



# **INSTRUCTIONAL PACKAGE**

WLD 154  
Pipe Fitting and Welding

Effective Term  
AY 2020/2021

# INSTRUCTIONAL PACKAGE

## Part I: Course Information

Effective Term: SPRING 2021

COURSE PREFIX: WLD 154

COURSE TITLE: Pipe Fitting and Welding

CONTACT HOURS: 8.0

CREDIT HOURS: 4.0

### **RATIONALE FOR THE COURSE:**

WLD 154 is a required course in the Advanced Welding Technology Program. WLD 154 will cover safety procedures and welding techniques associated with the Shielded Metal Arc Welding process.

### **COURSE DESCRIPTION:**

This course is a basic course in fitting and welding pipe joints, either ferrous or non-ferrous using standard processes.

### **PREREQUISITES/CO-REQUISITES:**

COMPASS Reading 54, Eng. 100 with a C or better.  
WLD-111

\***Online/Hybrid** courses require students to complete the DLI Online Student Orientation prior to completing an online course. The DLI Online Student Orientation can be found in WaveNet, under the My Student tab.

### **REQUIRED MATERIALS:**

Textbook required (Welding Principles and Applications 8<sup>th</sup> edition By Larry Jeffus)

Welding Equipment tool kit.

Please visit the [BOOKSTORE](#) online site for most current textbook information. Use the direct link below to find textbooks.

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

### **ADDITIONAL REQUIREMENTS:**

Basic writing supplies, computer access on and off campus. You must be able to have access to D2L and check it regularly. I will use this platform to communicate with you regarding classroom conversations, schedule and more. Class cancellation, assignment due dates and class updates will always be posted on D2L.

April 2020

## **TECHNICAL REQUIREMENTS:**

Access to Desire2Learn (D2L), HGTC's student portal for course materials.  
WaveNet and D2L email access.

## **STUDENT IDENTIFICATION VERIFICATION:**

Students enrolled in online courses will be required to participate in a minimum of one (1) proctored assignment and/or one (1) virtual event to support student identification verification. Please refer to your Instructor Information Sheet for information regarding this requirement.

## **CLASSROOM ETIQUETTE:**

No cell phones, iPads or computers unless instructed to use them for a project in class. You will be asked to leave if you can't abide by these rules, and if you are asked to leave, it will be counted as a half absence.

# **Part II: Student Learning Outcomes**

## **COURSE LEARNING OUTCOMES and ASSESSMENTS\*:**

1. During all laboratory periods each student will apply the safety procedures associated with welding, cutting, and related activities as described in the ANSI Z49.1 Safety in Welding, Cutting.
2. Each student will perform safety inspections of their personal protective equipment and clothing, welding equipment and accessories, required tools and the work area prior to beginning lab activities.
3. Make minor repairs to shielded metal arc welding equipment and accessories.
4. Set up for shielded metal arc welding operations.
5. Clean and prepare base metal for welding.
6. Set the welding machine on the correct polarity for Shielded Metal Arc Welding
7. Fit-up Pipe fit-up joints.
8. Check for joint misalignment and poor fit-up.
9. Produce groove welds without backing on plain carbon steel in the 2-G horizontal, 3-G vertical and 6-G 45° positions using E-6010 for root pass and E-7018 electrodes for filler passes and cap. Groove welds to be evaluated by visual inspection methods followed by face/root bend tests to comply with American Welding Society weld inspection standards.

Without the use of references, each student will accomplish the following objectives with a minimum of 65% accuracy.

1. Identify safety hazards associated with shielded metal arc welding and related operations.
2. Identify and explain job code specifications.
3. Identify the types and parts of groove welds.
4. Identify and explain distortion and how to control it.
5. Explain how to prepare, test, and evaluate guided bend test specimens.

## RECOMMENDED READING AND LAB ASSIGNMENTS:

(Instructor may modify schedule as required to meet the course objectives)

Welding Principles and Applications, Textbook

Section Two: Shielded Metal Arc Welding  
Read Chapter 5: Advanced Shielded Metal Arc Welding of Pipe

Lab #1	Orientation
Lab #2 – 9	2G Pipe Open Root Butt Joint 1/8" E-6010 & 3/32" E-7018 <b><u>Destructive Transverse Bend</u></b>
<b>Lab #10 –</b>	<b><u>TEST</u></b>
Lab #11 – 17	5G Pipe Open Root Butt Joint 1/8" E-6010 & 3/32" E-7018 <b><u>Destructive Transverse Bend</u></b>
<b>Lab #18 –</b>	<b><u>TEST</u></b>
Lab #19 – 27	6G Pipe Open Root Butt Joint 1/8" E-6010 & 3/32" E-7018 <b><u>Destructive Transverse Bend</u></b>
<b>Lab #28 –</b>	<b><u>TEST</u></b>
Lab #29	EXAM/Clean-Up

