

### Basic Course Information

Semester:	<b>Spring 2020</b>	Instructor Name:	<b>Frank Cervantes</b>
Course Title & #:	<b>Weld 135</b>	Email:	<b>Frank.cervantes@imperial.edu</b>
CRN #:	<b>21612</b>	Webpage (optional):	
Classroom:	<b>3120</b>	Office #:	
Class Dates:	<b>Feb 18 2020- Jun12 2020</b>	Office Hours:	<b>By Appt.</b>
Class Days:	<b>Tuesday/Thursday</b>	Office Phone #:	<b>760-427-0999</b>
Class Times:	6:00-10:15	Emergency Contact:	
Units:	4		

### Course Description

This course is designed to be a study of Shielded Metal Arc Welding (SMAW). This course is one of the required courses in the Welding Technology Program. The student will develop the theory and knowledge base to be able to safely and properly practice welding techniques in Shielded Metal Arc Welding (SMAW) on Structural Steel (A-36) plate. To support and enhance the understanding and application of SMAW and Welding Technology principles, the student will develop an understanding of Industrial Safety Standards, Technical Drawings, Weld/Welding Symbols, Electrical Fundamentals, Fundamental SMAW Welding Metallurgy, Fundamentals of Quality Assurance, Welding Codes (AWS D1.1), and Weld Testing/Inspection. The development of welding skills sets and practices for SMAW applications on plate will require the proper use of Personal Protective Equipment (PPE) and the application of all Safety Rules. (CSU)

### Course Prerequisite(s) and/or Corequisite(s)

**Weld 100**

### 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. Explain the legal responsibilities of Employers, Supervisors, and Welding Personnel with regard to “Right to Know” OSHA regulations. (ILO1, ILO3)
2. Explain what welding parameters of AWS D1.1 are influenced by the application of the code in Alaska in the Winter as compared to the application of the code in Brazil in the Summer. (ILO1, ILO2, ILO5)

3. Identify and apply the correct electrode type, electrode size, current setting, polarity, and welding technique for a given Welding Procedure Specification (WPS). (ILO1, ILO2)
4. Complete a written report based on information gathered from a Technical Literature Review of “Shielded Metal Arc Welding and its Many Uses in Manufacturing.” (ILO1, ILO4)
5. Define the physical and mechanical properties of Structural Steel (A-36) and how these are influenced by Shielded Metal Arc Welding (SMAW) (ILO1, ILO2)

### **Course Objectives**

Upon satisfactory completion of the course, students will be able to:

1. Understand, recognize, and demonstrate safe practices and proper use of related tools.
2. Understand and apply SMAW terminology and weld/welding symbols.
3. Understand and apply the principles of filler materials science and welding metallurgy.
4. Understand and explain the electrical fundamentals applicable to SMAW welding power sources.
5. Understand and explain the set-up and operation of welding circuits and power sources.
6. Understand and demonstrate the principles of Shielded Metal Arc Welding (SMAW).
7. Understand and demonstrate the principles of Quality Assurance and Weld Inspection.

### **Textbooks & Other Resources or Links**

Hobart Institute of Welding Technology  
Technical Guide and Lab Manual

[Shielded Metal Arc Welding Structural\(Advanced 1\)](#)

Item #: EW-369 SMAWA-1

Item #: EW-472

### **Course Requirements and Instructional Methods**

#### **Lecture Outline**

A Safety

- 1.1 Shop safety and established rules based on 29 CFR 1910 General Industry
- 1.2 Personal Protective Equipment for SMAW welding.
- 1.3 Hazard Controls
- 1.4 Right to Know OSHA Regulations
- 1.5 Safe use of tools and equipment related to SMAW.

1.6 Electrical Safety

B. Shielded Metal Arc Welding and its Terminology

2.1 SMAW Processes; DC welding and AC welding, manual and automated

2.2 Parts of a Weld both Groove and Fillet and Weld Joint Types

2.3 Weld/Welding Symbols and Industrial Technical Drawings

2.4 SMAW Consumables and base metals

2.5 SMAW Welder Qualification and Welder Certification to AWS D1.1

2.6 Welding Codes, Specifications, and Welding Procedure Specifications

C. Material Science and Welding Metallurgy

3.1 Alloys in SMAW and their Identification and Characteristics

3.2 Metal Physical Properties

3.3 Alloy Mechanical Properties

3.4 Steel Alloy Chemical Properties

3.5 Heat Affected Zone, and Time/Temperature/Transformation

D. Electrical Fundamentals and SMAW Welding Power Sources

4.1 Electricity and Electron Flow

4.2 Volts, Amperes, and Resistance

4.3 AC/DC current and Polarity (DCEN and DCEP)

4.4 Welding Circuits

4.5 Welding Power Sources and NEMA Rating

4.6 Transformers and Inverters

E. Shielded Metal Arc Welding (SMAW)

5.1 SMAW Power Sources and set-up for Steel (E-6010, E-7018)

5.2 SMAW Electrodes and Filler Metal (Steel)

5.3 SMAW Welding Circuits and Circuit Components

5.4 SMAW Manual welding on steel; 1G, 2G, 3G, 4G, and 1F, 2F, 3F, and 4F

F. Welding Quality Assurance, Weld Testing, and Inspection

6.1 Welding Codes and Acceptance Criteria

6.2 Nondestructive Testing and Destructive Testing on Weld Samples

6.3 Welder qualification in SMAW, ANSI/AWS D1.1 Welding Code

6.4 Welder Qualification, Guided Bend Test, Fillet Break Test, and ASME Leak Test (Visual)

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.

