

Minnesota

Articulated College Credit (ACC) Agreement

www.CTEcreditMn.com

Articulated College Credit Agreement:

Through Articulated College Credit (ACC), specific college curriculum learning outcomes and assessments are embedded in participating high school career and technical education (CTE) programs as specified in this agreement. Relevant knowledge, skills, and standards are taught by qualified CTE high school instructor(s) in one or more high school course. ACC is awarded if the student meets the college equivalency standards and later enrolls in the college(s) listed below requiring the course in a specific program.

Agreement Name: Arc Welding Processes - Regional
Agreement Reviewed/Revised: 2021 – 2022

These credits are valid for students in grades 10-12 for 5 years from the completion of this course.

College(s)	College Course(s)	College Programs	Articulated College Credit
Anoka Technical College	WELD 1009 – Shielded Metal Arc Welding I	*Welding (A.A.S. – 66 cr.) *Welding Technology (Diploma – 34 cr.) *Basic Welding (Certificate – 17 cr.)	1 credit of 1 credits
Central Lakes College	WELD 1100 – Introduction to Welding	Welding & Fabrication (A.A.S. –60 cr.; Diploma – 45 cr).	2 credits of 2 total credits
St. Cloud Technical & Community College	WELD 1505 – Arc Welding Processes	Welding/ Fabrication (Diploma – 37 cr.)	2 credits of 5 total credits
St. Cloud State University	ETS 1 – Technical Elective Credit in ETS Dept. Majors	Environmental & Technological Studies – BS (48 cr. + Gen. Educ.)	3 credits of 3 total credits

Course Description:

Students will study the safety concerns connected with the Shielded Metal Arc Welding (SMAW), along with an introduction into Gas Metal Arc Welding (GMAW-S), the types of power sources used with these two processes, and other related safety working conditions in the welding field. Time will be spent in the lab developing skills using the SMAW and GMAW-S processes. Welds will be made in the flat, horizontal, vertical and overhead positions. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) SENSE curriculum and code books.

Curriculum Learning Outcomes:

100% of the curriculum learning outcomes will be covered in the high school course(s) by qualified CTE high school instructor(s).

Upon completion of the course(s), students will:

- Demonstrates proper use and inspection of personal protection equipment (PPE).
- Demonstrates proper safe operation practices in the work area.
- Demonstrates proper use and inspection of ventilation equipment.
- Demonstrates proper Hot Zone operation.
- Demonstrates proper work actions for working in confined spaces.
- Demonstrates proper use of precautionary labeling and MSDS information.
- Passes AWS SENSE Practical Knowledge of Safety and Health of Welders and Shielded Metal Arc Welding (SMAW)
- Performs safety inspections of SMAW, GMAW equipment and accessories.
- Makes minor external repairs to SMAW, GMAW equipment and accessories.
- Operates and set up for SMAW, GMAW-S operations on carbon steel.
- Passes SMAW welder performance qualification test (2G and 3G, uphill, limited thickness test plates) on carbon steel.
- Passes GMAW-S welder performance qualification test on carbon steel.

Course Outline:

Lecture:

- Safety in Welding; Welding processes; Occupational Opportunities in Welding; Shielded Metal Arc Power Sources; Shielded Metal Arc Equipment Types; Shielded Metal Arc Setup, and Operation; Shielded Metal Arc Welding of Plate; Shielded Metal Arc Welding of Pipe; and AWS SENSE Test (Shielded Metal Arc Welding (SMAW))

Lab:

Shielded Metal Arc Welding (SMAW) – Equipment: SMAW

- Makes fillet welds in all positions on carbon steel.
- Makes groove welds in all positions on carbon steel
- Passes AWS SENSE Testing 2G and 3G uphill(AWS EDU-6)

Gas Metal Arc Welding (GMAW-S) – Equipment: GMAW-S (short circuit)

- Makes fillet welds in all positions on carbon steel.
- Makes groove welds in all positions on carbon steel
- Passes AWS SENSE Testing (AWS EDU-3)

Textbook:

Welding Principles and Applications – 6th ed.; Larry Jeffus; ©2004; Delmar Learning;
ISBN13: 9781401810467 **ISBN10:** 1401810462

Assessments:

- Teacher observation using the checklist provided at www.ctecreditmn.com
As class time permits, students will be assessed on the listed practical lab exercises, and must attain **80% or better** accuracy.

**Recommended Industry-Recognized Certification
or Comprehensive Assessment – High School & College**

Certification/ Assessment	Vendor	Other Information
Practical Knowledge of Safety & Health of Welders	AWS SENSE	www.aws.org
Shielded Metal Arc Welding (SMAW) 2G & 3G Uphill	AWS SENSE	www.aws.org
Gas Metal Arc Welding (GMAW-S)	AWS SENSE	www.aws.org