IMPERIAL VALLEY COLLEGE

Basic Course Information

Semester:	**Spring 2026**	Instructor Name:	**Frank Cervantes**
Course Title & #:	**Weld 135 SMAW on Plate**	Email:	**frank.cervantes@imperial.edu**
CRN #:	**20804**	Webpage (optional):	
Classroom:	**3120**	Office #:	**Online**
Class Dates:	**2/17/26 to 6/12/26**	Office Hours:	**Mon/Wed. 5pm to 6pm**
Class Days:	**Monday/Wednesday**	Office Phone #:	**7604270999**
Class Times:	**6:00pm to 10:25pm**	Emergency Contact:	
Units:	4	Class Format/Modality:	Face to Face in person

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)

Imperial Valley College Course Syllabus – Weld 135 Spring 2026

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

IMPERIAL VALLEY COLLEGE

Academic Honesty (Artificial Intelligence -AI)

IVC values critical thinking and communication skills and considers academic integrity essential to learning. Using AI tools as a replacement for your own thinking, writing, or quantitative reasoning goes against both our mission and academic honesty policy and will be considered academic dishonesty, or plagiarism unless you have been instructed to do so by your instructor. In case of any uncertainty regarding the ethical use of AI tools, students are encouraged to reach out to their instructors for clarification.

Accessibility Statement

Imperial Valley College is committed to providing an accessible learning experience for all students, regardless of course modality. Every effort has been made to ensure that this course complies with all state and federal accessibility regulations, including Section 508 of the Rehabilitation Act, the Americans with Disabilities Act (ADA), and Title 5 of the California Code of Regulations. However, if you encounter any content that is not accessible, please contact your instructor or the area dean for assistance. If you have specific accommodations through ***DSPS***, contact them for additional assistance.

We are here to support you and ensure that you have equal access to all course materials.

Course Policies

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 dro
• 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.

Financial Aid

Your Grades Matter! In order to continue to receive financial aid, you must meet the Satisfactory Academic Progress (SAP) requirement. Makings SAP means that you are maintaining a 2.0 GPA, you have successfully completed 67% of your coursework, and you will graduate on time. If you do not maintain SAP, you may lose your financial aid. If you have questions, please contact financial aid at finaid@imperial.edu.

IVC Student Resources

IVC wants you to be successful in all aspects of your education. For help, resources, services, and an explanation of policies, visit http://www.imperial.edu/studentresources or click the heart icon in Canvas.

Anticipated Class Schedule/Calendar

WEEK 1	**Introduction to Arc Welding** **Measurement in Welding** **Welding Safety**	**LAB PARTICIPATION**
WEEK 2	**Common Types of Welds and Joints .** **Welding Symbols** **Arc Welding Equipment.**	**LAB PARTICIPATION**

WEEK 3	**Types of Arc Welding Machines** **Electrodes**	**LAB PARTICIPATION**
WEEK 4	**Selecting the Proper Electrode** **Joint Preparation**	**LAB PARTICIPATION**
WEEK 5	**Preparing to Weld** **Running Short Beads**	**LAB PARTICIPATION**
WEEK 6	**Running Continuous Beads** **Running Multidirectional Beads** **Padding.**	**LAB PARTICIPATION**
WEEK 7	**Welding Problems—How to Solve Them** **Controlling Distortion**	**LAB PARTICIPATION**
WEEK 8	**MID TERM**	
WEEK 9	**Welding Square-Groove Joints** **Single-Pass Fillet Lap-Joint Welds**	**LAB PARTICIPATION**
WEEK 10	**Single-Pass Fillet Welds** **Multiple-Pass Fillet Welds**	**LAB PARTICIPATION**
WEEK 11	**V-Groove Butt Welds** **Corner Joint Fillet Welds** **Welding Round Stock**	**LAB PARTICIPATION**
WEEK 12	**Welding in the Horizontal Position** **Welding in the Vertical Position**	**LAB PARTICIPATION**
WEEK 13	**Welding in the Overhead Position** **Cutting with the Arc**	**LAB PARTICIPATION**
WEEK 14	**Welding Sheet Metal** **Hardsurfacing**	**LAB PARTICIPATION**
WEEK 15	**Identifying Metals** **Inspection and Quality Control** **Careers in Welding**	**LAB PARTICIPATION**
WEEK 16	**FINALS**	
LAB PROJECTS		
	MIX ELECTRODE CROSS 6010,7018,7024,6013	
	3G 7018 Practice Cross	
	4G 7018 Practice Cross	
	6010 open root test	
	6010 3F Weld Test Structure	
	7018 3F Weld Test Structure	
	6010 4F Weld Test Structure **7018 4F Weld Test Structure**	
	3G Unlimited Bend Test	
	4G Unlimited Bend Test	

Subject to change without prior notice