

CLASSROOM Curriculum Materials

| Subject Area | Lesson Title | Level | Instructor Lesson Plan | PowerPoint | Lab Activity | Assessment Questions .doc | Assessment Questions .pdf | Student Reference |
|--|--|---------|------------------------|------------|--------------|---------------------------|---------------------------|-------------------|
| Safety | Safe Working Conditions | Level 1 | • | • | | • | • | • |
| | Personal Protective Equipment | Level 1 | • | • | | • | • | • |
| | Fire Safety | Level 1 | • | • | • | • | • | • |
| | Inspection and Troubleshooting | Level 1 | • | • | • | • | • | • |
| | AWS/ANSI Z49.1:2012 Standard | Level 1 | • | • | | • | • | • |
| | Electrical Safety | Level 1 | • | • | • | • | • | • |
| | MSDS/SDS Sheets | Level 1 | • | • | | • | • | • |
| | Arc Welding and Cutting Equipment Safety | Level 1 | • | • | | • | • | • |
| | First Aid | Level 1 | • | • | • | • | • | • |
| GMAW Safety | Level 1 | • | • | | • | • | • | |
| Principles of Welding | Foundations of Arc Welding | Level 1 | • | • | • | • | • | • |
| | Variables in Welding | Level 1 | • | • | • | • | • | • |
| | Welding Technology | Level 1 | • | • | | • | • | • |
| | Introduction to Welding Joints, Positions, and Symbols | Level 1 | • | • | • | • | • | • |
| | Identifying Shapes and Dimensions of Metals | Level 1 | • | • | • | • | • | • |
| | Material Science, Properties, and Classification of Metals | Level 1 | • | • | • | • | • | • |
| | Preparation and Fit-up | Level 1 | • | • | • | • | • | • |
| | Welding Standards and Certifications | Level 1 | • | | • | • | • | • |
| | Visual Weld Inspection Plans | Level 1 | • | • | • | • | • | • |
| | Introduction to Weld Discontinuities and Defects | Level 1 | • | | | • | • | • |
| | Inspecting and Testing Welds | Level 1 | • | • | • | • | • | • |
| | Weld Certification Tests and Procedures | Level 1 | • | | | • | • | • |
| | Welding – A Fabrication Process | Level 3 | • | • | • | • | • | • |
| | Advanced Variables in Welding | Level 3 | • | • | • | • | • | • |
| | Welding Technology | Level 3 | • | | • | • | • | • |
| Material Science, Properties, and Classification of Metals | Level 3 | • | • | • | • | • | • | |
| Defects and Discontinuities | Level 3 | • | • | • | • | • | • | |
| Gas Metal Arc Welding (GMAW) | Vision and Body Position in Welding | Level 1 | • | • | • | • | • | • |
| | Principles of GMAW Welding | Level 1 | • | • | • | • | • | • |
| | GMAW Shielding Gases | Level 1 | • | • | • | • | • | • |
| | GMAW Electrodes | Level 1 | • | • | • | • | • | • |
| | GMAW Modes of Metal Transfer | Level 1 | • | • | • | • | • | • |
| | GMAW Advanced Waveform and Modes of Transfer | Level 2 | • | • | • | • | • | • |
| | GMAW Equipment and Accessories | Level 1 | • | • | • | • | • | • |
| | Advanced GMAW Process Controls | Level 2 | • | • | • | • | • | • |
| | GMAW Maintenance, Repair, and Troubleshooting | Level 2 | • | • | • | • | • | • |
| | GMAW Aluminum Welding | Level 3 | • | • | • | • | • | • |
| | GMAW Stainless Steel Welding | Level 3 | • | • | • | • | • | • |
| | GMAW Pipe Welding | Level 3 | • | • | • | • | • | • |

