Welding Technology Career Academy

Career academies are programs of study offered to high school students through an agreement or contract between their high school and a community college. They bridge high school and community college career technical education (CTE) programs. The career academy is a program of study that is non-duplicative, sequential, and ensures that the course of study is skill standards-based, integrates academic and technical instruction, utilizes work-based and work-site learning where appropriate and available, utilizes an individual career planning process with parent involvement, and prepares an individual for entry and advancement in a high-skill and rewarding career field. *Source: Senior Year Plus Guidelines, educateiowa.gov*

Career Academy Facts

- Southwestern's Welding Technology Career Academy is a one-year program designed to give students a foundation in the principles, practices, and usages of both gas and electric welding and blueprint reading.
- Students learn basic welding skills along with how to operate tools, identify different metals, and read and interpret blueprints.
- Successfully who complete the five-course sequence yields a student 12 college credits and a basic welding technology certificate from Southwestern, as well as a 10-hour OSHA general safety certification.
- Students earn high school and college credit at the same time.
- Students receive a head start on their college education preparing them for a rewarding career in a high demand field.
- All courses are offered at no tuition cost to the student.

Curriculum Outline

A career academy must articulate with an associate degree program, which may include a diploma or certificate, ensure that the secondary and postsecondary components of the career preparatory program are nonduplicative, identify a sequential course of study, delineate skill standards specific to the industry, and integrate academic and technical instruction. *Source: Senior Year Plus Guidelines, educateiowa.gov*

Southwestern's Welding Technology Career Academy course sequence is currently comprised of five courses that align with the institution's Welding Technology Diploma and Associate of Applied Science programs. In order to ensure the rigor and consistency among the delivery of coursework (on-campus or career academy), Southwestern requires all instructors to utilize the master course syllabus for each course (which includes the learner outcomes) for each course, the same college-assigned textbook, and administer any general common assessments to students. The Southwestern Welding Technology Advisory Committee, which is comprised of welding business and industry representatives from the Region 14 area, meets semi-annually to review the program's curriculum and ensure the currency and relevancy of the coursework. Any curriculum changes recommended by the Southwestern Welding Technology Advisory Committee will be reflected in all of the Welding Technology Career Academy programs.

Year 1 – Fall Semester

WEL 114 Introduction to Fabrication
3 credits
Course Description: This course develops the skills needed in a manufacturing atmosphere such as tool usage, layout methods and material estimating.

Course Learner Outcomes
- Apply and follow the safety procedures when operating metal fabrication equipment.
- Identify different metals and what special procedures are required for fabrication and welding.
- Set up and operate; drill presses, saws, iron workers, shears, hand tools and other equipment safely.
- Produce a completed part using metal working equipment and blueprints.

WEL 111 Welding Blueprint Reading
3 credits
Course Description: A course concerned with basic fundamentals of interpreting drafting as applied in the welding trade. Emphasis is placed on developing the ability to interpret blueprints from which the welder must work. Special emphasis is placed on lines, views, material descriptions, welding symbols, and terms.

Course Learner Outcomes
- Identify the various views on a mechanical drawing or sketch.
- Find various types of line in each view of the drawing.
- Obtain needed information from the title block of the drawing.
- Obtain needed dimensions from a drawing or sketch.
- Compute size on parts when those sizes are not provided directly.
- Identify the five basic welding joints.
- Identify and describe the various welds that may be used in each weld joint.
- Label the parts or areas of a grooved butt weld and a fillet weld.
- Locate and apply required weld and joints information from the AWS welding symbol.
- Produce a part according to the blueprint.

Year 1 – Spring Semester

WEL 139, Introduction to Oxyacetylene Welding, Cutting & Brazing
2 credits
Course Description: This course provides a thorough technical understanding of metallurgy, oxyacetylene welding, flame cutting and brazing fundamentals and develops skills necessary to produce high quality fillet and square groove welds in 3/16" plate. Students will develop understanding of weld hazards and safety procedures throughout the course.

Course Learner Outcomes
- Apply safety precautions that must be taken when using an oxyfuel outfit.
- Demonstrate how to safely set up and operate an oxyfuel outfit, start, operate and shut down properly.
- Identify the three types of flames used in the oxyfuel process.
- Demonstrate the ability to choose the proper welding, cutting or brazing tips for the job at hand.
- Apply the students cutting, brazing and welding skills with an oxyfuel outfit to produce products built to blueprint specifications.

WEL 162 Introduction to Shielded Metal Arc Welding (SMAW)
3 credits
Course Description: This course provides a thorough technical understanding of shielded metal arc welding fundamentals, weld hazards and weld safety, power sources and electrode selection. Provides ample time and direction to develop skills necessary to make high quality welds on 16 gauge to 1/4" mild steel in all positions.

Course Learner Outcomes

- Apply the safety aspects of this process and follow OSHA guidelines while using or performing the shielded metal arc process.
- Compare and contrast the differences between voltage, amperage and polarity to determine how they affect the weld and how they can be used to increase weld quality and performance.
- Interpret electrode classification and determine which electrode would be best for their welding application.
- Perform welds on the 5 basic weld fit-ups and in the 4 welding positions.

IND 114 General Industry Safety
1 credit
Course Description: This course provides instruction on general industry safety and health topics. The course will provide students with the knowledge to recognize the hazards of the workplace and to work safely in or around such hazards.

Course Learner Outcomes

- Identify workplace hazards.
- Evaluate what PPE is required.
- Demonstrate the proper use of PPE.
- Apply safe work principles.