

## WELDING TECHNOLOGY II

*Welding Technology II* includes classroom and laboratory experiences that develop a variety of skills in Gas Metal Arc welding, Flux Cored Arc Welding, Gas Tungsten Arc welding, Plasma Cutting and Carbon Arc. This course is designed for individuals who intend to pursue careers as Welders, Technicians, Sales Reps, Designers, Researchers or Engineers. Emphasis is placed on safety at all times. OSHA standards and guide lines endorsed by the American Welding Society (AWS) are used. Instructional activities emphasize properties of metals, safety issues, blueprint reading, electrical principles, welding symbols, and mechanical drawing through projects and exercises that teach students how to weld and be prepared for college and career success.

- DOE Code:5778
- Recommended Grade Level: Grade 12
- Recommended Prerequisites: Welding Technology I
- Credits: 2-3 credits per semester, maximum of 6 credits
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- This course is aligned with postsecondary courses for Dual Credit:
  - Ivy Tech
    - WELD 207-Gas Metal Arc (MIG) Welding
    - WELD 100-Welding Processes
  - Vincennes University
    - WELD 102-Shielded Metal Arc Welding

### Dual Credit

This course provides the opportunity for dual credit for students who meet postsecondary requirements for earning dual credit and successfully complete the dual credit requirements of this course.

### Application of Content and Multiple Hour Offerings

Intensive laboratory applications are a component of this course and may be either school based or work based or a combination of the two. Work-based learning experiences should be in a closely related industry setting. Instructors shall have a standards-based training plan for students participating in work-based learning experiences. When a course is offered for multiple hours per semester, the amount of laboratory application or work-based learning needs to be increased proportionally.

### Career and Technical Student Organizations (CTSOs)

Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in SkillsUSA, the CTSO for this area.

## Content Standards

### Domain 1 – Gas Metal Arc Welding

**Core Standard 1** Student creates appropriate welds on a variety of industrial metals using Gas Metal Arc Welding and cutting processes to meet industry standards.

## **Standards**

- WTII-1.1 Demonstrate and practice ALL SAFETY RULES that apply to welding
- WTII- 1.2 Communicate all common welding terms
- WTII-1.3 Apply metallurgy fundamentals to welding processes
- WTII-1.4 Performs safety inspections of GMAW equipment and accessories
- WTII-1.5 Makes minor external repairs to GMAW equipment and accessories
- WTII-1.6 Sets up for GMAW-S operations on carbon steel
- WTII-1.7 Operates GMAW-S equipment on carbon steel
- WTII-1.8 Makes fillet welds in all positions on carbon steel
- WTII-1.9 Makes groove welds in all positions on carbon steel
- WTII- 1.10 Passes GMAW-S welder performance qualification test on carbon steel
- WTII-1.11 Sets up for GMAW (spray) operations on carbon steel
- WTII-1.12 Operates GMAW (spray) equipment on carbon steel
- WTII-1.13 Makes fillet welds in the 1F and 2F positions on carbon steel
- WTII-1.14 Makes groove welds in the 1G position on carbon steel
- WTII-1.15 Passes GMAW (spray) welder performance qualification test on carbon steel
- WTII-1.16 Apply Flux Cored Arc Welding (FCAW / Gas Shielded and Self Shielded) process fundamentals
- WTII-1.17 Performs safety inspections of FCAW equipment and accessories
- WTII-1.18 Makes minor external repairs to FCAW equipment and accessories
- WTII-1.19 Sets up for FCAW- G/GM operations on carbon steel (Gas Shielded)
- WTII-1.20 Operates FCAW- G/GM equipment on carbon (Gas Shielded)
- WTII-1.21 Makes fillet welds in all positions on carbon steel (Gas Shielded)
- WTII-1.22 Makes groove welds in all positions on carbon steel (Gas Shielded)
- WTII-1.23 Passes FCAW-G/GM welder performance qualification test on carbon steel (Gas Shielded)
- WTII-1.24 Sets up for FCAW- S operations on carbon steel (Self Shielded)
- WTII-1.25 Operates FCAW- S equipment on carbon (Self Shielded)
- WTII-1.26 Makes fillet welds in all positions on carbon steel (Self Shielded)
- WTII-1.27 Makes groove welds in all positions on carbon steel (Self Shielded)
- WTII-1.28 Passes FCAW- S welder performance qualification test on carbon steel (Self Shielded)

## **Domain – Gas Tungsten Arc Welding**

**Core Standard 2** Students create appropriate Gas Tungsten Arc Welds on a variety of industrial metals to meet industry standards.

## **Standards**

- WTII-2.1 Apply Gas Tungsten Arc Welding (GTAW) process fundamentals
- WTII-2.2 Performs safety inspections of GTAW equipment and accessories
- WTII-2.3 Makes minor external repairs to GTAW equipment and accessories
- WTII-2.4 Sets up for GTAW operations on carbon steel, austenitic steel, and aluminum
- WTII-2.5 Operates GTAW equipment on carbon steel, austenitic steel, and aluminum

- WTII-2.6 Create fillet welds in all positions on carbon steel
- WTII-2.7 Makes groove welds in all positions on carbon steel
- WTII-2.8 Makes fillet welds in the 1F, 2F and 3F positions on austenitic stainless steel
- WTII-2.9 Makes groove welds, in the 1G and 2G positions on austenitic stainless steel
- WTII-2.10 Makes fillet welds in the 1F and 2F positions on aluminum
- WTII-2.11 Makes groove welds in the 1G position on aluminum
- WTII-2.12 Passes GTAW welder performance qualifications test on carbon steel, austenitic stainless steel, and aluminum

**Domain – Manual Plasma Arc Cutting and Air Carbon Arc Cutting**

**Core Standard 3** Students create appropriate Manual Plasma Arc Cutting and Air Carbon Arc Cutting cutting processes on a variety of industrial metal to meet industry standards.

**Standards**

- WTII-3.1 Performs safety inspections of manual PAC equipment and accessories
- WTII-3.2 Makes minor external repairs to manual PAC equipment and accessories
- WTII-3.3 Sets up for manual Pac operations on carbon Steel, austenitic stainless steel, and aluminum
- WTII-3.4 Operates manual Pac equipment on carbon steel, stainless steel, and aluminum
- WTII-3.5 Performs straight, square cutting operations, in the flat position on carbon steel, stainless steel, and aluminum
- WTII-3.6 Performs shape, edge cutting operations in the flat position on carbon steel, stainless steel, and aluminum
- WTII-3.7 Performs safety inspections of manual CAC-A equipment and accessories
- WTII-3.8 Makes minor external repairs to manual CAC- A equipment and accessories
- WTII-3.9 Sets up manual CAC-A scarfing and gouging operations on carbon steel
- WTII-3.10 Operates manual CAC-A equipment on carbon steel
- WTII-3.11 Performs scarfing and gouging operations to remove base and weld metal, in the flat and horizontal positions on carbon steel