Curriculum Framework for Welding

CIP Code: 48.0508

Initial Review Date: 09/05/2024 (August/September 2025, approved November 2025)

Eligibility Dates: 09/05/2024 through 08/21/2032

Credit Award: 32 Credits

Course Equivalencies:

Welding	Credits	TESU Course Equivalent	Effective Dates	For Staff Use
Welding Technology Program	3	TEC-1310	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	3	TEC-1320	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	3	TEC-2310	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	4	APS-2100	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	4	GRA-2510	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	3	TEC-1110	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	3	TEC-1120	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	3	TEC-2110	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	3	TEC-2320	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	3	TEC-1020	9/5/2024 – 8/31/2032	MCTS.WELD

Gaining Access to the Evaluated Credit Award

The following curriculum was evaluated by Thomas Edison State University (TESU) through its Professional Learning Review (PLR) Process to determine college-credit equivalency for the training program.

The current state approved Career and Technical Education (CTE) programs in New Jersey that have been verified to follow this curriculum, and to be eligible to receive TESU credit upon completion can be found on the Verification Letter.

Question: How does your CTE program become eligible for this credit award for your students?

Answer: To become eligible, and to have your school's name listed on the Verification Letter, please follow these instructions:

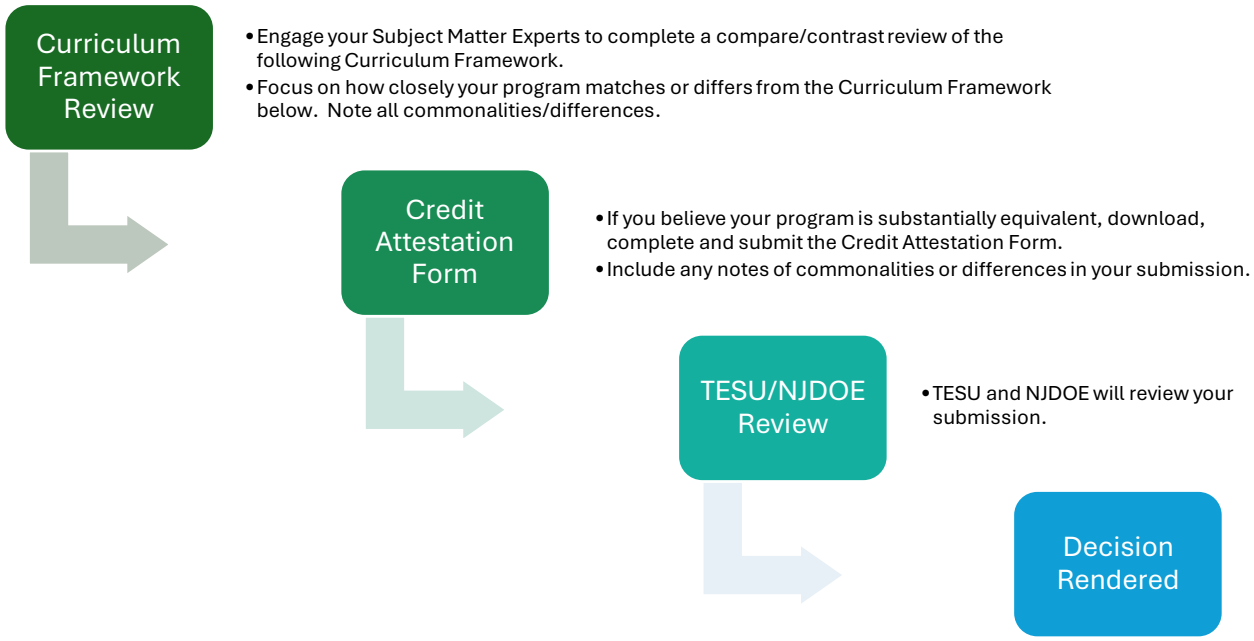
Step 1. Review the following Curriculum Framework and compare it against your school's current state approved CTE program. TESU suggests utilizing your school's subject matter experts for this compare/contrast review. The GOAL of your review is to ensure that the training program in place at your school matches the evaluated program.

