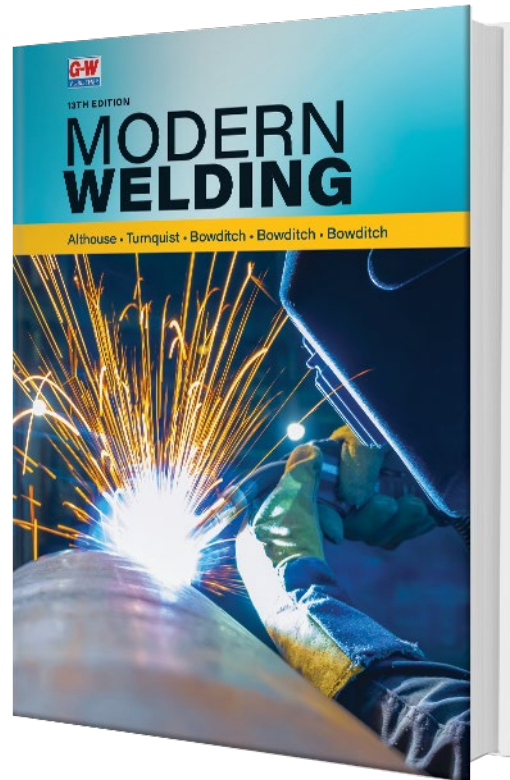




***Correlation of
Modern Welding***
 by Althouse, Turnquist, W. Bowditch, K. Bowditch, and M. Bowditch
 (Goodheart-Willcox Publisher ©2024)
 to
AWS SENSE Level I—Entry Welders

The following chart correlates the *Modern Welding* textbook and lab workbook to the American Welding Society’s AWS SENSE Level I—Entry Welder guide. The chart lists each of the Key Indicators in the guide, the page numbers where applicable information can be found in the *Modern Welding* textbook, and the numbers of applicable Lessons and Jobs in the lab workbook. The organization of the correlation chart allows you to easily gear your curriculum to the AWS SENSE training standards for entry-level personnel.

The AWS SENSE standards were created in accordance with the rules of the American National Standards Institute. They were created as a means of conveying the knowledge and skills identified by industry as essential to the job performance of entry-level welders. The standards listed are intended to assist instructors in developing and implementing curriculum and training content that will provide students with the welding skills and competencies needed to gain employment and to advance within the field.



Key Indicators	G-W Content
MODULE 1: Occupational Orientation	
1. Prepares time or job cards, reports, or records.	Textbook: pg. 847, 859 Lab Workbook Lessons: Lesson 33, Getting and Holding a Job in the Welding Industry Lab Workbook Jobs: Job 33-1, Applying and Interviewing for a Welding Job
2. Performs housekeeping duties.	Textbook: pg. 9 Lab Workbook Lessons: Lesson 1A, General Shop Safety
3. Follows verbal instructions to complete work assignments.	Textbook: pg. 74, 855–856 Lab Workbook Lessons: Lesson 33, Getting and Holding a Job in the Welding Industry

Correlation of *Modern Welding* to AWS SENSE Level I—page 2

Key Indicators	G-W Content
4. Follows written instructions to complete work assignments.	Textbook: pg. 74, 855–856 Lab Workbook Lessons: Lesson 33, Getting and Holding a Job in the Welding Industry Lab Workbook Jobs: All jobs.
MODULE 2: Safety and Health of Welders	
1. Demonstrates proper use and inspection of personal protection equipment (PPE).	Textbook: pg. 6–9, 124–125, 136–138, 194–195, 319 Lab Workbook Lessons: Lesson 1A, General Shop Safety Lab Workbook Jobs: All jobs.
2. Demonstrates proper safe operation practices in the work area.	Textbook: pg. 3–24 Lab Workbook Lessons: Lesson 1A, General Shop Safety Lab Workbook Jobs: All jobs.
3. Demonstrates proper use and inspection of ventilation equipment.	Textbook: pg. 12–14 Lab Workbook Lessons: Lesson 1A, General Shop Safety Lab Workbook Jobs: Job 6B-1, Inspecting and Setting Up an SMAW Station; Job 8D-1, Inspecting and Setting Up an GMAW/FCAW Station; Job 10C-1, Inspecting and Setting Up a GTAW Station; Job 11-1, Inspecting and Setting Up a PAC Station
4. Demonstrates proper Hot Zone operation.	Textbook: pg. 17–18 Lab Workbook Lessons: Lesson 1A, General Shop Safety Lab Workbook Jobs: All jobs.
5. Demonstrates proper work actions for working in confined spaces.	Textbook: pg. 14 Lab Workbook Lessons: Lesson 1A, General Shop Safety
6. Demonstrates proper use of precautionary labeling as well as SDS and MSDS information.	Textbook: pg. 10, 14 Lab Workbook Lessons: Lesson 1A, General Shop Safety
7. Demonstrates proper inspection and operation of equipment used for each welding and thermal cutting process.	Textbook: pg. 20–21, 136, 207–213, 277–290, 319, 371–374 Lab Workbook Lessons: Lesson 1A, General Shop Safety; Lesson 1B, Oxyfuel Gas Welding and Cutting Safety; Lesson 1C, Arc Welding and Cutting Safety; Lesson 1D, Resistance and Special Welding Process Safety Lab Workbook Jobs: Job 6B-1, Inspecting and Setting Up an SMAW Station; Job 8D-1, Inspecting and Setting Up an GMAW/FCAW Station; Job 10C-1, Inspecting and Setting Up a GTAW Station; Job 11-1, Inspecting and Setting Up a PAC Station