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|-----------------------------------|--|---------|------------------------|------------|--------------|---------------------------|---------------------------|-------------------|
| Shielded Metal Arc Welding (SMAW) | Vision and Body Position in Welding | Level 1 | ● | ● | ● | ● | ● | ● |
| | Principles of SMAW Welding | Level 1 | ● | ● | | ● | ● | ● |
| | SMAW Techniques | Level 2 | ● | ● | ● | ● | ● | ● |
| | SMAW Electrodes | Level 1 | ● | ● | ● | ● | ● | ● |
| | SMAW Evaluation and Troubleshooting | Level 1 | ● | ● | ● | ● | ● | ● |
| | SMAW Maintenance and Repair | Level 2 | ● | ● | ● | ● | ● | ● |
| | SMAW Welding on Plate | Level 1 | ● | ● | ● | ● | ● | ● |
| | SMAW Pipe Welding | Level 3 | ● | ● | ● | ● | ● | ● |
| Flux-Cored Arc Welding (FCAW) | Vision and Body Position in Welding | Level 2 | ● | ● | ● | ● | ● | ● |
| | Principles of FCAW Welding | Level 2 | ● | ● | ● | ● | ● | ● |
| | FCAW Techniques | Level 2 | ● | ● | ● | ● | ● | ● |
| | FCAW Electrodes and Shielding Gases | Level 2 | ● | ● | ● | ● | ● | ● |
| | FCAW Evaluation and Troubleshooting | Level 2 | ● | ● | ● | ● | ● | ● |
| | FCAW Equipment | Level 2 | ● | ● | ● | ● | ● | ● |
| | FCAW Maintenance and Repair | Level 2 | ● | ● | ● | ● | ● | ● |
| | FCAW Pipe Welding | Level 3 | ● | ● | ● | ● | ● | ● |
| Gas Tungsten Arc Welding (GTAW) | Vision and Body Position in Welding | Level 2 | ● | ● | ● | ● | ● | ● |
| | Principles of GTAW Welding | Level 2 | ● | ● | ● | ● | ● | ● |
| | Introduction to GTAW Welding | Level 2 | ● | ● | ● | ● | ● | ● |
| | Selection and Preparation of GTAW Consumables and Electrodes | Level 2 | ● | ● | ● | ● | ● | ● |
| | GTAW Techniques | Level 2 | ● | ● | ● | ● | ● | ● |
| | GTAW Equipment | Level 2 | ● | ● | ● | ● | ● | ● |
| | Advanced Power Source Variables | Level 2 | ● | ● | ● | ● | ● | ● |
| | GTAW Maintenance and Repair | Level 2 | ● | ● | ● | ● | ● | ● |
| Thermal Cutting | Plasma Arc Cutting: Safety, Set-Up and Operation | Level 1 | ● | ● | ● | ● | ● | ● |
| | Principles of Oxy-Fuel Cutting | Level 1 | ● | ● | ● | ● | ● | ● |