### PIPE WELDING INSPECTION STANDARDS

Visual Inspection: Where visual inspection is the only criterion for acceptance, all weld passes are subject to visual examination, at the discretion of the instructor. Welds shall be acceptable ONLY if the following conditions are satisfied:

1. Prior to assembly of the test pieces, to assure that the proper materials are being used, that the parts have been cleaned, and that the edge preparation is correct.
2. After fit-up, to check the joint clearances.
3. During welding to inspect for cracks, porosity, undercut, incomplete fusion, surface roughness, and poor crater conditions. Grinding may be used when necessary on starts and stops (butt joints only), but dressing of completed weld shall not be permitted.
4. Through fusion shall exist between adjacent layers of weld metal and base metal.
5. Before welding over previously deposited metal, all slag shall be removed and the weld and adjacent base metal shall be brushed clean. This requirement shall apply not only to successive layers but also to the crater area when welding is resumed after any interruption. Slag shall be

removed from all completed welds, and the weld and adjacent base metal shall be cleaned by brushing.

6. After welding has been completed, to detect any surface defects. The following are the acceptance requirements for a sample weld to pass visual inspection:
  - a. The specified base metal and filler metal shall have been used.
  - b. The weld and adjacent base metal are free from visible arc strikes, weld spatter, and gouge marks.
  - c. The spacing of the surface ripples is uniform.
  - d. The weld shall have no cracks or incomplete fusion/overlap.
  - e. Welds shall be terminated at the end of a joint in a manner that will ensure sound welds. All craters shall be filled to the full cross section of the weld and shall be free of cracks upon completion of the welding.
  - f. Porosity does not exceed one in each 4" of weld length and the maximum diameter shall not exceed 3/32".
  - g. Undercut shall not exceed the lesser of 10% of the base metal thickness or 1/32" in width or depth nor total more than 1" per 8" of weld.
  - h. Groove welds shall be made with slight or minimum face reinforcement. In the case of butt joints, (1/8" thick and over), the face reinforcement shall not exceed 1/8" in height and shall have a gradual transition to the plane of the base metal surface at least 1/16" but no more than 3/32" from the edge of the joint and at NO point falls below the surface of the base metal. In the case of butt joints, (under 1/8" thick), the face reinforcement shall be a minimum of 1/32" and not exceed 3/64" in height. The cumulative length of undercut is no longer than L/8, where L is the specified length of the weld. Melt-through that results in a hole is unacceptable.  
  
They shall be free of discontinuities shown for butt joints in Fig. 5.4 (E). The root of the weld shall be inspected, and there shall be no evidence of cracks, incomplete fusion, porosity, or inadequate joint penetration. A concave root surface is permitted within the limits shown below, provided the total weld thickness is equal to or greater than that of the base metal. In the case of butt joints, (1/8" thick and over), the maximum root surface concavity shall be 1/16" and the maximum melt-through shall be 1/8" without indication of burn through.

In the case of butt joints, (under 1/8" thick), the maximum root surface concavity shall be 1/164".

And the maximum melt-through shall be 3/64" without indication of burn through.

### **Root-, Face-, and Side Guided Bend Tests.**

The convex surface of the bend test specimen shall be visually examined for surface discontinuities. For acceptance, the surface shall contain no discontinuities exceeding the following dimensions:

1. 1/8" measured in any direction on the convex surface after bending.
2. 3/8" being the sum of the greatest dimensions of all discontinuities exceeding 1/32" but less than or equal to 1/8".
3. 1/4" maximum corner crack, except when that corner crack resulted from visible slag inclusions or other fusion type discontinuities, then 1/8" maximum shall apply. Specimens with corner cracks exceeding 1/4" with no evidence of slag inclusions or other fusion type discontinuities shall be disregarded, and a replacement test specimen from the original weldment shall be tested.

***\*Students – please refer to the Instructor’s Course Information sheet for specific information on assessments and due dates.***

## **Part III: Grading and Assessment**

### **EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS\*:**

Students’ performance will be assessed and the weight associated with the various measures/artifacts are listed below.

#### **EVALUATION\***

Lab Tests	100%
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***\*Students, for the specific number and type of evaluations, please refer to the Instructor’s Course Information Sheet.***

### **GRADING SYSTEM:**

State the College’s or departmental grading system as delineated in the Catalog. Please note the College adheres to a 10 point grading scale A = 100 – 90, B = 89- 80, C = 79 – 70, D = 69 – 60, F = 59 and below. You must have your Dean’s approval if changes in the scale are made.