Correlation of *Modern Welding* to AWS SENSE Level I—page 3

Key Indicators	G-W Content
MODULE 3: Drawing and Welding Symbol Interpretation	
1. Interprets basic elements of a drawing or sketch.	Textbook: pg. 27–35 Lab Workbook Lessons: Lesson 2, Print Reading Lab Workbook Jobs: All jobs.
2. Interprets welding symbol information.	Textbook: pg. 48–62 Lab Workbook Lessons: Lesson 3B, Reading Welding Symbols Lab Workbook Jobs: All jobs.
3. Fabricates parts from a drawing or sketch.	Textbook: pg. 27–62 Lab Workbook Lessons: Lesson 2, Print Reading; Lesson 3B, Reading Welding Symbols Lab Workbook Jobs: All jobs.
MODULE 4: Shielded Metal Arc Welding (SMAW)	
1. Performs safety inspections of SMAW equipment and accessories.	Textbook: pg. 136 Lab Workbook Lessons: Lesson 1C, Arc Welding and Cutting Safety; Lesson 6A, Shielded Metal Arc Welding Safety Lab Workbook Jobs: Job 6B-1, Inspecting and Setting Up an SMAW Station
2. Makes minor external repairs to SMAW equipment and accessories.	Textbook: pg. 112–114 Lab Workbook Lessons: Lesson 6A, Shielded Metal Arc Welding Safety; Lesson 6B, Shielded Metal Arc Welding Fundamentals Lab Workbook Jobs: Job 6B-1, Inspecting and Setting Up an SMAW Station
3. Sets up for SMAW operations on carbon steel.	Textbook: pg. 138–142 Lab Workbook Lessons: Lesson 6B, Shielded Metal Arc Welding Fundamentals Lab Workbook Jobs: Job 6B-1, Inspecting and Setting Up an SMAW Station
4. Operates SMAW equipment on carbon steel.	Textbook: pg. 139–145 Lab Workbook Lessons: Lesson 6A, Shielded Metal Arc Welding Safety; Lesson 6B, Shielded Metal Arc Welding Fundamentals Lab Workbook Jobs: Job 6B-2, Striking an Arc and Running Short Beads; Job 6B-3, Running Stringer Beads; Job 6B-4, Running Weave Beads; Job 6B-5, Running Stringer Beads

Key Indicators	G-W Content
<p>5. Makes fillet weld, in all positions, on carbon steel.</p>	<p>Textbook: pg. 153–156, 158–159, 162–164</p> <p>Lab Workbook Lessons: Lesson 6C, SMAW in the Flat Welding Position; Lesson 6D, SMAW in the Horizontal Position; Lesson 6E, SMAW in the Vertical and Overhead Positions</p> <p>Lab Workbook Jobs: Job 6C-2, Fillet Welds on Lap Joints in the Flat Welding Position; Job 6C-3, Fillet Welds on T-Joints in the Flat Welding Position; Job 6D-1, Fillet Welds on Lap Joints in the Horizontal Welding Position; Job 6D-2, Fillet Welds on T-Joints in the Horizontal Welding Position; Job 6E-1, Fillet Welds on Lap Joints in the Vertical Welding Position; Job 6E-2, Fillet Welds on T-Joints in the Vertical Welding Position; Job 6E-4, Fillet Welds on Lap Joints in the Overhead Welding Position; Job 6E-5, Fillet Welds on T-Joints in the Overhead Welding Position</p>
<p>6. Makes groove welds, in all positions, on carbon steel.</p>	<p>Textbook: pg. 152–164</p> <p>Lab Workbook Lessons: Lesson 6C, SMAW in the Flat Welding Position; Lesson 6D, SMAW in the Horizontal Position; Lesson 6E, SMAW in the Vertical and Overhead Positions</p> <p>Lab Workbook Jobs: Job 6C-1, Groove Welds on Square-Groove Edge Joints in the Flat Welding Position; Job 6C-4, Groove Welds on Bevel Groove Butt Joints in the Flat Welding Position; Job 6D-3, Groove Welds on Bevel-Groove Butt Joints and V-Groove Outside Corner Joints in the Horizontal Welding Position; Job 6E-3, Groove Welds on V-Groove Butt Joints in the Vertical Welding Position; Job 6E-6, Groove Welds on Bevel-Groove Butt Joints in the Overhead Welding Position; Job 6E-7, Structural Welding: Groove Welds in Thick Plate—Out of Position</p>
<p>7. Passes SMAW welder performance qualification tests (2G and 3G, uphill, limited thickness test plates) on carbon steel.</p>	<p>Textbook: pg. 164–167</p> <p>Lab Workbook Lessons: Lesson 6C, SMAW in the Flat Welding Position; Lesson 6D, SMAW in the Horizontal Position; Lesson 6E, SMAW in the Vertical and Overhead Positions</p> <p>Lab Workbook Jobs: Job 6E-7, Structural Welding: Groove Welds in Thick Plate—Out of Position</p>
<p>MODULE 5: Gas Metal Arc Welding (GMAW-S, GMAW spray transfer)</p>	
<p>1. Performs safety inspections of GMAW equipment and accessories.</p>	<p>Textbook: pg. 206–207</p> <p>Lab Workbook Lessons: Lesson 8A, Gas Metal and Flux Cored Arc Welding Safety; Lesson 8C, Setting Up a Gas Metal or Flux Cored Arc Welding Station</p> <p>Lab Workbook Jobs: Job 8D-1, Inspecting and Setting Up an GMAW/FCAW Station</p>

