



## **Course Syllabus 2022 - 2023**

### **Program Title**

Welding Technology I

### **Instructor**

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### **Course Description**

In the Welding Technology course, you will be introduced to the world of welding. This hands-on course will focus on the various welding processes used in today's industries. You will learn to weld carbon steels, stainless steels, and alloy steels in various positions. GOOD SAFETY practices are stressed in lab situations as required in the welding industry. You will also learn welding terminology that is essential in any welding career. You will develop and learn the importance of working together, thus promoting teamwork 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. You will have the opportunity to demonstrate your welding skills by completing individual and group projects (*Student is responsible for individual project costs and safety equipment*). Students will use state of the art welding equipment and be introduced to *CAD* software, *CNC Plasma Cutting*, and an introduction to *Robotics*. 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
  - Basic course in oxy-fuel welding
- Cutting Process
  - Oxy-Fuel Cutting torch
  - Plasma Cutting
  - CNC Plasma
- SMAW Welding
  - E6013
    - Flat Position – Stringer, Wearpad, Corner, Lap, Tee & Butt
  - E6010 & E7018
    - Flat Position – Stringer, Wearpad, Corner, Lap, Tee & Butt
- GMAW Welding
  - Flat Position – Stringer, Pipe to plate, Corner, Lap, Tee & Butt
  - Multiple wire feed processes include: short circuit, Fluxcore and spray transfer
- GTAW Welding
  - Flat Position – Stringer, Pipe to plate, Corner, Lap, Tee & Butt
  - Introduction to Aluminum & Stainless Steel
- Welding Metallurgy
- Welding Symbols
- Math for Welders
- Welding Fabrication Projects
- Career Exploration
- Applied Robotics
- Weld Quality

## **Skills Needed**

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

- Strong Math and Science skills
- Strong Technical Writing skills
- Must be able to work independently
- Great eyesight or corrective lenses
- Mechanical aptitude
- Manual dexterity
- Great Hand-Eye 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.

- Central McGowan kits are available.
- Average total cost for projects = \$60

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

### 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 Percentage
Effort & Participation	<ul style="list-style-type: none"><li>● Attendance</li><li>● Class participation</li><li>● Professionalism</li><li>● Attitude/Behavior</li><li>● Effort towards the tasks</li></ul>	Effort = 40%
Performance	<ul style="list-style-type: none"><li>● Performance and observation checklists</li><li>● Projects</li><li>● Non-Destructive Testing</li><li>● Destructive Testing</li><li>● Metallurgical Assessment</li></ul>	Performance = 30%
Knowledge of Course Content	<ul style="list-style-type: none"><li>● Written reflections</li><li>● Chapter assignments and tests</li></ul>	Knowledge = 30%

### 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

MN Program of Study	
Career Field	Engineering, Manufacturing & Technology
Career Cluster	Manufacturing
Career Pathway	Production Manufacturing & Production Process Development
<b>Related occupations requiring additional training or education:</b> <ul style="list-style-type: none"><li>● Welder, Cutter, Soldered or Brazer</li><li>● Welders Aide</li><li>● Welding Inspector</li><li>● Welding Sales Representative</li><li>● Pipefitter or SteamFitter</li><li>● Structural Metal Worker</li><li>● Metal Fabricator</li><li>● Boilermaker</li><li>● Assembler</li><li>● Foundry Worker</li><li>● Grinding, Lapping, and Buffing</li><li>● Millwright</li><li>● Welder</li><li>● Design Engineer</li><li>● Manufacturing / Welding Engineer</li><li>● CNC Operator</li><li>● Production Manager</li><li>● Welding / Manufacturing Supervisor</li></ul>	
Career Outlook	<i>information available @ <a href="http://www.iseek.org/careers">www.iseek.org/careers</a></i>

## 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

Visit the following website for specific articulated college courses – [www.ctecreditmn.com](http://www.ctecreditmn.com)