

**COURSE SYLLABUS**

**Advanced Gas Metal Arc Welding (GMAW)**

**WLDG 2447**

HCC is committed to provide learning and working environment that is free from discrimination on the basis of sex which includes all forms of sexual misconduct. Title IX of the Education Amendments of 1972 requires that when a complaint is filed, a prompt and thorough investigation is initiated. Complaints may be filed with the HCC Title IX Coordinator available at 713 718-8271.

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| **Semester with Course Reference Number (CRN)** | SPRING 2017  2447 Advance GMAW  10599 |
| **Instructor contact information (phone number and email address)** | John Mahoney  713-718-6822  John.Mahoney@hccs.edu |
| **Office Location and Hours** | Central campus workforce/JBW manufacturing building |
| **Course Location/Times** | 2447 GMAW Monday/Wednesday 2pm till 4:50pm |
| **Course Semester Credit Hours (SCH) (lecture, lab) If applicable** | |  |  |  | | --- | --- | --- | | Credit Hours | 4.00 |  | | Lecture Hours | 2.00 |  | | Laboratory Hours | 6.00 |  | |
| **Total Course Contact Hours** | 96 |
| **Continuing Education Units (CEU): if applicable** | N/A |
| **Course Length (number of weeks)** | 16 |
| **Type of Instruction** | Lab/Lecture |
| **Course Description:** | Advanced topics in Gas Metal Arc Welding (GMAW). Includes welding in various positions and directions. |
| **Course Prerequisite(s)** |  |
| **Academic Discipline/CTE Program Learning Outcomes** | * Demonstrate general shop safety * Setup oxy-fuel equipment * Setup arc welding equipment * Apply procedures for operating arc welding equipment |
| **Course Student Learning Outcomes (SLO): 4 to 7** | 1. Explain general shop safety procedures 2. Describe operation of Oxy-fuel equipment 3. Setup Gas Metal Arc and Flux-Cored Arc Welding equipment 4. Weld with Gas Metal Arc equipment |
| **Learning Objectives (Numbering system should be linked to SLO - e.g., 1.1, 1.2, 1.3, etc.)**  **SCANS and/or**  **Core Curriculum**  **Competencies: If applicable** | 1. **Explain general shop safety procedures**    1. Describe appropriate personal protective equipment.    2. Describe the special safety precautions associated with the handling and use of cylinders and oxy-fuel cutting equipment.    3. Evaluate the need for proper ventilation in work area near fuel cutting operations.   2. **Describe operation of oxy-fuel equipment**  2.1 Describe the properties of oxygen and acetylene cylinders.  2.2 Describe the acetylene cylinders valve and safety plugs.  2.3 Explain that cylinder valves should be cover with a cap when not in use.  2.4 Explain that a cylinder must be secured before its protective cap is  removed.  3. **Setup Gas Metal Arc and Flux-Cored Arc Welding equipment**  3.1 Describe general safety procedures for GMAW and FCAW.  3.2 Identify GMAW and FCAW equipment.  3.3 Explain the filler metals and shielding gases used to perform GMAW and  FCAW.  3.4 Explain how to set up and use GMAW and FCAW equipment.  3.5 Explain how to clean GMAW and FCAW welds  4. **Weld with Gas Metal Arc Equipment**  4.1 Explain Gas Metal Arc Welding GMAW safety.  4.2 Identify and explain the function of GMAW equipment.  4.3 Identify and explain the function of GMAW filler metals.  4.4 Identify and explain the function of GMAW shielding gases.  4.5 Set up GMAW equipment.      **Explain general shop safety procedures**  Work Place Competencies ©  C6 Organizes and Maintain Information  C9 Participates as a Member of a Team  C19 Applies Technology to Task  Foundations Skills  F3 Arithmetic  F9 Problem Solving  F13 Responsibility  **Describe operation of Oxy-fuel equipment**  Work Place Competencies ©  C6 Organizes and Maintain Information  C9 Participates as a Member of a Team  C19 Applies Technology to Task  Foundations Skills  F3 Arithmetic  F9 Problem Solving  F13 Responsibility  **Setup Gas Metal Arc and Flux-Cored Arc Welding equipment**  Work Place Competencies ©  C6 Organizes and Maintain Information  C9 Participates as a Member of a Team  C19 Applies Technology to Task  Foundations Skills  F3 Arithmetic  F9 Problem Solving  F13 Responsibility  **Weld with Gas Metal Arc equipment**  Work Place Competencies ©  C6 Organizes and Maintain Information  C9 Participates as a Member of a Team  C19 Applies Technology to Task  Foundations Skills  F3 Arithmetic  F9 Problem Solving  F13 Responsibility |
| **Course Calendar** | Current Catalog (CAT 2016) |
| **Instructional Methods** | Lecture/Lab |
| **Student Assignments** | **Explain general shop safety procedures**  Textbook Reading as assigned by instructor  Chapter Review /Questions – Test your knowledge  Weekly Quiz  **Describe operation of Oxy-fuel equipment**  Textbook Reading as assigned by instructor  Chapter Review /Questions – Test your knowledge  Weekly Quiz  **Setup Gas Metal Arc and Flux-Cored Arc Welding equipment**  Textbook Reading as assigned by instructor  Lab assignment/class project  Video  Weekly Quiz    **Weld with Gas Metal Arc equipment**  Textbook Reading as assigned by instructor  Lab assignment/class project  Video  Weekly Quiz |
| |  |  | | --- | --- | | **Student Assessments** |  | | |  | | --- | | Written Test: Students must score 70% or higher on mid-term and final exams.  Performance Testing: Students must be able to perform setting up, igniting, adjusting, and shutting down oxy fuel equipment. Students must be able to perform cutting a shape from thin and thick steel. Set up arc welding equipment. | |
| **Instructor's Requirements** | N/A |
| **Program/Discipline Requirements: If applicable** | Students are required to enroll in **LEAD 1300 -** Critical Thinking |
