

Lexington High School-Skills Armory

Welding 3/Manufacturing

Periods 0-1

2026-2027

Skills Armory-Welding Classroom and Shop

Instructor: Mr. Keith Nielson keith.nielson@lexschools.org

Plan Period 2: 8:45-9:39am M-F

Lab Makeup 3:45-5:30pm T & Th When the instructor has no other duties or appointments

1. Rationale

This is a capstone welding class that is the third 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.

2. Aims and Outcomes

This class is intended to build on knowledge and skills a student learned in Welding I and 2, Advanced Gas Metal Arc Welding (GMAW) and Gas Tungsten Arc Welding (GTAW) processes will be included in this course. Students will have the opportunity to perform pipe welds. Students will develop a project that will utilize their welding skills and knowledge of the CNC plasma torch. Design, perform cost estimation, profit margins, and fabricate a project that could include a variety of materials such as mild steel, stainless steel, wood, 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 perform welds in the 1G, 2G, 5G and 6G positions welding pipe.
- b. Students will design a project that would include the skills that utilize cutting operations such as oxy-fuel, plasma arc, CNC plasma cutting, and carbon arc cutting. Then apply welding techniques that use one or more of the following processes: SMAW, GMAW, FCAW and GTAW
- c. Students will demonstrate welding techniques related to maintenance.
- d. Students will submit design drawings of their project which includes all dimensions, weld symbols, and specifications for their project.
- e. Students will complete a materials list for their project.
- f. Students will complete a work log for their project from the beginning of the design phase to completion of the project.
- g. Students will determine a profit margin for their project.
- h. Students will complete a marketing plan for their project.

- i. Students will present their marketing plan to local businesses.
- j. Students will develop a job resume.

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 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 2026-2027 LHS Student Handbook,
- b. Course training materials:
 - i. Course text: Althouse, Andrew D., et al. Modern Welding. 11th 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 3, Pearson Publishing
 - v. NCCER Welding Level 4, Pearson Publishing
 - vi. Internet resources as required by the instructor.
- 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. Performance test 40%
 - ii. Unit Test 30%
 - iii. Class and Lab/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 may be deducted from the student's daily participation grade if s/he is unable to participate 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. **(Students may bring in their own helmet. However LPS is not responsible for the maintenance or securing your helmet from theft or damage caused during the course. You will provide your own cover plates and maintain your helmet.)**
 - 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. 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 and/or unreturned or the student pays 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 be 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.