

# Lexington High School-Skills Armory

Welding 2

Periods 7-8

2024-2025

Skills Armory-Welding Classroom and Shop

Instructor: Mr. Keith Nielson [keith.nielson@lexschools.org](mailto:keith.nielson@lexschools.org)  
Plan Period 2: 8:45-9:39am M-F  
Lab Makeup Times 3:45-5:30pm T & Th When the instructor does not have other commitments.

## 1. Rationale

This is an intermediate welding class that is the second in a three-course offering at LHS. Students that successfully complete Welding I, Welding II, & Welding Manufacturing III will have skills to qualify as an American Welding Society (AWS) Entry-Level Welder. Successful completion of NCCER test and performance objectives will be eligible for registration in the National NCCER registry database that can be used by employers to verify your skills. **To advance to Welding 3 you must successfully complete this course.**

## 2. Aims and Outcomes

This class is intended to build on knowledge and skills a student learned in Welding I. Gas Metal Arc Welding (GMAW) and Gas Tungsten Arc Welding (GTAW) processes will be introduced in this course. Students will have the opportunity to perform flat, horizontal, vertical and overhead welds. The course is intended to be 30% in the classroom and 70% in the lab.

## 3. Specific Learning Outcomes

- a. Students will learn how to identify and explain applicable codes and standards that have been established and accepted throughout the welding industry.
- b. Students will learn how to identify and interpret supplemental welding symbols.
- c. Students will learn how to complete a Hot Work Permit application.
- d. Students will learn how to safely use respirators to mitigate some of the dangers.
- e. Students will learn how to inspect and safely perform setup and disassembly of oxy-fuel equipment.
- f. Students will learn procedures and methods for performing various types of oxy-fuel cuts.
- g. Students will learn how to identify, prepare, and set up a computerized numerical control (CNC) plasma arc cutting system.
- h. Students will learn how to identify, prepare, and set up a plasma arc cutting torch to perform gouging operations.
- i. Students will learn procedures and methods for performing various types of PAC operations.
- j. Students will learn the principles of air carbon arc cutting (CAC) and gouging.

- k. Students will learn how to identify, prepare, and set up air carbon arc cutting and gouging.
- l. Students will learn procedures and methods for gouging and preparing base metals.
- m. Students will learn how to prepare base metal joints for welding
- n. Students will learn how to explain the principles of gas tungsten arc welding (GTAW).
- o. Students will learn how to identify, prepare, and set up gas tungsten arc welding (GTAW) equipment.
- p. Students will learn how to classify, select, store, and control electrodes and filler metal that are used for gas tungsten arc welding (GTAW).
- q. Students will learn how to strike an arc and how to make stringer beads with and without filler metal on mild steel, stainless steel, and/or aluminum base metal using the GTAW process.
- r. Students will learn how to make fillet welds in the flat (1F), horizontal (2F), vertical (3F) and overhead (4F) positions with the GMAW and GTAW process.
- s. Students will learn how to make groove welds without backing in the flat (1G) position with the GTAW process.

#### **4. Assumptions**

- Students are expected to read outside of the classroom to be familiar with lessons that will be taught and discussed in the classroom.
- A student who is enrolled in a welding class is, at the very minimum, willing to put forth an effort to learn and/or improve his/her welding & cutting skills and knowledge.
- Safety will be addressed, discussed and/or evaluated before, during, and after any lab activity. There must be 100% compliance with rules and procedures that are intended to ensure the health and safety of participants and observers.
  - Students who do not bring in the appropriate welding clothes will be given 1 day to have the appropriate clothing for class. Second day without appropriate clothing the Lab grade will be a 0.
- Students understand and appreciate the investments in tools, welding machines, consumables and misc. equipment that were made in order for them to have an opportunity to learn some employable skills.
- Tools, machinery, personal protective equipment, consumables, tables, stands, fixtures, etc. will be used for the purpose for which they were intended.
- Students prefer to learn in a high-quality training environment. Unsolicited welding on any welding booth partition walls, welding tables, stands, fixtures and/or tools that intentionally falls in the “Damaging or Stealing Property” category of the student handbook.
- Students have specific skills that they would like to possess. Students are encouraged to establish personal learning goals for the class and they should be willing to communicate those goals with the instructor.
- Zero tolerance for use of cell phone or using electronic devices in the classroom and lab. These can only be used under the approval of the instructor in the classroom.

#### **5. Course Requirements:**

- a. Class attendance: see 2021-2022 LHS Student Handbook, pg 8-10
- b. Course training materials:
  - i. Course text: Althouse, Andrew D., et al. Modern Welding. 11<sup>th</sup> ed. Goodheart-Willcox Company, Inc. 2013. Print.
  - ii. Student Workbooks: Hobart Institute of Welding Technology
  - iii. NCCER Construction Core, Pearson Publishing
  - iv. NCCER Welding Level 1, Pearson Publishing
  - v. NCCER Welding Level 2, Pearson Publishing
- c. Grading
  - i. Each quarter grade is 45% of semester grade.
  - ii. Semester test is 10% of the semester grade.
  - iii. Semester grade is 45% Quarter 1 + 45% Quarter 2 + 10% Semester test =Final grade:
  - iv. Final grade is 50% Semester 1 + 50% Semester 2 = Final grade.
- d. Grading Categories:
  - i. Early work 5%
  - ii. Performance test 40%
  - iii. Unit Test 30%
  - iv. Class and Lab work/Clean up 25%
- e. Required clothing: students
  - i. must be dressed in the specific attire in order for them to participate in lab activities that involve welding, cutting, and/or grinding, along with certain material handling activities.
  - ii. Jeans that are free of holes, tears, rips and/or frays are required.
  - iii. High-top leather work boots (steel or safety toes recommended).
  - iv. Athletic shoes with synthetic materials are not permitted.
  - v. Points will be deducted from the student's lab grade if he/she is unable to due to the lack of proper attire.
  - vi. Personal Protective Equipment (P.P.E.):
    - 1. Students will need specialized protective clothing and equipment to safely perform the tasks that they will be assigned to them in this class.
    - 2. Students will be provided with the necessary personal protective equipment (P.P.E.).
    - 3. Z49.1 Safety in Welding, Cutting and Allied Processes is the governing document for determining required P.P.E.
    - 4. P.P.E. that is assigned to the student for the period of the course must be signed for upon time of issue.
    - 5. The student takes responsibility for any P.P.E. upon signing for and/or taking possession of the equipment.
    - 6. No P.P.E. that is owned by the school may leave the school grounds unless the instructor grants permission.

7. Students may bring in their personal welding helmet. **However, the school is not responsible for damage or replacement if it is damaged or stolen.** Helmets must meet the Z47.1 Safety in Welding, Cutting and Allied Process standards.
8. The student will not receive any credit for the course until all P.P.E. that she/he was issued is returned to the school. The student will pay for unreturned PPE at the replacement cost for damaged P.P.E.

**f. Grading Procedures;**

- i. Early work is completed during the first 5 minutes of the class and is turned in.
- ii. Performance tasks that meet all of the criteria will be awarded full credit. Points may be deducted for not meeting all of the criteria.
- iii. Unit exams: Must attain at least a 70% for certification. You are allowed to retake the unit test no earlier than 48 hours after the original test was completed to improve your score.
- iv. Lab Grading Criteria:
  1. a. Punctual for all commitments OR notifies instructor before start of day if absent or tardy.
  2. Follow instructions and able to take direction from the instructor.
  3. Motivated to accomplish the task at hand.
  4. Uses language & manners suitable for the workplace
  5. Observes established rules, policies & procedures.
  6. Maintains equipment and supplies in good working condition.
  7. Organizes and implements a productive plan of work. Displays self-initiative
  8. Demonstrates honesty, integrity & reliability.
  9. Responds positively to ongoing performance feedback. Displays a willingness to cooperate.
  10. Maintains positive working relationships and respects cultural and ethnic differences.
  11. Wears clothing suitable to the job, task, and environments while adhering to the dress code.
  12. Communicates effectively with instructor(s) and classmates.
  13. Identifies problems and takes appropriate action.
  14. Identifies appropriate resources.
  15. Deals with stress in appropriate ways.