	Drafting projects – complete views
Seven	Drafting projects – draw three views (8-12)
Eight	Drafting project – multi-view drawing (19-22)
Nine	Drafting project – multi-view drawing (23-26)

Flight Technology

Students learn the principles of flight. They use a computer flight simulator to experience piloting aircraft. Each student evaluates the other and prepares a written critique of his or her partner's flight. Students are introduced to navigation and they plot a course using angular measurement and mathematical computation.

Day	Activity
Ten	Aviation Language
Eleven	Aircraft Basics
Twelve	Flight Controls
Thirteen	Forces of Flight
Fourteen	Weight and Gravity
Fifteen	Basic Flight Data
Sixteen	Weather
Seventeen	Flight Planning
Eighteen	Traffic Patterns
Nineteen	Computer Tools
Twenty	Aviation in History
Twenty-one	Flight Sim.
Twenty-two	Flight Sim.

Subject Area: 8th Grade Explore

Length of Unit: 22 days

Instructor: Ted Nixon

Standard 1: Students will demonstrate problem solving skills, analysis and decision making in Industrial Technology

Benchmarks:

1. Problem-solving (standard II)
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Read a plan for a project	Folded paper glider project	CS, LS, HOTS, HGD
2		1. Delegate duties & manage conflict, facilitating group interaction (teamwork) 2. Recognize relevant ethical issues and take responsibility for own mistakes	Group/partner work	GUID, HOTS, HGD, CS, MCGF, GS
3		1. Plan a project, given the teacher's or text's model	Flight plan, traffic pattern	HOTS, LS, TECH, MEDIA, CE, CS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: 8th Explore

Length of Unit: 22 days

Instructor: Ted Nixon

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computer and technological skills

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Speak, listen and write clearly. 2. Demonstrate courtesy skills (tactful, clear) being aware of human relation factors 3. Become skilled in the language and vocabulary of aviation	Teacher observation/checklist, class projects and activities	CS, GUID, HGD, CE, LS, TECH
2		1. Become familiar with the basics of flying an airplane	Flight simulation program	HOTS, LS, CS, TECH, CE

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCOF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: 8th Explore

Length of Unit: 22 days

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks:

1. Knowledge and skills of content areas
2. Demonstrate technical skills
3. Safety

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Students will and demonstrate the basic knowledge of flight technology	Rubric, classwork, flight plan, traffic pattern	CS, LS, CE, HOTS
2		1. Students will know and demonstrate the use of materials (maps) and equipment (flight simulator)	Flight plan, traffic pattern, flight simulation	CS, LS, CE, HOTS
3		1. Safety is infused into each content and process standard and benchmark	Students will know and apply safe techniques	CS, LS, CE, HOTS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: 8th Explore

Length of Unit: 22 days

Instructor: Ted Nixon

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks:

1. Careers
2. Cooperation and community service
3. Global and diversity issues

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Demonstrate job skills: initiative, effective time management, personal hygiene 2. Identify career options related to aviation.	Teacher student rubric of student behavior in class, class projects	CE, HGD, GUID, LS, CS, GS, HOTS
2		1. Exhibit dependability, responsibility, punctuality, follow directions, cooperate with others, accept new challenges, adapt to change	Teacher student rubric of student behavior in class	CE, LS, HGD, GUID
3		1. Be aware of the history of aviation and the contributions of aviation pioneers	Class activities and projects	GS, CE, CS, LS, MCGF

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Course Description

Drafting I – Semester

This course introduces students to the use of simple and complex graphic tools used to communicate and understand ideas and concepts found in the areas of architecture, manufacturing, engineering, science, and mathematics. Topics include problem-solving strategies, classical representation methods such as sketching, geometric construction techniques, and orthographic projection. Skills in communication, mathematics, science, leadership, and problem-solving are reinforced in this course. Hands-on work experiences and activities provide many opportunities to enhance classroom instruction and career development.

Week	Units/Exercises	Tests and Projects
1	1 - Why Study Drafting?	
	2 – Careers in Drafting	3-1A, 1B, 1C, 3-2
	3 - Sketching	
2	4 – Drafting Equipment	
	5 – Drafting Techniques	5- (1-7)
3-4	6 – Basic Geometric Constructions	6- (1-8)
5-6	7 – Lettering	7- (1-4)
7-9	8 - Multi-view	8- (1-22)
10-12	9 – Dimensioning	9- (1-6)
13-15	10 – Sectional Views	10- (1-10)
16-18	11 – Auxiliary Views	11- (1-8)
	12 – Pictorials	12- (1-11)
	13 – Pattern Development	13- (1-6)

Scope and Sequence Chart

Drafting I

The Scope and Sequence Chart identifies the major concepts presented in each chapter of the **Exploring Drafting** text. The chart is divided into five sections, which include Chapters 1-5, Chapters 6-10, Chapters 11-15, Chapters 16-20, and Chapters 21-25. Within these sections, entries are identified by a bold chapter number. Topics follow the chapter number for easy reference.

Chapters 1-5

Care and Use of Drafting Equipment

4: Drafting board; T-square; triangles; drafting machine; compass; dividers; pencil pointer; erasers; erasing shield; media fasteners; dusting brush; dry cleaning pads and drafting powder; protractor; French curves; templates; drafting media; pencils; scales; inspecting, maintaining, and servicing drafting tools.
5: Using a scale; drawing lines with instruments; erasing errors; using a compass; attaching a drawing sheet to the board.

Safe and efficient Work Practices and Techniques

3: Alphabet of Lines; sketching guidelines; guidelines for overlapping lines; sketching geometric shapes; sheet layout for sketching; enlarging and reducing drawings.
4: Working safely.
5: Using a scale; drawing lines with instruments; drawing a line perpendicular to a given line; erasing errors; using a compass; darkening lines; drafting sheet formats.

Basic Skills in Communication, Math and Science

2: Leadership in drafting technology; what to expect when you enter the world of work.
5: Using a scale.

Design/Problem-Solving Processes

3: Sketching guidelines; guidelines for overlapping lines; sketching geometric shapes.
5: Line conventions; drawing lines with instruments; drawing a line perpendicular to a given line.

Computer Applications and Literacy

4: Computer-aided drafting equipment; inspecting, maintaining, and servicing drafting tools.

Career Information and Employment Skills

2: Drafting occupations; industrial designers; tool designers; interior designers; teachers; engineers; architects; model makers; technical illustrators; leadership in drafting technology; what to expect when you enter the world of work; where to get information about careers in drafting technology; time management; employer expectations.

Chapters 6-10

Care and Use of Drafting Equipment

8: Lettering aids and devices

Safe and Efficient Work Practices and Techniques

6: Solving basic geometric problems.
8: Single-stroke Gothic lettering; lettering with a pencil; guidelines; spacing; letter height.
9: Visualizing the object and projecting views; identifying object features; primary and secondary views; true faces and foreshortening; edges, intersections, and limiting edges; selecting views to be drawn; projecting points and edges; centering a multiview drawing.

10: Dimensioning a drawing; fundamental rules for dimensioning; general rules for inch dimensioning; dimensioning circles, holes, and arcs; dimensioning small portions of an object.

Basic Skills in Communication, Math, and Science

6: Solving basic geometric problems.

9: Centering a multiview drawing.

10: Systems of measurement used in dimensioning; dimensioning a drawing; general rules for inch dimensioning; dimensioning circles, holes, and arcs; dimensioning angles; dimensioning small portions of an object; adapting U.S. customary conventions to metric dimensioning.

Design/Problem-Solving Processes

6: Solving basic geometric problems.

9: Centering a multiview drawing.

10: Systems of measurement used in dimensioning; dimensioning a drawing; general rules for inch dimensioning; dimensioning circles, holes, and arcs; dimensioning angles; dimensioning small portions of an object; adapting U.S. customary conventions to metric dimensioning.

Design/Problem-Solving Processes

6: Solving basic geometric problems

9: Visualizing the object and projecting views; identifying object features; primary and secondary views; true faces and foreshortening; edges, intersections, and limiting edges; selecting views to be drawn; projecting points and edges; centering a multiview drawing.

10: Systems of measurement used in dimensioning; unidirectional and aligned dimensioning; dimensioning a drawing; types of dimensions; fundamental rules for dimensioning; general rules for inch dimensioning; dimensioning circles, holes, and arcs; dimensioning angles; dimensioning small portions of an object; adapting U.S. customary conventions to metric dimensioning; geometric dimensioning and tolerancing (GD & T).

Computer Applications and Literacy

7: Overview of computer graphics and CAD; how CAD works; using basic CAD functions; drawing setup functions; creating objects; editing objects; using display commands; CAD systems and software.

8: Lettering in CAD.

9: Creating multiview drawings in CAD

10: Dimensioning in CAD.

Chapters 11-14

Safe and Efficient Work Practices and Techniques

12: Drawing circular features in auxiliary views.

13: Dimensioning pictorial drawings; centering pictorial drawings.

14: Pattern development of a rectangular prism; pattern development of a cylinder; pattern development of a truncated prism; pattern development of a truncated cylinder; pattern development of a pyramid; pattern development of a cone; pattern development for a right rectangular pyramid.

Design/Problem-Solving Processes

11: Cutting-plane lines; section lines; types of sections.

12: Projecting inclined surfaces and drawing auxiliary views; drawing circular features in auxiliary views.

