Imperial Valley College

Industrial Technology Department
Welding Technology Program

Course Syllabus,

WELD 100 (Welding Technology), **Spring Semester 2014**
Instructor: Gonzalo Huerta, BS, MA, AWS/CWI

I. Function and purpose for the course syllabus:

1. Establish a "Culture" of providing for the **"WHY of Activities."**
2. Establish an Early **Point-of-Contact** between Student and Faculty,
3. Establish an essential **Connection** between Student and Faculty,
4. Set the **Tone** for the teaching and learning experience,
5. Serve as a **General Orientation** for the semester,
6. Share educational **Purposes, Practices, Procedures, and Processes**,
7. Provide an opportunity for **Networking** and team-building,
8. Acquaint Students with the **Logistics** for the course,
9. Provide the college **Instructional Calendar** and **Course Calendar**,
10. Define **Student Responsibilities**,
11. Discuss Institutional **Student Learning Outcomes (SLO's),**
12. Define participation leading to **Successful Course Completion**,
13. Set **Course Parameters** ,
14. Explain **Course Context** for teaching and learning,
15. Describe available **Learning Resources** and support for learning,
16. Provide for **Commitment** from the Faculty and from the Students,
17. Define mutual **Obligations/Expectations** for Faculty and Students, and
18. Serve as a **Teaching and Learning Agreement** between Faculty and Students.

II. Essential Details: Weld 100, Spring Semester 2014,

Course Title	**Welding Technology**
Course Number	**WELD 100 (CRN 20793)**
Credit Hours/Units	5 cr. (3 lec. 2 lab.)
Semester	Spring 2014

Class Schedule

LEC: Tuesday 8:35 am to 11:45 am

LAB: Wednesday/Thursday 8:35 am to 11:45 am

Location

LEC 1200 Building and LAB 1200 Building

Professor:	Gonzalo Huerta, Sr., BS., MA., AWS/CWI
Contact Information	760-562-7758 Cell
	760-355-6419 Office
	gonzalo.huerta@imperial.edu
Office Location	1200 Building
Division Office	1100 Building
Division Phone Number	760-355-6262
Division Chair	Mr. Jose Lopez
Division Secretary	Frances Arce-Gomez

III. Course Description: WELD 100,

The study of metals is an integral part of essentially all science and technologically based disciplines. This course will prepare the student for the specialized application of **Welding and Welding processes** within their chosen field of study. The student will establish a broad knowledge base and understanding of the **properties of materials** used in our technological world. **Industrial Safety** will be of paramount importance and will be practiced during all activities associated with this course. Emphasis will be placed on the **welding, metallurgical, mechanical, and physical properties** of materials. Skills development will be stressed during the laboratory portion of the course and will be based on Welding Industry accepted **practices, procedures,** and **techniques**.

IVC Catalog Description; A complete basic study of welding technology and safety, the student practices welding techniques for skills development in Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), Gas Tungsten Arc Welding (GTAW), Oxy-Acetylene welding and cutting (OFW/OFC), and Plasma Arc Cutting (PAC). All the welding and cutting processes require proper use of Personal Protective Equipment (PPE) and the following of shop safety, electrical safety, and safe tools usage.

IV. Important Dates for Spring Semester 2014:

NOTE: Please refer to the Course Syllabus Addendum provided, the College General Catalog, the Spring Semester Class Schedule, and/or the IVC website (www.imperial.edu).

V. Course Goal(s): Weld 100, Spring Semester 2014

The goals to be achieved during the completion of WELD 100, Welding Technology are;

1. To have the **students acquire an understanding** of materials and materials science within the context of Manufacturing Processes and Welding Technology, and
2. To have the **students develop the fundamental skills set** applicable to Welding Technology and laboratory practices, techniques, and procedures.

VI. Course Objectives and Competencies: WELD 100,

Upon successful completion of WELD 100, Welding Technology the student will be able to;

1. Demonstrate knowledge of **materials** as related to Welding Technology,
2. Demonstrate knowledge of **Industrial Safety** (29 CFR 1910 General Industry),
3. Demonstrate **skill and knowledge** associated with SMAW, GTAW, GMAW, PAC, OFC, and OFW,
4. Demonstrate the necessary skills set to produce assigned **welding samples** per acceptable Welding Procedure Specifications **(WPS),**
5. Describe and discuss three fundamental groups of **materials' properties,**
6. Explain the importance of materials, their properties, their **microscopic** behavior, and their **macroscopic** behavior,
7. Describe the essential **components (T.T.T.)** of "Welding" to be controlled to attain desired results in mechanical treatment, thermal treatment, and service life of materials, and
8. Demonstrate an understanding of and use of **Terminology** associated with Welding Technology, Weld/Welding Symbols, Physical Metallurgy, and Manufacturing Processes Technology.