Step 2. Complete/Download the Credit Attestation Form for this program on TESU's website.

Step 3. Complete the Credit Attestation Form and email it to plr@tesu.edu.

Step 4. TESU will review the contents and share the attestation form information with the New Jersey Department of Education (NJDOE) for approval.

Step 5. Once approved by TESU and the NJDOE, you will be notified, and an updated Verification Letter will be added to the TESU website for this program.



If you have any questions, or if your compare/contrast review is close but off a little, please contact us at plr@tesu.edu.

Curriculum Framework

Approved Program Name: Welding

CIP Code: 48.0508

Length of Program: 2 Years

Credit Award: 32 Credits

Course Equivalencies:

Welding	Credits	TESU Course Equivalent	Effective Dates	For Staff Use
Welding Technology Program	3	TEC-1310	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	3	TEC-1320	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	3	TEC-2310	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	4	APS-2100	9/5/2024 – 8/31/2032	MCTS.WELD
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Welding Technology Program	3	TEC-2320	9/5/2024 – 8/31/2032	MCTS.WELD
Welding Technology Program	3	TEC-1020	9/5/2024 – 8/31/2032	MCTS.WELD

Welding Program

Course Title: Welding I

Effective Date Range: September 5, 2024 – August 31, 2032

Course Description: CIP Code*:* 48.0508

This course will provide students with an introduction to the welding field. Students will spend time in class studying terminology, safety, set-up, and shutdown of all welding equipment and related tools of the trade. Time will also be spent in the welding shop, so students will get hands-on experiences with oxy-acetylene cutting, welding, and brazing along with arc welding. First-year Welding students obtain their OSHA 10 certification and stackable wallet card certificates such as Shielded Metal Arc Welding (SMAW) and Gas Metal Arc Welding (GMAW).[1]

Course Objective: Students are introduced to the welding field.

Pre-requisite: None

Learning Outcomes: Upon successful course completion, the learner will be able:

- To explore the wide range of employment opportunities available in the welding industry.
- To analyze the historical developments and technological contributions of welding in industrial settings.
- To demonstrate advanced skills in the operation of machines and equipment used in the welding trade.
- To display positive attitudes and adherence to safety procedures and practices required of workers in the welding industry.
- To identify and utilize technical terminology commonly associated with the welding trade.
- To understand and describe the characteristics of the arc and the flame.
- To demonstrate operational techniques in SMAW, GMAW, Gas Tungsten Arch Welding (GTAW), oxyacetylene, and plasma cutting processes.
- To apply the basic and advanced principles of electricity as they relate to welding operations.
- To select, identify, and properly utilize SMAW, GMAW, GTAW, and specialized electrodes.
- To understand the characteristics of metallic elements and their alloys.
- To read and interpret blueprints and schematics relevant to the welding trade.
- To apply fabrication techniques utilized in welded construction.
- To identify and apply common testing and inspection methods used in the welding trade.
- To use tools and layout procedures effectively within the metal trades.
- To identify the knowledge, skills, and attitudes required of individuals entering the welding industry.

[1]**Industry Valued Credential(s)**: **(OSHA) Safety - 10 Hour**
The OSHA 10 course provides training for entry-level workers on the recognition, avoidance, abatement, and prevention of safety and health hazards in the workplace, as well as information regarding worker's rights and employer responsibilities. Upon completion of the OSHA 10 course, students take a certification exam that verifies that students have the knowledge they need to stay safe on the job.

Major Topics:

- Introduction to the World of Welding (Safety, History, Terminology, Prints and Symbol)
- Principles of Welding (Fuel Torch, Material Cutting, and SMAWs)
- Arc Welding Theory I

Methods of Instruction: Lecture, Laboratory, Simulation/Practicum/Field Experience = levels of Work-Based Learning (which are a requirement of CTE), Electronic/Online- components (not entire course).

