

**AMHERST COUNTY HIGH SCHOOL
AMHERST, VIRGINIA**

Course Syllabus 2022 - 2023

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Course Title: Welding I; Welding II; Welding III - CVCC Dual Enrollment 117-40QD,
120-40QD

Textbook: 5th Edition
NCCER STANDARDIZED CRAFT TRAINING FOR WELDERS
Core Curriculum, Welding Levels I, II, each level having 8 to 12
separate modules
(National Center for Construction Education and Research)

Objectives:

The primary objective for all levels of Welding is to satisfactorily complete the required competencies listed on the competency outline.

In addition, by instruction, demonstration and hands on practice, the welding program is designed to:

1. Develop positive attitude about work practices and careers.
2. Introduce a variety of career choices related to the welding field.
3. Develop the student's critical thinking and problem solving abilities through assignments, and in class problem solving exercises.
4. Develop an appreciation for the ever changing technology in the welding field but also develop an appreciation of learning to be a craftsman when having to do it with less than State of the art equipment.
5. Promote leadership and civic/social involvement through group participation in the Skills USA student organization
6. Promote professional and technical growth through the activities of the American Welding Society.

CVCC Dual Enrollment Fall Dates

Class begins: Aug 22nd

Class ends: Dec. 12th

No Classes:

Final Exam: Jan 10th 2024

Last day to Drop: Sep 8th

Last day to withdraw without academic penalty: Oct 29th

CVCC Dual Enrollment Spring Dates

Class begins: Jan 18th 2023

Class ends: May 1st 2023

No Classes:

Final Exam: May 25th 2023

Last day to Drop: Jan 26th 2023

Last day to withdraw without academic penalty: Mar 24th 2023

Safety:

Student provided proper clothing to be worn in the shop area shall be all cotton jeans or canvas work pants and shirts, leather over the ankle boots, no other foot wear will be allowed, leather gloves suitable to the procedures beings used. Eye protection must be worm at all times in the work areas of the shop.

The laws of the Commonwealth of Virginia require that ANSI Z87.1 approved safety glasses be worn during school laboratories activities.

(Virginia Statue 22-10.2 Protective Eye Devices.) We are also subject to all OSHA regulations.

No tools or pieces of equipment are to be operated until the student has received proper operating and safety instructions on it and have passed a general safety exam with a score of 100.

Horseplay is absolutely prohibited in the shop/laboratory and class room areas.

Common Student Learning Outcomes:

Students will demonstrate knowledge of safety requirements for shielded metal arc welding and the basic procedures for SMAW welding in flat position. Include welding butt, lap, tee joints on sheet metal (16ga). Arc welding will be performed on ¼” HRF

Attendance:

Because of the nature of this class and the sequence of topics covered, students must be present daily in order to learn the material and develop the necessary skills to work in business or industry. For school policy on attendance at Amherst County High School see your student’s handbook.

Grading Policy:

Mastery of Content 60%

Tests: Written and Weld
Weld Certifications
Projects

Measure of Progress 40%

Homework & Assignments
Weld Competencies
Weekly Participation Grade
Quizzes

Tests:

Written test will normally be given after the classroom part of each module has been completed. All tests will be taken from the written unit assignments. **A minimum score of a 70% is required.** All students that make less than 70 % on the written test will have the opportunity to retake the test. All tests taken will be averaged together for a nine weeks' grade. All testing will be done on line through NCCER.org

Written Unit Assignments and Notebook:

Written Unit assignments, will be assigned with each module studied. These unit assignments are a mandatory part of this course of study. Normally there will be from two to four unit assignments for each module taught. If you are absent on the day work is assigned you will be given an extra day to complete your homework. If you are absent more than one day, it is your responsibility to contact me as soon as you return and get your work.

Remember all tests are taken from these written unit assignments.

Notebook, 3 ring, 2 to 3-inch capacity, for welding assignment sheets, notes, and technical information.

Each student is required to maintain a welding notebook and that notebook may be graded each nine weeks.

Honor Code:

Amherst County High School / CVCC operate on the honor code system. On all tests and projects you must pledge the following:

"I have neither given or received any help on this work."

Course Break Down

Core Training in Welding I

BASIC SAFETY #00101-15 - Trainees are provided with an overview of the safety rules and precautions for working on construction job sites. This module provides awareness of standard safety rules including ladders and scaffolds, fire prevention, and lifting. The module also introduces Hassam, confined space entry, and lockout/tag out. This knowledge will be evident through the written unit assignments, correctly completing the procedure outlined in the assignment sheet and by scoring 90 percent on the modular test.

INTRODUCTION TO CONSTRUCTION MATH #00102-15 Review basic math skills such as adding subtracting multiplying and dividing whole numbers, fractions and decimals. Explain decimal fraction conversions.

INTRODUCTION TO HAND TOOLS #00103-15 - The selection, inspection, use, and maintenance of common hand tools is the focus of this module. Trainee practice is suggested using hand tools and observing safety rules. His/her knowledge will be evident through written unit assignments, correctly completing the procedures outline in the assignment sheet and by scoring 70 percent on the modular test.