NOTE: All activities during the semester will have as a basis the IVC *Institutional Student Learning Outcomes* which are;

IVC Institutional Student Learning Outcomes

Communication Skills
Critical Thinking Skills
Personal Responsibility
Information Literacy
Global Awareness

VII. Welding Technology Program Mission Statement:

*"*It the **Mission** of the IVC Welding Technology Program to offer **Educational, Academic,** and **Skills Development** opportunities designed to assist the individual in mastering the necessary **technical competencies** and **skills sets** to meet the qualification **requirements** to develop professionally as **Welders** (Certificate of Completion Option) and/or as **Welding Technicians** (Associate of Science Degree Option)*"*

VIII. Teaching Philosophy to Facilitate Learning:

As a Master Teacher, I believe it is my privilege and my duty to inspire my students to learn and it is my responsibility to challenge my students to reach their fullest potential.

To this end;

1. I believe my purpose as a teacher goes beyond the teaching of Welding Technology and Physical Metallurgy. It is equally important; to help my students grow as individuals, to support their intellectual and professional development, to challenge their assumptions, and to expand their worldviews.
2. I believe that I succeed as a Teacher when my students are inspired to inquire, teach themselves to pursue knowledge, and learn-to-learn.
3. I believe in challenging my students to meet and exceed standards of performance.
4. I believe in providing students with the resources necessary to reach the prescribed standards.
5. I accept my role as Teacher seriously and I want my students to know that I am personally dedicated to their success because I care deeply that they learn, grow, and develop.
6. I believe that an important element of learning is building structure to support the learning process that will lead to critical thinkers and effective life-long learners.

7. I believe that I should continuously improve my teaching skills and enhance the content of my courses.
8. My love of teaching was not the first inspiration for me to pursue and participate in my Post-Secondary Academic career; Technology and Engineering was my High School Graduation goal.
9. After teaching Part-Time I discovered my true Vocation was teaching and I returned to University for my B.S. in Industrial Technology and my M.A. in Administration and Supervision.
10. For the past forty (42) years, teaching has been my vocation, my passion, my profession, and my contribution to the betterment of my students, our community and our society.

IX. Academic Integrity:

Integrity is the foundation of all actions in our world. Any student participating in acts of academic dishonesty including, but not limited to; copying the work of others, using unauthorized "crib notes", plagiarism, stealing tests, or forging an instructor's signature; will be subject to the disciplinary procedures and consequences as outlined in the IVC Student Code of Conduct.

X. Expectations and Responsibilities:

We (Faculty and Students) will cooperatively strive to create and maintain a **healthy teaching and learning environment**. **Civility and respect** for all individuals present during all of our activities will foster team dynamics and will nurture the fundamentals for success.

1. Any form of **HARASSMENT** against any individual will not be acceptable,
2. Anything contributing to a **HOSTILE ENVIRONMNET** will not be acceptable,
3. Any type of classroom/lab **DISRUPTION** will not be acceptable.
4. Unauthorized use of **ELECTRONIC DEVICES** will not be acceptable.
5. **CELL PHONE** ring tones, texting, chatting, etc. during class will not be acceptable.

XI. Teaching and Learning Elements for WELD 100:

The course topics and course content listed below constitutes the elements for the AWS profile of **Entry Level Welding Personnel.** These are the components for teaching and learning that will guide our progress throughout the semester. This listing is arranged by content as presented, in part, by the American Welding Society (AWS QC10-95); *Specification for Qualification and Certification for Entry Level Welders* and **should not be interpreted as chapters** in the textbook, units of instruction, or instructional modules.

1. Safety and Health Requirements, Practices, and **OSHA References,**
2. Applied essential Reading, Computational, and Technical skills,
3. Standard Welding Terms and Definitions (ANSI/AWS A3.0),
4. Knowledge of Welding **Technology,**
5. Theory and Knowledge of **Welding** and Cutting,
6. Technical Drawing, Welding Symbols, and Weld Symbol Interpretation,
7. Base and Filler Metal Identification,
8. Base and Filler Metal Selection,
9. Essential Welding Variables and Parameters,
10. Welding Procedure Specifications (WPS's),
11. Electrical Fundamentals,
12. Weld Assembly and Fabrication Principles and Practices,
13. Essentials of Qualification Welding Tests and Welder Certification,
14. Materials and Metallurgical Properties of Metals,
15. Macroscopic Properties of Materials and Metal Behavior, (continued)
16. Alloys and Alloying Processes,
17. Metal Strengthening Mechanisms and Processes,
18. Physical Properties of Metals,
19. Mechanical Properties of metals,
20. Chemical Properties of Metals, and
21. Thermal Treatment Processes.

XII. Methods of Instruction for Learning:

1. Lecture
2. Media Presentations
3. Laboratory Experience
4. Formal and Informal Discussion
5. Outside Assignments

XIII. Evaluation and Grading Criteria and Methods:

This course (WELD 100) is designed to be an essential part of the course sequence in the Degree and Certificate programs in **Welding Technology.** As such, it is to be a "For Credit" course. The cumulative effort and participation of the student throughout the semester will contribute to the outcome of an earned grade of, A, B, C, D, or F.

All assigned activities will be quantifiable and recorded based on a designated point value.

