Utah System of Higher Education
Pipe Welding
FY2027 / 26 Credits (780 Clock-Hours)

Foundational Courses

TEWT 2316 Gas Metal Arc Welding (GMAW)/Flux Cored Arc Welding (FCAW) – Pre-Pipe **3 Credits / 90 Clock-Hours**

The GMAW/FCAW Pre-Pipe course will help students become familiar with the techniques, positions, and joints used for welding pipe as used in structural, pipeline, and pressure vessel applications. This course will teach the students specialized techniques used for pipe welding application such as open root “v” grooves, using GMAW RMD, GMAW Pulse, and FCAW gas shield. FCAW may be waived if students have achieved the D1.1 structural steel certification in these processes.
Objectives:
• Classify specialized techniques used for pipe welding applications.
• Interpret open root “V” grooves, using GMAW RMD, GMAW Pulse and FCAW gas shield.
• Demonstrate a tack using the feathering technique on ⅜”-½” plate with different size root opening.
• Perform a weld on ⅜”-½” plate in the following positions with GMAW RMD root, GMAW pulsed fill and cover pass, GMAW RMD root, FCAW gas shield fill and cover pass: 2G, 3G and 4G.

TEWT 2320 Gas Metal Arc Welding (GMAW) – Pipe **4 Credits / 120 Clock-Hours**

The GMAW Pipe course will help students become familiar with the techniques, positions and joints used for welding pipe using the GMAW process and used in structural, pipeline and pressure vessel applications.
Objectives:
• Demonstrate proper technique to weld 6” schedule 80 pipe in the 2G, 5G and 6G positions.
• Show use of RMD for the root passes, pulsed and short circuit transfers for the fill and cover passes.
• Identify techniques necessary to qualify for the American Welding Society’s (AWS) D1.1 Structural Steel Code as well as the American Society of Mechanical Engineer’s (ASME) Section IX pressure vessel and piping code.
• Demonstrate weld on 6” schedule 80 pipe in the following positions with RMD for the root and short circuit transfer and the root and pulsed for the fill and cover pass: 2G, 5G 6G.
• Qualify in the ASME IX 6G Pipe- RMD Root, Pulse Fill & Cap.

TEWT 2420 Flux Cored Arc Welding (FCAW) – Pipe **4 Credits / 120 Clock-Hours**

The FCAW Pipe course is designed to help students become familiar with the techniques, positions and joints used on welding pipe using the FCAW process as used in structural, pipeline and pressure vessel applications.
Objectives:
• Demonstrate proper technique to weld 6” schedule 80 pipe in the 2G, 5G and 6G positions.
• Use a backing ring and RMD for the root passes, gas shielded and self-shielded for the fill and cover passes.
• Identify techniques necessary to qualify for the American Welding Society’s (AWS) D1.1 Structural Steel Code as well as the American Society of Mechanical Engineer’s (ASME) Section IX pressure vessel and piping code.
• Demonstrate weld on 6” schedule 80 pipe in the following positions with RMD for root and gas, root and self-shield and backing ring and gas shielded for the root, fill and cover pass: 2G, 5G and 6G.
• Qualify in ASME IX 6G Pipe- GMAW RMD Root, FCAW Fill & Cap.
• Qualify in AWS D1.1 6G Pipe- FCAW Dual Shield with backing ring.

TEWT 2116 Shielded Metal Arc Welding (SMAW) – Pre-Pipe — 3 Credits / 90 Clock-Hours

The SMAW Pre-Pipe course will help students become familiar with the techniques, positions and joints used for welding pipe as used in structural pipeline and pressure vessel applications. This course will instruct students in the specialized techniques used for pipe welding applications such as open root "V" grooves, using SMAW E7018 and SMAW E6010. Students with D1.1 structural steel certification in this process may waive this course. SMAW may be waived if a student has a D1.1 structural steel certification in this process.

Objectives:
• Classify specialized techniques used for pipe welding applications.
• Interpret open root "V" grooves, using SMAW E7018 and SMAW E6010.
• Demonstrate a tack using the feathering technique on ⅜"-½" plate with different size root opening.
• Demonstrate a weld on ⅜"-½" plate in the following positions with E6010 Electrodes for the root, E7018 electrodes for the fill and cover pass: 2G, 3G and 4G.
• Demonstrate a weld on ⅜"-½" plate in the following positions with E6010 Electrodes for the root, first fill (hot pass) and E7018 Electrode for the last fill and cover pass: 2G, 3G and 4G.