### 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 exercises and homework)

Scale for Grades Based on cumulative points earned for the semester, the grade assigned will be as follows;

90-100% A and represents EXCELLENT work and outcomes

80%-89% B and represents GOOD work and outcomes

70%-79% C and represents SATISFACTORY work and outcomes

60%-69% D and represents LESS THAN SATISFACTORY work and outcomes

Below 59% F and represents UN-SATISFACTORY work and outcomes

As provided 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 (Ideally with Safety Toe)
- A welding jacket with leather sleeves or other flame 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 tools as will facilitate student learning activities
- If available secure a locker if so desired and provide a lock (contents must be removed at end 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 text book available in the IVC book store
- Follow all other IVC policies and guidelines etc...

## 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, only students enrolled in the class may attend; children are not allowed.

### **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.

- **CANVAS LMS.** Canvas is Imperial Valley College's main Learning Management System. To log onto Canvas, use this link: [Canvas Student Login](#). The [Canvas Student Guides Site](#) provides a variety of support available to students 24 hours per day. Additionally, a 24/7 Canvas Support Hotline is available for students to use: 877-893-9853.
- **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 counseling services are available for currently enrolled students. Services are provided in a confidential, supportive, and culturally sensitive environment. Please contact the IVC Mental Health Counseling Services at 760-355-6310 or in the building 1536 for appointments or more information..

### **Veteran's Center**

The mission of the [IVC Military and Veteran Success Center](#) is to provide a holistic approach to serving military/veteran students on three key areas: 1) Academics, 2) Health and Wellness, and 3) Camaraderie; to serve as a central hub that connects military/veteran students, as well as their families, to campus and community resources. Their goal is to ensure a seamless transition from military to civilian life. The Center is located in Building 600 (Office 624), telephone 760-355-6141.

### **Extended Opportunity Program and Services (EOPS)**

The Extended Opportunity Program and Services (EOPS) offers services such as priority registration, personal/academic counseling, tutoring, book vouchers, and community referrals to qualifying low-income students. EOPS is composed of a group of professionals ready to assist you with the resolution of both academic and personal issues. Our staff is set up to understand the problems of our culturally diverse population and strives to meet student needs that are as diverse as our student population.

Also under the umbrella of EOPS our CARE (Cooperative Agency Resources for Education) Program for single parents is specifically designed to provide support services and assist with the resolution of issues that are particular to this population. Students that are single parents receiving TANF/Cash Aid assistance may qualify for our CARE program, for additional information on CARE please contact Lourdes Mercado, 760-355- 6448, [lourdes.mercado@imperial.edu](mailto:lourdes.mercado@imperial.edu).

EOPS provides additional support and services that may identify with one of the following experiences:

- Current and former foster youth students that were in the foster care system at any point in their lives
- Students experiencing homelessness
- Formerly incarcerated students

To apply for EOPS and for additional information on EOPS services, please contact Alexis Ayala, 760-355-5713, [alexis.ayala@imperial.edu](mailto:alexis.ayala@imperial.edu).

### **Student Equity Program**

- The Student Equity Program strives to improve Imperial Valley College's success outcomes, particularly for students who have been historically underrepresented and underserved. The college identifies strategies to monitor and address equity issues, making efforts to mitigate any disproportionate impact on student success and achievement. Our institutional data provides insight surrounding student populations who historically, are not fully represented. Student Equity addresses disparities and/or disproportionate impact in student success across disaggregated student equity groups including gender, ethnicity, disability status, financial need, Veterans, foster youth, homelessness, and formerly incarcerated students. The Student Equity Program provides direct supportive services to empower students experiencing insecurities related to food, housing, transportation, textbooks, and shower access. We recognize that students

who struggle meeting their basic needs are also at an academic and economic disadvantage, creating barriers to academic success and wellness. We strive to remove barriers that affect IVC students' access to education, degree and certificate completion, successful completion of developmental math and English courses, and the ability to transfer to a university. Contact: 760.355.5736 or 760.355.5733 Building 100.

- The Student Equity Program also houses IVC's Homeless Liaison, who provides direct services, campus, and community referrals to students experiencing homelessness as defined by the McKinney-Vento Act. Contact: 760.355.5736 Building 100.

### **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.