

Career and Technical Education Adapted CTE Course Blueprint of Essential Standards

Trade and Industrial Education

IM62 Welding Technology II

Public Schools of North Carolina
State Board of Education • Department of Public Instruction
Academic Services and Instructional Support
Division of Career and Technical Education
Craig Pendergraft, Project Director

Raleigh, North Carolina
Summer 2013

Contact craig.pendergraft@dpi.nc.gov for more information

Special thanks to the following educators who developed this Adapted CTE Course Blueprint.

Danny Byerly – East Davidson High School
Michael Morton – Swansboro High School
Gary Treadway – Wilkes Central High School
David Wynn – Southside High School
Steve Ward – Watauga High School
Darryl Fox – North Buncombe High School
Michael Starnes – Robeson County Career Center
Byron Churchill – Monroe High School
Wesley Stevens – Crest High School
Russell Wahrman – Wake Technical Community College, AWS Certified Instructor

This Adapted CTE Course Blueprint has been reviewed by business and industry representatives for technical content and appropriateness for the industry.

Adapted CTE Course Blueprint of Essential Standards

Essential standards are big, powerful ideas that are necessary and essential for students to know to be successful in a course. Essential standards identify the appropriate verb and cognitive process intended for the student to accomplish. Essential standards provide value throughout a student's career, in other courses, and translate to the next level of education or world of work.

This document lays out the essential standards for successfully completing the Welding Technology II course. This is the second level course that leads to an industry certification in the field of Welding. The essential standards use Revised Bloom's Taxonomy (RBT) category verbs (remember, understand, apply, analyze, evaluate, create) that reflect the overall intended cognitive outcome of the indicators written by the certifying body. Each essential standard and indicator reflects the intended level of learning through two dimensions; The Knowledge Dimension is represented with letters A-C, and the Cognitive Process Dimension by numbers 1-6.

The Adapted CTE Course Blueprint includes units of instruction, essential standard(s) for each unit, and the specific indicators aligned with industry certification. Also included are the relative weights of the units and essential standards within the course.

This document will help teachers plan for curriculum delivery for the course, prepare daily lesson plans, and construct valid formative, benchmark, and summative assessments. Curriculum for this course is not provided by NCDPI. Curriculum is aligned to AWS standards. Assessment for this course is written at the level of the **ESSENTIAL STANDARD** and assesses the intended outcome of the sum of its indicators.

For additional information about this blueprint, contact the Division of Career and Technical Education, North Carolina Department of Public Instruction, 6361 Mail Service Center, Raleigh, North Carolina 27699-6361.

Reference: Anderson, Lorin W. (Ed.), Krathwohl, David R. (Ed.), et al., *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, Addison Wesley Longman, Inc., New York, 2001.

Interpretation of Columns on the NCDPI Adapted CTE Course Blueprint

No.	1	2	3	4
Heading	Essential Std #	Unit Titles, Essential Standards, and Indicators	Course Weight	RBT Designation
Column information	Unique course identifier and essential standard number.	Statements of unit titles, essential standards per unit, and specific indicators per essential standard. If applicable, includes % for each indicator.	Shows the relative importance of each unit and essential standard. Course weight is used to help determine the percentage of total class time to be spent on each essential standard.	Classification of outcome behavior in essential standards and indicators in Dimensions according to the Revised Bloom's Taxonomy. Cognitive Process Dimension: 1 Remember 2 Understand 3 Apply 4 Analyze 5 Evaluate 6 Create Knowledge Dimension: A Factual Knowledge B Conceptual Knowledge C Procedural Knowledge

Career and Technical Education conducts all activities and procedures without regard to race, color, creed, national origin, gender, or disability. The responsibility to adhere to safety standards and best professional practices is the duty of the practitioners, teachers, students, and/or others who apply the contents of this document.

Career and Technical Student Organizations (CTSO) are an integral part of this curriculum. CTOS are strategies used to teach course content, develop leadership, citizenship, responsibility, and proficiencies related to workplace needs.

**Adapted CTE Course Blueprint of Essential Standards
IM62 Welding Technology II**
(Recommended hours of instruction: 135 or 180)

Essential Std #	Units, Essential Standards, and Indicators (The Learner will be able to:)	Course Weight	RBT Designation
1	2	3	4
	Total Course Weight (Contact Hours)	135 hrs.	
1.00	Understand Safety and Health of Welders	2.5	B2
	1.01 Understand common hazards in welding. 1.02 Understand proper personal protection used in welding. 1.03 Understand how to avoid welding fumes. 1.04 Understand the causes of accidents. 1.05 Understand uses for material safety data sheets. 1.06 Understand safety techniques for storing and handling cylinder. 1.07 Understand how to avoid electric shock when welding. 1.08 Understand proper material handling methods.		
2.00	Apply Manual Plasma Arc Cutting - PAC	11.5	C3
	2.01 Apply procedures to set up plasma arc cutting equipment. 2.02 Apply procedures to set the amperage and gas pressures or flow rates for the type and thickness of metal to be cut. 2.03 Apply procedures to square-cut metal using plasma arc cutting equipment. 2.04 Apply procedures to bevel-cut metal using plasma arc equipment. 2.05 Apply procedures to pierce and cut slots in metal using plasma arc cutting equipment. 2.06 Apply procedures to dismantle and store equipment.		
3.00	Understand Welding Inspection and Testing	6.0	B2
	3.01 Understand codes governing welding. 3.02 Understand weld imperfections and their causes. 3.03 Understand nondestructive examination practices. 3.04 Understand welder qualification tests. 3.05 Understand the importance of quality workmanship. 3.06 Understand common destructive testing methods. 3.07 Understand how to visually inspection fillet welds.		
4.00	Understand Joint Fit-Up and Alignment	5.0	B2
	4.01 Understand job code specifications. 4.02 Understand how to use fit-up gauges and measuring devices to check joint fit-up. 4.03 Understand distortion and how it is controlled. 4.04 Understand how to fit up joints using plate and pipe fit-up tools. 4.05 Understand how to check for joint misalignment and poor fit-up before and after welding.		

5.00	Apply Shielded Metal Arc Welding – Groove Welds and Backing	30.0	C3
	5.01 Apply procedures to prepare groove welds. 5.02 Apply procedures to prepare groove welds with backing. 5.03 Apply procedures to set up shielded metal arc welding (SMAW) equipment for making V-groove welds. 5.04 Apply procedures to perform SMAW for V-groove welds with backing in the following positions: Flat (1G), Horizontal (2G), Vertical (3G), Overhead (4G).		
6.00	Apply Shielded Metal Arc Welding – Open V-Groove Welds	80.0	C3
	6.01 Apply procedures to prepare shielded metal arc welding (SMAW) equipment for open-root V-groove welds. 6.02 Apply procedures to perform open-root V-groove welds in the following positions: Flat (1G), Horizontal (2G), Vertical (3G), Overhead (4G).		

The NCCER textbook and course materials align to this crosswalk:

- 1.00 Understand Welding Safety (Module 29101-09)
- 2.00 Apply Plasma Arc Cutting (Module 29103-09)
- 3.00 Understand Weld Quality (Module 29106-09)
- 4.00 Understand Joint Fit-Up and Alignment (Module 29110-09)
- 5.00 Apply SMAW – Groove Welds and Backing (Module 29111-09)
- 6.00 Apply SMAW – Open V-Groove Welds (Module 29112-09)