TEWT 2121 Shielded Metal Arc Welding (SMAW) I – Pipe — 2 Credits / 60 Clock-Hours

The SMAW Pipe I course will continue to help students with advanced techniques, positions and joints used for welding pipe using the SMAW process as used in structural, pipeline and pressure vessel applications. The course will teach students proper techniques to weld pipe in the 2G, 5G and 6G
positions. Students will master the techniques necessary to qualify for the American Welding Society (AWS) D1.1 Structural Steel Code as well as the American Society of Mechanical Engineers (ASME) Section IX pressure vessel and piping code.

Objectives:
● Demonstrate technique to weld 6" schedule 80 pipe in the following positions with E6010 electrodes for the root and E7018 electrodes for the fill and cover passes: 2G, 5G uphill and 6G uphill.
● Demonstrate technique to weld on 6" schedule 80 pipe with E6010 electrodes for the root and hot pass, and E7018 electrodes for the remaining fill and cover passes: 2G 5G downhill root and hot pass and uphill fill and cover pass.

TEWT 2123 Shielded Metal Arc Welding (SMAW) II – Pipe — 3 Credits / 90 Clock-Hours

The SMAW Pipe II course will continue to help students with advanced techniques, positions and joints used for welding pipe using the SMAW process as used in structural, pipeline and pressure vessel applications. The course will teach students proper techniques to weld pipe in the 2G, 5G and 6G
positions. Students will master the techniques necessary to qualify for the American Welding Society (AWS) D1.1 Structural Steel Code as well as the American Society of Mechanical Engineers (ASME) Section IX pressure vessel and piping code.

Objectives:
● Demonstrate technique to weld 6" schedule 80 pipe with E6010 Electrodes for the root, fill and cover passes: 2G, 5G downhill and 6G downhill positions.
● Demonstrate the ability to weld in a restrictive area and perform a brother-in-law weld.
● Prepared to take the AWS D1.1 6G pipe qualification test.
● Prepared to take the API 1104 6G pipe qualification test.

TEWT 2216 Gas Tungsten Arc Welding (GTAW) – Pre-Pipe **3 Credits / 90 Clock-Hours**

The GTAW pre-pipe welding course will help students become familiar with the techniques, positions, and joints used for welding pipe as used in structural, pipeline, and pressure vessel applications. This course will teach students specialized techniques used for pipe welding applications such as open root “V” grooves, using GTAW “walking the cup” technique. GTAW may be waived if the student has a D1.1 structural steel certification in this process.

Objectives:
• Tack using the feathering technique on ⅜”- ½” plate with different sizing root opening.
• Demonstrate weld on ⅜” to ½” plate in the following positions, with the GTAW process: “walking the cup” for the root, first fill and E7018 for the fill and cover pass: 2G, 3G and 4G.
• Demonstrate weld on ⅜” to ½” plate in the following positions with the GTAW process: “walking the cup” for the root, fill and cover pass: 2G, 3G and 4G.

TEWT 2220 Gas Tungsten Arc Welding (GTAW) – Pipe **4 Credits / 120 Clock-Hours**

The GTAW pipe welding course will help students become familiar with the techniques, positions, and joints used for welding pipe as used in structural, pipeline, and pressure vessel applications. This course will teach students how to make root and fill passes using the GTAW process by “walking the cup” of the GTAW torch. Students will also prepare to qualify for the American Welding Society's (AWS) D1.1 structural steel code and the American Society of Mechanical Engineers (ASME) Section IX pressure vessel and piping code.
Objectives:
• Demonstrate weld on 6” schedule 80 pipe in the following positions, using the GTAW process for the root, fill and cover passes: 2G, 5G and 6G.
• Demonstrate weld on 6” schedule 80 pipe in the following positions with the GTAW process for the root and hot pass and E7018 for the fill and cover pass: 2G, 5G and 6G.
• Prepare for the ASME Section IX 6G Pipe qualification - GTAW root and hot pass, E7018 fill and cap.