

PIPE WELDING & FABRICATION LAB

WLD - 2241 001

Course Description

Practical Lab application of plate and pipe welding layout, fabrication, plate, and pipe welding techniques. Emphasis on American Welding Society D1.1 and American Petroleum Institute (API) 1104 welder qualification test preparation.

Prerequisite(s): WLD 2230 WLD 2231

Corequisite(s): WLD 2240

Semester(s) Taught: Fall, Spring

Course Student Learning Outcomes

- Demonstrate the safe and proper uses of multiple types of welding equipment.
- Show proficiency in layout and welding fabrication projects using various welding processes.
- Demonstrate welding proficiency on 3/8" plates with various processes and in various positions to achieve weld qualifications.
- Prepare to set up and take pipe welding qualification tests as per AWS and API standards.
- Prepare to set up and take pipe welding qualification tests as per American Welding Society (AWS) and American petroleum Institute (API) standards.

Course Prerequisites

WLD 2230, WLD 2231

Engagement Plan

I will respond to email within two days.

I will offer feedback on major assignments within one week.

The best way to contact me is via the Canvas Inbox, as I will prioritize this email over other modes of communication.

Keys for Success (how to succeed in the course)

Attendance and class Participation are critical to each student's success in the course.

Welding Tools & Personal Protective Equipment (PPE)

MATERIALS: Welding Tools & Personal Protective Equipment (PPE)

Because of their personal nature, and the necessity for welders to have these items on a job, students are required to purchase their own PPE and tools. Each welding student should obtain at least one of each of the following PPE & Tools prior to starting lab courses.

PPE:

- Welding Jacket
- Split Leg Leather Apron or Leather Chaps, or Coveralls (Must be cotton, denim, or twill material. (NO SYNTHETICS!))
- Safety Glasses (Clear Lenses Only)
- Heavy Welding Gloves
- Light Weight MIG Welding Gloves
- Clear Face Shield

- Work boots (Over the ankle. Steel toes not required.)
- Welding Helmet (Passive or Automatic) (Lincoln, Miller, or Speedglass brands preferred for Auto-darkening)
- Welding Cap
- Welding Goggles, #5 shade lens (Must fit over safety glasses.)
- Fillet Weld Gauges

Tools:

- Wire Brush
- 3/32" Tungsten
- Combination square
- Wire wheels/ Hard wheels/ flap disks
- Tig finger
- Torpedo level
- Triple Flint Spark Lighter
- Soap Stone with Holder (Rectangular shape preferred)
- Vise Grip Pliers (Optional – Vise Grip "C" Clamp)
- 12' Tape Measure (3/4" to 1" blade width is best)
- Combination Lock (Needed if you lease a locker)
- Welding Tip Cleaner
- Chipping Hammer
- Scribe (pen style)
- Ballpoint pen and black Sharpie marker
- Welding Pliers (Special tool for wire feed processes.)
- 4 1/2" Angle grinder
- Wire cutters

Additional Policies

Special Instructions

Because of the nature of the environment students will be working in; there are special rules that must be adhered to with zero tolerance.

- See the instructor immediately if you have an emergency situation.
- Use of cell phone for calls, texting, or internet will not be allowed in the shop floor. Cell phones may be used in the classroom, but they must be on silent or vibrate mode. If you receive a call, please leave the classroom briefly. Making a call or texting during class should be restricted for emergency purposes only.
- No profanity will be tolerated in class or lab.

General Lab Safety Rules

1. Safety glasses are to be worn at all times while in the welding lab.
2. Face shields and safety glasses are to be worn when using the grinders.
3. Wear proper protective clothing while performing welding & cutting operations.
4. THINK before you DO!
5. No horseplay will be tolerated in the welding lab!
6. Students, Faculty & Staff are required to adhere to Utah State Law and SLCC Policy regarding legally controlled substances, i.e.: Alcoholic beverages, Tobacco products, Vaporizers, drugs etc.
7. Report ALL accidents or injuries to your instructor as soon as they happen.
8. Treat all equipment as potential hazard.
9. Make sure compressed gas cylinders are secured when in use or storage.
10. Close compressed gas cylinder valves when not in use.
11. Make sure protective valve caps are secure on the compressed gas cylinders during moving and storage.
12. Do not burn weld material lying on concrete.
13. Use pliers or clamps to handle hot materials. (NOT GLOVES!)
14. Contain long hair with welding caps or other suitable protective wear.

