

William D. Ford Career-Technical Center

36455 Marquette
Westland, Michigan 48185
(734) 419-2100

Welding Technology II Syllabus - 2024/2025

Instructor: Mr. Tim Prichard

Office Phone: (734) 419-2100

Class Phone: (734) 419-2127

School Class Hours

First Shift: 7:25 – 10:05 A.M.

Second Shift: 11:10 – 1:50 P.M.

CIP: 48.0508

PSN: 19063

Course #: V2120

Distance Learning

Google Classroom Code: cflg4vn

Google Meet Link: <https://meet.google.com/oeq-gvxc-ktr>

Academic focus during distance learning for second-year students will be on blueprint reading, measurement, resume building, interview skills, and fabrication & metallurgy theory.

Prerequisites:

Successful completion of Welding Technology I with a “C” grade or better and permission of the instructor, who will consider student’s previous work ethic, attendance, timeliness, attitude, behavior, and other factors.

Year 2 Goal Statement:

To provide students with the opportunity to continue developing the skills and theory required to succeed in the professional welding field and/or continuing education.

Course Description:

Welding II students will build on the fundamental skills learned in Welding I by continuing their welding training on GMAW, GTAW, and SMAW processes in the horizontal, vertical, and overhead positions. Focus for year 2 students will be on projects and hands-on, competency-based training with narrowed textbook instruction and theory that builds on the principles introduced in year 1, rather than repeating them. Advanced applications include weld testing, plasma cutting nonferrous metal, arc gouge cutting, art fabrication, welding project fabrication, flux cored arc welding and customer project repair. Year 2 students will take on more responsibility as leaders through teamwork, mentoring, foreman positions, fabrication projects and welding repair work. They will have increased opportunities for involvement in competitions - potentially leading to employment, scholarships, awards and/or prizes. The overall focus for the second year student is to prepare for entry level employment in the welding industry and/or advanced studies in a postsecondary college program. The students are also expected to

participate in leading activities such as open house, high school welding tryouts, middle school tours, etc. A highly motivated student will be in a great position for his / her next career step when leaving this class.

Year 2 Student Competency Standards:

1. Advanced GMAW Techniques: Students will build upon their year 1 skills in the gas metal arc welding process through the addition of additional materials, Aluminum; as well as additional joints, thicknesses, positions, projects, and spool gun use.

2. Advanced GTAW Techniques: Students will build upon their year 1 skills in the gas tungsten arc welding process through the addition of additional materials, including stainless and aluminum; as well as additional joints, thicknesses, positions, and projects.

3. Advanced SMAW Techniques: Students will build upon their year 1 skills in the shielded metal arc welding process through the addition of additional electrodes, joints, thicknesses, positions, and projects.

4. Flux Cored Arc Welding: Students will learn and apply the various techniques and theories that are used in the welding industry while operating the flux cored welding process.

5. Plasma Arc Cutting (including CNC) and Arc Gouging: Students will learn and apply the various techniques and theory that are used in the manual and CNC plasma arc cutting processes, using ferrous and non-ferrous metals. Additionally, they will learn and apply the procedures to make quality cuts on ferrous metals with the industry-used copper clad electrode / arc gouging processes.

6. Competency / Project Based Learning: Students will read weld designs and develop projects; including the creation of blueprints, material lists or BOMs, layout, cutting, tacking and welding of all materials needed for fabrication of the project - whilst holding measurement tolerances and squareness within 1/16".

7. Destructive and Non-Destructive Weld Testing: Students will create advanced welds in the Shielded Metal Arc Welding process that they will critique and evaluate using the certification testing method of face and root bending. Additionally, they will use their knowledge of welding flaws/defects to analyze, critique and identify welding discontinuities in their welds through visual inspection and dye penetrant tests.

8. Blueprint Reading and Measurement: Students will build upon their year 1 training in weld symbols, and learn to read and create drawings and prints. Additionally, measurement in metric and U.S. standard will be emphasized.