| **HCC Grading Scale** | |  |  |  | | --- | --- | --- | | A (90-100/ Excellent) |  | 4 points per semester hour | | B (80-89/Good) |  | 3 points per semester hour | | C (70-79/Fair) |  | 2 points per semester hour | | D (60-69/Passing \*) |  | 1 points per semester hour |  | | F (Failing) |  | 0 points per semester hour |  | | FX (Failure due to non-attendance ) |  | 0 points per semester hour |  | | IP ( In Progress) |  | 0 points per semester hour |  | | W (Withdrawn) |  | 0 points per semester hour |  | | I ( Incomplete) |  | 0 points per semester hour |  |   AUD (Audit) 0 points per semester hour  IP (In Progress) is given only in certain developmental courses. The student must re-enroll to receive credit.  COM (Completed) is given in non-credit and continuing education courses. To compute grade point average (GPA), divide  the total grade points by the total number of semester hours attempted. The grades "IP," "COM" and "I" do not affect GPA. |
| **Instructional Materials** | N/A |
| **HCC Policy Statement:** | |
| **Access Student Services Policies on their Web site:** | <http://hccs.edu/student-rights> |
| **Distance Education and/or Continuing Education Policies** | |
| **Access DE Policies on their Web site:** | <http://de.hccs.edu/Distance_Ed/DE_Home/faculty_resources/PDFs/DE_Syllabus.pdf> |
| **Access CE Policies on their Web site:** | <http://hccs.edu/CE-student-guidelines>  **COURSE POLICIES**  **Attendance**  Students are expected to attend classes regularly, and to be on time for every class period. Students can be dropped from a class due to excessive absences. Excessive tardiness may be considered absences. Students are responsible for subjects, assignments, and projects covered during their absences. Consult the ***Student Handbook*** for more details or visit http://www.hccs.edu/hccs/current-students.  **Academic Honesty**  Scholastic dishonesty is treated with the utmost seriousness by the instructor and the College. Academic dishonesty includes, but it is not limited to the willful attempt to misrepresent one’s work, cheat, plagiarize, or impede other students’ scholastic progress. Consult the ***Student Handbook*** for more details.  **Students with Disabilities**  The Disability Support Services Office (DSSO) assists students with physical, learning, or emotional disabilities in developing independence and self-reliance. Students with Disabilities are urged to contact the DSSO at least 30 to 60 days prior to the first day of class. The goal is to ensure that students with disabilities get off to a good start and have the support necessary for them to succeed. The DSSO are committed to compliance with the Americans with Disabilities Act (ADA) and Rehabilitation Act of 1973 (section 504).  Student can contact by phone at 713.718.6164 - TTY 713.718.6335. Fax 713.718.1468  **Course Repeater Policy:**  Beginning in the Fall 2006, students who repeat a course for a third or more times will face significant tuition/fee increases at HCC and other Texas public colleges and universities. Please ask your instructor and/or counselor about opportunities for tutoring/other assistance prior to considering course withdrawal or if you are not receiving passing grades.  **Cell Phones**  All cell phones must be muted, set to vibrate, or turned off during class. Cell phone activity during class is deemed disruptive to the academic process and will not be tolerated. If you need to make or receive an ***Emergency Call***, please leave the classroom.  **Calculators**  If the course allows the use of a calculator during class, lab projects, and exams, the student is responsible to bring his/her calculator. Cell phones are not calculators, and are not allowed to be used for that purpose during class, tests, or exams.  **Student ID**  Students are required to obtain a Student ID. For additional information, consult the ***Student Handbook***.  **Parking Rules and Regulations** Students are required to follow HCC’s regulations regarding parking and permits. For additional information, visit <http://www.hccs.edu/hccs/about-hcc/police/parking/parking-rules-and-regulations>  **Books, Tools and Supplies**  Students are required to purchase and bring to class the required textbooks, tools, notebooks, supplies, and writing instruments as required by the instructor.  **Dress Code**  This is a workforce environment, students must dress accordingly.  **Classroom and Laboratory Conduct**  Proper behavior is expected in all classes and laboratories. Foul language and horseplay are not allowed. Making or receiving cell phone calls during class are not allowed. Sleeping in class is not allowed. If an emergency exists, tardiness or absence, inform the instructor by calling the number at the top of page.  **Course Withdrawal**  It is the responsibility of the student to officially withdraw from a course before the official withdrawal deadline. A student who does not withdraw from a course by the deadline will receive an “FX” as the final grade. Also, note that under Section 51.907 of the Texas Education Code, an institution of higher education may not allow a student to drop more than sic coursed per semester.  **COURSE TEXT:**  Contren Learning Series NCCER Level 3: Prentice Hall Craft Training, Revised 2010  **SUPPLY LIST:**  Welding Hood with flip-up visor, Welding Gloves (leather), Welding Sleeves and Caper or Welding Jacket, Chipper Hammer, Wire Brush, Safety Glasses, Welder Cloth Cap, Steel Toed Lather Shoes, Burning Goggles, Tip Cleaner (for cutting torch tips), Adjustable Wrench 12:, Grinder 4”, Extension Cord 12”, Tape Measure, Small Lock, Flint Stringer, Notebook or Plain Paper, Pen/#2 Pencils, Channel Lock Pliers (for picking up hot metal) Mig parts – nozzle, diffuser tips. Tig parts – gas diffuser, tig cups, tungsten. |