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the [academic calendar](#) for deadlines for add/drop. You must attend at least one meeting of all of your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

## Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of 80 percent (80%) of their classes in order to receive credit for any course. Due to the varied nature of courses taught at the college, some faculty may require up to 90 percent (90%) attendance. Pursuant to 34 Code of Federal Regulations 228.22 - Return to Title IV Funds, once a student has missed over 20% of the course or has missed two (2) consecutive weeks, the faculty is obligated to withdraw the student and a student may not be permitted to reenroll. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

**For online and hybrid courses**, check your Instructor's Course Information Sheet for any required on-site meeting times. Please note, instructors may require tests to be taken at approved testing sites, and if you use a testing center other than those provided by HGTC, the center may charge a fee for its services.

## Part V: Student Resources



### THE STUDENT SUCCESS AND TUTORING CENTER (SSTC):

The SSTC offers to all students the following **free** resources:

1. **Academic tutors** for most subject areas, **Writing Center support**, and **college success skills**.
2. Online **tutoring** and academic support resources.
3. Professional and interpersonal communication **coaching** in the EPIC Labs.

Visit the [Student Success & Tutoring Center](#) website for more information. To schedule tutoring appointments using TutorTrac, visit the Student Services tab in WaveNet. Email [sstc@hgtc.edu](mailto:sstc@hgtc.edu) or call SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455, or go to the [Online Resource Center](#) to access on-demand resources.



## CENTRAL STUDENT INFORMATION CENTER: TECH Central

TECH Central offers to all students the following **free** resources:

1. **Getting around HGTC:** General information and guidance for enrollment!
2. Use the [Online Resource Center \(ORC\)](#) including scheduled technology training, Office 365 support, password resets, and username information.
3. **Drop-in technology support or scheduled training** in the Center or in class.
4. **In-person workshops, online tutorials and more services** are available.
5. **Chat with our staff on TECH Talk**, our live chat service. TECH Talk can be accessed on the student portal and on TECH Central's website, or by texting questions to (843) 375-8552.

Visit the [Tech Central](#) website for more information. Live Chat and Center locations are posted on the website. Or please call (843) 349 – TECH (8324).

### **DISABILITY SERVICES:**

HGTC is committed to providing an accessible environment for students with disabilities. Inquiries may be directed to HGTC's [Accessibility and Disability Service webpage](#). The Accessibility and Disability staff will review documentation of the student's disability and, in a confidential setting with the student, develop an educational accommodation plan.

Note: It is the student's responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided.

### **STATEMENT OF EQUAL OPPORTUNITY/NON-DISCRIMINATION STATEMENT:**

Horry-Georgetown Technical College prohibits discrimination and harassment, including sexual harassment and abuse, on the basis of race, color, sex, national or ethnic origin, age, religion, disability, marital or family status, veteran status, political ideas, sexual orientation, gender identity, or pregnancy, childbirth, or related medical conditions, including, but not limited to, lactation in educational programs and/or activities.

### **TITLE IX REQUIREMENTS:**

All students (as well as other persons) at Horry-Georgetown Technical College are protected by Title IX—regardless of their sex, sexual orientation, gender identity, part- or full-time status, disability, race, or national origin—in all aspects of educational programs and activities. Any student, or other member of the college community, who believes that he/she is or has been a victim of sexual harassment or sexual violence may file a report with the college's Chief Student Services Officer, campus law enforcement, or with the college's Title IX Coordinator, or designee.

\*Faculty and Staff are required to report incidents to the Title IX Coordinators when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).



## **INQUIRIES REGARDING THE NON-DISCRIMINATION/TITLE IX POLICIES:**

**Student and prospective student** inquiries concerning Section 504, Title II, and Title IX and their application to the College or any student decision may be directed to the Vice President for Student Affairs.

**Dr. Melissa Batten, VP Student Affairs**

*Title IX Coordinator*

Building 1100, Room 107A, Conway Campus

PO Box 261966, Conway, SC 29528-6066

843-349-5228

[Melissa.Batten@hgtc.edu](mailto:Melissa.Batten@hgtc.edu)

**Employee and applicant** inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Vice President for Human Resources.

**Jacquelyne Snyder, VP Human Resources**

*EEO and Title IX Coordinator*

Building 200, Room 212A, Conway Campus

PO Box 261966, Conway, SC 29528-6066

843-349-5212

[Jacquelyne.Snyder@hgtc.edu](mailto:Jacquelyne.Snyder@hgtc.edu)