13: Types of pictorial drawings; isometric drawing; oblique drawings; dimensioning pictorial drawings; perspective drawings; exploded assembly drawings; cutaway pictorial drawings; centering pictorial drawings.

14: Pattern development and manufacturing; drawing patterns.

Subject Area: Drafting I

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology Benchmarks:

1. Problem-solving
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning.

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Unit 6	1. Solve math problems related to drafting	At least 50% of worksheet completed correctly or student redoes	LS, CS, HOTS
	Unit 11 and 21	2. Read and interpret a variety of drawings including welded assembly	Do exercise Unit 11 and 21 satisfactorily (at least 50% correct)	LS, CS
2	Unit 2-12	1. Delegate duties and manage conflict, facilitating group interaction (teamwork) 2. Become personally involved in professional organizations 3. Recognize relevant, ethical issues and take responsibility for own mistakes	Students peer teaching rubric 1-2 Not involved in professional organizations at this time Students peer teaching rubric 1-2	GS, CE
3	Throughout Units	1. Can set and maintain goals	Students peer teaching rubric 1-2	

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Length of Unit: 18 Weeks

Subject Area: Drafting I

Instructor: Ted Nixon

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computer and technological skills (standard)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Unit 6, 8, 9, 10, 11, 12	1. Demonstrates effective interactions with others. Speak effectively in front of others, in person, on telephone, leading discussions,	Students mentor peer effectively – See rubric 1-2	CS, GUID, CE
	Unit 4	2. Listens effectively	Teacher observation checklist	CE
	Unit 6	3. Organizes thoughts and write clearly	Teacher observation checklist	CE
	All units	4. Demonstrate courtesy skills (tactful, clear)	Teacher observation checklist	CE
	All units	5. Identify human relations factors in vocational education	Teacher observation checklist	CE
	Unit 9-12	6. Develop visual- promotional display; Prepare drawings designs using appropriate media	Rubric 2.1	CE, CS
	Unit 5, p. 79	7. Be able to explain processes using terminology in vocational education	Unit Test Knowledge quiz	
2	Unit 4	1. Operate office equipment effectively (paper, ruler, drafting table, blueprint processing, protractor, compass)	Teacher observation checklist	CS, LS
	See Drafting II	2. Use computer hardware & software effectively (database, word processing, spreadsheet, email, www,)	See drafting II	---
	Unit 5, p. 69	3. Use measurements correctly including metrics	Unit of unit test for 5	CS, LS, GS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Drafting I

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

- Benchmarks:**
1. Knowledge and skills of content areas (standard II construction)
 2. Demonstrate technical skills (standard II construction)
 3. Apply principles of entrepreneurship
 4. Safety (standard I construction)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Unit 4	1. Use and maintain basic drafting equipment and machines & use precision measuring instruments	End of unit knowledge test	LS
	Unit 4, p. 61-62	2. Use architectural, metric civil and mechanical engineers' scales and demonstrate scaling techniques (know all 4, use customary and metric)	Observation Grade project	GS, LS CS
	Unit 3, p. 31-32	3. Identify and draw various line types (all nine types)	Draw all 9 types of lines and label to teacher observation requirements	LS CS
	Unit 7, p. 115-116	4. Demonstrate correct lettering techniques (freehand or CAD)	Worksheet completed 50% or more correctly or redo to meet level	LS
	Unit 6	5. Perform basic geometry constructions	Worksheet completed 50% or more correctly or redo to meet level	LS
	In Drafting II	6. Demonstrate basic CAD	---	
2	Unit 6	1. Construct drawings including bisect lines, arcs, angles, perpendicular & parallel lines, tangent lines, ellipses, orthographic views and transfer features.	Worksheet completed 50% or more correctly or redo to meet level	LS
	Unit 9	2. Apply basic dimensioning techniques including sectional views.	Unit Test Your Knowledge quiz	LS
	Unit 11	3. Construct drawings of primary and secondary auxiliary views. (Multi-dimensional drawings)	Worksheet completed 50% or more correctly or redo to meet level	LS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Drafting I

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

- Benchmarks:**
1. Knowledge and skills of content areas (standard II construction)
 2. Demonstrate technical skills (standard II construction)
 3. Apply principles of entrepreneurship
 4. Safety (standard I construction)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
2	Unit 9	4. Construct and interpret geometric dimension and tolerance symbols.	Grade project	
3	Unit 2	1. Identify skills of a business owner, entrepreneur 2. Recognize adv. & dis. of different kinds of business ownership 3. Explain competition, profit, market analysis 4. Create a business plan, identifying financing options, purchasing fixed and variable assets, and resources for technical assistance	Test Your knowledge section	CE
4	Unit 5	1. Follow rules and regulations	Unit 5 Test Your Knowledge	CE
	Unit 4	2. Utilize equipment correctly and safely (follow standard drafting procedures correctly)	Teacher observation checklist	CE
	Unit 4	3. Demonstrate safe use of tools, chemicals and other substances	Teacher observation checklist	CE, HGD

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Drafting I

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks:

1. Careers
2. Cooperation and community service
3. Adapt to change
4. Global and diversity issues

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Throughout units Unit 2	1. Demonstrate job skills: initiative, effective time management, personal hygiene 2. Demonstrate job application skills: write a resume & application letter 3. Identify vocational career options 4. Evaluate a job offer (benefits, time and working environment)	Teacher observation checklist Connected to MOC class	CE
2	Throughout units	1. Explain relationship between public & private sector 2. Exhibit dependability, responsibility, punctuality, follow directions well 3. Accept supervisions willingly, asking for help when needed 4. Respect property and cooperate with others	Connected to MOC class Teacher observation checklist	CE
3	Throughout units	1. Accept new challenges 2. Adapt to change, demonstrate flexibility, adapting to environment and situation.	Teacher observation checklist	CE
4	In Woods System Unit 5, 69	1. Identify types of production systems used worldwide 2. Identify monetary & measurement systems of selected countries & impact on US (Metric and customary)	----- Test Your Knowledge quiz 5.1	- GS
	In Woods Class	3. Identify where raw materials and finished products are in the world.	-----	

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Student-Peer Tutoring Rubric 1-2			
Unsatisfactory	Satisfactory	Excellent	
Not explain clearly	Explains clearly and demonstrates	Guides and instructs but does not do for the student	
Unsure of content, weak content knowledge	Adequate, basic content knowledge	Mastery of knowledge, content	
Materials used incorrectly or unsafely	Uses basic materials safely	Consistently uses and reminds others of safe tool and material use	
Does not complete project- lesson	Completes project	Completes project and leads student into next step	
Interacts negatively	Completes activity with acceptable levels of positive interaction	Serves as mentor and guide to fellow students' in a positive and supportive manner.	

Teacher Observation Checklist- Drafting 1				
Standards & Benchmarks, Critical Objectives	Behaviors or activities	Consistently	Occasionally	Never
1-3-1	Can set and maintain goals			
2-1-2	Listens effectively			
2-1-3	Organizes thoughts and writes (draws correctly)			
2-1-4	Is courteous to teacher and fellow students			
2-1-5	Identify human relations factors (need to be team player)			
2-2-1	Operates office equipment correctly			
3-1-3	Student can draw all 9 line types			
3-4-2	Utilize equipment correctly and safely			
3-4-3	Demonstrate safe use of tools and other substances			
4-1-1	Demonstrate job skills, time management			
4-2-2	Exhibit dependability, responsibility, punctuality, follow directions well,			
4-2-3	3. Accept supervisions willingly, asking for help when needed			
4-2-4	4. Respect property and cooperate with others			
4-3-1	1. Accept new challenges			
4-3-2	2. Adapt to change, demonstrate flexibility, adapting to environment and situation.			

Rubric 2.1 Drawing Checklist

	Met	Not Met
Lines are straight and correct		
Measurements are within 1/6 th of an inch		
Drawing is neat with no erasure marks		
Correct lettering		
Correct and neat numbers		
Geometric shapes are correct and clear		
Key is clear and understandable		

Course Description

Drafting II – Semester – Prerequisites: Drafting I

(I do not recommend taking this course without taking Drafting I first)

Drafting II is a more advance course that will teach students about the world of CADD (Computer Assisted Design Drafting). This is a hands-on course that will provide information about more advanced drafting styles and techniques. This class is broken down into different units and will spend time in several styles and techniques throughout the semester. This class will be computer aid drafting and design (CADD). Students will use computer-aided-drafting (CAD software to explore the fundamentals of drafting. They use CAD software to create multiview drawings of a geometric solid. Students also use CAD software to complete a set of floor plans. The floor plans are based on standards for architectural drawings and the students implement 3-D software to create a computer “walk through” of their floor plans.

As a result of this unit, students will be able to:

1. Explore engineering and architectural drafting with the use of CAD software
2. Become familiar with the language of drafting using CAD software
3. Complete a mechanical drawing with the use of CAD software.
4. Complete an architectural drawing with the use of CAD software

I would recommend this course if you are thinking about a career in the construction, manufacturing and engineering fields.