**COURSE OUTLINE**

**WEEK # 1: COURSE RULES AND ORIENTATION**

* Introduction
* Purpose of the course
* Overview of course syllabus
* Course policies
* Required materials, textbook(s), supplies, and resources (if applicable)
* Disability Support Services
* Registration, schedules, receipts, and student ID
* Importance of updating and maintaining student data (Name, Address, ID #, phone numbers, emails)
* Parking rules and regulations
* Classroom and laboratory safety
* Course withdrawal, ***Official Day of Record,*** *and last day for withdrawal*
* Course tests, quizzes, exams, and assignments
* Course grading policies
* Instructor information
* Campus orientation

**WEEK #2**

* General shop safety
* Set up and demonstrate safety procedures

**WEEK #3**

* Explain safety requirements for Oxy fuel Cutting and set up requirements

**WEEK #4**

* Explain Plasma Arc Cutting and safe preparation
* Perform Air Carbon, Arc Cutting and Gouging

**WEEK #5**

* Explain weld quality
* Describe Shielded Meta Arc welding safety

**WEEK #6**

* Explain electrode characteristic and different types of filler metals
* Describe the preparation and set up of Arc Welding equipment properly striking and extinguish an arc
* Tools required for welding

**WEEK #7**

* Make stringer, weave and overlapping beads using E6010 and E7018 electrodes

**WEEK #8**

* Mid-term Exam

**WEEK #9**

* Make welds in 1G Position using E70S-6 mig wire

**WEEK #10**

* Make welds in 2G Position using E70S-6 electrodes

**WEEK #11**

* Make welds in 3G Position using E70S-6 electrodes

**WEEK #12**

* Make welds in 4G Position using E70S-6 electrodes

**WEEK #13**

* Describe general safety procedures for GMAW
* Identify GMAW and FCAW equipment
* Describe how to make grove welds on carbon steel plate

**WEEK #14**

* Explain (GMAW) Gas Metal Arc Welding Filler Metals and shielding gasses

**WEEK #15**

* Make welds using GMAW equipment

**WEEK #16**

* Final Exam