Basic Course Information

Semester:	**Fall 2015**	Instructor Name:	**Carlos Araiza Ainza**
Course Title & #:	**Weld 115**	Email:	**Carlos.araiza@imperial.edu**
CRN #:	**10949**	Webpage (optional):	
Classroom:	**3111-3120**	Office #:	**3122**
Class Dates:	**Aug 17- Dec 11, 2015**	Office Hours:	**11:00am-2:00pm**
Class Days:	**T 6:15PM-8:50PM** **R 6:15PM-10:05PM**	Office Phone #:	**760-355-6319**
Class Times:		Emergency Contact:	
Units:	**3 units**		

Course Description

Complete study course in Flux Core Arc Welding process and safety. The course is created to prepare the students for entry welding performance test in manufacturing, fabrication, structural, and shipyard industries. Student will practice welding to build skills in FCAW process. Safety, equipment setup, trouble-shooting, and proper use of measuring tools will be complementing this course. (CSU) Safety and PPE (Proper Personal Equipment) is enforced through the course. (CSU)

Student Learning Outcomes

Upon course completion, the successful student will have acquired new skills, knowledge, and/or attitudes as demonstrated by being able to:

1. 1 discuss three welding hazards specifically associated with the FCAW process and list potential abatement action for these hazards. (ILO1, ILO2, ILO3)
2. List the two most common shielding methods used in FCAW and define the advantages and disadvantages of the various shielding methods. (ILO1, ILO2)
3. Set up the equipment used in FCAW, set up all parameters associated with welding ¼ and 3/8 inch steel plate, and safety demonstrate the adjustment of essential variables per given WPS. (ILO1, ILO2, ILO3)
4. Fabricate various assigned weld joints safely demonstrating and using the forehand and backhand welding techniques per the given WPS. (ILO1, ILO2, ILO3)

Explain the relationship between a Welding Code, a Welding Standard, a Procedure Qualification Record (PQR) and a Welding Procedure Specification (WPS0. (ILO1, ILO4)

Course Objectives

Couse Goals:

1.1 Develop understanding of safe practices associated with the set up and use of FCAW welding equipment it relates to welding of steel plate.

1.2 Develop understanding of safe practices associated with use of related equipment for cutting, grinding and preparation of material for plate welding.

1.3 Develop skills in the use of FCAW (Flux Core Arc Welding) equipment for application in the welding of steel plate.

Textbooks & Other Resources or Links

Hobart Institute of Welding Technology Flux Core Basics; Technical Guide and Lab Manual.

As provides or required, all students and faculty will bring, make use of at each class such (PPE) personal protective equipment as to provide personal protection for the work being performed. All students will secure use of as provided or required an OSHA/ANSI approved:

- Welding helmet or OFC/W welding and cutting face shield as instructed
- A pair of OSHA/ANSI approved clear safety glasses with side shields
- A pair of welding gloves
- A pair of over the ankle leather work boots
- A welding jacket with leather sleeves or other fame resisting material
- A welding cap
- A pair of ear/hearing protection type ear plugs or other OSHA/ANSI approved hearing protection
- Wear a denim type all cotton pant and sleeved shirt in good repair and tuck in the shirt tail for safety reasons
- Such other personal safety equipment, materials, and supplies as needed and keep in a well maintained condition to contribute to the learning process and success in the course

Additionally:

- A pair of pliers for handling hot metal and other such tolls as will facilitate student learning activities
- If available secure a locker if so desired and provide a lock (contents must be removed at tend of semester or lock will be removed and contents disposed of)
- A three ring binder, paper and such writing tools as needed
- Purchase the required book available in the IVC Book Store
- Follow all other IVC policies and guidelines etc....

Course Requirements and Instructional Methods

Out of Class Assignments: The Department of Education policy states that one (1) credit hour is the amount of student work that reasonably approximates not less than one hour of class time and two (2) hours of out-of-class time per week over the span of a semester. WASC has adopted a similar requirement.