INTRODUCTION TO POWER TOOLS #00104-15 - Selection, inspection, use, and maintenance of common power tools is covered in this module, as well as setting up the work, safety practices, and basic rules of use. This knowledge will be evident through the written unit assignments, correctly completing the procedures outlined in the assignment sheet and by scoring 70 percent on the modular test.

INTRODUCTION TO BLUEPRINTS #00105-15 - This module introduces the graphic information found onsite plans, elevations, plan views, sectional and detail drawings. Trainees earn the basic components of blueprints, including title block, lines, symbols, and revision symbols. This knowledge will be evident through written unit assignments, correctly completing the procedures outlined in the assignment sheet and by scoring 70 percent on the modular test.

BASIC RIGGING #00106-09 Explain the use of ropes, chains, hoists, loaders, cranes in moving materials and equipment from one location to another safely.

BASIC COMMUNICATION SKILLS #00107-15 Provide the students with techniques for communicating effectively with co-workers and supervisors. Including role playing, written reports, time card and time log reports. Also discuss effective telephone and email communication skills.

BASIC EMPLOYABILITY SKILLS 00108-15 The student will learn to write a resume and cover letter. Identify the roles of different individual positions in the work place. Introduce critical thinking skills, problem solving skills, computer systems and their industry applications. Learn effective relationship skills and self presentation skills, and key work place issues i.e. sexual harassment, stress, and substance abuse

MATERIALHANDLING 00109-15 Recognizes hazards associated with material handling techniques and procedures. Introduce material handling equipment.

Welding II Training

* **WELDING SAFETY 29101-15** Covers safety equipment, protective clothing and procedures applicable to the cutting and welding of metals

* **OXYFUEL CUTTING #29102-15** - The Trainee will learn principles of oxy fuel safety, including care and maintenance of equipment. The module also covers the set-up and use of oxyfuel equipment and assists the trainee in learning to perform various types of oxyfuel cuts. This knowledge will be evident through the written unit assignments, correctly completing the procedures outlined in the assignment sheet and by scoring 70 percent on the modular test.

* **PLASMA ARC CUTTING (PAC) #29103-15** - Explains light duty and heavy duty equipment including step-by-step sequences for setting up the equipment and the techniques for performing cutting, beveling and piercing.

AIR CARBON ARC CUTTING AND GOUGING #29104-15 - Identifies hazards and describes general safety procedures for Air Carbon Arc Cutting and Gouging. Explains the equipment, power supply and air requirements as well as electrode styles and selection. The student will learn step-by-step sequences for setting up the equipment and the techniques for performing cutting, washing and gouging.

* **BASE METAL PREPARATION #29105-15** - The trainee will learn how to clean base metals for welding and cutting, how to identify and explain joint design and how to prepare base metal joints for welding. This knowledge will be evident through the written unit assignments, correctly completing the procedures outlined in the assignment sheet and by scoring 70 percent on the modular test.

* **WELD QUALITY #29106-15** - The trainee will learn the importance of quality workmanship and how to find, identify and avoid weld imperfections. The module also discusses qualifications test and explain site quality organizational structures.

* **SHIELDED METAL ARC WELDING EQUIPMENT AND SETUP #29107-15**

In addition to learning Shielded Metal Arc Safety, the trainee will learn types of welding equipment and how to set it up for use. The trainee will also learn about electrical current used in welding and how to clean welds.

* **SHIELDED METAL ARC ELECTRODES AND SELECTION #29108-15**

This module discusses the different types of filler metals and their relationship to welding electrical current and explains the considerations in electing electrodes. The trainee will learn about AWS/ASME filler metal classification the storage, control and traceability requirements of filler metals as well as how to use applicable code requirements

*** SHIELDED METAL ARC WELDING BEADS AND FILLET WELDS #29109-15**

In this hands-on module, the trainee will learn to use E6010 and E7018 electrodes to make beads and fillet welds on flat, horizontal, vertical and overhead positions.

*** JOINT FIT-UP AND ALIGNMENT #29110-15** - This module helps the trainee learn job code specifications, how to use gauges to check joint fit-up, how to fit-up joints using pipe and plate fit-up tools and how to check for poor fit-up and misalignment. Distortion and how to control it is also covered.

*** SHIELDED METAL ARC WELDING GROOVE WELDS WITH BACKING #29111-15**
Covers the techniques and procedures for making V-butt welds with steel backing in the flat, horizontal, vertical and overhead positions using low hydrogen electrodes.

*** SHIELDED METAL ARC WELDING OPEN V-BUTT WELDS #29112-15** -
The trainee will learn the techniques and procedures for making V-butt welds in the flat, horizontal vertical and overhead positions using low-hydrogen electrodes.

