

**Material Science Center of Excellence Welding Technology Department**

https://www.hccs.edu/programs/areas-of-study/construction-industry--manufacturing/welding-technology/

# WLDG 1428: Introduction to Shielded Metal Arc Welding

**WLDG 1428| Lecture/Lab |CRN# 14043**

Summer 2021 | 10 Weeks (June 7 2021 to August 15 2021)

In-Person |Stafford Campus , Southwest Workforce Building |

T-Th 6:00 p.m. - 9:20 p.m.

96 hours per semester

**Instructor Contact Information**

Instructor: Bernardo Carrillo Office Phone: 7137182642

Office: SE Office Hours: T, TH 11:30 am to 12:00,

HCC Emai: bernardo.carrillo@hccs.edu Office Location: SE Workforce Building II

Please feel free to contact me concerning any problems that you are experiencing in this course. Your performance in my class is very important to me. I am available to hear your concerns and just to discuss course topics.

#### Instructor’s Preferred Method of Contact

I will respond to emails within 24 hours Monday through Friday; I will reply to weekend messages on Monday mornings.

**What’s Exciting About This Course**

Is learning to weld something that has always been of interest to you? Did you know according to the U.S. Bureau of Labor Statistics the need for welders is expected to grow by 26% by 2020? Nearly half of U.S. industries report difficulties locating skilled welders. This course will help you acquire the skills these industries are searching for to be productive in the welding industry.

### My Personal Welcome

Welcome to Introduction to Welding Using Multiple Processes—I’m delighted that you have chosen this course. I will present the information in the most exciting way I know, so that you can grasp the concepts and apply them now and hopefully throughout your career. As we work through lecture, hands on activities, and information that may challenge you, I am

available to support you. The fastest way to reach me is by my HCC email. The best way to really discuss issues is in person and I’m available during posted office hours to tackle any questions you might have. My goal is for you to walk out of the course with the basic skills to weld. So please visit me or contact me whenever you have a question.

### Prerequisites and/or Co-Requisites

None. High School Diploma or GED recommended

Please carefully read and consider the repeater policy in the [HCCS Student Handbook.](http://www.hccs.edu/resources-for/current-students/student-handbook/)

### Eagle Online Canvas Learning Management System

This section of WLDG 1407 will use [Eagle Online Canvas](https://eagleonline.hccs.edu/login/ldap) ([https://eagleonline.hccs.edu](https://eagleonline.hccs.edu/)) to supplement in-class assignments, exams, and activities.

HCCS Open Lab locations may be used to access the Internet and Eagle Online Canvas. It is recommended that you **USE** [**FIREFOX**](https://www.mozilla.org/en-US/firefox/new/) **OR** [**CHROME**](https://www.google.com/chrome/browser/desktop/index.html) **AS YOUR BROWSER**.

#### HCC Online Information and Policies

Here is the link to information about HCC Online classes including the required Online Orientation for all fully online classes: <http://www.hccs.edu/online/>

#### Scoring Rubrics, Sample Assignments, etc.

Look in Eagle Online Canvas for the scoring rubrics for assignments, samples of class assignments, and other information to assist you in the course. <https://eagleonline.hccs.edu/login/ldap>

Instructional Materials

### Textbook Information

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The textbook listed below is ***required*** for this course.

***Welding Principles and Applications (Fall 2020-Optional)***

ISBN: 9781305494695

You may either use a hard copy of the book, or rent the e-book from Pearson.

Order your book here: [HCC Bookstore](https://hccs.bncollege.com/webapp/wcs/stores/servlet/BNCBHomePage?storeId=19561&amp;catalogId=10001&amp;langId=-1)

Instructional Websites: Miller Openbook and HCC Canvas





**Other Instructional Resources**

**Tutoring**

HCC provides free, confidential, and convenient academic support, including writing critiques, to HCC students in an online environment and on campus. Tutoring is provided by HCC personnel in order to ensure that it is contextual and appropriate. Visit the [HCC Tutoring](http://www.hccs.edu/resources-for/current-students/tutoring/) [Services](http://www.hccs.edu/resources-for/current-students/tutoring/) website for services provided.

#### Libraries

The HCC Library System consists of 9 libraries and 6 Electronic Resource Centers (ERCs) that are inviting places to study and collaborate on projects. Librarians are available both at the libraries and online to show you how to locate and use the resources you need. The libraries maintain a large selection of electronic resources as well as collections of books, magazines, newspapers, and audiovisual materials. The portal to all libraries’ resources and services is the HCCS library web page at [http://library.hccs.edu](http://library.hccs.edu/).

#### Supplementary Instruction

Supplemental Instruction is an academic enrichment and support program that uses peer- assisted study sessions to improve student retention and success in historically difficult courses. Peer Support is provided by students who have already succeeded in completion of the specified course, and who earned a grade of A or B. Find details at <http://www.hccs.edu/resources-for/current-students/supplemental-instruction/>.