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|---|---|-----------------------------------|------------------------|------------|--------------|---------------------------|---------------------------|-------------------|
| Robotics | Robotics: Yesterday, Today and Tomorrow | Level 2 | ● | | ● | ● | ● | ● |
| | Safety in the Robotics Lab | Level 2 | ● | | ● | ● | ● | ● |
| | Creating and Testing Your First Program | Level 3 | ● | | ● | ● | ● | ● |
| | Editing Your First Program | Level 2 | ● | | ● | ● | ● | ● |
| | Cleaning up Your Program | Level 3 | ● | | ● | ● | ● | ● |
| | Create 2nd program: Bead around Box | Level 2 | ● | | ● | ● | ● | ● |
| | Create 3rd program: Actual weld on Plate | Level 3 | ● | | ● | ● | ● | ● |
| | How to Input Weld Procedure Values for a R301B Robot | Level 2 | ● | | ● | ● | ● | ● |
| | Setting up a Jog Frame | Level 3 | ● | | ● | ● | ● | ● |
| | Teach Circular Motion on a Box | Level 2 | ● | | ● | ● | ● | ● |
| | Weld a Circle | Level 2 | ● | | ● | ● | ● | ● |
| | Weaving | Level 3 | ● | | ● | ● | ● | ● |
| | Wait Instruction – Timer Instruction | Level 3 | ● | | ● | ● | ● | ● |
| | Program Copy, Delete, Comment, Write Protect | Level 3 | ● | | ● | ● | ● | ● |
| | Creating a Zero Position Program | Level 3 | ● | | ● | ● | ● | ● |
| | Teaching a Six-Point Tool Center Point | Level 2 | ● | | ● | ● | ● | ● |
| | Program Editing by Using the Replace Command | Level 3 | ● | | ● | ● | ● | ● |
| | CNC Plasma Cutting | History of CNC Plasma Arc Cutting | Level 2 | ● | | | ● | ● |
| Plasma Arc Cutting Safety | | Level 2 | ● | | | ● | ● | ● |
| CNC Plasma Cutting Machine | | Level 2 | ● | | | ● | ● | ● |
| CNC Related Software and Coordinate Systems | | Level 2 | ● | | | ● | ● | ● |
| G-Code Programming | | Level 2 | ● | | | ● | ● | ● |
| Introduction to Tool Paths | | Level 2 | ● | | | ● | ● | ● |
| Torchmate Driver Software – User Interface | | Level 2 | ● | | | ● | ● | ● |
| Test Cutting | | Level 2 | ● | | ● | ● | ● | ● |
| Introduction to Torchmate CAD | | Level 2 | ● | | | ● | ● | ● |
| Basic CAD Project | | Level 2 | ● | | ● | ● | ● | ● |
| Importing Images into Torchmate CAD | | Level 3 | ● | | ● | ● | ● | ● |
| Torchmate CAD – Advanced Layout Options | | Level 3 | ● | | ● | ● | ● | ● |
| Torchmate CAD – Advanced Shape Creation | | Level 3 | ● | | ● | ● | ● | ● |
| Importing Files From AutoCAD | | Level 3 | ● | | ● | ● | ● | ● |
| Tracing an Image in Torchmate CAD | | Level 3 | ● | | ● | ● | ● | ● |
| Plate Marker | | Level 3 | ● | | ● | ● | ● | ● |
| Troubleshooting | | Level 3 | ● | | ● | ● | ● | ● |
| Manufacturing and Engineering | | Introduction to Welding Codes | Level 2 | ● | ● | ● | ● | ● |
| | Basics of Welding Code Documentation | Level 2 | ● | ● | | ● | ● | ● |
| | Understanding Numbering Systems Used by Welding Codes | Level 2 | ● | ● | | ● | ● | ● |
| | Understanding Welding Procedure Qualifications | Level 2 | ● | ● | | ● | ● | ● |
| | Welder Qualification Testing | Level 2 | ● | ● | | ● | ● | ● |
| | Visual Inspection | Level 2 | ● | ● | ● | ● | ● | ● |
| | Destructive Tests | Level 2 | ● | ● | ● | ● | ● | ● |
| | Non-Destructive Tests | Level 2 | ● | ● | ● | ● | ● | ● |

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|---|---|---------|------------------------|------------|--------------|---------------------------|---------------------------|-------------------|
| Fabrication | Reading Plans and Drawings | Level 1 | • | • | • | • | • | • |
| | Introduction to Fabrication Plans | Level 1 | • | • | | • | • | • |
| | Drawing a Plan | Level 1 | • | | | • | • | • |
| | Strengths of Materials | Level 1 | • | • | | • | • | • |
| | Developing the Cut List and Bill of Materials | Level 1 | • | • | | • | • | • |
| | Cost Analysis-Budgeting (Materials/Time) | Level 2 | • | • | | • | • | • |
| | Loads and Static Forces | Level 2 | • | • | | • | • | • |
| | Principles of Fabrication Quality | Level 2 | • | • | | • | • | • |
| | Principles of Project Design | Level 2 | • | • | | • | • | • |
| Mathematics in Welding | Math in the Work Place | Level 2 | • | | | • | • | • |
| | Addition and Subtraction of Fractions | Level 2 | • | | • | | | • |
| | Addition and Subtraction of Mixed Fractions | Level 2 | • | | | • | • | • |
| | Multiplication of Fractions and Mixed Fractions | Level 2 | • | | | • | • | • |
| | Division of Fractions and Mixed Fractions | Level 2 | • | | | • | • | • |
| | Conversion of Fractions to Decimals | Level 2 | • | | | • | • | • |
| | Addition and Subtraction of Decimals | Level 2 | • | | | • | • | • |
| | Multiplication and Division of Decimals | Level 2 | • | | | • | • | • |
| | Conversion of Decimals to Closest Fractional Inch | Level 2 | • | | | • | • | • |
| | Introduction to Dimensional Analysis | Level 2 | • | | | • | • | • |
| | Using Dimensional Analysis in Welding Problem Solving | Level 2 | • | | | • | • | • |
| | Conversion of Angles to Decimal Angles | Level 2 | • | | | • | • | • |
| | Calculating Perimeter and Area of Objects | Level 2 | • | | | • | • | • |
| | Calculating Volume of Objects | Level 2 | • | | | • | • | • |
| Weight of Structural, Sheet and Plate Materials | Level 2 | • | | | • | • | • | |
| Careers | Careers in the Welding Industry | Level 1 | • | • | | • | • | • |
| | Certified Welder as a Career | Level 1 | • | • | | • | • | • |
| | Welding Inspector (CWI) as a Career | Level 1 | • | • | | • | • | • |
| | Welding Instructor as a Career | Level 1 | • | • | | • | • | • |
| | Communicating Effectively in the Work Place | Level 1 | • | • | | • | • | • |
| | Interviewing for a Welding Position | Level 1 | • | • | | • | • | • |
| | Problem Solving in the Workplace | Level 1 | • | • | | • | • | • |
| | Practical Living With A Welding Career | Level 1 | • | • | | • | • | • |