Correlation of *Modern Welding* to AWS SENSE Level I—page 5

Key Indicators	G-W Content
<p>2. Makes minor external repairs to GMAW equipment and accessories.</p>	<p>Textbook: pg. 212, 219–222, 238–240 Lab Workbook Lessons: Lesson 8A, Gas Metal and Flux Cored Arc Welding Safety; Lesson 8C, Setting Up a Gas Metal or Flux Cored Arc Welding Station Lab Workbook Jobs: Job 8D-1, Inspecting and Setting Up an GMAW/FCAW Station</p>
<p>3. Sets up for GMAW-S operations on carbon steel.</p>	<p>Textbook: pg. 207–222 Lab Workbook Lessons: Lesson 8C, Setting Up a Gas Metal or Flux Cored Arc Welding Station Lab Workbook Jobs: Job 8D-1, Inspecting and Setting Up an GMAW/FCAW Station; Job 8D-2, Adjusting GMAW and FCAW Welding Machines and Guns; Job 8D-3, Setting Up a GMAW Welding Machine and Making Fillet Welds on Lap Joints in the Flat Welding Position</p>
<p>4. Operates GMAW-S equipment on carbon steel.</p>	<p>Textbook: pg. 224–228 Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds Lab Workbook Jobs: Job 8D-3, Setting Up a GMAW Welding Machine and Making Fillet Welds on Lap Joints in the Flat Welding Position</p>
<p>5. Makes fillet welds, in all positions, on carbon steel.</p>	<p>Textbook: pg. 228–236 Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds; Lesson 8E, GMAW and FCAW Procedures for Vertical and Overhead Welds Lab Workbook Jobs: Job 8D-3, Setting Up a GMAW Welding Machine and Making Fillet Welds on Lap Joints in the Flat Welding Position; Job 8D-4, Fillet Welds on Inside Corner and T-Joints in the Flat Welding Position; Job 8D-6, Fillet Welds on Lap Joints in the Horizontal Welding Position; Job 8D-7, Fillet Welds on T-Joints in the Horizontal Welding Position—GMAW; Job 8E-1, Fillet Welds on Lap Joints in the Vertical Welding Position; Job 8E-2, Fillet Welds on T-Joints in the Vertical Welding Position—GMAW; Job 8E-5, Fillet Welds on Lap Joints in the Overhead Welding Position; Job 8E-6, Fillet Welds on Lap Joints in the Overhead Welding Position—GMAW</p>

Key Indicators	G-W Content
6. Makes groove welds, in all positions, on carbon steel.	<p>Textbook: pg. 228, 230–233</p> <p>Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds; Lesson 8E, GMAW and FCAW Procedures for Vertical and Overhead Welds</p> <p>Lab Workbook Jobs: Job 8D-5, Groove Welds on Square-Groove Butt Joints in the Flat Welding Position; Job 8D-9, Groove Welds on Square-Groove Butt Joints in the Horizontal Welding Position; Job 8E-4, Groove Welds on Bevel-Groove Butt Joints in the Vertical Welding Position; Job 8E-8, Groove Welds on Square-Groove Butt Joints in the Overhead Welding Position</p>
7. Passes GMAW-S workmanship qualification test on carbon steel.	<p>Textbook: pg. 228, 230–233</p> <p>Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds; Lesson 8E, GMAW and FCAW Procedures for Vertical and Overhead Welds</p> <p>Lab Workbook Jobs: Job 8D-3, Setting Up a GMAW Welding Machine and Making Fillet Welds on Lap Joints in the Flat Welding Position; Job 8D-4, Fillet Welds on Inside Corner and T-Joints in the Flat Welding Position; Job 8D-5, Groove Welds on Square-Groove Butt Joints in the Flat Welding Position; Job 8D-6, Fillet Welds on Lap Joints in the Horizontal Welding Position; Job 8D-7, Fillet Welds on T-Joints in the Horizontal Welding Position—GMAW; Job 8D-9, Groove Welds on Square-Groove Butt Joints in the Horizontal Welding Position; Job 8E-1, Fillet Welds on Lap Joints in the Vertical Welding Position; Job 8E-2, Fillet Welds on T-Joints in the Vertical Welding Position—GMAW; Job 8E-4, Groove Welds on Bevel-Groove Butt Joints in the Vertical Welding Position; Job 8E-5, Fillet Welds on Lap Joints in the Overhead Welding Position; Job 8E-6, Fillet Welds on Lap Joints in the Overhead Welding Position—GMAW; Job 8E-8, Groove Welds on Square-Groove Butt Joints in the Overhead Welding Position</p>
8. Sets up for GMAW (spray) operations on carbon steel.	<p>Textbook: pg. 207–222</p> <p>Lab Workbook Lessons: Lesson 8C, Setting Up a Gas Metal or Flux Cored Arc Welding Station</p> <p>Lab Workbook Jobs: Job 8D-1, Inspecting and Setting Up an GMAW/FCAW Station; Job 8D-2, Adjusting GMAW and FCAW Welding Machines and Guns</p>
9. Operates GMAW (spray) equipment on carbon steel.	<p>Textbook: pg. 224–228</p> <p>Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds</p>