## Course Overview

WLDG 1428 will teach the necessary skills to perform SMAW in the flat, horizontal, vertical, and overhead position. Various types of electrodes will be used and troubleshooting techniques will be emphasized.

### Core Curriculum Objectives (CCOs)

* ***Critical Thinking***: Students will be able to identify types of electrodes used in welding processes, and identify various welding and cutting practices.
* ***Communication Skills***: Students will demonstrate understanding through demonstration of basic welding processes.
* ***Quantitative and Empirical Literacy***: Students will demonstrate the ability to set up and calibrate different welding machines, perform entry level welding functions, and have knowledge of proper joint preparation techniques by completing textbook reading assignments, completing assignments, and answering questions on quizzes and exams.
* ***Social Responsibility***: Students will demonstrate basic shop safety, and identify types of consumables used in welding processes.

### Course Student Learning Outcomes (CSLOs)

Upon completion of WLDG 1428, the student will be able to:

1. Students will be able to: setup SMAW equipment,
2. select proper filler metal for application,
3. discuss weld quality,
4. perform SMAW in the flat, horizontal, vertical, and overhead position.

## Student Success

Expect to spend at least twice as many hours per week outside of class as you do in class studying the course content. Additional time will be required for written assignments. The assignments provided will help you use your study hours wisely. Successful completion of this course requires a combination of the following:

* Reading the textbook
* Attending class in person and/or online
* Completing assignments
* Participating in class activities

There is no short cut for success in this course; it requires reading (and probably re-reading) and studying the material using the course objectives as your guide.

### Instructor and Student Responsibilities

As your Instructor, it is my responsibility to**:**

* Provide the grading scale and detailed grading formula explaining how student grades are to be derived
* Facilitate an effective learning environment through learner-centered instructional techniques
* Provide a description of any special projects or assignments
* Inform students of policies such as attendance, withdrawal, tardiness, and make up
* Provide the course outline and class calendar which will include a description of any special projects or assignments
* Arrange to meet with individual students before and after class as required

As a student, it is your responsibility to**:**

* Attend class in person and/or online
* Participate actively by reviewing course material, interacting with classmates, and responding promptly in your communication with me
* Read and comprehend the textbook
* Complete the required assignments and exams
* Ask for help when there is a question or problem
* Keep copies of all paperwork, including this syllabus, handouts, and all assignments
* Attain a raw score of at least 50% on the departmental final exam
* Be aware of and comply with academic honesty policies in the [HCCS Student Handbook](http://www.hccs.edu/resources-for/current-students/student-handbook/)

## Assignments, Exams, and Activities

### Quizzes

Students are required to complete welding quizzes in class.

### Midterm Exam

Students are required to complete the midterm in class.

### Final Exam

All students are required to take a final exam that will be administered in class.

### Grading Formula

Canvas Assignments: 30%

Welding Performance Test: 70%

|  |  |
| --- | --- |
| **Grade** | **Final Average in Percent** |
| A | 100-90 |
| B | 80-89 |
| C | 70-79 |
| D | 60-69 |
| F | 59-Below |

#### HCC Grading Scale can be found on this site under Academic Information: <http://www.hccs.edu/resources-for/current-students/student-handbook/>

Tentative Instructional Outline:

| **Week Number** | **Unit Lessons** | Objectives, Details, & Guided Classwork |
| --- | --- | --- |
| 1 | Class overview, expectations, and introductions | Class Syllabi |
| Welding Safety | Describe the procedure for safely working in an industrial setting. p.47-48 / Safety Test |
| SMAW Setup and Operation | Be able to setup and troubleshoot SMAW equipment.p.68 |
| Electrode Selection | Explain the importance of proper electrode selection.p.697-698 |
| 2 | SMAW of Plate | Be able to perform fillet welds on plate using various techniques.p.105 / Welding Lab |
| SMAW of Plate – Surfacing Welds | Be able to produce multipass surfacing weld using E6010 electrode. |
| SMAW of Plate – 2F | Be able to perform fillet welds on plate in the 2F-horizontal position. E6010 only |
| 3 | SMAW of Plate – 2F | Be able to perform fillet welds on plate in the 2F-horizontal position. E6010 only |
| SMAW of Plate – 3F | Be able to perform fillet welds on plate in the 3F-vertical position. E6010 only |
| 4 | SMAW of Plate – 3F | Be able to perform fillet welds on plate in the 3F-vertical position. E6010 only |
| Mid-Term Exam | Mid-Term Exam  50% Written, 50% Performance |
| 5 | SMAW of Plate – 4F | Be able to perform fillet welds on plate in the 4F-Overhead position. E6010 only |
| SMAW of Plate – 4F | Be able to perform fillet welds on plate in the 4F-Overhead position. E6010 only |
| 6 | SMAW of Plate – 1F | Be able to perform fillet welds on plate in the 1F-Flat position. E6010 only |
| SMAW of Plate – 1F | Be able to perform fillet welds on plate in the 1F-Flat position. E6010 only |
| 7 | SMAW of Plate – 1F,2F,3F,4F | Be able to perform fillet welds on plate in various positions using E6010 and E7018 electrodes. |
| SMAW of Plate – 1F,2F,3F,4F | Be able to perform fillet welds on plate in various positions using E6010 and E7018 electrodes. |
| 8 | SMAW of Plate – 1F,2F,3F,4F | Be able to perform fillet welds on plate in various positions using E6010 and E7018 electrodes. |
| Final Examination | Performance Based Final Exam  1F,2F,3F,4F using E6010 and E7018 |