9. Customer Repair and Fabrication: Students will evaluate customer products in need of repair, develop plans, devise repair options, create cost lists, and use their advanced welding skills and knowledge to demonstrate expertise on the various welding processes; and provide a satisfactory outcome for the customer.

10. Creative Art Fabrication: Students will have the opportunity to learn and apply artistic fabrication techniques, on an individual basis; from concept through creation.

11. Advanced Fabrication: Students will learn and apply the safe and accurate use of different pieces of shop equipment and hand tools, as it applies to fabricating parts and projects of ferrous and non-ferrous metals. Topic and tools covered will include: hole creation, shearing, hammer forming, bending / straightening, achieving and maintaining squareness.

12. Lincoln Project / Final Project: Students will create, design, develop and formulate a written report, containing - blueprints, safety guidelines, procedure application, welding fabrication, material list, and photographs - into a comprehensive collection of all of the components of a manufactured product, in alignment with industry expectations.

In Addition to Segment Standards, year 2 students will be expected to:

- Maintain excellent attendance and punctuality
- Treat all people and property with respect
- Work safely and hold others accountable to do the same
- Understand and follow all shop and classroom rules
- Act as leaders to peers and year 1 students
- Develop a strong work ethic

Welding Credit Issued:

1-1/2 elective welding credit - per semester - unless the student is enrolled in a specific integrated math or a VPAA section; then the welding credit would be 1, and the math or visual arts credit would be 1/2.

Textbook and Materials Used:

- *Welding Skills* by B.J. Moniz and R.T. Miller
- *Basic Blueprint Reading Skills* by C. Thomas Olivo, Albert V. Payne, Thomas P. Olivo
- Various handouts and videos covering welding related topics

Welding Equipment needed for participation in the Welding Program:

Please see document, "Welding Supply Cost List," for helpful pricing and purchasing locations.

1. **Safety Glasses:** One pair is provided, expect to be replaced regularly. Must be Z87+ compliant. No tinted safety glasses are permitted.
2. **Welding Jacket:** Fire-stop or fire retardant welding jacket / with or without leather sleeves (leather sleeves are better and preferred.)
3. **Welding Helmet:** Passive or Auto-Darkening.
4. **Boots:** Steel or composite safety-toe, full leather boots (6" boot height min.)
5. **Jeans:** Denim jeans without holes or frays.
6. **Welding Gloves:** Multiple styles; expect to replace them regularly.
7. **Welding Cap:** Flame retardant cotton cap.
8. **Pliers:** Vise grips or channel locks
9. **Tape Measure:** Metric/standard measurement units.
10. **OAW Cutting / Welding glasses:** Glasses or goggles; #3 for cutting #5 for welding.
11. Chipping Hammer, Wire Brush, GMAW Pliers are also recommended.

Total costs can vary depending on where the safety equipment and clothes are purchased. Students **will** receive a document, "*Welding Supply Cost List*," with this syllabus. Costs can be expected to start at around \$160 for basic equipment, and increase from there.

Students are required to wear safety equipment in the lab every day to be a part of the class; however, any parents / students that can't get the safety clothes and equipment (PPE) should contact Mr. Prichard so that he can assist in helping them get everything they need.

Evaluation and Grading of Tests, Quizzes, and Projects:

Grade weights are as follows:

40% - **Daily Employability Sheets:** These are filled out **DAILY** by the student, and initialed at the end of each class. Each student starts the day with 10 points available. Points may be deducted for any reason at the discretion of the instructor, but specifically in the categories of: punctuality, initiative, safety, behavior, attitude, performance, and clean-up. Think of this as a time card in a professional setting; if you don't punch in, you don't get paid. Students must be in attendance to receive their 10 points each day, with the exception of school-related events.

20% - **Hands-On Welding:** Including objective sheets, projects, and final.

20% - **Written Assignments:** This includes book work, reviews, math & writing assignments, definitions, crossword puzzles, etc.

20% - **Written Tests & Quizzes:** Including safety, chapter, and math tests.

Extra credit will be available at the instructor's discretion, for students choosing to apply themselves beyond the minimum requirements.