LAB Curriculum Materials

| Process | Lesson Title | Level | Instructor Lesson Plan | Student Reference | Video |
|---------|--|---------|------------------------|-------------------|-------|
| SMAW | E6010 Stringer Bead on Flat Plate | Level 1 | • | • | • |
| | E6013 Stringer Bead | Level 1 | • | • | • |
| | E7018 Stringer Bead | Level 1 | • | • | • |
| | E6010 2F (Horizontal) T-Joint 10 GA | Level 1 | • | • | • |
| | E6010 2F (Horizontal) T-Joint 1/4 in. | Level 1 | • | • | • |
| | E7018 2F (Horizontal) T-Joint 10 GA | Level 1 | • | • | • |
| | E7018 2F (Horizontal) T-Joint 1/4 in. | Level 1 | • | • | • |
| | E6010 2F (Horizontal) T-Joint 3/8 in. | Level 1 | • | • | • |
| | E7018 2F (Horizontal) T-Joint 3/8 in. | Level 1 | • | • | • |
| | E6010 2F (Flat) Lap 10 GA | Level 1 | • | • | • |
| | E6013 2F (Flat) Lap 10 GA | Level 1 | • | • | • |
| | E7018 2F (Flat) Lap 10 GA | Level 1 | • | • | • |
| | E6010 3F (Vertical Up) T-Joint | Level 1 | • | • | • |
| | E6010 3F (Vertical Up) T-Joint 3/8 in. | Level 1 | • | • | • |
| | E6010 3F (Vertical Up) Lap 10 GA | Level 1 | • | • | • |
| | E6010 3F (Vertical Down) T-Joint 10 GA | Level 1 | • | • | • |
| | E6013 3F (Vertical Down) T-Joint 10 GA | Level 1 | • | • | • |
| | E6010 4F (Overhead) T-Joint 3/8 in. | Level 3 | • | • | |
| | E7018 4F (Overhead) T-Joint 3/8 in. | Level 3 | • | • | |
| | E6010 4F (Overhead) T-Joint 3/8 in. | Level 3 | • | • | |
| | E6010 4F (Overhead) T-Joint 1/4 in. | Level 3 | • | • | |
| | E7018 4F (Overhead) T-Joint 10 GA | Level 3 | • | • | |
| | E7018 4F (Overhead) T-Joint 1/4 in. | Level 3 | • | • | |
| | E6010 4F (Overhead) Lap 10 GA | Level 3 | • | • | |
| | E6013 4F (Overhead) Lap 10 GA | Level 3 | • | • | |
| | E6010 1G (Flat) Groove 3/8 in. | Level 2 | • | • | • |
| | E7018 1G (Flat) Groove 3/8 in. | Level 2 | • | • | • |
| | E6013 1G (Flat) Groove 3/8 in. | Level 2 | • | • | • |
| | E7018 2G (Horizontal) Groove 3/8 in. | Level 2 | • | • | • |
| | E6010 2G (Horizontal) Groove 3/8 in. | Level 2 | • | • | • |
| | E6013 2G (Horizontal) Groove 3/8 in. | Level 2 | • | • | • |
| | E6010 3G (Vertical Up) Groove 3/8 in. | Level 2 | • | • | |
| | E7018 3G (Vertical Up) Groove 3/8 in. | Level 2 | • | • | |
| | E6013 3G (Vertical Up) Groove 3/8 in. | Level 2 | • | • | |
| | E7018 4G (Overhead) Groove 3/8 in. | Level 3 | • | • | |
| | E6010 4G (Overhead) Groove 3/8 in. | Level 3 | • | • | |
| | E6013 4G (Overhead) Groove 3/8 in. | Level 3 | • | • | |