**Syllabus Modifications**

The instructor reserves the right to modify the syllabus at any time during the semester and will promptly notify students in writing, typically by e-mail, of any such changes

## Instructor’s Practices and Procedures

#### Missed Assignments

All assignments must be turned in on designated due dates/time.

#### Academic Integrity

All students are expected to maintain academic integrity at all times.

Here’s the link to the HCC information about academic integrity (Scholastic Dishonesty and Violation of Academic Scholastic Dishonesty and Grievance):

[http://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-](http://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-procedures/) [procedures/](http://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-procedures/)

#### Attendance Procedures

100% attendance is expected. An instructor may drop a student who misses more than 3 instructional days.

#### Student Conduct

As your instructor and as a student in this class, it is our shared responsibility to develop and maintain a positive learning environment for everyone. Your instructor takes this responsibility very seriously and will inform members of the class if their behavior makes it difficult for him/her to carry out this task. As a fellow learner, you are asked to respect the learning needs of your classmates and assist your instructor achieve this critical goal.

#### Electronic Devices

Please turn off all cell phones while in the classroom or lab.

## HCC Policies

Here’s the link to the HCC Student Handbook [http://www.hccs.edu/resources-for/current-](http://www.hccs.edu/resources-for/current-students/student-handbook/) [students/student-handbook/](http://www.hccs.edu/resources-for/current-students/student-handbook/) In it you will find information about the following:

|  |  |
| --- | --- |
| Academic Information | Incomplete Grades |
| Academic Support | International Student Services |
| Attendance, Repeating Courses, and  Withdrawal | Health Awareness |
| Career Planning and Job Search | Libraries/Bookstore |
| Childcare | Police Services & Campus Safety |
| disAbility Support Services | Student Life at HCC |
| Electronic Devices | Student Rights and Responsibilities |
| Equal Educational Opportunity | Student Services |
| Financial Aid TV (FATV) | Testing |
| General Student Complaints | Transfer Planning |
| Grade of FX | Veteran Services |

#### EGLS3

The EGLS3 ([Evaluation for Greater Learning Student Survey System](http://www.hccs.edu/resources-for/current-students/egls3-evaluate-your-professors/)) will be available for most courses near the end of the term until finals start. This brief survey will give invaluable information to your faculty about their teaching. Results are anonymous and will be available to faculty and division chairs after the end of the term. EGLS3 surveys are only available for the Fall and Spring semesters. EGLS3 surveys are not offered during the Summer semester due to logistical constraints.

<http://www.hccs.edu/resources-for/current-students/egls3-evaluate-your-professors/>

#### Campus Carry Link

Here’s the link to the HCC information about Campus Carry: <http://www.hccs.edu/departments/police/campus-carry/>

#### HCC Email Policy

When communicating via email, HCC requires students to communicate only through the HCC email system to protect your privacy. If you have not activated your HCC student email account, you can go [to HCC Eagle ID](http://www.hccs.edu/resources-for/current-students/student-e-maileagle-id/) and activate it now. You may also use Canvas Inbox to communicate.

#### Housing and Food Assistance for Students

Any student who faces challenges securing their foods or housing and believes this may affect their performance in the course is urged to contact the Dean of Students at their college for support. Furthermore, please notify the professor if you are comfortable in doing so.

This will enable HCC to provide any resources that HCC may possess.