Methods of instruction for learning:

- Lecture
- Institutional Technology Presentations
- Group and Individual Discussions
- Demonstration
- Outside Assignments

Learning activities

- Individual and group learning activities
- Individual and group discussions
- Individual and group oral presentations
- Individual and group classroom/lab demonstrations
- Other, as the instructor may determine appropriate in and out of class learning assignments, use of computer technology, writing assignments and library research assignments

Course Grading Based on Course Objectives

Evaluation:

- Class participation required
- Written and practical test
- Quizzes/exams
- Group and individual projects
- Assignments (written reports, class/lab excises and homework)

1. **Attendance:** first day of class, regular attendance and withdrawal after exceeding the number of class hours per week.
2. **Tardiness:** three times equals one absence (I.V.C. Gen. Catalog pg. 24) 09-10
3. **Absences:** 3 absences= automatic drop (I.V.C. Gen catalog pg.24) 09-10
4. **Student Conduct:** (I.V.C. Gen. catalog pg. 22) 2009-10
5. **Grading System** (I.V.C. Gen catalog pg.17)

   A= 90%-100% of points= Excellent
   B= 80%-89% of points= Good
   C= 70%-79% of points= Satisfactory

D= 60%-69% of points= Pass, less that satisfactory
F= Less than 60% of points= Failing

Competences:

- Develop understanding of qualification and certification under the requirements of the A.W.S (American Welding Society) D.1 Structural Welding Code and other applicable welding standards.
- Demonstrate safe work practices as they relate to use of equipment for materials preparation, performance of welding applications and participation in the classroom and laboratory environment.
- Demonstrate understanding of methods used to select equipment, consumable, qualify weld procedures, certification of welders and the methods used to test and evaluate results of such test for open v-groove welds.
- Demonstrate understanding of the correct weld techniques necessary to complete weld under the AWS (American Welding Society) D.1 Structural Welding Code and other applicable welding standards.

Attendance

- A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class. Should readmission be desired, the student's status will be the same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See General Catalog for details.
- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped. For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.

Classroom Etiquette

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor.
- Food and Drink are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed by the instructor.
- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the General Catalog.
- Children in the classroom: Due to college rules and state laws, no one who is not enrolled in the class may attend, including children.

Online Netiquette

- What is netiquette? Netiquette is internet manners, online etiquette, and digital etiquette all rolled into one word. Basically, netiquette is a set of rules for behaving properly online.
- Students are to comply with the following rules of netiquette: (1) identify yourself, (2) include a subject line, (3) avoid sarcasm, (4) respect others' opinions and privacy, (5) acknowledge and return

messages promptly, (6) copy with caution, (7) do not spam or junk mail, (8) be concise, (9) use appropriate language, (10) use appropriate emoticons (emotional icons) to help convey meaning, and (11) use appropriate intensifiers to help convey meaning [do not use ALL CAPS or multiple exclamation marks (!!!!)].

Academic Honesty

Academic honesty in the advancement of knowledge requires that all students and instructors respect the integrity of one another's work and recognize the important of acknowledging and safeguarding intellectual property.

There are many different forms of academic dishonesty. The following kinds of honesty violations and their definitions are not meant to be exhaustive. Rather, they are intended to serve as examples of unacceptable academic conduct.

- Plagiarism is taking and presenting as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to "cite a source" correctly, you must ask for help.
- Cheating is defined as fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or plagiarizing will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the General Catalog for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to, the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment; (c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment; (e) using a commercial term paper service.

Additional Student Services

Imperial Valley College offers various services in support of student success. The following are some of the services available for students. Please speak to your instructor about additional services which may be available.

- **Blackboard Support Site**. The Blackboard Support Site provides a variety of support channels available to students 24 hours per day.
- **Learning Services**. There are several learning labs on campus to assist students through the use of computers and tutors. Please consult your Campus Map for the Math Lab; Reading, Writing & Language Labs; and the Study Skills Center.
- **Library Services**. There is more to our library than just books. You have access to tutors in the Study Skills Center, study rooms for small groups, and online access to a wealth of resources.