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LAB Curriculum Materials

| Process | Lesson Title | Level | Instructor Lesson Plan | Student Reference | Video |
|---------|--|---------|------------------------|-------------------|-------|
| GMAW | Short Arc Flat Bead on Plate 1/4 in. | Level 1 | ● | ● | ● |
| | Axial Spray Flat Stringer 1/4 in. | Level 1 | ● | ● | ● |
| | Short Arc Flat Bead on Plate 1/4 in. 0.035 | Level 1 | ● | ● | |
| | Short Arc Flat Bead on Plate 1/4 in. 0.045 | Level 1 | ● | ● | |
| | Short Arc 2F (Horizontal) T-Joint 10 GA | Level 1 | ● | ● | ● |
| | Short Arc 2F (Horizontal) T-Joint 1/4 in. | Level 1 | ● | ● | ● |
| | Axial Spray 2F (Horizontal) T-Joint 3/8 in. | Level 1 | ● | ● | ● |
| | Pulse 2F (Horizontal) T-Joint 3/8 in. 0.035 | Level 1 | ● | ● | |
| | Pulse 2F (Horizontal) T-Joint 3/8 in. 0.045 | Level 2 | ● | ● | |
| | Spray 2F (Horizontal) T-Joint 3/8 in. 0.052 | Level 2 | ● | ● | ● |
| | Spray 2F (Horizontal) T-Joint 1/4 in. | Level 2 | ● | ● | ● |
| | Short Arc 2F (Horizontal) T-Joint 1/4 in. | Level 2 | ● | ● | ● |
| | Pulse 2F (Horizontal) T-Joint 3/8 in. 0.052 | Level 2 | ● | ● | |
| | Short Arc 2F (Flat) Lap 10 GA | Level 1 | ● | ● | ● |
| | Short Arc 3F (Vertical Up) T-Joint 1/4 in. | Level 1 | ● | ● | ● |
| | Pulse 3F (Vertical Up) T-Joint 3/8 in. 0.035 | Level 3 | ● | ● | |
| | Pulse 3F (Vertical Up) T-Joint 3/8 in. 0.045 | Level 2 | ● | ● | |
| | Spray 3F (Vertical Up) T-Joint 3/8 in. | Level 2 | ● | ● | |
| | Short Arc 3F (Vertical Up) T-Joint 3/8 in. | Level 2 | ● | ● | ● |
| | Pulse 3F (Vertical Up) T-Joint 3/8 in. 0.052 | Level 2 | ● | ● | |
| | Short Arc 3F (Vertical Down) T-Joint 10 GA | Level 2 | ● | ● | ● |
| | Short Arc 3F (Vertical Down) T-Joint 1/4 in. | Level 2 | ● | ● | ● |
| | Short Arc 3F (Vertical Down) Lap 10 GA | Level 1 | ● | ● | ● |
| | Short Arc 4F (Overhead) T-Joint 10 GA | Level 2 | ● | ● | |
| | Pulse 4F (Overhead) T-Joint 3/8 in. 0.035 | Level 3 | ● | ● | |
| | Pulse 4F (Overhead) T-Joint 3/8 in. 0.045 | Level 3 | ● | ● | |
| | Pulse 4F (Overhead) 3/8 in. T-Joint 0.052 | Level 3 | ● | ● | |
| | Short Arc 1G (Flat) Groove 3/8 in. | Level 2 | ● | ● | ● |
| | Axial Spray 1G (Flat) Groove 3/8 in. 0.045 | Level 2 | ● | ● | ● |
| | Axial Spray 1G (Flat) Groove 3/8 in. 0.052 | Level 2 | ● | ● | |
| | Pulse 1G (Flat) Groove 3/8 in. 0.035 | Level 2 | ● | ● | |
| | Pulse 1G (Flat) Groove 3/8 in. 0.045 | Level 2 | ● | ● | |
| | Pulse 1G (Flat) Groove 3/8 in. 0.052 | Level 2 | ● | ● | |
| | Short Arc 2G (Horizontal) Groove 3/8 in. | Level 2 | ● | ● | ● |
| | Pulse 2G (Horizontal) Groove 3/8 in. 0.045 | Level 2 | ● | ● | |
| | Pulse 2G (Horizontal) Groove 3/8 in. 0.035 | Level 2 | ● | ● | |
| | Pulse 2G (Horizontal) Groove 3/8 in. 0.052 | Level 2 | ● | ● | |
| | Short Arc 3G (Vertical Up) Groove 3/8 in. | Level 2 | ● | ● | ● |
| | Pulse 3G (Vertical Up) Groove 3/8 in. 0.045 | Level 2 | ● | ● | |
| | Pulse 3G (Vertical Up) Groove 3/8 in. 0.035 | Level 2 | ● | ● | |