Course Title: Welding II

Effective Date Range: September 5, 2024 – August 31, 2032

Course Description: CIP Code: 48.0508

In year two (2) the students will experience a deeper dive into arc welding theory II, an introduction to metal fabrication and mechanical fastening, and be engaged in CNC Thermal cutting from design phase to machine operations. Students will have the opportunity to participate in work-based learning opportunities and compete in their CTSO SkillsUSA. Welding Technology follows the AWS (American Welding Society) SENSE program. This will provide students with the opportunity to achieve and become a Certified Welder, which has been considered by the New Jersey Department of Labor as an industry-valued credential (IVC).[2]

Course Objective: Students can achieve and become a Certified Welder.

Pre-requisite: Welding I

Learning Outcomes: Upon successful course completion, the learner will be able:

- To identify the knowledge, skills, and attitudes required of individuals entering the welding industry.
- To identify the employment opportunities available in the welding industry.
- To identify the historical developments and technological contributions of welding in industry.
- To demonstrate advanced skills in the operation of machines and equipment used in the welding trade.
- To display positive attitudes regarding the safety procedures and practices required of workers in the welding industry.
- To identify and utilize the technical terms commonly associated with the welding trade.
- To identify the characteristics of the arc and the flame.
- To demonstrate the operational techniques involved in arc, mig, tig, oxyacetylene, and plasma cutting processes.
- To utilize the basic and advanced principles of electricity as applied to welding operations and functions.
- To select, identify, and utilize arc, mig, tig, and special electrodes.
- To identify the characteristics of metallic elements and their alloys.
- To read and interpret blueprints applicable to the welding trade.
- To be able to apply fabrication techniques as utilized in the process of welded construction.
- To identify and apply the common methods of testing and inspection used in the welding trade.
- To identify and apply the various tools and layout procedures applicable to the metal trades.

[2] **AWS Certified Welder Certification**
The AWS Certified Welder program allows welders to obtain multiple certifications to expand their credentials. Every certification that a welder earns increases the number of skills needed to perform a wide range of welding jobs. The Certified Welder (CW) program tests welders on procedures used in the structural steel, petroleum pipelines, sheet metal, and chemical refinery welding industries. CW tests are performed at AWS Accredited Testing Facilities (ATFs) located throughout the world, and candidates must make an appointment to participate. These testing facilities adhere to strict standards for welder testing and can test welders to AWS Standard Welding Procedures, industry-standard specifications, and company-supplied or non-code welding specifications.

NOCTI Job Ready - Welding (4372)
Job-ready assessments measure technical skills at the occupational level and include items that gauge factual and theoretical knowledge. Job-ready assessments typically offer both a written and performance component and can be used at the secondary and post-secondary levels for the National College Credit Recommendation Service, in the lower division baccalaureate/associate degree category, recommending 3 semester hours in Welding Technology or Mechanical Technology.

Major Topics:

- Arc Welding Theory II, SMAW, GMAW. FCAW, GTAW
- Metal Fabrication
- CNC Thermal Cutting

Methods of Instruction: Lecture, Laboratory, Simulation/Practicum/Field Experience = levels of Work-Based Learning (which are a requirement of CTE), Electronic/Online- components (not entire course).

Credit Recommendation: The team recommends the completion of both Welding I and Welding II to obtain the in the lower division baccalaureate/associate degree category:

- 16 credits of Technical Studies Credit
- 9 credits welding, manufacturing fabrication
- 3 credits for Safety
- 4 credits in CAD.
- 15 credits of Technical Concentration for the lab portion of Welding I and Welding II
- 1 credit for OSHA 10 course

32 total credits

End of Curriculum Framework

Suggested Degree Programs at TESU:

- Associate of Applied Science (AAS) in Mechanics and Maintenance
- Associate of Applied Science (AAS) in Construction and Facilities Support
- Associate of Applied Science (AAS) in Multidisciplinary Technology
- Associate of Science (A.S.) in Technical Studies
- Bachelor of Science (B.S.) in Construction
- Bachelor of Science (B.S.) in Technical Studies

For more information, please contact Thomas Edison State University's Professional Learning Review Office via email at plr@tesu.edu.