Disabled Student Programs and Services (DSPS)

Any student with a documented disability who may need educational accommodations should notify the instructor or the Disabled Student Programs and Services (DSP&S) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313. Please contact them if you feel you need to be evaluated for educational accommodations.

Student Counseling and Health Services

Students have counseling and health services available, provided by the pre-paid Student Health Fee.

- **Student Health Center**. A Student Health Nurse is available on campus. In addition, Pioneers Memorial Healthcare District provide basic health services for students, such as first aid and care for minor illnesses. Contact the IVC Student Health Center at 760-355-6128 in Room 1536 for more information.
- **Mental Health Counseling Services**. Short-term individual, couples, family, and group therapy are provided to currently enrolled students. Contact the IVC Mental Health Counseling Services at 760-355-6196 in Room 2109 for more information.

Student Rights and Responsibilities

Students have the right to experience a positive learning environment and to due process of law. For more information regarding student rights and responsibilities, please refer to the IVC General Catalog.

Information Literacy

Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. The IVC Library Department provides numerous Information Literacy Tutorials to assist students in this endeavor.

Anticipated Class Schedule/Calendar

Module 2: Safety and Health of Welders		
1 Demonstrates proper use and inspection of personal protection equipment (PPE).	**Text:** Ch. 1: 14, 16–17, 20–21, 25, 27, 30–33 Ch. 5: 147–150 Ch. 6: 160–161, 186, 228–229 Ch. 7: 228 Ch. 8: 249, 252, 264 Ch. 9: 302 Ch. 10: 311–312 Ch. 11: 349–350 Ch. 12: 392 Ch. 14: 419 Ch. 16: 478–479 Ch. 18: 526 Ch. 22: 621	**Lab Workbook:** Lessons 1A, 1B, 1C, 1D, 5B, 6A, 8A, 9A, 11B, 17A, 23A
2 Demonstrates proper safe operation practices in work area.	**Text:** Ch. 1: 14–15, 18–19, 25–33 Ch. 5: 146 Ch. 10: 311–312 Ch. 12: 392–395 Ch. 14: 410–415, 429–430 Ch. 16: 478–479 Ch. 22: 621 Ch. 32: 825–826, 829–830	**Lab Workbook:** Lessons 1A, 1B, 1C, 1D, 6A, 8A, 9A, 11B, 17A, 23A
3 Demonstrates proper use and inspection of ventilation equipment.	**Text:** Ch. 1: 19–21, 23–24, 27 Ch. 6: 161, 187 Ch. 7: 226 Ch. 22: 621 Ch. 32: 817	**Lab Workbook:** Job 6B-1 Lesson 9A
4 Demonstrates proper Hot Zone operation.	**Text:** Ch. 1: 24–26 Ch. 5: 229 Ch. 6: 160–161 Ch. 12: 393–395 Ch. 14: 419 Ch. 22: 621	**Lab Workbook:** Lessons 1A, 1B, 1C, 1D, 6A, 8A, 11B

5 Demonstrates proper work actions for working in confined spaces.	**Text:** Ch. 1: 20–21, 24 Ch. 7: 226 Ch. 8: 264 Ch. 14: 430 Ch. 22: 621	
6 Demonstrates proper use of precautionary labeling and MSDS information.	**Text:** Ch. 1: 21–22	
7 Demonstrates proper inspection and operation of equipment used for each welding and thermal cutting process used. (This is best done as a part of the process module/unit for each of the required welding or thermal cutting processes.)	**Text:** Ch. 1: 27, 31–33 Ch. 5: 131, 134 Ch. 6: 159–160 Ch. 8: 236–250 Ch. 9: 274–290 Ch. 10: 310–311 Ch. 12: 364–372 Ch. 23: 624–626	**Lab Workbook:** Lessons 1C, 6A, and 7B All welding and cutting jobs
Module 3: Drawing and Welding Symbol Interpretation		
1 Interpret basic elements of a drawing or sketch.	**Text:** Ch. 2: 35–43	**Lab Workbook:** Lesson 2 All Jobs in Lessons 6C, 6D, and 6E Jobs 9D-2 through 9D-7
2 Interpret welding symbol information.	**Text:** Ch. 3: 55–67	**Lab Workbook:** Lesson 3B Jobs 6E-1 through 6E-4 All Jobs in Lesson 8C All Jobs in Lesson 9D Jobs 9E-2 through 9E-6 All Jobs in Lessons 12C, 12D, and 12E Job 12F-1 Job 16A-1 Job 16B-1 Job 20-1 Job 21-1
3 Fabricate parts from a drawing or sketch.	**Text:** Ch. 2: 35–43 Ch. 3: 45–55	**Lab Workbook:** Lesson 2 All Jobs use drawing and AWS weld symbols.

Module 4: Shielded Metal Arc Welding (SMAW)		
1 Perform safety inspections of SMAW equipment and accessories.	**Text:** Ch. 1: 31–33 Ch. 5: 131, 134 Ch. 6: 159–160	**Lab Workbook:** Lesson 1C Lesson 6A Job 6B-1
2 Make minor external repairs to SMAW equipment and accessories.	**Text:** Ch. 5: 131, 134–138	Job 6B-1
3 Set up for (SMAW) operations on carbon steel.	**Text:** Ch. 6: 158–159, 161–165 Ch. 20: 561	**Lab Workbook:** Job 6B-1 All Jobs in Lessons 6C, 6D, and 6E
4 Operate SMAW equipment on carbon steel.	**Text:** Ch. 6: 161–172, 176–186	**Lab Workbook:** Jobs 6B-2 through 6B-5 All Jobs in Lessons 6C, 6D, and 6E
5 Make fillet welds in all positions on carbon steel.	**Text:** Ch. 6: 173–174, 177–180	**Lab Workbook:** Lesson 6C Job 6C-2 Job 6C-3 Lesson 6D Job 6D-1 Job 6D-2 Lesson 6E Job 6E-1 Job 6E-2 Job 6E-4 Job 6E-5
6 Make groove welds in all positions on carbon steel.	**Text:** Ch. 6: 173, 180–185	**Lab Workbook:** Lesson 6C Job 6C-1 Job 6C-4 Lesson 6D Job 6D-3 Lesson 6E Job 6E-3 Job 6E-6
7 Passes SMAW welder performance qualification test (2G and 3G, uphill, limited thickness test plates) on carbon steel.	Ch. 31: 797–799	

Module 5: Gas Metal Arc Welding (GMAW-S, GMAW Spray Transfer)		
Note: Jobs in the Lab Workbook can be modified as necessary by changing the specified metal transfer method.		
1 Perform safety inspection of GMAW equipment and accessories.	**Text:** Ch. 7: 208–222, 226 Ch. 9: 275, 291	**Lab Workbook:** Lesson 9A Job 6B-1
2 Make minor external repairs to GMAW equipment and accessories.	**Text:** Ch. 6: 214 Ch. 7: 220 Ch. 9: 278–280, 289–290	**Lab Workbook:** Lesson 7B
Short-Circuiting Transfer		
3 Set up for GMAW-S operations on carbon steel.	**Text:** Ch. 9: 268–270, 274–290	**Lab Workbook:** Lesson 7B Lesson 9C Job 9D-1
4 Operate GMAW-S equipment on carbon steel.	**Text:** Ch. 9: 268–270, 291–292	**Lab Workbook:** Lesson 9B Lesson 9D Job 9D-6 Lesson 9E All Jobs in Lesson 9E
5 Make fillet welds in all positions on carbon steel.	**Text:** Ch. 9: 268–270, 293–298	**Lab Workbook:** Job 9D-2 Job 9D-6 Job 9E-1 Job 9E-2 Job 9E-4 Job 9E-5
6 Make groove welds in all positions on carbon steel.	**Text:** Ch. 9: 268–270, 294–298	**Lab Workbook:** Job 9E-3 Job 9E-6
7 Passes GMAW-S welder performance qualification test on carbon steel.		