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LAB Curriculum Materials

| Process | Lesson Title | Level | Instructor Lesson Plan | Student Reference | Video | |
|---|---|---|------------------------|-------------------|-------|---|
| GMAW (continued) | Pulse 3G (Vertical Up) Groove 3/8 in. 0.052 | Level 2 | • | • | | |
| | Short Arc 4G (Overhead) Groove 3/8 in. | Level 2 | • | • | | |
| | Pulse 4G (Overhead) Groove 3/8 in. 0.035 | Level 3 | • | • | | |
| | Pulse 4G (Overhead) Groove 3/8 in. 0.045 | Level 3 | • | • | | |
| | Pulse 4G (Overhead) Groove 3/8 in. 0.052 | Level 3 | • | • | | |
| | Spray 2F (Horizontal) T-Joint 3/8 in. on Aluminum | Level 2 | • | • | | |
| | Pulse 2F (Horizontal) T-Joint on Aluminum | Level 2 | • | • | | |
| | Pulse 2F (Horizontal) T-Joint 3/8 in. on Aluminum | Level 2 | • | • | | |
| | Pulse 2F (Flat) Lap 10 GA on Aluminum | Level 2 | • | • | | |
| | Pulse 3F (Vertical Up) T-Joint on Aluminum | Level 2 | • | • | | |
| | Spray 1G (Flat) Groove 3/8 in. on Aluminum | Level 2 | • | • | | |
| | Pulse 2G (Horizontal) Groove 3/8 in. on Aluminum | Level 2 | • | • | | |
| | Pulse 3G (Vertical Up) Groove on Aluminum | Level 2 | • | • | | |
| | Spray 2F (Horizontal) T-Joint on Stainless Steel | Level 2 | • | • | | |
| | Pulse 2F (Horizontal) T-Joint on Stainless Steel | Level 2 | • | • | | |
| | Pulse 2F (Flat) Lap 10 GA on Stainless Steel | Level 2 | • | • | | |
| | Pulse 3F (Vertical Down) T-Joint on Stainless Steel | Level 2 | • | • | | |
| | Pulse 3F (Vertical Down) Lap 10 GA on Stainless Steel | Level 2 | • | • | | |
| | Spray 1G (Flat) Groove 3/8 in. on Stainless Steel | Level 3 | • | • | | |
| | Pulse 3G (Vertical Up) Groove on Stainless Steel | Level 3 | • | • | | |
| | GTAW | Flat 10 GA on Mild Steel | Level 2 | • | • | |
| | | 2F (Horizontal) T-Joint on Mild Steel | Level 2 | • | • | • |
| | | Pulse 2F (Horizontal) T-Joint on Aluminum | Level 2 | • | • | |
| 2F (Horizontal) T-Joint on Aluminum | | Level 2 | • | • | | |
| Pulse 2F (Horizontal) T-Joint on Stainless Steel | | Level 2 | • | • | | |
| Pulse 2F (Horizontal) T-Joint on Mild Steel | | Level 2 | • | • | • | |
| 2F (Horizontal) T-Joint 3/8 in. on Stainless Steel | | Level 2 | • | • | | |
| 2F (Flat) Lap on Aluminum | | Level 2 | • | • | | |
| 2F (Flat) Lap on Stainless Steel | | Level 2 | • | • | | |
| 2F (Flat) Lap on Mild Steel | | Level 2 | • | • | • | |
| Pulse 2F (Flat) Lap on Aluminum | | Level 2 | • | • | | |
| Pulse 2F (Flat) Lap on Mild Steel | | Level 2 | • | • | • | |
| Pulse 2F (Flat) Lap on Stainless Steel | | Level 2 | • | • | | |
| Pulse 2F (Horizontal) Autogenous Lap on Aluminum | | Level 2 | • | • | | |
| Pulse 2F (Horizontal) Autogenous Lap on Mild Steel | | Level 2 | • | • | • | |
| Pulse 2F (Horizontal) Autogenous Lap on Stainless Steel | | Level 2 | • | • | | |
| Pulse 3F (Vertical Up) T-Joint on Stainless Steel | | Level 2 | • | • | | |
| Pulse 3F (Vertical Up) T-Joint on Mild Steel | | Level 2 | • | • | | |
| Pulse 3F (Vertical Up) T-Joint on Aluminum | | Level 2 | • | • | | |
| 3F (Vertical Up) T-Joint on Mild Steel | | Level 2 | • | • | • | |
| 3F (Vertical Up) T-Joint on Aluminum | | Level 2 | • | • | | |

