SOUTHWEST TECH

SOUTHWEST TECHNICAL COLLEGE

TEWT 1045 - Inspection, Metallurgy, and Blueprints (2 Credits)

Course Description

This course will introduce students to welding symbols and blueprints that welding professionals use. Discussing different welding processes and materials that can be welded. Basic AWS standards and types of nondestructive testing (NDT) and destructive testing will be covered.

Course Objectives

- Discuss codes, standards, and types of nondestructive and destructive testing.
- Identify and interpret basic AWS standardized welding symbols, blueprints, and bill of materials.
- Identify parts of a joint, parts of a weld, and how they correspond with blueprints.
- Identify and state various stresses a weld can be subjected to.
- Explain welder qualifications, certification, and welding procedure specifications (WPS).

Course Outline

- Weld Symbols and Welding Symbols
- Print Reading
- Codes, Standards and Welding Procedure Specification
- Destructive and Non-destructive Testing
- Welding Metallurgy
- Weldability of Metals and Electrodes

Textbook & Reading Materials

Cengage Unlimited Subscription, Cengage

Assignments and Assessments

Work Place Practices- Importance of Blueprints
READ Chapter 22: Welding Joint Design and Welding Symbols
LEARN IT: Chapter 22: Overview
Chapter 22: Review Questions
Chapter 22 Practice Test
Practice 22-1: Reading Welding Symbols
Practice 22-2: Reading Welding Symbols
Grooves and Fillet Welds
Weld Plate Work Sheet Joints and Welding Positions
Types of Welds- Website to Read
Chapter 22: Flashcards
READ Welding in the Real World
Checkpoint Meeting Module 2
READ Chapter 24: Welding Codes and Standards
LEARN IT: Chapter 24: Overview
Chapter 24: Review Questions
Chapter 24 Practice Test
Example of Procedure Qualification Record
Welding Procedure Specification
Practice 24-1: Writing a Welding Procedure Specification (WPS)
Practice 24-2: Procedure Qualification Record (PQR)
READ Welding in the Real World
Chapter 24: Flashcards
Checkpoint Meeting Module 3
READ Chapter 25: Testing and Inspection
LEARN IT: Chapter 25: Overview
Chapter 25: Review Questions
Chapter 25 Practice Test
Welding Defects
Weld Discontinuities
Weld Plate Work Sheet Identifying Discontinuities
READ Welding in the Real World
Chapter 25: Flashcards
Checkpoint Meeting Module 4
READ Chapter 25: Testing and Inspection
LEARN IT: Chapter 25: Overview
Chapter 25: Review Questions
Chapter 25 Practice Test
Caliper
Ultrasound Testing
V-WACGauge
Fillet Weld Gauge
Misc tools
Weld Plate Work Sheet Using Inspection Tools
Chapter 25: Flashcards
READ Welding in the Real World
Checkpoint Meeting Module 5
Welding w ithout a Table
Weld Sequencing
Large Scale Squaring
Tape Measures
Levels
Making Marks on Metals
Checkpoint Meeting Module 6
READ Chapter 26: Welding Metallurgy
LEARN IT: Chapter 26: Overview
Chapter 26: Review Questions
Chapter 26 Practice Test
Steel Metallurgy - Principles of Metallurgy
Engineering Materials - Principles of Metallurgy
Real Engineering: The History of Iron and Steel
Properties and Grain Structure
Steel
American Steel
READ Welding in the Real World
Chapter 26: Flashcards
Checkpoint Meeting Module 7
READ Chapter 27: Weldability of Metals
LEARN IT: Chapter 27: Overview
Chapter 27: Review Questions
Chapter 27 Practice Test
The Difference Between Copper, Brass and Bronze
Copper, Brass & Bronze alloys explai ned
Metal- Modern Marvels
The Four Types of Steel- Metal Supermarkets
Stainless Steel Grades Explained
Stainless Forgotten History: A Revolution in Steel
Heavy Metals- Modern Marvels
Aluminum - The Material That Changed The World
How Stuff Works - Aluminum
Aluminium Alloys Explained
Aluminum- Modern Marvels
Cold Rolled VS Hot Rolled
READ Welding in the Real World
Chapter 27: Flashcards
Checkpoint Meeting Module 8
READ Chapter 28: Filler Metal Selection
LEARN IT: Chapter 28: Overview
Chapter 28: Review Questions
Chapter 28 Practice Test
Choosing the Right SMAW Electrode
5 Common Types Of Welding Filler Rods
Read through this text. A short video is included.
WIKI is also a good resource for answering questions and providing additional
information.
READ Welding in the Real World
Chapter 28: Flashcards
Checkpoint Meeting Module 9
How to Read Welding Symbols: Part 1 - Fillet Welds
Symbols for Welding
Checkpoint Meeting Module 10
Blueprint Reading For Welders and Fitters
End of Course Survey

Work Ethic Assessment
Checkpoint Meeting Module 11

Subject to change. Please consult your Canvas course for the most current instructions and updates.

Classroom Hours

Mo, Tu, W, Th
12:00 PM - 4:00 PM
5:00 PM - 9:00 PM

For a full list of course hours visit: Course Schedule

Instructor Contact Information

Robert Blake — rblake@stech.edu
Christopher Durand — cdurand@stech.edu
Ethan Hollinger — ehollinger@stech.edu
Jordan Noel — jnoel@stech.edu
Jacob Hartner — jhartner@stech.edu
Director, Carl Johnson — cjohnson@stech.edu

Office Hours: By appointment

Email is the preferred method of communication; you will receive a response within 24 hours during regular business hours.

Canvas Information

Canvas is the where course content, grades, and communication will reside for this course.

- stech.instructure.com
- For Canvas passwords or any other computer-related technical support contact Student Services.
- For regular Hours and Weekdays call (435) 586 - 2899.
- For after Hours & Weekends call (435) 865 - 3929 (Leave a message if no response).

Course Policies

Attendance: Students are expected to follow their schedule. Absences, tardiness, and early departures will affect your record. Maintain at least 80% attendance. If below 80%, work with the instructor to improve. Take a 10-minute break per hour; inform the instructor if you need longer. Notify the instructor ASAP if you'll be late or absent.
Grading: This is a competency based course. To complete a course, students must demonstrate competency to industry standards. This will result in a B grade. Students who perform to this standard while maintaining all standards as indicated in this syllabus will receive an A. The instructor has the right to increase a grade in extenuating circumstances.
Cell Phone / Electronics: Limit phone use to coursework. Put away devices if used for non-coursework. Headphones are allowed for music. In the welding lab, keep one ear free and when needed, use OSHA-approved hearing protection; consumer headphones are not acceptable. Take calls or check messages outside the lab and welding booths to maintain a focused work environment.
Prerequisites: Follow the course order in the welding program's sequence unless changed by instructors. Lab courses require a demonstration of skills. Skills Upgrade and Personal Interest students must show prerequisite knowledge through tests or skill demonstrations before enrolling. All students must complete the Welding Safety course before entering the welding lab.
Competencies: Complete all reading assignments and written responses to progress. Using AI or searching the internet for answers is considered cheating. Outside materials are allowed if assignments are fulfilled. Lab modules require demonstrating welding skills per American Welding Society standards. Check course parameters on Canvas. Homeschool students on a post-secondary schedule will undergo an SAP check each quarter. If progress is insufficient, they will receive a warning, then probation, similar to post-secondary students. Dismissal for low SAP means re-enrollment is only possible the next year.
Lab Rules: Students will not be permitted to enter the lab without first submitting a signed copy of the Safety and Behavior Disclosure for Welding Technology to their instructor. Students shall wear safety glasses at all times in the lab. Other PPE includes but is not limited to long pants and, no synthetics, no open-toed shoes. Steeled-toed or composite-toed that are non-slip are preferred. Each course will require specific PPE as you go through the program. We are training students for industry, and most welding businesses will require these things, it is good to start investing in them. Only water bottles with sealable lids are allowed; no other food or drink. Report injuries to an instructor immediately. Only use machines with proper permission and training. Clean your workspace and participate in group clean-ups. Violations will result in a verbal warning, a write-up, and potentially removal from the program. Egregious violations may result in immediate removal.
Industry Environment: Be ready to work in hot, cold, dirty, dusty, and noisy conditions. Speak clearly for effective communication. Maintain situational awareness to avoid impacting others or being impacted. Use and knowledge of proper PPE are mandatory for safety. While vulgar language may be used in some shops, it is not allowed in the lab. Keep your space clean to minimize hazards. Always treat everyone with consideration and courtesy.
Substance Abuse: Possession or use of controlled substances or their imitations in the welding lab, which can impair judgment or emergency response, is a severe safety violation. This disregard for safety may result in immediate withdrawal from the program. No one may work in the lab with any substance, legal or otherwise, that may impair them in any way.
Cheating: Performing a weld out of position, using incorrect parameters, or passing off another's work will result in immediate removal from the program with zero tolerance. Mistakes or confusion will receive a verbal warning, a note in the student system, and an email to the student and the director of Manufacturing. Instructors may require a weld demonstration to verify the student's work quality before passing off.

High School Power School Grades: Quarter student grades will be determined by student progress percentage. Faculty will use the higher percentage of either 1) quarter progress, or 2) cumulative progress for the current training plan year. The progress percentage will be used with the grading scale to determine the minimum grade. High School Grade Scale: The following grading scale will be used to determine a letter grade from the progress percentage:

- A : 94 - 100%
- A- : 90 - 93%
- B+ : 87 - 89%
- B : 83 - 86%
- B- : 80 - 82%
- C+ : 77 - 79%
- C : 73 - 76%
- C- : 70 - 72%
- D+ : 67 - 69%
- D : 63 - 66%
- D- : 60 - 62%
- F : 0 - 59%

Additional Information

InformaCast Statement: Southwest Tech uses InformaCast to ensure the safety and well-being of our students. In times of emergency, such as weather closures and delays, this app allows us to promptly deliver notifications directly to your mobile devices. To stay informed and receive real-time updates, we encourage all students to sign up for notifications. Your safety is our priority, and staying connected ensures a swift response to any unforeseen circumstances. More information and directions for signing up are available at: https://stech.edu/emergency-notifications/

Internet Acceptable Use Policy: The student is expected to review and follow the Southwest Technical College Internet Safety Policy at: https://stech.edu/students/policies/

Student Code of Conduct Policy: The student is expected to review and follow the Southwest Technical College Student Code of Conduct Policy at: https://stech.edu/students/policies/

Accommodations: Students with medical, psychological, learning, or other disabilities desiring accommodations or services under ADA, must contact the Student Services Office. Student Services determines eligibility for and authorizes the provision of these accommodations and services. Students must voluntarily disclose that they have a disability, request an accommodation, and provide documentation of their disability. Students with disabilities may apply for accommodations, based on an eligible disability, through the Student Services office located at 757 W. 800 S., Cedar City, UT 84720, and by phone at (435) 586-2899. No diagnostic services are currently available through Southwest Technical College.

Safety and Building Maintenance: The College has developed and follows a variety of plans to ensure the safe and effective operation of its facilities and programs. The following plans are available online:
1) Facilities Operations and Maintenance Plan; 2) Technical Infrastructure Plan; and 3) Health and Safety Plan.

Withdrawals and Refunds: Please refer to the Southwest Technical College Refund Policy at:
https://stech.edu/students/policies/

Any high school or adult student, who declares a technical training objective is eligible for admission at Southwest Technical College (Southwest Tech). Program-specific admissions requirements may exist and will be listed on the Southwest Tech website. A high school diploma or equivalent is not required for admission but is mandatory for students seeking Title IV Federal Financial Aid.

Non-Discriminatory Policy: Southwest Technical College affirms its commitment to promote the goals of fairness and equity in all aspects of the educational enterprise, and bases its policies on the idea of global human dignity.

Southwest Tech is committed to a policy of nondiscrimination. No otherwise qualified person may be excluded from participation in or be subjected to discrimination in any course, program or activity because of race, age, color, religion, sex, pregnancy, national origin or disability. Southwest Technical College does not discriminate on the basis of sex in the education programs or activities that it operates, as required by Title IX and 34 CFR part 106. The requirement not to discriminate in education programs or activities extends to admission and employment. Inquiries about Title IX and its regulations to STECH may be referred to the Title IX Coordinator, to the Department of Education, and/or to the Office for Civil rights.

If you believe you have experienced discrimination or harassment on our campus, please contact the Title IX Coordinator, Cory Estes: cestes@stech.edu, (435) 865-3938.

For special accommodations, please contact the ADA Coordinator, Cyndie Tracy: ctracy@stech.edu, (435) 865-3944.
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