Spray Transfer		
8 Set up for GMAW (spray) operations on carbon steel.	**Text:** Ch. 9: 271–290	**Lab Workbook:** Lesson 7B Lesson 9C Job 9D-7
9 Operate GMAW (spray) equipment on carbon steel.	**Text:** Ch. 9: 271–272, 291–302	**Lab Workbook:** Lesson 9B Lesson 9D Job 9D-3 Job 9D-4 Job 9D-5 Job 9D-7
10 Make fillet welds in 1F and 2F on carbon steel.	**Text:** Ch. 9: 271–272, 293–296	**Lab Workbook:** Job 9D-3 Job 9D-5
11 Make groove welds in the 1G position on carbon steel.	**Text:** Ch. 9: 271–272, 294–295	**Lab Workbook:** Job 9D-4
12 Passes GMAW (spray) welder performance qualification test on carbon steel.	Ch. 31: 797–799	
Module 6: Flux Cored Arc Welding (FCAW-G/GM, FCAW-S)		
Note: Jobs in the Lab Workbook can be changed from the GMAW process to the FCAW-G or FCAW method.		
1 Perform safety inspections of FCAW equipment and accessories.	**Text:** Ch. 9: 275, 291	**Lab Workbook:** Job 6B-1 Lesson 9A
2 Make minor external repairs to FCAW equipment and accessories.	**Text:** Ch. 6: 214 Ch. 7: 220 Ch. 9: 278–281, 289–290	Job 6B-1 Lesson 7B
Gas Shielded		
3 Set up for FCAW-G/GM operations on carbon steel.	**Text:** Ch. 9: 273–290	**Lab Workbook:** Lesson 7B Lesson 9C All welding jobs in Lessons 9D and 9E require the setting of variables.
4 Operate FCAW-G/GM equipment on carbon steel.	**Text:** Ch. 9: 291–298	**Lab Workbook:** Lessons 9D and 9E Jobs 9D-2 through 9D-6 All Jobs in Lesson 9E

5 Make fillet welds in all positions on carbon steel.	**Text:** Ch. 9: 293–298	**Lab Workbook:** Lessons 9D and 9E Job 9D-2 Job 9D-3 Job 9D-5 Job 9D-6 Job 9E-1 Job 9E-2 Job 9E-4
6 Make groove welds in all positions on carbon steel.	**Text:** Ch. 9: 294–298	**Lab Workbook:** Lessons 9D and 9E Job 9D-4 Job 9D-7 Job 9E-3 Job 9E-6
7 Passes FCAW-G/GM welder performance qualification test on carbon steel.	Ch. 31: 797–799	
Self-Shielded		
8 Set up for FCAW-S operations on carbon steel.	**Text:** Ch. 9: 273–281, 289–290	**Lab Workbook:** Lesson 7B Lesson 9C Job 9D-1
9 Operate FCAW-S equipment on carbon steel.	**Text:** Ch. 9: 291–292	**Lab Workbook:** Lessons 9D and 9E All Jobs in Lessons 9D and 9E
10 Make fillet welds in all positions on carbon steel.	**Text:** Ch. 9: 293–298	**Lab Workbook:** Lessons 9D and 9E Job 9D-2 Job 9D-3 Job 9D-5 Job 9D-6 Job 9E-1 Job 9E-2 Job 9E-4
11 Make groove welds in all positions on carbon steel.	**Text:** Ch. 9: 294–298	**Lab Workbook:** Job 9D-4 Job 9D-7 Job 9E-3 Job 9E-6
12 Passes FCAW-S welder performance qualification test on carbon steel.	Ch. 31: 797–799	