*This information subject to change at any time.

LAB Curriculum Materials

| Process | Lesson Title | Level | Instructor Lesson Plan | Student Reference | Video | |
|------------------|--|---------|------------------------|-------------------|-------|---|
| GTAW (continued) | 3F (Vertical Up) T-Joint on Stainless Steel | Level 2 | • | • | | |
| | Pulse 3F (Vertical Up) Lap on Aluminum | Level 2 | • | • | | |
| | Pulse 3F (Vertical Up) Autogenous Lap on Stainless Steel | Level 2 | • | • | | |
| | Pulse 3F (Vertical Up) Lap on Stainless Steel | Level 2 | • | • | | |
| | Pulse 3F (Vertical Up) Autogenous Lap on Mild Steel | Level 2 | • | • | | |
| | Pulse 3F (Vertical Up) Lap on Mild Steel | Level 2 | • | • | | |
| | Pulse 3F (Vertical Up) Autogenous Lap on Aluminum | Level 2 | • | • | | |
| | 3F (Vertical Up) Autogenous Lap on Aluminum | Level 2 | • | • | | |
| | 3F (Vertical Up) Lap on Mild Steel | Level 2 | • | • | • | |
| | 3F (Vertical Up) Lap on Aluminum | Level 2 | • | • | | |
| | 3F (Vertical Up) Autogenous Lap on Stainless Steel | Level 2 | • | • | | |
| | 3F (Vertical Up) Lap on Stainless Steel | Level 2 | • | • | | |
| | 3F (Vertical Up) Autogenous Lap on Mild Steel | Level 2 | • | • | | |
| | 3F (Vertical Down) Lap on Mild Steel | Level 2 | • | • | | |
| | Pulse 4F (Overhead) T-Joint on Mild Steel | Level 3 | • | • | | |
| | Pulse 4F (Overhead) T-Joint on Aluminum | Level 3 | • | • | | |
| | Pulse 4F (Overhead) T-Joint on Stainless Steel | Level 3 | • | • | | |
| | 4F (Overhead) Lap on Stainless Steel | Level 3 | • | • | | |
| | 4F (Overhead) Lap on Mild Steel | Level 3 | • | • | | |
| | Pulse 4F (Overhead) Autogenous Lap on Aluminum | Level 3 | • | • | | |
| | Pulse 4F (Overhead) Autogenous Lap on Stainless Steel | Level 3 | • | • | | |
| | Pulse 4F (Overhead) Lap on Mild Steel | Level 3 | • | • | | |
| | Pulse 4F (Overhead) Autogenous Lap on Mild Steel | Level 3 | • | • | | |
| | Pulse 4F (Overhead) Lap on Aluminum | Level 3 | • | • | | |
| | Pulse 4F (Overhead) Lap on Stainless Steel | Level 3 | • | • | | |
| | 1G (Flat) Butt Walking the Cup on Mild Steel | Level 3 | | | | • |
| | 1G (Flat) Butt on Aluminum | Level 3 | • | • | | |
| | Pulse 1G (Flat) Butt on Aluminum | Level 3 | • | • | | |
| | 2G (Horizontal) Butt on Aluminum | Level 3 | • | • | | |
| | Pulse 2G (Horizontal) Butt on Aluminum | Level 3 | • | • | | |
| | 3G (Vertical Up) Butt on Aluminum | Level 3 | • | • | | |
| | Pulse 3G (Vertical Up) Butt on Aluminum | Level 3 | • | • | | |
| | Pulse 4G (Overhead) Butt on Aluminum | Level 3 | • | • | | |
| | 4G (Overhead) Butt on Aluminum | Level 3 | • | • | | |



