

Welding

Course Syllabus 2026-2027

Instructor – Michael A. Saenz

This course is available to all students at Bishop High School who have completed their Core curriculum certification.

Through this class, students will have the opportunity to receive a Welding level one certification which is received from the National Consortium for Construction Education and Research (NCCER) . This certification is industry recognized and will truly benefit your future as you pursue a career in welding.

The NCCER Welding Level 1 Covers:

- Welding Safety
- Oxyfuel Cutting
- Plasma Arc Cutting
- Air Carbon Arc Cutting and Gouging
- Base Metal Preparation
- Weld Quality
- SMAW – Equipment and Setup
- Shielded Metal Arc Electrodes
- SMAW – Beads and Fillet Welds
- Joint Fit-Up and Alignment
- SMAW – Groove welds with Backing
- SMAW – Open V-Groove Welds

85.5 hours are required for completion. Certification requires successful completion of all practical labs and a score of 70% or higher on ALL written exams. Please note that it is possible to pass and receive credit in this class without receiving certification.

Grading criteria:

- ★ Daily work/participation 40%
- ★ Tests 30%
- ★ Quizzes 10%
- ★ Projects 20%

Total 100%

§130.363(c) Knowledge and Skills Outline

(1) Professional Standards & Employability Skills

- **(1)(A)** Express ideas clearly through written and verbal communication.
- **(1)(B)** Demonstrate acceptable work ethics (punctuality, task completion).
- **(1)(C)** Conduct oneself in a professional manner (dress, speech, professional etiquette).
- **(1)(D)** Choose ethical courses of action and adhere to workplace rules/regulations.

(2) Workplace Safety, Health, & Environmental Regulations

- **(2)(A)** Apply safety principles, personal protective equipment (PPE), and shop rules.
- **(2)(B)** Identify, handle, store, and properly dispose of hazardous materials per SDS guidelines.
- **(2)(C)** Demonstrate safe operation procedures for hand tools, power tools, and shop machinery.

(3) Welding Blueprints, Symbols, & Math Applications

- **(3)(A)** Interpret blueprints, technical drawings, and specifications.
- **(3)(B)** Identify and apply AWS standard welding symbols and joint designs.
- **(3)(C)** Apply mathematical concepts, precision measurements, and layout calculations for welding fabrication.

(4) Thermal Cutting Processes (OFC & PAC)

- **(4)(A)** Operate Oxy-Fuel Cutting (OFC) systems safely (setup, lighting, flame adjustment, and shutting down).
- **(4)(B)** Perform manual and guided thermal cuts, including straight cuts, beveling, and piercing.
- **(4)(C)** Demonstrate Plasma Arc Cutting (PAC) setup and operational techniques on varied metals.

(5) Shielded Metal Arc Welding (SMAW)

- **(5)(A)** Select proper SMAW power sources, polarity settings, and electrode types (e.g., E6010, E7018).
- **(5)(B)** Prepare base metals and fit up joint configurations (butt, lap, tee, corner, edge).
- **(5)(C)** Perform fillet and groove welds using SMAW in 1G/1F (flat), 2G/2F (horizontal), 3G/3F (vertical), and 4G/4F (overhead) positions.

(6) Gas Metal Arc Welding (GMAW) & Flux-Cored Arc Welding (FCAW)

- **(6)(A)** Set up and adjust GMAW/FCAW equipment, wire feed systems, drive rolls, and shielding gas flow rates.
- **(6)(B)** Select appropriate filler wire, wire diameter, and shielding gas mixtures for carbon steel.
- **(6)(C)** Perform fillet and groove welds in multiple positions using GMAW and FCAW processes.

(7) Gas Tungsten Arc Welding (GTAW)

- **(7)(A)** Identify GTAW power sources, torch assemblies, gas lens setups, and tungsten electrode types.
- **(7)(B)** Prepare tungsten electrodes and base materials for clean weld execution.
- **(7)(C)** Demonstrate basic torch manipulation and filler rod feeding techniques for GTAW.

(8) Weld Quality, Inspection, & Testing

- **(8)(A)** Identify common weld defects (porosity, undercut, overlap, lack of penetration, spatter).
- **(8)(B)** Perform visual inspection (VT) on completed welds according to AWS standards.
- **(8)(C)** Understand principles of non-destructive testing (NDT) and destructive testing methods.

Guidelines for Success:

This course was designed by professionals in the construction industry and contains information that those individuals felt is necessary to be safe and successful in the construction industry. It is the same curriculum that is taught to adults who are trying to improve employability by achieving construction trade certifications. The course is not easy and requires real effort on the part of students to achieve certification. The following tips will help ensure success.

> **Come prepared** – always have pencil/pen and a spiral notebook. This course also includes time in the shop handling, cutting, and welding metal. During shop time, students must have closed toe shoes or boots, long pants that are not made of synthetic materials (non-frayed jeans work great), and a long sleeve 100% cotton shirt that can be worn over another shirt when welding. Commercially available welding shirts are great but not required. The clothes can be old as long as they are in good shape. **Frayed jeans and cotton shirts are a fire hazard.** Second hand stores such as Goodwill are a good place to get shop clothes for minimum expense. Shop clothes WILL get dirty and damaged. Cotton is used since it does not easily catch fire and when it does burns slowly enough that it can be put out before the student gets injured. Synthetic materials melt and burn rapidly and can cause severe injury to the skin. The teacher will give advanced notice of shop days so that students can be prepared. Late in the year, almost every day will be a shop day.

> **If at first you don't succeed, try again.** I allow up to two retests on module exams so that the required 70% for certification can be achieved. Study for retests happens outside of class time and the test itself must be scheduled with the teacher for before or after school. Upon request, students can sign out a copy of the chapter to take home for study.

> **Listen carefully in class and take notes.** Listening and note taking are valuable skills whether you are going to college, technical school or straight to work. Listening and note taking are the most reliable indicators of who will do well in this course.

Classroom/Shop Rules:

★ Classroom

- Be attentive during instruction and on task during group activities
- Be respectful of other students and their property
- Be seated when entering the classroom and stay in your seat until released by the teacher.

★ Shop

- No horseplay
- Wear Personal Protective Equipment (PPE) in the shop. Safety glasses must be worn 100% of the time
- Follow all safety rules associated with tools and equipment in the shop
- Clean up and return tools to the tool room 8 minutes before the bell rings
- All classroom rules (except being seated) apply to the shop as well

How to reach me:

I look forward to working with both parents and students this year. I can be contacted via email or calling the school. I am also available to students, by appointment, for help, tutorials, makeup tests, and retests after school. I can also meet with students before school if it is coordinated in advance.

Best Regards,
Mr. Saenz

CTE Welding

Please sign and return this portion indicating that you have read the syllabus. Please check your preferred method of contact.

Student _____ Parent/Guardian _____

Printed name of Parent/Guardian _____

Preferred ☐ Email _____

Preferred ☐ Phone _____