Scope and Sequence for Drafting II – Using basic CAD functions, drawing setup functions; creating objects; editing objects

Week	Units	Activity	Exercises
1-2	Chapter 1	Starting AutoCad	
	Getting started	AutoCad Screen	
		Input Methods	
		Using Dialog Boxes	
3-5	Chapter 2	Constructing Geometric Figures	
	Fundamentals	Coordinate Systems	2 (1-24)
		Object Selection	
		Modify Objects	
6-7	Chapter 3	Drafting Settings	
	Fundamentals II	Display Control	3
		Setting Multiple Viewpoints	3 (1-6)
		Creating and Modifying Layer System	
		Setting the Linetype Scale Factor	
		Undo and Redo Commands	
8-9	Chapter 4	Drawing Construction Lines	4 (1-7)
	Fundamentals III	Drawing Polygons	
		Drawing Ellipses	
		Drawing Polylines	
		Drawing Test	
		Creating, Modifying Text Styles	
		Modifying Objects	
10-11	Chapter 5	Constructing Geometric Features	
	Fundamentals IV	Object Selection	5 (1-5)
		Object Selection Modes	
		Modifying Objects	
12-13	Chapter 6	Multilines	
	Fundamentals V	Spline Curves	6 (1-6)
		Editing with grips	
		Selecting Objects by Quick Select	
		Select Set by Filter Tool	
		Changing Properties of Selected Objects	
		Grouping Objects	
		Information About Objects	
14-15	Chapter 7	Dimensioning	
	Fundamentals VI	Dimension Terminology	7-1
		Associative-Non Associative Dimensions	7-2
		Dimensioning Commands	7-3
		Overriding the Dimensioning Feature	7-4
		Updating Dimensions	7-5
16-17-18		Architectural Drafting	Complete a Set of Floor Plans

Drafting II – Class Outline

Chapter 1 – Getting Started

- AutoCad Commands
- Starting AutoCad
- AutoCad Screen
- Input Methods
- Using Dialog Boxes
- Getting Help
- Beginning a New Drawing With The New Command
- Opening An Existing Drawing With the Open Command
- Working With Multiple Drawings
- Changing Units
- Changing The Area
- Saving A Drawing
- Exiting AutoCad
- Review Questions

Chapter 2 – Fundamentals I

- Constructing Geometric Figures
- Coordinate Systems
- Exercises 2-1 Through 2-4
- Object Selection
- Modify Objects
- Exercises 2-5 Through 2-8
- Exercises 2-9 Through 2-24

Chapter 3 – Fundamentals II

- Drafting Settings
- Display Control
- Setting Multiple Viewports
- Creating and Modifying Layer System
- Setting the Linetype Scale Factor
- U, Undo, And Redo Commands
- Exercises 3-1 Through 3-6

Chapter 4 – Fundamentals III

- Drawing Construction Lines
- Drawing Polygons
- Drawing Ellipses
- Drawing Polylines
- Drawing Text
- Editing Text
- Creating And Modifying Text Styles
- Creating Objects From Existing Objects
- Modifying Objects
- Exercises 4-1 Through 4-7

Chapter 5 – Fundamentals IV

- Constructing Geometric Figures
- Object Selection
- Object Selection Modes
- Modifying Objects
- Exercises 5-1 Through 5-5

Chapter 6 – Fundamentals V

- Multilines
- Spline Curves
- Editing With Grips
- Selecting Objects By Quick Select
- Selection Set By Filter Tool
- Changing Properties Of Selected Objects
- Grouping Objects
- Information About Objects
- System Variables
- Exercises 6-1 Through 6-6

Chapter 7 – Dimensioning

- Dimension Terminology
- Associative/Non-Associative Dimensions
- Dimensioning Commands
- Editing Dimension Text
- Dimension Styles
- Overriding The Dimension Feature
- Updating Dimensions
- Exercises 7-1 Through 7-5

Subject Area: Drafting IIInstructor: Ted Nixon

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology
 Benchmarks:

1. Problem-solving
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning.

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Solve math problems related to drafting 2. Identify appropriate manufacturing processes 3. Read and interpret a variety of drawings including welded assembly		LS, CS, HOTS
2		1. delegate duties & manage conflict, facilitating group interaction (teamwork)	Students peer teaching rubric 1-2	GS, CE
	Internet, www	2. become personally involved in professional organizations	Can locate web sites of professional organizations	TECH
		3. recognize relevant, ethical issues- and take responsibility for own mistakes	Students peer teaching rubric 1-2	GS, CE
3	Throughout units	1. Can set and maintain goals	Student peer teaching rubric 1.2	CE

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Drafting II

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computer and technological skills (standard)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Throughout chapters	1. Demonstrates effective interactions with others. Speak effectively in front of others, in person, on telephone, leading discussions, 2. Demonstrate social skills (listen effectively, organize thoughts, tactful clear communication, human relations skills) 3. Use terminology and communication and media skills in vocational education and	Students mentor peer effectively – See rubric 1-2 Teacher observation checklist Rubric 2.1	CS, GUID CE CE CE, CS
2		1. operate office equipment effectively (paper, ruler, drafting table, blueprint processing, protractor, compass) 2. use computer hardware & software effectively (database, word processing, spreadsheet, email, www.) 3. Use measurements correctly including metrics	Teacher observation checklist Each student individually initiates Auto cad Input computer measurement	CS, LS TECH CS, LS, GS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Drafting II

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

- Benchmarks:**
1. Knowledge and skills of content areas (standard II construction)
 2. Demonstrate technical skills (standard II construction)
 3. Apply principles of entrepreneurship
 4. Safety (standard I construction)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Knows how to start Auto CAD program and initiate programs 2. Knows basic CAD components	Observation Checklist Direct Questions	LS, GS, CS
2		1. Demonstrate basic CAD operations 2. Demonstrate proper care and maintenance of CAD equipment and software 3. Demonstrate proficiency in creating two-dimensional CAD drawings 4. Demonstrate proficiency in creating 3-dimensional CAD drawings 5. Demonstrate proficiency in 3 dimensional CAD modeling	Grade Assignment Teacher Observation Checklist Grade Project	LS, CS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Drafting II

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks:

1. Careers
2. Cooperation and community service
3. Adapt to change
4. Global and diversity issues

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Throughout units	1. Demonstrate job skills: initiative, effective time management, personal hygiene 2. Demonstrate job application skills: write a resume & application letter 3. Identify vocational career options 4. Evaluate a job offer (benefits, time and working environment)	Teacher observation checklist Connected to MOC class	CE
2	Throughout units	1. Explain relationship between public & private sector 2. Exhibit dependability, responsibility, punctuality, follow directions well 3. Accept supervisions willingly, asking for help when needed 4. Respect property and cooperate with others	Connected to MOC class Teacher observation checklist	CE
3	Throughout units	1. Accept new challenges 2. Adapt to change, demonstrate flexibility, adapting to environment and situation	Teacher observation checklist	CE

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Course Description

Woods I – Prerequisite – None

This course is designed to introduce the student to the fundamentals of woodworking. Topics covered include: safety, wood technology, career opportunities, care and use of tools, design and construction of furniture, and finishing. This course will provide the student with the basic knowledge, skills and procedures to be utilized in the woodworking field. It is also designed to give the student insight into the major areas of woodworking and to serve as a reference for design and construction principles and methods. Students will be required to complete the assigned projects.

Benchmarks:

- Appreciate working accurately, neatly, and safely.
- Use hand and power tools correctly and safely
- Learn wood construction techniques and terminology
- Use thinking and problem-solving skills by planning a wood furniture project
- Plan and produce a wood project

Scope and Sequence for Woods I

Week	Chapter	Activity
1	1	Review Questions
	2	Review Questions, Test Material
2	3	Design
	4-5	Drawing and Planning Your Work
	6	Measurement Marks
	7-8	Safety, Careers
	9-10	Cutting, Hand Plane
3		Safety Test, Measurement Test
	11-13	
	59	Drill Press, Safety Test
	55	Radial Arm Safety Test
	54	Circular Saw
4	54	Table Saw Safety
	56	Band Saw Test
	61	Wood Lathe Test, Wood Lathe Between Center, Face Plate
5	61	Wood Lathe
	53	Planer
	14-15	Cutting and Gluing
	16-18	Squaring, Layout and Cutting
6	53	Planer Safety Test
	58	Jointer
	62	Portable Electric Drills
	60	Disc Sander Test, Start Checker Board
7	19-20	Curves, Chamfer

Scope and Sequence for Woods I (cont.)

Week	Chapter	Activity
	21-22	Chisel, Wood Carving
	23-24	Bending, Laminator
	25	Hand Drill, Shop
8		Shop
	63	Portable Saw
	26	Shaping Tools
	64	Portable Router
		Router Safety Test
9	65	Portable Safety Test
	31	Miter Cut, Shop
	57	Scroll (jigsaw)
10	27	Butt, Dowel Biscuit Jolly
	28	Rabbet Joints
	29	Dado Joints
11		Shop
	30	Lap Joints
12	32	Mortise-and-Tenon Joint
13	33-34	
	35-36	Shop
	37-38	
14	39-40	Shop
	41-42	Shop
16	43	Shop
	44	Finish
17	45-47	Shop
	48-50	Shop

Subject Area: Woods I

Instructor: Ted Nixon

Length of Unit: 18 Weeks

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology Benchmarks:

1. Problem-solving
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning.

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. delegate duties & manage conflict, facilitating group interaction (teamwork)	Teacher observation checklist	GC, CE
2		1. Become personally involved in professional organizations 2. Recognize relevant, ethical issues- and take responsibility for own mistakes	Discuss questioning	CS, HOTS, LS
3		1. Plan a project	Teacher observation checklist	HOTS, LS, CS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Woods I

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computer and technological skills (standard)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Speak effectively in front of others, in person, on telephone, leading discussions, demonstrates effective interactions with others. 2. Listens effectively 3. Organizes thoughts and write clearly 4. Demonstrate courtesy skills (tactful, clear) 5. Identify human relations factors in vocational education 6. Develop visual- promotional display 7. Be able to explain processes using terminology in vocational education	Teacher observation checklist Directed questioning Grade project Discussion Grade assignment	HOTS, LS, CS, GUID, CE, MEDIA
2		1. Operate office equipment effectively 2. Use computer hardware & software effectively (database, word processing, spreadsheet, email, www,) 3. Use measurements correctly including metrics	Observation Grade activity	HOTS, MEDIA, TECH, LS, CS, GS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Woods I

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

- Benchmarks:**
1. Knowledge and skills of content areas (standard II construction)
 2. Demonstrate technical skills (standard II construction)
 3. Apply principles of entrepreneurship
 4. Safety (standard I construction)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Students know and safely work with hand tools 2. Students know how to safely join and assemble wood 3. Schools know how to finish wood 4. Students know how to safely operate wood working machines	1. Student test - identify hand tools and how to cut, place, glue and shape wood. 2. Quiz - joining wood by butt, dowel, biscuit, rabbet, dado, lap, miter, and joint 3. Quiz - demonstrate knowledge of how to finish wood including stain, shellac, varnish, oil, lacquer 4. Quiz - demonstrate plane, circular saw, radial arm saw, band saw, and scroll saw	HOTS, SPECIAL, LS, CS, HGD
2		1. Students demonstrate safely working with hand tools 2. Students demonstrate safely joining and assembling wood 3. Schools demonstrate finishing wood with each of the finishes (stain, shellac, etc) 4. Students demonstrate safely operating wood working machine to complete a project	1. Rubric of safety using hand tools 2. Rubric of safety and correctly using assembly methods 3. Rubric of students correctly and safely using finishes. 4. Rubric of student safety and correctly using woodworking machines to complete project. 5. Rubric of satisfactory completed project	HOTS, SPECIAL, LS, CS, HGD
3		1. Identify skills of a business owner, entrepreneur 2. Recognize adv. & dis. of different kinds of business ownership	Directed questioning	HOTS, MEDIA, HGD
4		1. Safety is infused into each content and process standard and benchmark	Observation checklist	LS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Woods I

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks:

1. Careers
2. Cooperation and community service
3. Adapt to change
4. Global and diversity issues

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Demonstrate job skills: initiative, effective time management, personal hygiene 2. Demonstrate job application skills: write a resume & application letter 3. Identify vocational career options 4. Evaluate a job offer (benefits, time and working environment)	Teacher observation checklist Connected to MOC	LS, CE
2		1. Explain relationship between public & private sector 2. Exhibit dependability, responsibility, punctuality, follow directions well 3. Accept supervisions willingly, asking for help when needed 4. Respect property and cooperate with others	Teacher student rubric of student behavior in class	CE
3		1. Accept new challenges 2. Adapt to change, demonstrate flexibility, adapting to environment and situation.	Teacher observation checklist	CE
4		1. Identify types of production systems used worldwide 2. Identify monetary & measurement systems of selected countries & impact on U.S. 3. Identify where raw materials and finished products are in the world.	Directed questioning Grade project Woods I	GS, TECH

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Woods I Rubric for Student Safety With Tools			
Wood Process or Tool	Teacher Demonstration	Student Demonstration with Supervision	Teacher observation indicates that student consistently follows safe practices in the sue of tools
Hand saws, backsaws, coping saw, compass saw			
Screwdrivers, hammers, planers, hand drills, file knife, file, rasp, sharpening tools			
Glue, stain, shellac, varnish, oil, lacquer			
Machine tools: electric planer, joiner, rotary jointer-surfacer, drill press, sanding machines, wood lathe, portable electric drills, portable sanders			
Circular saw, radial-arm saw, band saw, scroll (jig) saw, and portable saws.			

Course Description

Woods II – semester – Prerequisites: Woodworking I
(I do not recommend taking Woods II without taking Woods I first)

Woods II is a class for students wishing to build a cabinet or other wood project. Students will learn the process of woodworking. They will learn the proper use of many different woodworking tools. Students will also learn different fabrication methods and various types of jointing. Staining and finishing processes will also be learned. Students will be required to complete the assigned projects, but will also be given the opportunity to design and build their own projects with the instructor's approval. Safety will be stressed at all times.

Course Objectives:

At the end of this course, students should be able to:

1. Demonstrate safe practices of woodworking equipment
2. Identify various woodworking tools.
3. Label different kinds of wood commonly used in woodworking.
4. Produce a set of plans for their wood project and follow them.
5. Choose the appropriate tools and joining technique for a given situation.
6. Stain and finish a wood project.
7. Create an accurate material list, cut list and plan of procedure.

Scope and Sequence – Woods II

Week	Topic	Activity
1	Introduction to Woods II	Design process
2-3	Safety	Tool Demonstration
4-12	Design and Planning	Plan, Design, Build project
13-14	Advanced Procedures	Demonstration
15-18	Design and Planning	Design, Plan, Build project

Subject Area: Woods II

Instructor: Ted Nixon

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology

Benchmarks:

1. Problem-solving
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning.

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Chapter 5	1. Develop a plan for shop project listing materials, time and costs – determining best option	Student will justify orally their project selection	HGD, HOTS, CS
2		1. Delegate duties and manage conflict, facilitating group interaction (teamwork) 2. Become personally involved in professional organizations 3. Recognize relevant, ethical issues and take responsibility for won mistakes	Student-peer helper rubric	GS, CE
3		1. Plan a project given the textbook's or teacher's model	Observation checklist, grade project	HOTS, LS, CS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Woods II

Instructor: Ted Nixon

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computer and technological skills (standard)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Speak, listen and write clearly 2. Demonstrate courtesy skills (tactful, clear) being aware of human relation factors 3. Develop visual-promotional display using correct vocational terminology	Teacher observation checklist Directed questioning	HOTS, LS, CS, GUID, CE, HGD
2	Unit 6	1. Operate technology related equipment correctly (office machines, www. email). 2. Use measurements correctly including metrics	Observation Grade activity	MEDIA, TECH, LS, CS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Woods II

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

- Benchmarks:
1. Knowledge and skills of content areas (standard II construction)
 2. Demonstrate technical skills (standard II construction)
 3. Apply principles of entrepreneurship
 4. Safety (standard I construction)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Students know how to safely join and assemble wood 2. Students know how to finish wood including more advanced techniques 3. Students know how to safely operate wood working machines	Quiz – joining wood by butt, dowel, biscuit, rabbet, dado, lap, miter, and joint Quiz – demonstrate knowledge of how to finish wood including stain, shellac, varnish, oil, lacquer Quiz – demonstrate plane, circular saw, radial arm saw, band saw, and scroll saw	HOTS, LS, CS, HGD
2		1. Students demonstrate safely joining and assembling wood 2. Schools demonstrate finishing wood with each of the finishes (stain, shellac, etc) 3. Students demonstrate safely operating wood working machine to complete a project	Students demonstrate safety and correctly using assembly methods Rubric of students correctly and safely using finishes. Rubric of satisfactory completed project	HOTS, LS, CS, HGD
3		1. Identify skills of a business owner, entrepreneur 2. Recognize adv. & dis. of different kinds of business ownership	Students will ask questions of guest speaker-carpenter	CS, HOTS
4		1. Safety is infused into each content and process standard and benchmark	Students will know and apply safe lab techniques	HOTS, LS, CS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Woods II

Instructor: Ted Nixon

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks:

1. Careers
2. Cooperation and community service
3. Adapt to change
4. Global and diversity issues

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Demonstrate job skills: initiative, effective time management, personal hygiene 2. Demonstrate job application skills: write a resume & application letter, identify career options related to woods, and evaluate job offers	Teacher student rubric of student behavior in class MOC assessments in class and on the job	HOTS, LS, CE
2		1. Exhibit dependability, responsibility, punctuality, follow directions well, accept supervision, ask for help, respect property and cooperate with others, accept new challenges, adapt to change	Teacher student rubric of student behavior in class	CE, LS
3		1. Identify monetary & measurement systems of selected countries & impact on U.S. (metric customary) 2. Identify where raw materials and finished products are in the world.	Student can use standard measure to the 1/32 inch Student can identify and tell where various woods are grown	GS, LS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Woods II Rubric for Student Safety With Tools			
Wood Process or Tool	Teacher Demonstration	Student Demonstration with Supervision	Teacher observation indicates that student consistently follows safe practices in the use of tools
Hand saws, backsaws, coping saw, compass saw			
Screwdrivers, hammers, planers, hand drills, file knife, file, rasp, sharpening tools			
Glue, stain, shellac, varnish, oil, lacquer			
Machine tools: electric planer, joiner, rotary jointer-surfacer, drill press, sanding machines, wood lathe, portable electric drills, portable sanders			
Circular saw, radial-arm saw, band saw, scroll (jig) saw, and portable saws.			

Woods II Rubric – Plan Your Work – Then Work Your Plan			
	Low Proficiency	Proficient	Above Proficiency
Selecting Project	Not realistic to complete with budget and time	Realistic to complete	Well thought out-decision made promptly, student can orally justify choices
Getting Design	Student does not have a readable sketch or drawing to follow-measurements are incorrect or missing, project is not to scale	Student has readable sketch or drawing, measurements, scale and dimensions are correct.	Drawing is accurately and realistically drawn, showing more than one angle or view
Materials	No materials list or incomplete or inaccurate	Basic materials list and estimated cost is included	Materials list is complete, each cost is included with a break down of expenses, tax, and handling charges
Tools and equipment	No list or inaccurate list	Basic tools and equipment listed	Exact tool and equipment list as well as notes to check safety and operation issues. Student consults manual to match project with tool
Stock cutting list	Not present or inaccurate	Basic cut list with dimensions and number of cuts and basic measurements listed	Detailed stock cutting list with exact dimensions, and drawing of cuts
Procedure	Not all steps included or in wrong order	At least basic steps to create project listed	Detailed list of steps of project and order for completion including time elements to complete

Course Description

Construction - Prerequisite – Woods I – Grades 11-12

Text: Modern Carpentry

Construction provides a basic introduction to construction work and the technical aspects of carpentry. Topics include safety, measurement, and the identification, selection, and use of tools, equipment, lumber, materials, and fasteners. Basic skills, leadership, career development, thinking and reasoning skills, mathematics, and principles of technology are reinforced. Activities provide many opportunities to enhance classroom instruction and career development.

Scope and Sequence for Construction I

Week	Unit
1	1, 2
2	3, 4
3	5, 6
4	7
5	8
6	9
7	10
8	11
9	12
10	13
11	14
12	15
13	16
14	17
15	18
16	19
17	20
18	21

Construction

Course Outline

1. Construction Materials

- A. Sawed Lumber and Engineered Lumber
- B. Timbers
- C. Sheet Materials
- D. Concrete and Concrete Blocks
- E. Fasteners and Metal Framing Materials
- F. Miscellaneous Materials

2. Safety

- A. Personal Protective Equipment
- B. Working Safely
- C. Handling Hazardous Materials
- D. Fire protection
- E. First Aid

3. Hand Tools

- A. Identification
- B. Hand Tool Safety
- C. Common Uses
- D. Care and Maintenance

4. Power Tools

- A. Identification
- B. Power Tool Safety
- C. Common Uses
- D. Care and Maintenance

5. Leveling Instruments

- A. Set Up
- B. Reading the Rod
- C. Calculations
- D. Applications

6. Laying Out Buildings

- A. Getting Started
- B. Squaring Using the 3-4-5 Method
- C. Batter Boards and Stakes

7. Footings and Foundations

- A. Codes and Specifications
- B. Block Laying
- C. Cast Concrete Walls
- D. Types of Foundations
- E. Pole Construction
- F. Concrete Technology
- G. Concrete Flatwork
- H. Special Treatments

8. Wall Framing

- A. Conventional
- B. Post Construction

9. Roof Framing

- A. Roof types
- B. Roof Math
- C. Laying Out and Cutting Common Rafters
- D. Making and Setting Truss Rafters
- E. Sheathing

10. Exterior Wall Sidings and Enclosures

- A. Types of Sidings
- B. Vertical Steel Siding
- C. Enclosing Overhangs

11. Roof Finishing

- A. Types of Coverings
- B. Asphalt Shingles and Roll Roofing
- C. Wood Shingles and Shakes
- D. Metal Roofing
- E. Flashings
- F. Gutters

12. Insulation-Thermal and Sound

- A. Types of Materials
- B. R-Values
- C. Vapor Barriers
- D. Ventilation
- E. Basic Wiring Procedures

13. Electrical Wiring

- A. Service Entrance
- B. Single-Phase and Three-Phase Power
- C. Simple Circuits
- D. Conduit and Romex
- E. Basic Wiring Procedures

14. Plumbing

- A. Well and Pump Troubleshooting
- B. Outdoor Hydrants and Valves
- C. Connecting Fixtures to Pipe and Tubing
- D. Drains and Traps

15. Building Codes and Permits

- A. Electrical
- B. Plumbing
- C. General Construction
- D. Area Plan Commission/Board of Zoning Appeals (BZA)

Length of Unit: 18 Weeks

Subject Area: Construction

Instructor: Ted Nixon

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology

Benchmarks:

1. Problem-solving
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning.

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Modern Carpentry Unit 7-11 Unit 5-7 Unit 26	1. Explain the importance of estimating in the construction trade 2. Explain how to prepare a building site including establish elevation reference point from benchmark, establish footing, locate and square corners, lay out building 3. Diagnose malfunctions of simple electrical systems using test and measurement equipment and repair such as voltmeter, am meter and ohmmeter.	Unit Test	LS, CS, HOTS
2		1. delegate duties & manage conflict, facilitating group interaction (teamwork) 2. Become personally involved in professional organizations 3. Recognize relevant, ethical issues- and take responsibility for own mistakes	Directed Questioning MOC	LS, CS, TECH, HGD
3	Unit 30	1. Define goals 2. Identify skills, physical & emotional requirements for a job	Unit Test	LS, CS
4	Unit 7-13 Unit 6 Unit 7-11 Unit 1	1. Receive, inspect, inventory, stack, and properly store equipment, materials and supplies on site. 2. Interpret a materials list 3. Explain the cost of doing a job to include labor, tools, materials, and overhead and their relationship to profit 4. Computer the quantity of commonly used materials needed for a job (area, cubic area, and linear measurement) 5. Identify parts and materials using a suppliers and manufacturers catalog and manual	Test Your Knowledge Unit Test	LS, CS, HGD

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Construction

Instructor: Ted Nixon

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computer and technological skills (standard)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Speak, listen, organize, and write clearly	Observation	HOTS, LS, HGD
2		1. Use materials and equipment effectively (computers, office equipment, measure devices)	Directed questioning	TECH, LS, HGD

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: ConstructionInstructor: Ted Nixon**Standard 3: Students will demonstrate knowledge and skills of subject area**

- Benchmarks:
1. Knowledge and skills of content areas (standard II construction)
 2. Demonstrate technical skills (standard II construction)
 3. Apply principles of entrepreneurship
 4. Safety (standard I construction)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Unit 3-4 Unit 7-13 Unit 3-13	1. Cut materials to specified dimensions and shape 2. Identify, Install and remove fasteners properly (nails, screws, hangers and supports, anchor bolts) 3. Measure and compute using fractions and decimals, rulers, tape measure, chalk line, level, transit and square.	Woods I & II	LS, HGD
2	Unit 6 Unit 7	1. Identify parts of a structure from a cross section on a blue print 2. Concrete: Explain all components of preparing foundations, footings, 3. Concrete: build forms, pour and finish concrete, strip and clean forms,	Unit 6 Test Unit Test	HOTS, LS LS, HGD CS
	Unit 7, 13, 21	4. Masonry: Explain bonding, joint finishes, 5. Masonry Demonstrate mortar mixing, layout for inside and outside corners, 6. Metals: Measure cut, form fit and install metal flashing, siding and trim	Unit Test	LS, HGD, CS
	Unit 13	7. Wood and Plastics Identify parts of a stair and computer rise, run and headroom, brought in wall, install cabinetry, miter and install trim, prefab truss or rafter roof system, and lay out structural members on centers	Unit Test	LS, HGD
	Unit 17	8. Thermal and Moisture Protection: Identify side wall and ceiling insulation 9. Thermal and Moisture Protection. Install vapor barriers, ventilation and air infiltration, types of roofing systems. 10. Thermal and Moisture Protection: install insulation and observe appropriate waterproofing and drainage procedures	Quiz	LS, CS, HGD
	Unit 14		Unit Test	LS, CS, HGD

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Length of Unit: 18 Weeks

Subject Area: Construction

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

- Benchmarks:
1. Knowledge and skills of content areas (standard II construction)
 2. Demonstrate technical skills (standard II construction)
 3. Apply principles of entrepreneurship
 4. Safety (standard I construction)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
2	Unit 12	11. Door And Windows Install prehung door and or precased window	Unit Test	LS, CS
	Unit 20	12. Finishes: Identify different types of exterior & interior finishes and pros and cons of each. (Cornice, door, window, siding fascia, soffit, stucco, wood, masonry, aluminum and vinyl).	Unit Test	LS, CS, HOTS
	Unit 26	13. Demonstrate appropriate techniques for installing and finishing drywall	Unit Test	LS, CS
	Unit 28	14. Electrical: Identify and explain ground fault protection, size and types of wire, wire covering and appropriate short circuit protection, types and sizes of electrical conduits, and method of transporting electrical power	Unit Test	LS, CS
	Unit 27	15. Mechanical: Explain the different between the component and operations of HVAC systems: steam, hot water, forced air and unit ventilation, air condition and solar systems.	Unit Test	LS, CS
3		14. Plumbing: Explain the installation of water faucet and water closet replacement. Identify the components of the plumbing system (ventilation, sewage, potable water, storm system)		HOTS, LS, CE
4	Unit 2-4	1. Identify skills of a business owner, entrepreneur 2. Create a business plan, identifying financing options, purchasing fixed and variable assets, and resources for technical assistance	Woods I & II	LS, CS
	Unit 3-4	1. Comply with shop and equipment safety rules 2. Inspect workplace for safe working environment & report unsafe conditions and correct safety hazards leaving work area in safe condition	Woods I & II	LS, CS
	Unit 2, 29	3. Demonstrate safe use of tools, chemicals and other substances 4. Demonstrate proper shoveling & lifting techniques 5. Explain OSHA job safety compliance rules		
	Unit 2	6. Explain the application of first aid intervention for particular situations	Woods I & II	LS, HGD

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Length of Unit: 18 Weeks

Subject Area: Construction

Instructor: Ted Nixon

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks: 1. Careers

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Demonstrate job skills: initiative, effective time management, personal hygiene 2. Demonstrate job application skills: write a resume and application letter, job offers 3. Exhibit dependability, responsibility, punctuality, follow directions well	Teacher observation MOC	LS, CS, CE, HOTS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Course Description

Residential Wiring – ½ credits – 1 semester – Prerequisite Woods I (grades 11-12)

Text: Modern Residential Wiring

This course introduces residential wiring, electrical installation, and service. Topics include basic electricity, electrical construction codes and practices, the National Electricity Code, the use of test equipment, and electrical hand and power tools. Skills in safety, mathematics, leadership, and problem-solving are reinforced in this course.

In this course students learn the principles of electricity and draw schematics of both parallel and series circuits. Students wire a series and parallel circuit and classify conductors and insulators. They use a volt-ohm meter as well as identify the magnetic fields important to the concept of electricity. Students also measure voltage, resistance, and current during the class activities.

Activities include:

1. Draw schematic diagrams of series and parallel circuits.
2. Discover the relationship among electrical voltage, current, and resistance.
3. Demonstrate their knowledge of electrical circuits.
4. Classify samples of electrical conductors and insulators.
5. Explore the concepts of electricity and magnetism.
6. Observe the strength and direction of magnetic lines of force.

Scope and Sequence for Residential Wiring

Week	Section	Activity
1-2	Section 1-Fundamentals	1. Safety 2. Electrical Energy Fundamentals 3. Tools for the Electrician
3-9	Section 2 – Installation	4. Wiring Systems 5. Conductors 6. Boxes, Fittings, and Covers 7. Device Wiring 8. Overcurrent Protection 9. Grounding 10. The Service Entrance
10-12	Section 3 – Planning	11. Electrical Prints and Specifications 12. Branch-Circuit, Feeder, and Service Design 13. Appliance Wiring and Special Outlets
13-15	Section 4 – Specialized Installations	14. Farm Wiring 15. Mobile Home Wiring 16. Swimming Pool Wiring 17. Telephone and Computer Network Wiring 18. Motors 19. Emergency and Standby Systems
16-17-18	Section 5 – The Professional Electrician	20. Electrical Remodeling 21. Maintenance and Troubleshooting 22. Electrical Careers

Course Outline – Residential Wiring

Section 1 – Fundamentals

Chapter 1 – Safety

- Workplace Injuries
- Working Safely
- Responding to an Accident
- Hazardous Environments
- Reference

Chapter 2 – Electrical Energy Fundamentals

- Electron Theory
- Measuring Electricity
- Circuits
- Circuit Fundamentals
- Electromagnetic Induction
- Electrical System Overview

Chapter 3 – Tools for the Electrician

- Measuring Tools
- Wire Tools
- Conduit
- Striking
- Drilling
- Soldering
- Miscellaneous
- Care and Repair of Tools
- Grounding Basics
- How the System Ground Works
- Equipment Grounding
- Ground-Fault Circuit Interrupters (GFCI)
- Arc-Fault Circuit Interrupter (AFCI)

Section 2 – Installation

Chapter 4 – Wiring Systems

- Electrical Codes and Safety Agencies
- Wiring Systems
- Cables
- Raceways

Chapter 5 – Conductors

- Materials
- Conductor Size

- Conductor Identification

Chapter 6 – Boxes, Fittings, and Covers

- Boxes
- Fittings
- Fill Allotment
- Covers

Chapter 7 – Device Wiring

- Wiring Methods and Materials
- Preparation of Conductors
- Wiring Switches, Receptacles, and Fixtures

Chapter 8 – Overcurrent Protection

- Causes of Overcurrent
- Protective Devices
- Protective Device Rating

Chapter 9 – Grounding

- Grounding Basics
- How the System Ground Works
- Equipment Grounding
- Ground-Fault Circuit Interrupters (GFCI)
- Arc-Fault Circuit Interrupter (AFCI)

Chapter 10 – The Service Entrance

- Service Entrance Components
- Service Disconnects
- Service Grounding
- Service Clearances
- Service Completion
- Transformers
- Phases

Section 3 – Planning

Chapter 11 – Electrical Prints and Specifications

- Prints
- Understanding Electrical Prints
- Specifications
- Wiring Circuits

Chapter 12 – Branch-Circuit, Feeder, and Service Design

- Branch Circuit Design
- Determining the Number of Branch Circuits
- Feeder and Service Load Calculations
- Balancing Circuit Loads

Chapter 13 – Appliance Wiring and Special Outlets

- General Considerations
- Kitchen Appliances
- Room Air Conditioner Units
- Miscellaneous Special Outlet Units
- Water Heaters
- Heaters

Section 4 – Specialized Installations

Chapter 14 – Farm Wiring

- Power Distribution
- Cable or Conduit

Chapter 15 – Mobile Home Wiring

- Distribution Panelboard
- Feeder Assembly
- Mobile Home Service Equipment
- Mobile Home Parks

Chapter 16 – Swimming Pool Wiring

- Bonding
- Grounding
- Receptacles
- Switches
- Lighting
- Miscellaneous Equipment
- Overhead Conductor Clearance

Chapter 17 – Telephone and Computer Network Wiring

- Systems Overview
- Installation
- Other Systems

Chapter 18 – Motors

- Types of Motors
- Motor Nameplate
- Proper Size of Motor Feeder Conductors
- Protection of Motor Feeder Conductors
- General Layout
- Controller Requirements
- Motor Duty
- Selecting the Proper Size Disconnect
- Motor Installation Rips
- Mounting
- Service and Repair of Motors

Section 5 – The Professional Electrician

Chapter 20 – Electrical Remodeling

- Basic Considerations
- Safety
- Special Tools
- Materials
- Building Construction
- Wall Openings
- Installing Cable
- Box Installation
- Modernizing a Service Entrance
- Adding a Subpanel
- Grounding Panelboards
- Grounding Remodeled Systems
- Surface Raceways and Multioutlet Assemblies

Chapter 21 – Maintenance and Troubleshooting

- Safety Considerations
- Troubleshooting Tools
- Diagnosing Problems

Chapter 22 – Electrical Careers

- Career Categories
- Owning a Business
- Training, Other Qualifications, and Advancement

Length of Unit: 18 Weeks

Subject Area: Residential Wiring

Instructor: Ted Nixon

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology

Benchmarks:

1. Problem-solving (standard II)
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning.
4. Planning (standard III from Construction)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Modern Residential Wiring Chapter 1 Chapter 12	1. Analyze, construct and troubleshoot resistant CNA capacitance (RCP resistance inductance) (RL) and inductance and capacitance (RLC) circuits 2. Analyze, and apply principles of transformers to AC circuits using a schematic (single and three phase).	Chapter test	LS, CS
2		1. Delegate duties and manage conflict, facilitating group interaction (teamwork) 2. Become personally involved in professional organizations 3. Recognize relevant, ethical issues-and take responsibility for own mistakes	Direct questioning MOC	HOTS, LS, CS, TECH
3		1. Define goals 2. Identify skills, physical and emotional requirements for a job	Construction Class, Chapter 9, Unit test	LS, CS
4		1. Receive, inspect, inventory, stack, and properly store equipment, materials and supplies on site 2. Interpret a materials list 3. Explain the cost of doing a job to include labor, tools, materials, and overhead and their relationship to profit 4. Computer the quantity of commonly used materials needed for a job (area, cubic area, and linear measurement) 5. Identify parts and materials using a suppliers and manufacturers catalog and manual	Construction Class, Chapter 8, Unit test Construction Class, Chapter 13, Unit test	HOTS, LS, CS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Length of Unit: 18 Weeks

Subject Area: _____

Instructor: Ted Nixon

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computer and technological skills (standard)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Speak, listen, organize, and write clearly	Observation	CS, LS
2		1. Use materials and equipment effectively (computers, office equipment, measure devices)	Direct questioning	TECH

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Residential Wiring

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks:

1. Knowledge and skills of content areas (standard II construction)
2. Demonstrate technical skills (standard II construction)
3. Apply principles of entrepreneurship
4. Safety (standard I construction)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Chapter 9 Chapter 4	1. Cut materials to specified dimensions and shape 17. Use basic shop skills of stripping wire, soldering, de-soldering, IC sockets, wire wrap and assembling connors 2. Identify, install and remove fasteners properly (nails, screws, hangers and supports, anchor bolts) 3. Measure and compute using fractions and decimals, rulers, tape measure, chalk line, level, transit and square	Woods I, II Chapter tests	LS, CS
2	Chapter 3 Chapter 11 Chapter 2 Chapter 1	1. Interpret component identifiers and read schematics (color codes, manufacturers and type number 9. Cross reference various electronic devices using manufacturers reference materials 2. Identify schematic symbols and read and interpret electronic schematic diagrams 8. Identify specific characteristics of various electronic device using manufacturer reference manuals 10. Interpret control diagram for electrical systems 16. Read and interpret basic three views and three-dimensional drawings 3. Explain the relationship between energy, power and work 4. Remove and replace components on printed circuit board using soldering and de-soldering equipment 5. Record data, plot curves, and graphs and analyze results of laboratory experiments 6. Write technical reports, which document methods, results and conclusions 7. Identify major governing bodies, which set standards relevant to the industry (Military, IEEE, UL ANSI, NFPS, etc.)	Chapter tests MOC	LS, CS, CE

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Residential Wiring

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks:

1. Knowledge and skills of content areas (standard II construction)
2. Demonstrate technical skills (standard II construction)
3. Apply principles of entrepreneurship
4. Safety (standard I construction)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
2	Chapter 20 Chapter 8 Chapter 4 Chapter 12	11. Diagnose malfunctions of electrical system using test and measurement equipment (fuses, circuit breakers, relate and solenoid failure, etc.) 12. Determine maintenance procedures using technical manuals. 13. Explain the importance of preventative maintenance and the re-recording of repair activities 14. Disassemble, fit, straighten and reassemble parts 15. Measure parts with precision tools in metric and English system 18. Use basic power and hand tools associated with electronic and electrical service 19. Demonstrate an understanding of electricity in AC circuits	Chapter tests MOC	LS, CS, CE, HOTS
3	Chapter 22	1. Identify skills of a business owner, entrepreneur 2. Create a business plan, identifying financing options, purchasing fixed and variable assets, and resources for technical assistance	Chapter test	CS
4	Chapter 5	1. Comply with shop and equipment safety rules 2. Inspect workplace for safe working environment and report unsafe conditions and correct safety hazards leaving work area in safe condition 3. Demonstrate safe use of tools, chemicals and other substances 4. Demonstrate proper shoveling and lifting techniques 5. Explain OSHA job safety compliance rules 6. Explain the application of first aid intervention for particular situations	Chapter test Observation checklist Wood I & II	LS, HOTS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Residential Wiring

Instructor: Ted Nixon

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks:

1. Careers
2. Cooperation and community service
3. Adapt to change
4. Global and diversity issues

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Demonstrate job skills: initiative, effective time management, personal hygiene 2. Demonstrate job application skills: write a resume and application letter job offers 3. Exhibit dependability, responsibility, punctuality, follow directions well, accept challenges, adapt to change	Observation checklist Class assignments	LS, CS, TECH

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

AC Currents

Standard V: Understand and demonstrate the basic concepts of AC Circuits

Benchmarks:

1. Explain the power formula ($P=EI$) and the variables of power, voltage and current.
2. Demonstrate an understanding of sources of electricity in AC circuits.
3. Demonstrate an understanding of the properties of an AC signal.
4. Demonstrate an understanding of basic motor/generator theory and operation.
5. Demonstrate an understanding of measurement of power in AC circuits.
6. Demonstrate an understanding of the principles of operation of safety grounding systems: (lightning arresters, ground fault interrupters, etc.)

DC Circuits

Standard VI: Understand and demonstrate the basic concept of DC circuits.

Benchmarks:

1. Explain the concepts of DC current.
2. Demonstrate an understanding of sources of electricity in DC circuits.
3. Demonstrate an understanding of principles and operation of batteries.
4. Demonstrate an understanding of measurement of resistance of conductors and insulators and the computation of conductance.
5. Demonstrate an understanding of magnetic properties of circuits and devices.
6. Explain the basic circuit components of resistance, capacitance and inductance.
7. Analyze, construct and troubleshoot series, parallel, and series-parallel circuits.
8. Explain ohms law ($R=E/I$ – and the variables of resistance, voltage and current.
9. Explain the power formula ($O=EI$) and the variables of power, voltage and current.

Course Description

Energy, Power and Transportation Technology – semester

Text: Energy, Power and Transportation; Goodheart-Wilcox

In this course students will gain a basic understanding of energy sources, the principles of power technology, and the concept of mechanical advantage and machines. Students see how fluids can be used with other simple machines. Using education instruments, students learn the fundamentals of gears, fluid mechanics and three classes of levers:

1. Understand the concepts of gears and gear ratios.
2. Demonstrate knowledge of the three classes of levers by completing an activity.
3. Discover the functions and potential uses for pneumatics, hydraulics, and gears.
4. View video segments on energy, work, and the future.
5. Control energy by adjusting the flow or air pressure.
6. Differentiate between renewable and non renewable energy.

Students will work on projects that are designated by the instructor. Safety will be stressed at all times.

Scope and Sequence for Energy, Power and Transportation Technology

Week	Activity
1	1. Energy, Power and Transportation Technologies
2	2. An Introduction to Energy
3	3. Nonrenewable Sources of Energy 4. Nuclear Energy
4	5. Renewable and Inexhaustible Energy Sources 6. Solar Energy
5	7. An Introduction to Power 8. Electrical Power Systems
6	9. Mechanical Power Systems 10. Fluid Power Systems
7	11. Control Technology and Automation 12. Electronics
8	13. Energy and Power Conversion Devices
9-10	14. Small Gas Engines
11	15. An Introduction to Transportation Systems
12	16. An Introduction to Vehicular Systems 17. Land Transportation Systems
13	18. Land Vehicular Systems 19. Water Transportation Systems
14	20. Water Vehicular Systems 21. Air Transportation Systems
15	22. Air Vehicular Systems 23. Space Transportation Systems
16	24. Space Vehicular Systems 25. Intermodal Transportation and Vehicular Systems
17-18	26. Energy, Power, Transportation, and the Environment 27. Energy, Power, Transportation, and the Future

Length of Unit: 18 Weeks

Subject Area: Energy, Power and Transportation Technology

Instructor: Ted Nixon

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology

Benchmarks:

1. Problem-solving (standard II)
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning.

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	<u>Energy, Power and Transportation Technology</u>			
2		1. Delegate duties and manage conflict, facilitating group interaction (teamwork) recognizing relevant ethical issues 2. Become personally involved in professional organizations	Observation Directed questioning	HOTS, LS, CS, GUID
3		1. Student will identify goals for class	Student survey of goals	HGD

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Energy, Power and Transportation Technology

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computer and technological skills (standard)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Speak, listen and write clearly 2. Demonstrate courtesy skills (tactful, clear) 3. Be able to explain processes using terminology and visual displays in vocational education	Observation checklist MOC	CS, LS, CE
2		1. Use materials correctly (office equipment, measurements, (Metric and standard) and computers	Class activity	TECH, LS, CS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Energy, Power and Transportation Technology

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks:

1. Knowledge and skills of content areas
2. Demonstrate technical skills
3. Apply principles of entrepreneurship
4. Safety

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Chapter 1-5 Chapter 19-20 Chapter 21-22	1. Student needs to know the different types of energy (mechanical, thermal, light) 2. Student needs to know the operation of a small gasoline engine. 3. Student needs to know about mechanical power 4. Student needs to know about fluid power	Chapter tests Grade assignment	LS, CS, HGD, HOTS
2	Chapter 9	1. Structural Analysis and Damage Repair: Inspect and identify suspecting for damaged or worn parts 2. Inspect tires and wheels 3. Students will be able to analyze pollution and operation of engine based on exhaust pipe inspection	Using component parts identify worn parts Using component parts and cars in parking lot inspect and evaluate tire wear, run pollution test	LS, CS, HOTS
3		1. Identify skills of a business owner in the auto field 2. Recognize adv. and disadvantages of different kinds of business ownership 3. Explain competition, profit, market analysis 4. Create a business plan, identifying financing options, purchasing fixed and variable assets, and resources for technical assistance	Class assignment MOC	LS, CS, CE
4	Chapter 16	1. Apply shop and equipment safety rules including hazardous materials 2. Know first aid procedures 3. Discuss the hazards of substance abuse in the workplace 4. Identify and report unsafe shop conditions 5. Demonstrate proper care and use of hand and power tools	Chapter test	LS, HOTS, CS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Energy, Power and Transportation Technology

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 4: **Students will demonstrate knowledge of careers in Industrial Technology**

Benchmarks:

1. Careers
2. Cooperation and community service
3. Adapt to change
4. Global and diversity issues

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Chapter 30	1. Demonstrate job skills: initiative, effective time management, personal hygiene 2. Demonstrate job application skills: write a resume and application letter, evaluate careers and job offers 3. Exhibit dependability, responsibility, punctuality, follow directions well, accept supervision, ask for help, respect property and cooperate with others, accept challenges, adapt to change	Chapter test MOC Teacher observation Rubric checklist	LS, CS, CE, HGD, GUID
2		1. Identify types of production systems and materials used worldwide and how foreign production impacts domestic use 2. Identify monetary and measurement systems of selected countries and impact on U.S.	Class project Class discussion	GS, TECH

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Course Description

General Auto – semester – Prerequisite: None

Text: Auto Fundamentals: Goodheart – Wilcox

This course introduces basic automotive skills and job opportunities in the auto repair industry. Topics include engine theory, automotive service preventative maintenance, brake repair, electrical systems troubleshooting, safety, test equipment, and measuring. Skills in science, mathematics, thinking, and leadership are reinforced in this course.

Students will work on projects that are designated by the instructor. Safety will be stressed at all times.

