Wright Technical Center
1405 3rd Ave. NE • Buffalo, MN 55313
Phone: 763-682-4112
www.wtc.k12.mn.us

Course Syllabus
2024 - 2025

Program Title
Welding Technology II

Course Prerequisite
WELD 1001 – Welding Technology I

Instructor
Cody Mjoness
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Course Description
In the Welding Technology course, you will be introduced to the advanced welding techniques and equipment. This hands-on course will focus on the various advanced aspects of the welding processes used in today's industries. You will improve your ability to weld mild steel, stainless steels, alloy steels and non-ferrous metals in multiple positions. GOOD SAFETY practices are stressed in lab situations as required in the welding industry. You will also further your understanding of welding theory and implementation of blueprint reading, symbols, and applied mathematics that are essential in any welding career. You will develop and learn the importance of being a good leader, thus promoting smoother workflow and cooperation in the welding workplace. You will participate in career exploration and investigation activities and develop a better understanding of all aspects of the welding industry. Students in this course will further their knowledge using *CAD* software and operate the *CNC plasma Cutting* equipment as well as the *Robotic Systems*. You will also have the opportunity to demonstrate your welding skills by completing individual and group projects *(Student is responsible for individual project costs and safety equipment)*. While working towards completing CTE Certification the students' skills and knowledge will be challenged and tested thoroughly.

Textbook & Classroom Resources
Bennett, A.E. *Blueprint Reading For Welders* 9th edition

Jeffus, Larry. *Welding Principles and Applications* 9th Edition

Schell. Practical Problems in Mathematics 4th edition

Course Goals

This program will enable a student to:

1. Comprehend and apply technical information through technical blueprint reading.
2. Ensure that safety aspects of welding processes and practices are understood and followed.
3. Complete welding projects assigned by the instructor in various positions using various welding processes by industry standards
4. Research, fabricate and test a new or improved product using welding skills learned in the program.
5. Demonstrate leadership and workplace readiness skills.
6. Explore a variety of welding career clusters to make a well informed career decision.

Course Outline & Topics

- Shop Safety
  - Personal Safety Equipment
  - Safe Operation of Shop Equipment
- Oxy-Acetylene Welding
  - Assist 1st year students with learning process
- Cutting Processes
  - Oxy-Acetylene Cutting
  - Plasma Cutting
  - CNC Plasma
- SMAW Welding
  - E6010 & E7018
    - Vertical Position – **single and multi-pass*** Corner, Lap, Tee & Butt
    - Overhead – **single and multi-pass***Corner, Lap, Tee & Butt
- GMAW Welding
  - Vertical and horizontal Position – Corner Lap, Tee & Butt
  - Overhead – Corner Lap, Tee & Butt
- GTAW Welding
  - Vertical Position – Corner Lap, Tee & Butt
  - Overhead – Corner Lap, Tee & Butt
  - Steel
  - Introduction to Aluminum-Stainless Steel
- Welding Metallurgy
- Welding Symbols
- Geometric Dimensioning & Tolerancing
- Math for Welders
- Welding Fabrication Projects
- Career Exploration

Skills Needed

To be successful in this program, you should have the following skills:

- Strong Technical Writing and Reading skills
- Strong Math and Science skills
- Must be able to work independently
- Great eyesight or corrective lenses
- Mechanical aptitude
- Manual dexterity
- Eye-hand coordination
- Detail oriented
- Ability to problem solve
- willingness to learn and improve

Classroom Supplies & Shop/Lab Fees

It is recommended that each student purchase his/her own welding leathers, gloves, safety glasses, welding helmet, welding pliers, chipping hammer and wire brush – at an approximate cost of $100.

** Limited safety equipment and tools are available to students, based upon individual economic need.*

Program Safety

Students will complete industry and shop specific safety training before being allowed to participate in shop activities or equipment operation.

- SP/2 Safety Training
- Hands on instructor safety training with each piece of equipment to ensure safe operations. Equipment is as follows: Grinders, Plate Shear, Ironworker, Bandsaw, Chopsaw, Bevelers, Plasma Cutter and welders.
- Students are required to have and use the appropriate PPE when in the shop. Long sleeves, pants (no shorts), closed toed shoes, eye/ear protection at all times when welding or grinding is going on.

Evaluation of Learning Student performance will be evaluated using multiple assessments involving assigned program activities. Student's course grades will be based on the following:

Evaluation Criteria	Method of Evaluation	Weighted Grading
Effort & Participation	• Attendance • Class participation • Professionalism • Attitude/Behavior	40% of the grade
Performance	• Performance and observation checklists • Projects • Non-Destructive Testing • Destructive Testing • Metallurgical Assessment	40% of the grade
Knowledge of Course Content	• Written reflections • Chapter assignments and tests	20% of the grade

Grading Scale

Grade	Percentage
A+	100% – 98%
A	97% – 93%
A-	92% – 90%
B+	89% – 88%
B	87% – 83%
B-	82% – 80%

Grade	Percentage
C+	79% – 78%
C	77% – 73%
C-	72% – 70%
D+	69% – 68%
D	67% - 63%
D -	62% - 60%
F	59% - Below

Late Assignments

You may earn half credit for late assignments that have been turned in within a week of their due date. All assignments more than one week late will be zeros.

Career Information

<table>
<tr><th colspan="2">MN Program of Study</th></tr>
<tr><td>Career Field</td><td>Engineering, Manufacturing & Technology</td></tr>
<tr><td>Career Cluster</td><td>Manufacturing</td></tr>
<tr><td>Career Pathway</td><td>Production Manufacturing & Production Process Development</td></tr>
<tr><td colspan="2">Related occupations requiring additional training or education:

● Welder, Cutter, Soldered or Brazer
● Welders Aide
● Welding Inspector
● Welding Sales Representative
● Pipefitter or SteamFitter
● Structural Metal Worker
● Metal Fabricator
● Boilermaker
● Assembler
● Foundry Worker
● Grinding, Lapping, and Buffing
● Millwright
● Welder
● Design Engineer
● Manufacturing / Welding Engineer
● Production Manager
● Welding / Manufacturing Supervisor
● CNC Operator</td></tr>
<tr><td>Career Outlook</td><td>information available @ www.iseek.org/careers</td></tr>
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College Credit Opportunities

College credits can also be earned if you maintain a "B" or above grade in the course. Credits are available from the following schools:

- Central Lakes College
- St. Cloud State University
- St. Cloud Technical & Community College
- Ridgewater College
- Anoka Technical College
- Hennepin Technical College
- Minnesota West Community and Technical College
- Rochester Community and Technical College
- South Central College
- Minnesota State College Southeast

Visit the following website for specific articulated college courses – www.ctecreditmn.com