Key Indicators	G-W Content
<p>10. Makes fillet welds in the 1F and 2F positions on carbon steel.</p>	<p>Textbook: pg. 228–230 Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds Lab Workbook Jobs: Job 8D-4, Fillet Welds on Inside Corner and T-Joints in the Flat Welding Position; Job 8D-6, Fillet Welds on Lap Joints in the Horizontal Welding Position; Job 8D-7, Fillet Welds on T-Joints in the Horizontal Welding Position—GMAW</p>
<p>11. Makes groove welds in the 1G position on carbon steel.</p>	<p>Textbook: pg. 230 Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds Lab Workbook Jobs: Job 8D-5, Groove Welds on Square-Groove Butt Joints in the Flat Welding Position</p>
<p>12. Passes GMAW (spray) workmanship qualification test on carbon steel.</p>	<p>Textbook: pg. 228, 230–231 Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds Lab Workbook Jobs: Job 8D-4, Fillet Welds on Inside Corner and T-Joints in the Flat Welding Position; Job 8D-5, Groove Welds on Square-Groove Butt Joints in the Flat Welding Position; Job 8D-6, Fillet Welds on Lap Joints in the Horizontal Welding Position</p>
<p>MODULE 6: Flux Cored Arc Welding (FCAW-G/GM, FCAW-S)</p>	
<p>1. Performs safety inspections of FCAW equipment and accessories.</p>	<p>Textbook: pg. 206–207 Lab Workbook Lessons: Lesson 8A, Gas Metal and Flux Cored Arc Welding Safety; Lesson 8C, Setting Up a Gas Metal or Flux Cored Arc Welding Station Lab Workbook Jobs: Job 8D-1, Inspecting and Setting Up an GMAW/FCAW Station</p>
<p>2. Makes minor external repairs to FCAW equipment and accessories.</p>	<p>Textbook: pg. 212, 219–222, 238–240 Lab Workbook Lessons: Lesson 8A, Gas Metal and Flux Cored Arc Welding Safety; Lesson 8C, Setting Up a Gas Metal or Flux Cored Arc Welding Station Lab Workbook Jobs: Job 8D-1, Inspecting and Setting Up an GMAW/FCAW Station</p>
<p>3. Sets up for FCAW-G/GM operations on carbon steel.</p>	<p>–Textbook: pg. 207–222 Lab Workbook Lessons: Lesson 8C, Setting Up a Gas Metal or Flux Cored Arc Welding Station Lab Workbook Jobs: Job 8D-1, Inspecting and Setting Up an GMAW/FCAW Station; Job 8D-2, Adjusting GMAW and FCAW Welding Machines and Guns</p>

Key Indicators	G-W Content
<p>4. Operates FCAW-G/GM equipment on carbon steel.</p>	<p>Textbook: pg. 224–228</p> <p>Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds</p> <p>Lab Workbook Jobs: Job 8D-3, Setting Up a GMAW Welding Machine and Making Fillet Welds on Lap Joints in the Flat Welding Position</p>
<p>5. Makes fillet welds, in all positions, on carbon steel.</p>	<p>Textbook: pg. 228–236</p> <p>Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds; Lesson 8E, GMAW and FCAW Procedures for Vertical and Overhead Welds</p> <p>Lab Workbook Jobs: Job 8D-3, Setting Up a GMAW Welding Machine and Making Fillet Welds on Lap Joints in the Flat Welding Position; Job 8D-4, Fillet Welds on Inside Corner and T-Joints in the Flat Welding Position; Job 8D-6, Fillet Welds on Lap Joints in the Horizontal Welding Position; Job 8D-8, Fillet Welds on T-Joints in the Horizontal Welding Position—FCAW; Job 8E-1, Fillet Welds on Lap Joints in the Vertical Welding Position; Job 8E-3, Fillet Welds on T-Joints in the Vertical Welding Position—FCAW; Job 8E-5, Fillet Welds on Lap Joints in the Overhead Welding Position; Job 8E-7, Fillet Welds on Lap Joints in the Overhead Welding Position—FCAW</p>
<p>6. Makes groove welds, in all positions, on carbon steel.</p>	<p>Textbook: pg. 228, 230–233</p> <p>Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds; Lesson 8E, GMAW and FCAW Procedures for Vertical and Overhead Welds</p> <p>Lab Workbook Jobs: Job 8D-5, Groove Welds on Square-Groove Butt Joints in the Flat Welding Position; Job 8D-9, Groove Welds on Square-Groove Butt Joints in the Horizontal Welding Position; Job 8E-4, Groove Welds on Bevel-Groove Butt Joints in the Vertical Welding Position; Job 8E-8, Groove Welds on Square-Groove Butt Joints in the Overhead Welding Position</p>

Key Indicators	G-W Content
<p>7. Passes FCAW-G/GM workmanship qualification test on carbon steel.</p>	<p>Textbook: pg. 228, 230–233</p> <p>Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds; Lesson 8E, GMAW and FCAW Procedures for Vertical and Overhead Welds</p> <p>Lab Workbook Jobs: Job 8D-3, Setting Up a GMAW Welding Machine and Making Fillet Welds on Lap Joints in the Flat Welding Position; Job 8D-4, Fillet Welds on Inside Corner and T-Joints in the Flat Welding Position; Job 8D-5, Groove Welds on Square-Groove Butt Joints in the Flat Welding Position; Job 8D-6, Fillet Welds on Lap Joints in the Horizontal Welding Position; Job 8D-8, Fillet Welds on T-Joints in the Horizontal Welding Position—FCAW; Job 8D-9, Groove Welds on Square-Groove Butt Joints in the Horizontal Welding Position; Job 8E-1, Fillet Welds on Lap Joints in the Vertical Welding Position; Job 8E-3, Fillet Welds on T-Joints in the Vertical Welding Position—FCAW; Job 8E-4, Groove Welds on Bevel-Groove Butt Joints in the Vertical Welding Position; Job 8E-5, Fillet Welds on Lap Joints in the Overhead Welding Position; Job 8E-7, Fillet Welds on Lap Joints in the Overhead Welding Position—FCAW; Job 8E-8, Groove Welds on Square-Groove Butt Joints in the Overhead Welding Position</p>
<p>8. Sets up for FCAW-S operations on carbon steel.</p>	<p>Textbook: pg. 207–222</p> <p>Lab Workbook Lessons: Lesson 8C, Setting Up a Gas Metal or Flux Cored Arc Welding Station</p> <p>Lab Workbook Jobs: Job 8D-1, Inspecting and Setting Up an GMAW/FCAW Station; Job 8D-2, Adjusting GMAW and FCAW Welding Machines and Guns</p>
<p>9. Operates FCAW-S equipment on carbon steel.</p>	<p>Textbook: pg. 224–228</p> <p>Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds</p> <p>Lab Workbook Jobs: Job 8D-3, Setting Up a GMAW Welding Machine and Making Fillet Welds on Lap Joints in the Flat Welding Position</p>