INSTRUCTION ENGINEERED by LINCOLN ELECTRIC

LAB Curriculum Materials

| Process | Lesson Title | Level | Instructor Lesson Plan | Student Reference | Video |
|-------------------------------------|---|---------|------------------------|-------------------|-------|
| FCAW | FCAW-G Flat Stringer Bead | Level 2 | • | • | • |
| | FCAW-S Stringer Bead | Level 2 | • | • | • |
| | FCAW-S Flat Pad | Level 2 | • | • | • |
| | FCAW-G Flat Pad | Level 2 | • | • | • |
| | FCAW-G 2F (Flat) Lap 3/8 in. | Level 2 | • | • | • |
| | FCAW-S 2F (Horizontal) T-Joint 3/8 in. | Level 2 | • | • | • |
| | FCAW-G 3F (Vertical Up) T-Joint 3/8 in. | Level 2 | • | • | • |
| | FCAW-S 3F (Vertical Up) T-Joint 3/8 in. | Level 2 | • | • | • |
| | FCAW-G 4F (Overhead) T-Joint 3/8 in. | Level 3 | • | • | • |
| | FCAW-S 4F (Overhead) T-Joint 3/8 in. | Level 3 | • | • | • |
| | FCAW-G 1G (Flat) Groove 3/8 in. | Level 2 | • | • | • |
| | FCAW-S 1G (Flat) Groove 3/8 in. | Level 2 | • | • | • |
| | FCAW-G 2G (Horizontal) Groove 3/8 in. | Level 2 | • | • | • |
| | FCAW-S 2G (Horizontal) Groove 3/8 in. | Level 2 | • | • | • |
| | FCAW-G 3G (Vertical Up) Groove 3/8 in. | Level 2 | • | • | • |
| | FCAW-S 3G (Vertical Up) Groove 3/8 in. | Level 2 | • | • | • |
| FCAW-G 4G (Overhead) Groove 3/8 in. | Level 3 | • | • | • | |
| Pipe | API Fit Up Tack Up | Level 3 | • | • | |
| | ASME Fit Up and Tack Up | Level 3 | • | • | |
| | API 1G | Level 3 | • | • | |
| | API 2G | Level 3 | • | • | |
| | API 5G | Level 3 | • | • | • |
| | API 6G | Level 3 | • | • | • |
| | ASME 1G | Level 3 | • | • | |
| | ASME 2G | Level 3 | • | • | • |
| | ASME 5G | Level 3 | • | • | • |
| | ASME 6G | Level 3 | • | • | • |

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E-LEARNING Curriculum Materials

| Lesson Title | Level |
|-----------------------------------|---------|
| Thermal Cutting Overview | Level 1 |
| Oxyfuel Cutting Applications | Level 2 |
| Safety for Metal Cutting | Level 1 |
| Welding Fumes and Gases Safety | Level 1 |
| PPE for Welding | Level 1 |
| Welding Safety Essentials | Level 1 |
| Electrical Safety for Welding | Level 1 |
| Overview of Soldering | Level 3 |
| Welding Ferrous Metals | Level 3 |
| Welding Nonferrous Metals | Level 3 |
| Introduction to Welding | Level 1 |
| Introduction to Welding Processes | Level 1 |
| Material Tests for Welding | Level 2 |
| Overview of Weld Types | Level 2 |
| Overview of Weld Defects | Level 2 |
| Welding Symbols and Codes | Level 2 |
| Electrical Power for Arc Welding | Level 2 |
| Introduction to SMAW | Level 1 |
| SMAW Applications | Level 1 |
| Advanced GMAW Applications | Level 3 |
| GMAW Applications | Level 1 |
| Introduction to GMAW | Level 1 |
| Blueprint Reading | Level 3 |
| Fabrication Process | Level 2 |
| Introduction to FCAW | Level 2 |
| FCAW Applications | Level 2 |
| Introduction to GTAW | Level 2 |
| GTAW Applications | Level 2 |
| Math Fundamentals for Welding | Level 2 |
| Geometry for Welding | Level 3 |
| Plasma Cutting | Level 2 |
| Introduction to Automation | Level 2 |

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