## Office of Institutional Equity

Use the link below to access the HCC Office of Institutional Equity, Inclusion, and Engagement (<http://www.hccs.edu/departments/institutional-equity/>)

#### disAbility Services

HCC strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please meet with a campus Abilities Counselor as soon as possible in order to establish reasonable accommodations. Reasonable accommodations are established through an interactive process between you, your instructor(s) and Ability Services. It is the policy and practice of HCC to create inclusive and accessible learning environments consistent with federal and state law. For more information, please go to <http://www.hccs.edu/support-services/disability-services/>

#### Title IX

Houston Community College is committed to cultivating an environment free from inappropriate conduct of a sexual or gender-based nature including sex discrimination, sexual assault, sexual harassment, and sexual violence. Sex discrimination includes all forms of sexual and gender-based misconduct and violates an individual’s fundamental rights and personal dignity. Title IX prohibits discrimination on the basis of sex-including pregnancy and parental status in educational programs and activities. If you require an accommodation due to pregnancy please contact an Abilities Services Counselor. The Director of EEO/Compliance is designated as the Title IX Coordinator and Section 504 Coordinator. All inquiries concerning HCC policies, compliance with applicable laws, statutes, and regulations (such as Title VI, Title IX, and Section 504), and complaints may be directed to:

David Cross

Director EEO/Compliance

Office of Institutional Equity & Diversity 3100 Main

(713) 718-8271

Houston, TX 77266-7517 or [Institutional.Equity@hccs.edu](mailto:Institutional.Equity@hccs.edu) <http://www.hccs.edu/departments/institutional-equity/title-ix-know-your-rights/>

## Office of the Dean of Students

Contact the office of the Dean of Students to seek assistance in determining the correct complaint procedure to follow or to identify the appropriate academic dean or supervisor for informal resolution of complaints.

[https://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-](https://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-complaints/speak-with-the-dean-of-students/) [complaints/speak-with-the-dean-of-students/](https://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-complaints/speak-with-the-dean-of-students/)

## Department Chair Contact Information

Alberto Urbina,Dean Material Science COE, [Alberto.Urbina@HCCS.edu](mailto:Alberto.Urbina@HCCS.edu)

713-718-6839

**Welding Tool List**

***Tools Needed for All Welding Classes***

|  |  |
| --- | --- |
| **Item** | **Approximate Cost\*** |
| Welding Hood | $39 |
| Leather Welding Gloves | $15 |
| Welding Sleeves or Welding Jacket | $75 |
| Chipping Hammer | $9 |
| Wire Brush | $10 |
| Clear Safety glasses | $15 |
| Welder Cloth Cap | $8 |
| Leather Work Boots | $40 |
| HCC Blue Welding Shirt | $32 |
| Work Denim Pants | $30 |
| Oxyfuel Tip Cleaner | $6 |
| 12” Adjustable Wrench | $10 |
| 4 1-2” Electric Grinder | $75 |
| 4 -1/2” Grinding Wheels | $20 |
| 12 ft Extension Cord | $15 |
| 25 Foot Tape Measure | $10 |
| Flint Lighter (Striker) | $6 |
| Locker Pliers | $15 |
| MIG Pliers | $12 |
| **Total =** | **$442** |

***Additional Tools Needed for WLDG 2447 – Gas Metal Arc Welding***

|  |  |
| --- | --- |
| **Item** | **Approximate Cost\*** |
| Nozzle (part # 401-54-62) | $25 |
| 0.035” Contact Tubes (part # T-035) | $20 |
| 0.045” Contact Tubes (part # T-045) | $20 |
| **Total =** | **$65** |

***Additional Tools Needed for WLDG 1434 – Intro to Gas Tungsten Arc Welding and WLDG 2451 – Advance Gas Tungsten Arc Welding***

|  |  |
| --- | --- |
| **Item** | **Approximate Cost\*** |
| TIG Torch Body with valve – Flex (Model # 17FV) | $150 |
| Ribbed Torch Handle (Model # H-100R) |
| Back Cap – Long (Model # 57Y02) |
| Power 2 Piece Cable – (Model # 57Y01-2) |
| Male Dinse Connector (Model # WDC-25-P) |
| Ceramic Cup (Model # 10N47) | $10 |
| 1/8” Collet (Model # 10N24) | $5 |
| 1/8” Collet Body (Model # 10N32) | $5 |
| 2% 1/8” Thoriated Tungsten 3PC | $30 |
| TIG Gloves | $13 |
| **Total =** | **$213** |

***Additional Tools Needed for WLDG 2453 – Advance Pipe and WLDG 2413 – Intermediate Welding Using Multiple Processes***

|  |  |
| --- | --- |
| **Item** | **Approximate Cost\*** |
| Half Round File | $20 |

***Books Needed Per Class***

|  |  |  |
| --- | --- | --- |
| **Book** | **Class** | **Approximate Cost\*** |
| NCCER Core Curriculum: Introductory Craft Skills ISBN #: 978013412143-6 | WLDG 1407 | $72 |
| Welding: Principles and Applications ISBN# 9781305494695 | All WLDG Classes (Fall 2020-Optional) | $180 |
| Blueprint Reading for Welders ISBN#: 9781428335288 | WLDG 1413 | $144 |

Possible Vendors:

* **Airgas**

713-738-2346

* **Praxair**

713-675-6251

* **Matheson**

281-498-2310

* **HCC College Bookstore**
* **Harbor Freight Tools**

[www.harborfreight.com](http://www.harborfreight.com)