Key Indicators	G-W Content
<p>10. Makes fillet welds, in all positions, on carbon steel.</p>	<p>Textbook: pg. 228–230, 229–236</p> <p>Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds; Lesson 8E, GMAW and FCAW Procedures for Vertical and Overhead Welds</p> <p>Lab Workbook Jobs: Job 8D-3, Setting Up a GMAW Welding Machine and Making Fillet Welds on Lap Joints in the Flat Welding Position; Job 8D-4, Fillet Welds on Inside Corner and T-Joints in the Flat Welding Position; Job 8D-6, Fillet Welds on Lap Joints in the Horizontal Welding Position; Job 8D-8, Fillet Welds on T-Joints in the Horizontal Welding Position—FCAW; Job 8E-1, Fillet Welds on Lap Joints in the Vertical Welding Position; Job 8E-3, Fillet Welds on T-Joints in the Vertical Welding Position—FCAW; Job 8E-5, Fillet Welds on Lap Joints in the Overhead Welding Position; Job 8E-7, Fillet Welds on Lap Joints in the Overhead Welding Position—FCAW</p>
<p>11. Makes groove welds, in all positions, on carbon steel.</p>	<p>Textbook: pg. 228, 230–236</p> <p>Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds; Lesson 8E, GMAW and FCAW Procedures for Vertical and Overhead Welds</p> <p>Lab Workbook Jobs: Job 8D-5, Groove Welds on Square-Groove Butt Joints in the Flat Welding Position; Job 8D-9, Groove Welds on Square-Groove Butt Joints in the Horizontal Welding Position; Job 8E-4, Groove Welds on Bevel-Groove Butt Joints in the Vertical Welding Position; Job 8E-8, Groove Welds on Square-Groove Butt Joints in the Overhead Welding Position</p>

Key Indicators	G-W Content
<p>12. Passes FCAW-S workmanship qualification test on carbon steel.</p>	<p>Textbook: pg. 228, 230–236</p> <p>Lab Workbook Lessons: Lesson 8D, GMAW and FCAW Procedures for Flat and Horizontal Welds; Lesson 8E, GMAW and FCAW Procedures for Vertical and Overhead Welds</p> <p>Lab Workbook Jobs: Job 8D-3, Setting Up a GMAW Welding Machine and Making Fillet Welds on Lap Joints in the Flat Welding Position; Job 8D-4, Fillet Welds on Inside Corner and T-Joints in the Flat Welding Position; Job 8D-5, Groove Welds on Square-Groove Butt Joints in the Flat Welding Position; Job 8D-6, Fillet Welds on Lap Joints in the Horizontal Welding Position; Job 8D-8, Fillet Welds on T-Joints in the Horizontal Welding Position—FCAW; Job 8D-9, Groove Welds on Square-Groove Butt Joints in the Horizontal Welding Position; Job 8E-1, Fillet Welds on Lap Joints in the Vertical Welding Position; Job 8E-3, Fillet Welds on T-Joints in the Vertical Welding Position—FCAW; Job 8E-4, Groove Welds on Bevel-Groove Butt Joints in the Vertical Welding Position; Job 8E-5, Fillet Welds on Lap Joints in the Overhead Welding Position; Job 8E-7, Fillet Welds on Lap Joints in the Overhead Welding Position—FCAW; Job 8E-8, Groove Welds on Square-Groove Butt Joints in the Overhead Welding Position</p>
<p>MODULE 7: Gas Tungsten Arc Welding (GTAW)</p>	
<p>1. Performs safety inspections of GTAW equipment and accessories.</p>	<p>Textbook: pg. 277–278</p> <p>Lab Workbook Lessons: Lesson 10A, Gas Tungsten Arc Welding Safety; Lesson 10B, Gas Tungsten Arc Welding Principles</p> <p>Lab Workbook Jobs: Job 10C-1, Inspecting and Setting Up a GTAW Station</p>
<p>2. Makes minor external repairs to GTAW equipment and accessories.</p>	<p>Textbook: pg. 255–265, 305–306</p> <p>Lab Workbook Lessons: Lesson 10A, Gas Tungsten Arc Welding Safety; Lesson 10B, Gas Tungsten Arc Welding Principles</p> <p>Lab Workbook Jobs: Job 10C-1, Inspecting and Setting Up a GTAW Station</p>
<p>3. Sets up for GTAW operations on carbon steel.</p>	<p>Textbook: pg. 277–290</p> <p>Lab Workbook Lessons: Lesson 10A, Gas Tungsten Arc Welding Safety; Lesson 10B, Gas Tungsten Arc Welding Principles</p> <p>Lab Workbook Jobs: Job 10C-1, Inspecting and Setting Up a GTAW Station</p>