Welding III Training & Dual Enrollment* 117-120

**DE 117 – 120 students will revisit OFC and SMAW skills and theory required by CVCC 117-120 covered previously in Welding II along with the NCCER Welding Level 2 material listed below*

*** WELDING SYMBOLS #29201-15** - Identifies and explains how to read and interpret AWS standard welding symbols. Information includes understanding various groove weld symbols and the significance of their position on the reference line, interpreting size, dimensions and fill as well as weld finish and special notes.

*** READING WELDING DETAIL DRAWINGS #29202-15** - Information includes understanding how lines and section files are used, how views are developed and used how dimensions, notes and bill of materials are applied to detail drawings.

*** PHYSICAL CHARACTERISTICS AND MECHANICAL PROPERTIES OF METAL #29203-15** The student will learn physical characteristics, mechanical properties, compositions, and classifications of common ferrous and nonferrous metals Identify standard metal forms and structural shapes. Learn how to extract metal information from a WPS and PQR. This unit also covers NDT inspection methods.

*** PREHEATING AND POSTHEATING OF METALS #09204-15**
Explain preheating, interposes temperature control and post heating of metals. Explain why these procedures are necessary and identify metals requiring these procedures. Also identify and explain the equipment used for these procedures.

*** GMAW - FCAW EQUIPMENT AND FILLER METAL #29205-15 -**

Identify hazards and describe general safety procedures for Gas Metal Arc Welding. Explain the electrical welding current and describe power sources, wire feeders and shielding gases and related equipment. Explain filler wires, metal transfer modes and selecting and setting up of the equipment. Also includes locating the ground clamp and basic weld-cleaning tools.

*** GMAW – FCAW ARC WELDING PLATE #29206-15**

Explains how to prepare the area, set up the equipment and prepare the welding coupons for fillet welds on plate. Covers the techniques and procedures for making welds in the flat, horizontal, vertical and overhead positions using the Gas Metal Arc Welding process.

*** GAS TUNGSTEN ARC WELDING EQUIPMENT AND FILLER METALS #29207-15**

Covers electrode selection and preparation, filler rods, and selecting and setting up air cooled and water cooled torches. Also included locating ground clamp and basic weld cleaning tools.

*** GTAW - CARBON and STAINLESS and ALUMINUM PLATE #029209-15**

Explains how to prepare the area, setup equipment and prepare welding coupons for multi-pass, open V-butt welds using mild steel filler rod on plate.

APPLYING FOR A WELDING JOB - After completion of this unit, the student will be able to discuss procedures in applying for a welding job, list reasons why welding applicants need to be well prepared, what employers look for in a welding job application. The student will also be able to complete an application, a personal resume', write a letter requesting a job interview, and fill out a job application form and a medical questionnaire. This knowledge will be evidenced by correctly performing the procedure outlined in the written unit assignment sheets.

The opportunity for the students to complete the above listed objectives depend on two things: The Students willingness to complete written assignments at home and to work daily in the shop on welding competencies.

- **Welding II, and III students have the opportunity to earn an additional SOL credit to apply toward graduation by completing all of the above listen competencies in each of the levels.**

Title IX Statement

As a recipient of federal funds Central VA Community College is required to comply with Title IX of the Higher Education Amendments of 1972, 20 U.S.C. § 1681 et seq. ("Title IX"), which prohibits discrimination on the basis of sex in educational programs or activities, admission and employment. Under certain circumstances, sexual misconduct, sexual harassment, and similar conduct constitute sexual discrimination prohibited by Title IX.

The purpose of this Policy is to establish that the College prohibits discrimination, harassment, sexual assault, domestic violence, dating violence, stalking, and retaliation and to set forth procedures by which such allegations shall be filed, investigated and resolved.

Inquiries concerning the application of Title IX may be referred to ACHS counseling department or the College's Title IX Coordinator, Nancy Mitchell, whose office is located in Amherst Hall, room # 2119, and may be contacted at 434.832.7802 or email mitchelln@cvcc.vccs.edu. Campus Police may be contacted at 434.832.7700, Amherst Hall, in the Student Center.

Additional information may be accessed at <http://www.cvcc.vccs.edu/TitleIX/default.asp>

The Amherst County Public Schools Board of Education provides equal academic age opportunity for all students and does not discriminate on the basis of race, color, national origin, sex or disability in its programs and activities, as required by Title VI, Title VII, Title IX, and Section 504. Mr. Josh Neighbors is the division's Section 504 Coordinator and Jim Gallagher, Assistant Superintendent, is designated as the Compliance Office responsible for assurances of non-discrimination. Mr. Neighbors and Mr. Gallagher may be reached at the following address: PO Box 1257, Amherst, VA 24521, and telephone number (434) 946-9386. Ms. Hollie Jennings is the Division Discipline Supervisor and is responsible for the fair and equitable implementation of the Division's discipline policies. She can be reached at the following address: 219 Trojan Lane, Madison Heights, VA 24572, telephone number (434) 528-6485, and e-mail hjennings@amherst.k12.va.us. The school system is committed to providing a learning environment which reflects the racial, gender and cultural diversity of our county and the children we serve. We are dedicated to equality of opportunity.

Notes and Questions