Scope and Sequence for General Auto

Week	Chapter
One	1 and 30
Two	2
Three	3
Four	4-6
Five	7-8
Six	9
Seven	10-11
Eight	12
Nine	13-14
Ten	15-16
Eleven	17
Twelve	18-19
Thirteen	20-21
Fourteen	22-23
Fifteen	24
Sixteen	25-26
Seventeen	27
Eighteen	28-29

Subject Area: General Auto

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology
Benchmarks:

1. Problem-solving (standard II)
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning.

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Chapter 16 Chapter 28 Chapter 6	1. Identify, test and evaluate starting systems and components, remove and replace as required, using diagnostic equipment. 2. Evaluate operation of heating and air condition systems 3. Evaluate engine operation using testing equipment	Chapter tests	LS, CS
2		1. Delegate duties & manage conflict, facilitating group interaction (teamwork) 2. Become personally involved in professional organizations 3. Recognize relevant, ethical issues- and take responsibility for own mistakes	Class Project MOC	HOTS, LS, CS, CE

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: General Auto

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computer and technological skills (standard)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Speak, listen and write clearly. 2. Demonstrate courtesy skills (tactful, clear) 3. Be able to explain processes using terminology in vocational education	Observation checklist MOC	LS, CS, HOTS, HGD
2		1. Use materials correctly (office equipment, measurements-metric and standard) and computers	Class Project	TECH, CS, LS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: General Auto

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks:

1. Knowledge and skills of content areas
2. Demonstrate technical skills
3. Apply principles of entrepreneurship
4. Safety

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Chapter 1 Chapter 2 Chapter 3 Chapter 5	1. Students need to know the four stroke cycle of the engine 2. Students need to know and identify the different engine parts (block, head, connecting rods, and crankshaft). 3. Students need to know engine classification and parts identification 4. Students need to know the different tools and the correct use for them.	Chapter test	LS, CS, HGD
2		1. Structural Analysis and Damage Repair: Inspect and identify suspected damage or worn parts 2. Inspect tires and wheels	Using component parts Identify worn parts. Using component parts and cars in parking lot, inspect and evaluate tire wear	LS, CS, HOTS
3	Chapter 30	1. Identify skills of a business owner, entrepreneur 2. Recognize adv. & dis. of different kinds of business ownership 3. Explain competition, profit, market analysis 4. Create a business plan, identifying financing options, purchasing fixed and variable assets, and resources for technical assistance	Chapter test Class discussion MOC Class project	LS, CS, CE
4	Chapter 4 Chapter 5	1. Apply shop and equipment safety rules including hazardous materials 2. Know first aid procedures 3. Discuss the hazards of substance abuse in the workplace 4. Identify and report unsafe shop conditions 5. Demonstrate proper care and use of hand and power tools	Class discussion Chapter tests	LS, CS, HGD

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: General Auto

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks:

1. Careers
2. Cooperation and community service
3. Adapt to change
4. Global and diversity issues

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Demonstrate job skills: initiative, effective time management, personal hygiene 2. Demonstrate job application skills: write a resume & application letter 3. Exhibit dependability, responsibility, punctuality, follow directions well, accept supervision, ask for help, respect property and cooperate with others, accept challenges, adapt to change	MOC Teacher observation Rubric checklist	CE, HGD, GUID
2		1. Identify types of production systems and materials used worldwide and how foreign production impacts domestic use 2. Identify monetary & measurement systems of selected countries & impact on U.S.	Class Project	TECH, LS, CS, HGD

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Course Description

Welding – semester – Prerequisite: None

Text: Modern Welding Technology: Prentice Hall

Welding technology is designed to provide the basic fundamental skills of welding. AC and DC electric arc welding, MIG oxy-acetylene gas welding, flame cutting, and brazing will be covered. This course is open to all students. Safety will be stressed at all times.

The students will:

- Identify specific career opportunities in the fields of metal fabrication and welding
- Safely use the basic hand tools, power equipment, and welding equipment
- Identify and understand welding symbols used on basic production drawings.
- Set up and operate gas and electric arc welding equipment and perform a list of competencies.
- Practice problem-solving techniques to improve success in various competencies
- Practice the key components of industrial work ethic

Scope and Sequence for Welding

Week	Chapter	Activity
One	1 (pages 1-17)	Welding Background, Review Questions (1-20)
Two	2 (pages 19-30)	Fundamentals of Welding, Review Questions (1-20)
Three	3 (pages 31-40)	Welding Training and Certification, Review Questions (1-20)
Four	4 (pages 41-67)	Safety and Health, Review Questions (1-20)
Five	5 (pages 68-106)	Arc Welding (Non-Consumable Electrode), Review Questions (1-20)
Six	6 (pages 107-205)	Arc Welding (Consumable Electrode), Review Questions (1-20)
Seven	6 (pages 107-205)	Arc Welding (Consumable), Review Questions (1-20)
Eight	7 (pages 207-239)	Gas Welding, Review Questions (1-20)
Nine	8 (pages 240-269)	Resistance Welding, Review Questions (1-20)
Ten	9 (pages 270-304)	Oxyacetylene, Review Questions (1-20)
Eleven	10 (pages 305-339)	Power Sources, Review Questions (1-20)
Twelve	11 (pages 340-364)	Welding Equipment, Review Questions (1-20)
Thirteen	12 (pages 365-420)	Robotic Arc Welding, Review Questions (1-20)
Fourteen	13 (pages 421-439)	Electrodes and Filler Metals, Review Questions (1-20)
Fifteen	14 (pages 440-457)	Gas uses in Welding, Review Questions (1-20) Metal Weldability, Review Questions (1-20)
Sixteen	19 (pages 568-604)	Design for Welding, Review Questions (1-20)
Seventeen	21 (pages 621-656)	Quality and Evaluation, Review Questions (1-20)
Eighteen	22 (pages 657-682)	Specification, Review Questions (1-20)

Subject Area: Welding

Instructor: Ted Nixon

Standard 1: Students will demonstrate problem-solving skills, analysis and decision making in Industrial Technology

Benchmarks:

1. Problem-solving (standard II)
2. Understand leadership and ethics development
3. Demonstrate principles of goal setting, personal and organizational planning.

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
	<u>Modern Welding Technology</u>			
1	Chapter 10 Chapter 2	1. Measure and trouble shoot welding equipment and processes 2. Differentiate between cast iron, metallic arc, gas tungsten, TIG, oxy/act, welding including the selection of equipment and supplies 3. Interpret plans and working drawings	Review Questions	LS, CS, HOTS
2	Chapter 19	1. delegate duties & manage conflict, facilitating group interaction (teamwork) 2. Become personally involved in professional organizations	Observation Checklist Class Project	HOTS, LS, CS
3	Chapter 3	1. Recognize relevant, ethical issues- and take responsibility for own mistakes	Review Questions	LS, CS, HGD

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (L-S); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Welding

Instructor: Ted Nixon

Length of Unit: 18 Weeks

Standard 2: Students will demonstrate effective communication skills

Benchmarks:

1. Communication
2. Computer and technological skills (standard)

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1		1. Speak, listen, write and organize thoughts clearly and effectively. 2. Demonstrate courtesy skills (tactful, clear) 3. Be able to explain processes using terminology in vocational education 4. Interpret and use prints, charts, diagrams tables and graphs	Observation Checklist Chapter test	HGD, LS, CS
2		1. Operate office equipment effectively	Class Project	TECH, CS, LS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Welding

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 3: Students will demonstrate knowledge and skills of subject area

Benchmarks:

1. Knowledge and skills of content areas
2. Demonstrate technical skills
3. Apply principles of entrepreneurship
4. Safety

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Chapter 4 Chapter 21	1. Clean and store precision equipment properly 2. Explain destructive and nondestructive methods of testing 3. Measure parts using precision measurement tools (micrometer, vernier, dial, calipers, and dial indicators)	Chapter test Auto-Power Transportation	LS, CS, HOTS, HGD
3		1. Identify skills of a business owner, entrepreneur 2. Create a business plan, identifying financing options, purchasing fixed and variable assets, and resources for technical assistance	Class MOC	CE
4	Chapter 4	1. Follow rules and regulations 2. Utilize equipment correctly and safely 3. Demonstrate safe use of tools, chemicals and other substances	Chapter test IAB	LS, CS, HGD, HOTS

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)

Subject Area: Welding

Length of Unit: 18 Weeks

Instructor: Ted Nixon

Standard 4: Students will demonstrate knowledge of careers in Industrial Technology

Benchmarks:

1. Careers
2. Cooperation and community service
3. Adapt to change
4. Global and diversity issues

Benchmarks	Section from Text	Critical Objectives	Assessments	Infusions/ Provisions
1	Chapters 1 & 3	1. Demonstrate job skills: initiative, effective time management, personal hygiene 2. Evaluate a job offer (benefits, time and working environment)	Chapter test MOC	LS, CS, HGD, CE
2		1. Exhibit dependability, responsibility, punctuality, follow directions well, respect property of others, adapt to change, accept new challenges	MOC	CE
3		1. Identify types of production systems used worldwide 2. Identify monetary & measurement systems of selected countries & impact on U.S.	Project	TECH, HGD, LS, CS,

Higher Order Thinking Skills (HOTS); Special Education (SPECIAL); Media Information Skills (MEDIA); Technology (TECH); Multi-Cultural Gender Fair (MCGF); Guidance (GUID); Talented and Gifted (TAG); Learning Skills (LS); Communication Skills (CS); Global Studies (GS); Human Growth and Development (HGD); Career Education (CE)