Correlation of *Modern Welding* to AWS SENSE Level I—page 12

Key Indicators	G-W Content
4. Operates GTAW equipment on carbon steel.	Textbook: pg. 291–292 Lab Workbook Lessons: Lesson 10C, Gas Tungsten Arc Welding Procedures Lab Workbook Jobs: Job 10C-2, Bead on Plate—Carbon Steel
5. Makes fillet welds, in all positions, on carbon steel.	Textbook: pg. 294–300 Lab Workbook Lessons: Lesson 10C, Gas Tungsten Arc Welding Procedures Lab Workbook Jobs: Job 10C-3, Fillet Welds on Lap Joints in the Flat Welding Position; Job 10C-4, Fillet Welds on Inside Corner Joints in the Flat Welding Position; Job 10C-6, Fillet Welds on Lap Joints in the Horizontal Welding Position; Job 10C-7, Fillet Welds on Inside Corner and T-Joints in the Horizontal Welding Position; Job 10C-9, Fillet Welds on Lap Joints in the Vertical Welding Position; Job 10C-10, Fillet Welds on T-Joints in the Vertical Welding Position; Job 10C-12, Fillet Welds on Lap Joints in the Overhead Welding Position; Job 10C-13, Fillet Welds on T-Joints in the Overhead Welding Position
6. Makes groove welds, in all positions, on carbon steel.	Textbook: pg. 293–300 Lab Workbook Lessons: Lesson 10C, Gas Tungsten Arc Welding Procedures Lab Workbook Jobs: Job 10C-5, Groove Welds on Square-Groove Butt Joints in the Flat Welding Position; Job 10C-8, Groove Welds on Square-Groove Butt Joints in the Horizontal Welding Position; Job 10C-11, Groove Welds on Square-Groove Butt Joints in the Vertical Welding Position; Job 10C-14, Groove Welds on Square-Groove Butt Joints in the Overhead Welding Position

Key Indicators	G-W Content
<p>7. Passes GTAW workmanship qualification test on carbon steel.</p>	<p>Textbook: pg. 293–300 Lab Workbook Lessons: Lesson 10C, Gas Tungsten Arc Welding Procedures Lab Workbook Jobs: Job 10C-3, Fillet Welds on Lap Joints in the Flat Welding Position; Job 10C-4, Fillet Welds on Inside Corner Joints in the Flat Welding Position; Job 10C-5, Groove Welds on Square-Groove Butt Joints in the Flat Welding Position; Job 10C-6, Fillet Welds on Lap Joints in the Horizontal Welding Position; Job 10C-7, Fillet Welds on Inside Corner and T-Joints in the Horizontal Welding Position; Job 10C-8, Groove Welds on Square-Groove Butt Joints in the Horizontal Welding Position; Job 10C-9, Fillet Welds on Lap Joints in the Vertical Welding Position; Job 10C-10, Fillet Welds on T-Joints in the Vertical Welding Position; Job 10C-11, Groove Welds on Square-Groove Butt Joints in the Vertical Welding Position; Job 10C-12, Fillet Welds on Lap Joints in the Overhead Welding Position; Job 10C-13, Fillet Welds on T-Joints in the Overhead Welding Position; Job 10C-14, Groove Welds on Square-Groove Butt Joints in the Overhead Welding Position</p>
<p>8. Sets up for GTAW operations on austenitic stainless steel.</p>	<p>Textbook: pg. 277–290, 301–302 Lab Workbook Lessons: Lesson 10A, Gas Tungsten Arc Welding Safety; Lesson 10B, Gas Tungsten Arc Welding Principles Lab Workbook Jobs: Job 10C-1, Inspecting and Setting Up a GTAW Station</p>
<p>9. Operates GTAW equipment on austenitic stainless steel.</p>	<p>Textbook: pg. 291–292, 301–302 Lab Workbook Lessons: Lesson 10C, Gas Tungsten Arc Welding Procedures Lab Workbook Jobs: Job 10D-1, Bead on Plate—Stainless Steel</p>
<p>10. Makes fillet welds in the 1F, 2F, and 3F positions, on austenitic stainless steel.</p>	<p>Textbook: pg. 294–302 Lab Workbook Lessons: Lesson 10C, Gas Tungsten Arc Welding Procedures Lab Workbook Jobs: Job 10D-2, Fillet Welds on Lap Joints—Stainless Steel; Job 10D-3, Fillet Welds on T-Joints—Stainless Steel</p>
<p>11. Makes groove welds in the 1G and 2G positions, on austenitic stainless steel.</p>	<p>Textbook: pg. 293–302 Lab Workbook Lessons: Lesson 10C, Gas Tungsten Arc Welding Procedures Lab Workbook Jobs: Job 10D-4, Groove Welds on Square-Groove Butt Joints—Stainless Steel; Job 10D-5, V-Groove Weld on Plate—Stainless Steel</p>

Correlation of *Modern Welding* to AWS SENSE Level I—page 14

Key Indicators	G-W Content
<p>12. Passes GTAW workmanship qualification test on austenitic stainless steel.</p>	<p>Textbook: pg. 293–302 Lab Workbook Lessons: Lesson 10C, Gas Tungsten Arc Welding Procedures Lab Workbook Jobs: Job 10D-2, Fillet Welds on Lap Joints—Stainless Steel; Job 10D-3, Fillet Welds on T-Joints—Stainless Steel; Job 10D-4, Groove Welds on Square-Groove Butt Joints—Stainless Steel; Job 10D-5, V-Groove Weld on Plate—Stainless Steel</p>
<p>13. Sets up for GTAW operations on aluminum.</p>	<p>Textbook: pg. 277–290, 302 Lab Workbook Lessons: Lesson 10A, Gas Tungsten Arc Welding Safety; Lesson 10B, Gas Tungsten Arc Welding Principles Lab Workbook Jobs: Job 10C-1, Inspecting and Setting Up a GTAW Station</p>
<p>14. Operates GTAW equipment on aluminum.</p>	<p>Textbook: pg. 291–292, 302 Lab Workbook Lessons: Lesson 10C, Gas Tungsten Arc Welding Procedures Lab Workbook Jobs: Job 10E-1, Bead on Plate—Stainless Steel</p>
<p>15. Makes fillet welds in the 1F and 2F positions, on aluminum.</p>	<p>Textbook: pg. 294–300, 302 Lab Workbook Lessons: Lesson 10C, Gas Tungsten Arc Welding Procedures Lab Workbook Jobs: Job 10E-2, Fillet Welds on Lap Joints—Aluminum; Job 10E-3, Fillet Welds on T-Joints—Aluminum</p>
<p>16. Makes groove welds in the 1G position, on aluminum.</p>	<p>Textbook: pg. 293–300, 302 Lab Workbook Lessons: Lesson 10C, Gas Tungsten Arc Welding Procedures Lab Workbook Jobs: Job 10E-4, Groove Welds on Square-Groove Butt Joints—Aluminum</p>
<p>17. Passes GTAW workmanship qualification test on aluminum.</p>	<p>Textbook: pg. 293–300, 302 Lab Workbook Lessons: Lesson 10C, Gas Tungsten Arc Welding Procedures Lab Workbook Jobs: Job 10E-2, Fillet Welds on Lap Joints—Aluminum; Job 10E-3, Fillet Welds on T-Joints—Aluminum; Job 10E-4, Groove Welds on Square-Groove Butt Joints—Aluminum</p>