15. Do not weld on or near compressed gas cylinders.
16. Do not use gasoline powered machines inside of the building.
17. Use ventilation fans when welding and/or cutting operations are being done in the lab.

Welding Lab Policies & Procedures

- All welding students are to complete the Welding Safety exam with 100% accuracy prior to working in the welding lab.
- No students are to be working in the welding lab without the presence of an instructor. No permission is to be granted to a student to work in the lab other than their regular class period without the consent of any faculty member who will be present during that time.
- Room WTEC-xxx is tool room. This room is not to be accessed by students without the accompaniment of an instructor or the tool room attendant.
- The welding lab has a Lab Coordinator for the day and a tool room attendant for the evening class times. These positions will be responsible to check out any and all tools or other material and equipment as needed.
- ALL students are responsible for their individual areas to be cleaned at the end of each class period. All booths and floor areas are to be cleaned and swept daily and maintained in good condition which meets OSHA and industry standards.
- NO ONE is to use any equipment without first obtaining task training and proving competent in safety procedures in its operation and function. No students should use the shear without the presence and instruction from a welding faculty member. Strict adherence to the size of plate, cut procedures, and materials used are to be enforced.
- Student and class projects need to be approved by faculty and consideration should be given to size, appropriateness for class, and storage during constructions.
- Be conservative with consumable materials, i.e. use welding electrodes down to two-inch stubs; use OAW filler rod completely by welding stuffs to long rods; return unused and partially used welding electrodes and welding rods to their proper storage container; use practice materials (sheet, plate, pipe, etc.) efficiently. DO NOT throw away and usable materials!
- Place scrap metal in the proper disposal containers.

- DO NOT weld on welding tables, clamps, fixtures.
- Students suspected of attending class while under the influence of drugs and/or alcohol will be asked to leave. Continuation of this type of behavior termination from the class.
- Lab telephones and computers are for official college use and are not to be used by students.
- Mobile phones and audio devices, i.e. cell phones, MP3 players, portable stereos, electronic wearables (wireless headphones, watches), etc. are not allowed in the lab. Any device that detracts from being alert to inherent dangers or warning sounds are not to be used in the lab.
- Students enrolled in courses where learning activities take place in the welding lab are required to have general safety instruction provided. The content of which must include items of general nature as will be found in venues that employ welding personnel. (Reverence.: AWSZ49.1 SAFETY IN WELDING AND CUTTING AND ALLIED PROCESSES). An assessment of the content learned by the student is required. No student shall be permitted to work in the welding lab with an assessment score lower than 100%.
- Students enrolled in courses where learning activities take place in the welding lab are required to have process specific safety instruction provided. The content of which must include items consistent with the safe use and operation of the welding process being taught. An assessment of the content learned by the student is required. No student shall be permitted to work in the welding lab with an assessment score lower than 100%.
- Students are allowed to work in the welding lab only during their scheduled lab time (SLCC Policy). An instructor from the welding department must be present in the welding lab anytime students are working.
- The Tool Room is NOT accessible to welding students. In extenuating circumstances, students may enter the tool room ONLY when accompanied by an instructor, Lab Coordinator, or Tool Room Attendant.
- Students are required to "sign out" and "sign in" tools and/or equipment acquired from the tool room through the tool room service window.
- Students are responsible to clean their individual work areas 9Welding stations and/or booths) at the end of each class period. Clean worktables by sweeping off

loose material, sweep floors, neatly hang hoses & cable, remove welding rods & electrodes from holders, sweep off power sources, scrap loose spatter from welding tables & fixtures, etc.

