

**WELDING TECHNOLOGY
CAREER PATHWAYS
2016-2017**

**SKILLED TRADES WELDING TRACK
CIP 48.0508.99**

PATHWAY DESCRIPTION: The Welding TRACK is designed as a pre-apprenticeship pathway for students to enter the Registered Apprenticeship training program. Students must successfully complete the four course sequence and 8 safety modules. In addition, each student must pass the Kentucky Department of Transportation (KY DOT) written exam and the KY DOT 3G performance exam OR AWS 2F exam OR AWS Sense exam. Upon completion the student will receive a pre-apprenticeship industry certification issued by the Kentucky Labor Cabinet. This certification will be recognized by participating partners for an interview and possible credit upon placement. Credit is at the discretion of the training organization. For more information or a list of participating organizations, please visit: <http://education.ky.gov/CTE/cter/Pages/TRACK.aspx>

BEST PRACTICE CORE

*Foundational Skills Necessary for Career-Ready Measure:
(KOSSA/Industry Certification)*

Complete (4) FOUR REQUIRED CREDITS:

- 480522 Gas Metal Arc Welding (GMAW)
- 480521 Shielded Metal Arc Welding (SMAW)
- 480528 SMAW Groove Welds with Backing Lab
- 480535 SMAW open Groove Lab

Additional coursework to ENHANCE pathway:

- 480525 Gas Tungsten Arc Welding
- 480530 GTAW Groove Lab
- 480538 Gas Tungsten Arc Welding Pipe Lab A
- 480595 Special Problems (Welding)

See information specific to TRACK on previous page.

**EXAMPLE
ILP-RELATED
CAREER TITLES**

Combination Welder
Pipe Welder
Ironworker
Tungsten Inert Gas (TIG) Welder
Certified Welding Inspector (CWI)
Certified Welding Educator (CWE)
Welding Engineer
Structural Engineer
Mechanical Engineer

Gas Metal Arc Welding

Valid Course Code: 480522

<p>Course Description: This course covers identification, inspection, and maintenance of GMAW machines; identification, selection and storage of GMAW electrodes; principles of GMAW; and the effects of variables on the GMAW process. Theory and applications of related processes such as FCAW and SAW and metallurgy are also included. Students learn the practical application and manipulative skills of Gas Metal Arc Welding and the proper safety situations needed in this process. Both ferrous and non-ferrous metals will be covered, as well as various joint designs on plate in all positions.</p>
<p style="text-align: center;">Content/Process</p>
<p>Students will:</p> <ol style="list-style-type: none">1. Practice and perform safe shop procedures at all times.2. Apply the technical math required for employment opportunities in welding.3. Perform all duties with integrity, responsibility, quality, discipline and teamwork.4. Use lab equipment and tools.5. Apply principles of GMAW to weld metals including FCAW and SAW.6. Apply knowledge of the effects of variables of GMAW to weld plate and pipe.7. Apply knowledge of basic metallurgy to control chemical, physical, and mechanical properties of alloy steels.8. Identify and select filler materials for GMAW processes.9. Weld fillet welds in all positions using various transfer modes on steel, stainless steel, and aluminum.
<p style="text-align: center;">Content/Process – Additional content for students in Skilled Trades Welding Track – CIP 48.0508.99</p>
<ol style="list-style-type: none">1. Interpret and apply tolerances2. Interpret and apply American Welding Society welding symbols3. Draw shop sketches4. Read and interpret blueprints5. Interpret lines.6. Interpret views to include AWS (ISO symbols optional).7. Interpret conventional and datum line dimensions.8. Interpret and apply tolerances.9. Interpret sectioning and section lines.10. Apply principles of oxy-fuel systems to cut, weld, braze, and braze-weld with oxy-fuel.11. Apply principles of controlling distortion.12. Setup components of oxy-fuel equipment and setup procedures.13. Apply oxy-fuel cutting applications and procedures.14. Apply oxy-fuel welding applications and procedures.15. Apply brazing and braze welding principles and applications.
<p style="text-align: center;">Connections</p>
<ul style="list-style-type: none">• Common Core Standards• KOSSA• Common Core Technical Standards• New Generation Science Standards• American Welding Society (AWS) Industry Standards• KCTCS Course: WLD 140• CTSO - SkillsUSA

Shielded Metal Arc Welding (SMAW)

Valid Course Code: 480521

Course Description: Students learn the identification, inspection, and maintenance of SMAW electrodes; principles of SMAW; the effects of variables on the SMAW process to weld plate and pipe; and metallurgy.

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities in welding.
3. Perform all duties with integrity, responsibility, quality, discipline and teamwork.
4. Identify, select, and store SMAW electrodes.
5. Apply principles of SMAW process to cut and weld metals.
6. Apply the knowledge of the effects of variables on the SMAW process to weld plate and pipe.
7. Apply the knowledge of basic metallurgy to control chemical, physical, and mechanical properties of carbon steel.
8. Use shop equipment and tools.

Content/Process –

Additional content for students in Skilled Trades Welding Track – CIP 48.0508.99

1. Interpret and apply tolerances
2. Interpret and apply American Welding Society welding symbols
3. Draw shop sketches
4. Read and interpret blueprints
5. Interpret lines.
6. Interpret views to include AWS (ISO symbols optional).
7. Interpret conventional and datum line dimensions.
8. Interpret and apply tolerances.
9. Interpret sectioning and section lines.
10. Apply principles of oxy-fuel systems to cut, weld, braze, and braze-weld with oxy-fuel.
11. Apply principles of controlling distortion.
12. Setup components of oxy-fuel equipment and setup procedures.
13. Apply oxy-fuel cutting applications and procedures.
14. Apply oxy-fuel welding applications and procedures.
15. Apply brazing and braze welding principles and applications.

Connections

- Common Core Standards
- KOSSA
- Common Core Technical Standards
- New Generation Science Standards
- American Welding Society (AWS) Industry Standards
- KCTCS Course: WLD 120
- CTSO - SkillsUSA

SMAW Groove Welds with Backing Lab

Valid Course Code: 480528

Course Description: Students will acquire the manipulative skills to do groove welds in all positions with backing.

Prerequisites: Shielded Metal Arc Welding (SMAW) - 480521 or Consent of Instructor

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities in welding.
3. Perform all duties with emphasis on Integrity, responsibility, quality, discipline and teamwork.
4. Weld SMAW groove welds in all positions.

Connections

- Common Core Standards
- KOSSA
- Common Core Technical Standards
- New Generation Science Standards
- American Welding Society (AWS) Industry Standards
- KCTCS Course: WLD 123
- CTSO - SkillsUSA

SMAW Open Groove Lab
Valid Course Code: 480535

Course Description: This course offers the student the opportunity to advance skills in the practical aspects of vee-butt plate welding using SMAW.

Prerequisites: Shielded Metal Arc Welding (SMAW)-480521 or Consent of Instructor

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities in welding.
3. Perform all duties with emphasis on Integrity, responsibility, quality, discipline and teamwork.
4. Apply principles of SMAW to welding.
5. Perform skills in vee-butt plate welding.

Connections

- Common Core Standards
- KOSSA
- Common Core Technical Standards
- New Generation Science Standards
- American Welding Society (AWS) Industry Standards
- KCTCS Course: WLD 225
- CTSO - SkillsUSA