Correlation of *Modern Welding* to AWS SENSE Level I—page 15

Key Indicators	G-W Content
MODULE 8: Thermal Cutting Processes	
Unit 1: Manual Oxyfuel Gas Cutting (OFC)	
1. Performs safety inspections of manual OFC equipment and accessories.	Textbook: pg. 370–374, 422, 442 Lab Workbook Lessons: Lesson 12B, Oxyfuel Gas Welding and Cutting Safety; Lesson 13A, Oxyfuel Gas Welding—Turning the Outfit On and Off; Lesson 14, Oxyfuel Gas Cutting Equipment and Supplies; Lesson 15, Oxyfuel Gas Cutting—Cutting Steel
2. Makes minor external repairs to manual OFC equipment and accessories.	Textbook: pg. 410–415 Lab Workbook Lessons: Lesson 12A, Oxyfuel Gas Welding Equipment and Supplies; Lesson 12B, Oxyfuel Gas Welding and Cutting Safety; Lesson 14, Oxyfuel Gas Cutting Equipment and Supplies
3. Sets up for manual OFC operations on carbon steel.	Textbook: pg. 375–380, 422–424 Lab Workbook Lessons: Lesson 12A, Oxyfuel Gas Welding Equipment and Supplies; Lesson 12B, Oxyfuel Gas Welding and Cutting Safety; Lesson 14, Oxyfuel Gas Cutting Equipment and Supplies
4. Operates manual OFC equipment on carbon steel.	Textbook: pg. 401–404, 424–429 Lab Workbook Lessons: Lesson 13A, Oxyfuel Gas Welding—Turning the Outfit On and Off; Lesson 15, Oxyfuel Gas Cutting—Cutting Steel Lab Workbook Jobs: Job 13A-1, Turning On, Lighting, and Shutting Down an Oxyacetylene Welding Outfit
5. Performs straight, square edge cutting operations, in the flat position, on carbon steel.	Textbook: pg. 430–436 Lab Workbook Lessons: Lesson 15, Oxyfuel Gas Cutting—Cutting Steel Lab Workbook Jobs: Job 15-1, Cutting in the Flat Position with an Oxyfuel Gas Torch
6. Performs shape, square edge cutting operations, in the flat position, on carbon steel.	Textbook: pg. 436 Lab Workbook Lessons: Lesson 15, Oxyfuel Gas Cutting—Cutting Steel Lab Workbook Jobs: Job 15-2, Cutting Shapes and Piercing with an Oxyfuel Gas Torch
7. Performs straight, bevel edge cutting operations, in the flat position, on carbon steel.	Textbook: pg. 436 Lab Workbook Lessons: Lesson 15, Oxyfuel Gas Cutting—Cutting Steel Lab Workbook Jobs: Job 15-1, Cutting in the Flat Position with an Oxyfuel Gas Torch
8. Performs scarfing and gouging operations to remove base and weld metal, in the flat and horizontal positions, on carbon steel.	Textbook: pg. 438–439 Lab Workbook Lessons: Lesson 15, Oxyfuel Gas Cutting—Cutting Steel Lab Workbook Jobs: Job 15-6, Gouging to Remove Weld Reinforcement from the Face of a Weld

Correlation of *Modern Welding* to AWS SENSE Level I—page 16

Key Indicators	G-W Content
Unit 2: Mechanized Oxyfuel Gas Cutting (OFC) [e.g., Track Burner]	
<p>1. Performs safety inspections of mechanized OFC equipment and accessories.</p>	<p>Textbook: pg. 370–374, 422, 442 Lab Workbook Lessons: Lesson 12B, Oxyfuel Gas Welding and Cutting Safety; Lesson 13A, Oxyfuel Gas Welding—Turning the Outfit On and Off; Lesson 14, Oxyfuel Gas Cutting Equipment and Supplies; Lesson 15, Oxyfuel Gas Cutting—Cutting Steel Lab Workbook Jobs: Job 15-8, Setting Up and Inspecting a Semiautomatic Oxyfuel Gas Cutting Torch</p>
<p>2. Makes minor external repairs to mechanized OFC equipment and accessories.</p>	<p>Textbook: pg. 410–415 Lab Workbook Lessons: Lesson 12B, Oxyfuel Gas Welding and Cutting Safety; Lesson 13A, Oxyfuel Gas Welding—Turning the Outfit On and Off; Lesson 14, Oxyfuel Gas Cutting Equipment and Supplies; Lesson 15, Oxyfuel Gas Cutting—Cutting Steel Lab Workbook Jobs: Job 15-8, Setting Up and Inspecting a Semiautomatic Oxyfuel Gas Cutting Torch</p>
<p>3. Sets up for mechanized OFC operations on carbon steel.</p>	<p>Textbook: pg. 439–441 Lab Workbook Lessons: Lesson 13A, Oxyfuel Gas Welding—Turning the Outfit On and Off; Lesson 15, Oxyfuel Gas Cutting—Cutting Steel Lab Workbook Jobs: Job 13A-1, Turning On, Lighting, and Shutting Down an Oxyacetylene Welding Outfit; Job 15-8, Setting Up and Inspecting a Semiautomatic Oxyfuel Gas Cutting Torch</p>
<p>4. Operates mechanized OFC equipment on carbon steel.</p>	<p>Textbook: pg. 439–441 Lab Workbook Lessons: Lesson 15, Oxyfuel Gas Cutting—Cutting Steel Lab Workbook Jobs: Job 15-9, Using a Motorized Carriage to Make Square and Bevel Edges on Plate and Pipe</p>
<p>5. Performs straight, square edge cutting operations in the flat position, on carbon steel.</p>	<p>Textbook: pg. 439–441 Lab Workbook Lessons: Lesson 15, Oxyfuel Gas Cutting—Cutting Steel Lab Workbook Jobs: Job 15-9, Using a Motorized Carriage to Make Square and Bevel Edges on Plate and Pipe</p>
<p>6. Performs straight, bevel edge cutting operations in the flat position, on carbon steel.</p>	<p>Textbook: pg. 439–441 Lab Workbook Lessons: Lesson 15, Oxyfuel Gas Cutting—Cutting Steel Lab Workbook Jobs: Job 15-9, Using a Motorized Carriage to Make Square and Bevel Edges on Plate and Pipe</p>

Correlation of *Modern Welding* to AWS SENSE Level I—page 17

Key Indicators	G-W Content
Unit 3: Manual Plasma Arc Cutting (PAC)	
1. Performs safety inspections of manual PAC equipment and accessories.	Textbook: pg. 318–320 Lab Workbook Lessons: Lesson 11, Plasma Arc Cutting Lab Workbook Jobs: Job 11-1, Inspecting and Setting Up a PAC Station
2. Makes minor external repairs to manual PAC equipment and accessories.	Textbook: pg. 318–320 Lab Workbook Lessons: Lesson 11, Plasma Arc Cutting Lab Workbook Jobs: Job 11-1, Inspecting and Setting Up a PAC Station
3. Sets up for manual PAC operations on carbon steel, austenitic stainless steel, and aluminum.	Textbook: pg. 318–322 Lab Workbook Lessons: Lesson 11, Plasma Arc Cutting Lab Workbook Jobs: Job 11-1, Inspecting and Setting Up a PAC Station
4. Operates manual PAC equipment on carbon steel, austenitic stainless steel, and aluminum.	Textbook: pg. 320–328 Lab Workbook Lessons: Lesson 11, Plasma Arc Cutting Lab Workbook Jobs: Job 11-2, Piercing and Cutting Using the Plasma Arc Cutting Process
5. Performs straight, square edge cutting operations, in the flat position, on carbon steel, austenitic stainless steel, and aluminum.	Textbook: pg. 320–328 Lab Workbook Lessons: Lesson 11, Plasma Arc Cutting Lab Workbook Jobs: Job 11-2, Piercing and Cutting Using the Plasma Arc Cutting Process
6. Performs shape, square edge cutting operations, in the flat position, on carbon steel, austenitic stainless steel, and aluminum.	Textbook: pg. 320–328 Lab Workbook Lessons: Lesson 11, Plasma Arc Cutting Lab Workbook Jobs: Job 11-4, Cutting a Shape Using the Plasma Arc Cutting Process
Unit 4: Manual Air Carbon Arc Cutting (CAC-A)	
1. Performs safety inspections of manual CAC-A equipment and accessories.	Textbook: pg. 654 Lab Workbook Lessons: Lesson 24A, Special Cutting Safety; Lesson 24B, Special Cutting Processes Lab Workbook Jobs: Job 24B-1, Inspecting a CAC-A Station
2. Makes minor external repairs to manual CAC-A equipment and accessories.	Textbook: pg. 654–655 Lab Workbook Lessons: Lesson 24A, Special Cutting Safety; Lesson 24B, Special Cutting Processes Lab Workbook Jobs: Job 24B-1, Inspecting a CAC-A Station
3. Sets up for manual CAC-A scarfing and gouging operations on carbon steel.	Textbook: pg. 645–658 Lab Workbook Lessons: Lesson 24A, Special Cutting Safety; Lesson 24B, Special Cutting Processes Lab Workbook Jobs: Job 24B-3, Removing Weld Reinforcement Using CAC-A

Key Indicators	G-W Content
4. Operates manual CAC-A equipment on carbon steel.	Textbook: pg. 655–658 Lab Workbook Lessons: Lesson 24A, Special Cutting Safety; Lesson 24B, Special Cutting Processes Lab Workbook Jobs: Job 24B-2, Cutting and Piercing Using CAC-A
5. Performs scarfing and gouging operations to remove base and weld metal, in the flat and horizontal positions, on carbon steel.	Textbook: pg. 655–658 Lab Workbook Lessons: Lesson 24A, Special Cutting Safety; Lesson 24B, Special Cutting Processes Lab Workbook Jobs: Job 24B-3, Removing Weld Reinforcement Using CAC-A
MODULE 9: Welding Inspection and Testing	
1. Examines cut surfaces and edges of prepared base metal parts.	Textbook: pg. 46–47, 325–327, 432 Lab Workbook Lessons: Lesson 30, Inspecting and Testing Welds Lab Workbook Jobs: All jobs.
2. Examines tacks, root passes, intermediate layers, and completed welds.	Textbook: pg. 144–145, 150–152, 225–226, 305–306, 784–786 Lab Workbook Lessons: Lesson 30, Inspecting and Testing Welds Lab Workbook Jobs: All jobs.