There will be a total point value per assignment/activity and there will be a total point value for the semester. Based on the cumulative points earned for the semester, the grade assigned will be as follows;

1. A grade of "A" represents EXCELLENT work and outcomes = 90 to 100% of Total Points in Lecture and Lab,

2. A grade of "B" represents GOOD work and outcomes= 80 to 90% of Total Points in Lecture and Lab,

3. A grade of "C" represents SATISFACTORY work and outcomes=70 to 80% of Total Points in Lecture and Lab,

   Note: The ACCEPTABLE/SATISFACTORY criteria for many Certification and Evaluation activities <u>in Industry</u> is set at the 70% rate to designate success with a notation of (Pass-Fail/Accept-Reject)

4. A grade of "D" represents LESS THAN SATISTACTORY work= 60 to 70% of Total Points in Lecture and Lab, and

5. A grade of "F" represents UN-SATISFACTORY work LESS THAN 60% of Total Points in Lecture and Lab.

XIV. Grading Activities, Behaviors, Elements, and Characteristics that impact Performance and Grading:

1. Student PARTICIPATION will generate points and will impact learning outcomes;
   a. Attendance is important and required,
   b. Attendance for First-Day-of-Classes is required,
   c. Tardiness and Absenteeism is not acceptable and will negatively impact the student's ability to participate, learn, and perform,
   d. WITHDRAWAL from class should be considered when students are un-able to meet their commitment to the class, and
   e. Student conduct will be in accordance with the College Code of Conduct.

2. There will be four **Unit Exams** plus the **Final** exam during the semester;
   a. Unit Exams will be announced and will be closed book, 100 pts +/- each, Note: Any examination not completed by the student during the examination period must be "made-up" by the student **prior** to the next regularly scheduled class meeting.
   b. Final Exam will be Comprehensive Knowledge (Lecture/Lab) 250 pts +/-,
   c. **Quizzes** will **not** be announced 25 pts +/- each,
      Note: Missed Quizzes **cannot** be "Made-up."
   d. **Lab Exercise** Technical Reports will be 50 pts +/- each,
   e. One **Technical Research/Literature Review Paper** will be 250 pts +/-,

XV. Students with Disabilities:

Any student with a disability who may need accommodations should notify the Instructor to assure that arrangements for proper accommodations are made. Imperial Valley College provides academic accommodations to students with disabilities through the Office of Student Services. Disabled Student Programs and Services (DSPS) provides reasonable and appropriate accommodations to students who have documented disabilities. It is the responsibility of the student to make the Coordinator of DSPS aware of the need for accommodations in the classroom prior to the beginning of the semester. Students should follow-up with their Instructors once the semester begins. Please contact the Coordinator of DSPS at (760) 355-6312, (760) 355-4174 (TDD), and in the College Counseling Center (Building 100).

XVI. Necessary Equipment, Materials, and Supplies:

1. Textbook; Per the textbook presented by the Instructor,
2. OSHA Certified and Acceptable Safety Glasses (ANSI Z-87),
3. Required Personal Protective Equipment (PPE)
   - Welding Cap,
   - Ear and Hearing Protection,
   - Welding Face Shield (Hood/Helmet),
   - Work Shirt,
   - Welding Jacket,
   - Work Pants,
   - Work Shoes (Ideally with Safety Toe),
   - Welding gloves, and
4. All other equipment, materials, and supplies that will contribute to the learning process and student success in the course will be provided.

XVII.Textbook

Welding Technology Fundamentals

Author: Bowditch, Bowditch, and Bowditch
Edition: Fourth (4^{th})
Publisher: The Goodheart-Wilcox Company, Inc
ISBN: 978-1-60525-256-8

XVIII. Standards and Specifications References for Welding Technology:

American Society for Metals (ASM International)
American Welding Society (AWS)
American Society of Testing and Materials (ASTM)
American National Standards Institute (ANSI)
American Society of Mechanical Engineers (ASME)
American Society for Nondestructive Testing (ASNT)

IXX. FREQUENTLY ASKED QUESTIONS (FAQ) in Welding:

1. Why do metals **crystallize?**
2. What does **stress** have to do with metals?
3. **Carbon is it'**; why worry about anything else?
4. Why would we want metals to be **elastic** and stretch out of shape?
5. Why wait for the **weld to cool,** use water or air to cool it down?
6. If you heat up the metal, won't that make it distemper?
7. Isn't it a fact that if a metal is hard it is strong?
8. What does **metallurgy** have to do with Welder Certification?
9. There are many types of **Certifications,** why not get the one that covers it all?
10. Why involve metallurgy in **Welding Codes** for welders?
11. **Careers in Welding** are for welders and why should the scientist get involved?
12. Why are there **so many certifications**?
13. Which is the "Life-Time" Welding Certification?
14. What are Welding Codes and **Welding Specifications**?
15. What are the **Health Hazards** associated with Welding?
16. Is employment controlled by **Unions and Apprenticeship Programs**?
17. What **educational levels** are required for Careers in Welding?
18. What **knowledge and skills** do Welders, Inspectors, Technicians, and Engineers need to be successful in a Welding Technology related Career?
19. Other Questions???????????????

(To be discussed during orientation)

Notes: