### WILLIAM RAINEY HARPER COLLEGE CAREER AND TECHNICAL PROGRAMS DIVISION

**GENERAL COURSE OUTLINE**

Department Coordinator: Kurt J. Billsten Phone: 847-925-6149 Email: Kbillste@harpercollege.edu

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| --- | --- | --- | --- |
| Course Prefix | Course Number | Course Title | *Contact Hours* |
| WLD | 212 | WELDING IV | 1. *2. Lecture/Demonstration*   1. 4 *Lab/Studio* 2. 4 *Credit Hours* |

**Course Description**

Prerequisite: WLD 211 with a grade of Cor better, or consent of program coordinator.

Covers advanced out-of-position and multi-pass arc welding including GMAW (gas metal arc welding), SMAW (shielded metal arc welding) and GTAW (gas tungsten arc welding). Emphasizes working from blueprints and development of welding skills necessary to pass welder qualification tests. Students must pass guided bend tests to become "certified welders" in accordance with the AWS (American Welding Society) D1.1 Structural Welding Code.

### Topical Outline

1. Safety in Welding
2. Lab Safety

Ill. Lab Set-up Procedure

1. Weld Evaluation and Testing
   1. Destructive Testing
      1. Guided Bend Test
      2. Hardness Test
   2. Nondestructive Examination
   3. Weld Discontinuities
   4. Welding Procedure Qualification
      1. Welding Procedure Specification
      2. Procedure Qualification Records
   5. Welder Qualification
2. Reading Welding Blueprints
   1. Welding Symbols
   2. Nondestructive Examination Symbols
3. Repair Welding
   1. Choosing Best Method
   2. Failure Analysis
   3. Identifying Base Metal
   4. Procedures
4. Standards and Codes
   1. Organizations
      1. ASTM
      2. SAE

3.AWS

4.ANSI

5.1SO

* 1. Materials Standards
  2. Fabrication Standards
  3. Welding Standards

### Method of Presentation

1. Lecture
2. Laboratory
3. Other:
   1. Videos where applicable

### Student Outcomes (The student should)

1. demonstrate knowledge of welding and material standards.
2. be able to work from blueprints and welder procedure specification sheets (WPS).
3. demonstrate proficiency in all forms of arc welding in all positions.
4. be able to pass guided bend tests for one (GMAW) and one (SMAW) WPS (become certified welder).

### Method of Evaluation

* 1. *Typical classroom assessment techniques*

\_Projects

\_Class participation

\_Objective tests

\_Studio/Lab performance

\_Final exam

\_Portfolios

\_Essays/Term papers

\_Oral examination

\_Research report

* 1. *Course content learning outcomes*

\_Quizzes

\_Group participation

\_Case study assignments

\_Homework

\_Midterm Exam

\_Exams

1. *Additional assessment information (optional).*

The following assignments will be considered satisfactorily completed when approved by the instructor.

* 1. Written examinations
  2. GTAW aluminum (vertical position)
     1. fillet
     2. butt
     3. inside corner
     4. outside corner
  3. GMAW aluminum (vertical position)
     1. fillet
     2. butt
     3. inside corner
     4. outside corner
  4. GTAW stainless steel (vertical position)
     1. fillet
     2. butt
     3. inside corner
     4. outside corner
  5. GMAW stainless steel (vertical position)
     1. fillet

### Textbook

* + 1. butt
    2. inside corner
    3. outside corner
  1. Welder qualification (must pass guided bend test)
     1. SMAW multi pass vertical up
     2. GMAW multi pass vertical up
        1. *Required*

o Item #EW369 SMAWA 1. Shielded Metal Arc Welding-Advanced 1. Hobart Institute of Welding Technology, 2012

o *Supplementary materials*

***None***

o *Software*

***None***

Prepared by: Kurt Billsten Fall 2012

CID: 3625

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