- It is expected that students who have worked in a general use area of the lab (i.e.: Grinding room, OAC Track Torch, CNC Plasma Torch, Air-Arc rooms, etc.) during their lab time help clean up these areas at the end of their lab class.
- Complete task training is required for each piece of equipment in the welding lab prior to use. A comprehensive assessment of user competency is required prior to use. Minimum acceptable test score is 80%. STUDENTS ARE NOT AUTHORIZED TO USE THE PLATE SHEAR!
- Conservation of consumable materials used for instruction purposes shall be observed. This includes all base materials, Filler materials, Welding electrodes, Welding gases, etc.
- Recycle all metals. Place scrap in its proper container: Ferrous Metals; Aluminum Alloys, Copper Alloys, Stainless Steels.
- Clamps and fixtures for holding practice weldments are provided in each welding booth and OAW workstation. It is expected that these devices be kept in good operating condition. DO NOT force or overtighten clamps and fixtures!
- Due to regular use and normal wear and tear, these devices will eventually require maintenance. Students shall inform their instructor of malfunctioning fixturing devices. Instructors shall teach students how to make repairs to these fixtures and assist them as necessary. WELDING ON WORKSTATION OR BOOTH FIXTURES AS A TEMPORARY REPAIR IS CONSIDERED VANDALISM. DO NOT WELD ON TABLES OR FIXTURES!!! DISCIPLINARY ACTION WILL BE REQUIRED UPON VIOLATION OF THIS POLICY.
- DO NOT weld practice weldments on worktable tops. Use the clamps and fixtures that are provided.
- Face shields are required PPE for all grinding, power sanding, power wire brushing operations, and use of metal cut-off wheels.
- Safety glasses shall be worn upon entering the welding lab and at all times that students are working in the lab. Safety glasses shall have clear lenses. Shaded lenses are not approved for indoor use and will NOT be allowed in the welding lab.

- Behavior deemed to be “Horse Play” or “Harassment” has no place in the welding lab and will not be tolerated. Please refer to the SLCC Student Code of Conduct for interpretation.
- Compressed gas cylinders shall have protective valve caps in place when cylinders are not in use. Cylinders shall not be moved without the protective valve caps in place. Gas cylinders shall be secured when being moved or stationary.
- Ventilations fans shall be used while welding and/or cutting operations are taking place in the welding lab.
- White boards located in welding booths are for instructor use only. Only erasable white boards markers are to be used.
- No graffiti activity, which includes, markers, spray paint, stickers, etc. shall take place at any location on SLCC property. Notice: Security cameras are in use everywhere.
- NO food in the welding lab or classrooms!
- All instructors are responsible to enforce department and college policies. Instructors may halt any activity deemed to be unsafe, hazardous, unlawful, or of nonconformance to welding department/SLCC policy, etc. This policy crosses all boundaries regardless of whether or not involved parties are THAT instructors’ students or not.

Cellular Phone & Electronic Device Use

Cellular phones will be set to silent mode before entering the classroom.

No electronic devices or cell phones are allowed in the welding lab.

If the phone does not have a silent option, it must be turned off while in class. CELL PHONES ARE NOT TO BE ANSWERED in the classroom. In extenuating circumstances, such as an emergency, excuse yourself, leave the classroom, and either answer or return the phone call in a non-disturbing area (please abstain from using your cellphone outside the classroom doors – it is extremely disruptive). While a student is taking an examination, his or her cell phone MUST be in the OFF MODE and NOT accessible to the student.

Emergency Procedures

- In the event of an emergency and should the Westpointe campus need to be evacuated, you are to go out the closest open exit and assemble at the northwest corner of the parking lot.
- DO NOT leave as your instructor must account for your whereabouts. Instructors must take roll to account for all their students.
- Always leave the building immediately. Turn off equipment and lights and close the door behind you. (A closed door will limit the spread of heat and smoke and will also act as a fire barrier and can serve as a theft deterrent in case of other evacuations.) Do not take personal belongings.
- Use stairways to exit. Never use an elevator as an emergency exit.
- As you evacuate the building:
 - Please be aware of individuals with disabilities who are also trying to leave the building and offer assistance where you can. The College has placed devices called Evacu-Trac in many buildings to assist in the evacuation of individuals who use wheelchairs or have mobility challenges. For assistance in evacuating an individual with a disability, contact your Building Marshal, or the Department of Public Safety. Know where the nearest Evacu-Trac Device is located and learn how to use it.
 - EvacuTract Training Video
 - If you encounter individuals who are ignoring the fire alarm or the request to evacuate, instruct them to leave the building immediately. If they do not respond, report their location to building marshal, police, or fire fighters after you have safely evacuated.
- Keep streets and walkways clear for emergency vehicles and personnel.
- Do not reenter the building until it is determined that is safe to do so as by Fire personnel or the Fire Marshal.

Brief Description of Assignments/Exams

2241 lab objectives

1. Shielded Metal Arc Welding E6010 root pass E7018 fill and cap with 3/8" plate single v-groove
 1. 1G
 2. 2G
 3. 3G
 4. 4G
2. Gas Tungsten Arc Welding root pass with E7018 fill and cap on 3/8" plate single V-groove
 1. 1G
 2. 2G
 3. 3G
 4. 4G
3. Gas Tungsten Arc Welding root pass with FCAW-G fill and cap on 3/8" plate single V-groove
 1. 1G
 2. 2G
 3. 3G
 4. 4G
4. Fabrication and Layout projects
5. 6-inch pipe welding 6010 root pass with 8010 fill and cap down-hill position
6. 6-inch pipe welding 6010 root pass with 7018 fill and cap
 1. 2G position
 2. 5G position
 3. 6G position

- ## Assignment Schedule

[illegible]

Due Date	Assignment Name	Assignment Type	Points
	2G position	Assignment	4
	2G position	Assignment	4
	3G position	Assignment	4
	3G position	Assignment	4
	3G position	Assignment	4
	4G position	Assignment	4
	4G position	Assignment	4
	4G position	Assignment	4
	5G Downhill	Assignment	4
	5G position	Assignment	4
	5G position	Assignment	4
	5G position	Assignment	4
	5G position	Assignment	4
	6G position	Assignment	4
	6G position	Assignment	4
	6G position	Assignment	4
	6G position	Assignment	4
	Fabrication Project 1	Assignment	100
	Fabrication Project 2	Assignment	100
	Fabrication Project 3	Assignment	100
	Fabrication Project 4	Assignment	100
	Roll Call Attendance	Assignment	100

Grading Scale

Attendance and class participation (20%)

Fabrication projects (20%)

Welding Assignments (60%)

A (92-100%) C (74-76%)

A- (89-91%) C- (71-73%)

B+ (86-88%) D+ (67-69%)

B (83-85%) D (64-66%)

B- (80-82%) E (below 64%)

C+ (77-79%) I (Incomplete)

UW (Unofficial withdrawal)

How to Navigate to Canvas

Institutional Policies

As members of our academic community, we would like to invite you to review the Institutional Syllabus which covers important policies and procedures. This document contains important links for students on the code of student rights and responsibilities, academic integrity, and grading policies, Title IX and other important acknowledgements. By familiarizing yourself with this information, you can help us create a safe and respectful environment for everyone.

For more information, navigate to the Institutional Policies tab on the [Institutional Syllabus](#) page.

[Learning Support and Tutoring Services](#)

We are pleased to offer a range of tutoring and learning support services to help you achieve your academic goals. Whether you need assistance with a specific subject or want to improve your study skills, you have many options for tutoring or other support.

To learn more about the services we offer and how to access them, visit the [Institutional Syllabus](#) page under the Tutoring and Learning Support tab. We encourage you to take advantage of these resources to help you succeed in your studies. If you have any questions or would like to schedule a tutoring session, please don't hesitate to reach out to us. We are here to support you in any way we can.

[Advising and Counseling Support Services](#)

At our institution, we are committed to supporting your academic and personal growth. That's why we offer a range of advising and counseling services to help you navigate the challenges of college life. To learn more about the resources available to you and how to access them, visit the [Institutional Syllabus](#) page under the Advising and Counseling Support Services tab. Our advising team and the support centers across campus are here to support you in achieving your goals and overcoming any obstacles you may face.

[Student Academic Calendar](#)

As students you should be aware of all important dates in the semester, such as the day that courses begin and end, as well as the drop date and the last day to withdraw. To learn more about those dates, navigate to the Student Academic Calendar below:

[SLCC Student Academic Calendar](#)