Grading Scale and Policy:

Pluses and minuses are not factored into grade point averages. (Ex: A+, A, A- are all calculated as 4.0) Therefore, to simplify the grading policy, the scale is as follows:

- **A** = 90 - 100%
- **B** = 80 – 89.99%
- **C** = 70 – 79.99%
- **D** = 60 – 69.99%
- **E** = 0 – 59.99%

Attendance, attitude, social behavior, work ethic and available extra credit assignments will determine whether a borderline grade will be raised or lowered. Students are expected to carry themselves professionally while treating each other respectfully. Social, academic and technical skills are all taught in the class to further prepare students for advancement into college, or entry level work in the welding industry. While this is a welding *class*, this is a *career* training center, and as such, soft skills are taken into consideration.

Work-Based Learning (Course Requirement):

Work-Based Learning is a valuable experience in which every student in career and technical education is required to participate. All students will be given opportunities to attend a minimum of one field experience each school year. Those students who do not attend the scheduled experience(s) will be required to find a site at which they will spend a minimum of one class period in a business - related to their program of study. The student will be required to get the teacher's signed permission, the parent/guardian's signed permission, fill out a training agreement to be signed by the site supervisor, and provide their own transportation to and from the site. Upon completion of the field experience, the student will turn in a question and answer assignment provided by the teacher regarding the experience.

Classroom Accommodations:

As the instructor, it is my goal that every student be given the greatest opportunity to succeed in this class. Therefore, accommodations will be made for all students with individual educational plans and special circumstances. Time outside of regular class hours will be made available for students to practice welding skills and / or make up assignments, at the instructor's discretion. A permission slip is available for students wishing to take advantage of this opportunity. Additionally, students experiencing physical or emotional issues of any kind, for any reason, will be met with understanding and reasonable accommodations - again, at instructor discretion.

Program Attendance Policy:

Students must attend class regularly in order to receive credit or be considered for employment and competitive opportunities. **If a student needs to be absent due to illness or an emergency situation, including court, funerals etc., she (he) should contact the office and bring in documentation for all absences. The main office will determine whether an absence is unexcused, excused, documented or undocumented. All make-up work is required to be done within the first week of an absence.** A student may lose credit for the class if they exceed 10 days of absence unless they make arrangements to make up all hours missed over the 10 days, and complete course requirements per instructor expectations. Make-up time and assignments must be arranged with the instructor. NO credit will be given unless this requirement is met. **Remember...**We are training students in preparation for entry level employment. All employers expect excellent attendance and great attitudes. Please help support us in these important areas!

Students must receive prior permission from the instructor for all school related functions, co-op working arrangements, field trips, competitions and any class sponsored experiences.

Certificates that may be earned:

Student looking to earn a certificate must meet grade and attendance requirements:

1. *AWS: SENSE Level 1 Certificate:* Must complete all required theory exams and practical welding projects with proficiency as detailed in AWS - QC:10
2. *Certificate of Completion* to students who complete one full year in the program with at least 70% of welding competencies completed as defined in the "Objective Sheet."

Thank you very much for all the support you provide for your progeny! We will do our very best to help you in preparing your young person for a successful school year and career.

Mr. Prichard may be contacted by email at: PrichardT@wwcsd.net or phone at (734) 419-2127

Please sign the following page and return it to your instructor.

Welding Technology Classroom Contract

I have read and understand the requirements for my child to participate in the Welding Technology Program at the William D. Ford Career-Technical Center. I will provide all necessary equipment or make arrangements with the instructors. I agree to keep open lines of communication about my child's progress, development, and behavior with the instructors and administration.

Parent Signature:

Parent Name Printed:

Parent Email:

Parent Phone Number:

Preferred Method of Contact: Phone Text Email

I have read, understand, and agree to the requirements for my own participation in the Welding Technology Program at the William D. Ford Career-Technical Center. I understand that this is **not** a "blow off class," or "an easy A." I will be expected to work safely and diligently, and be respectful at all times. Furthermore, I will follow all rules of the building, the classroom, and the directions of the instructor without argument.

Student Signature:

Student Name Printed:

Student Phone Number:
