



**Internal Program Review
Self-Study Report**

Program Name

Industrial Welding and Metal Fabrication/
Welding Technology

Credentials Offered

Certificate of Applied Science in Welding Technology- 39 Credits
Associate of Applied Science in Industrial Welding and Metal Fabrication – 72 Credits

Self-Study Completed by:

Glen Zeigler, Phillip Holcombe

Date Completed:

AY 2018-2019

A. Introduction - The primary goal in the first year of the Welding Technology program is to give students the skills and instruction they need to enter the welding industry. With an emphasis on safety and attainment of OSHA 10 certification, students will receive hands-on, theoretical, and technical training in rigging, job estimation, blueprint reading, and layout and pattern making. In addition, students will receive extensive lab training in a wide variety of welding and cutting processes including SMAW (stick electrode), GTAW (wire processes), GMAW-P, GTAW, plasma cutting, oxyfuel cutting, and CAC-A. The focus of the training is to give the students the skills necessary to successfully pass American Welding Society (AWS) qualification AWS D1.1. A Certified Welding Inspector (CWI) administers our qualification exams with an independent company sanctioned by the AWS. Students will also get a brief introduction to design and fabrication; thus allowing them to perform repairs and fabricate simple projects.

If students persist into the second year of Industrial Welding and Metal Fabrication, they will acquire skills, which allow them to perform advanced fabrication and repair work on complex projects. Students will learn advanced fabrication techniques using a wide variety of equipment including shears, bending brakes, forming rolls, iron workers, saws, drill presses, pipe bevelers, and track torches. In addition to this fabrication equipment students will also receive instruction on some advanced joining processes including submerged arc welding (SAW), orbital TIG welding, soldering, brazing, stud welding, and resistance spot welding. Students will also receive training in various methods of pipe welding with an opportunity to take the API 1104 qualification exam. Second year students will be given instruction in Computer Numerical Control (CNC) burn table programming and operation using a variety of nesting, simulation and CAD software.

Helena College has been designated as a regional training center in the United States by Miller Electric, one of the industry leaders in welding equipment. This partnership allows students to receive the most technologically advanced training on state-of-the-art welding equipment. Miller Electric rotates equipment on a three-year cycle in order to update the technology as it grows and progresses. Helena College is also an educational partner with AWS which demonstrates our commitment to excellence in the area of welding.

B. Alignment with Mission, Strategic Goals and Core Themes - We have updated our Mission, Strategic Goals and Core Themes in 2018 as follows:

Mission Statement- Helena College, a comprehensive two-year college, provides access to and support of high quality lifelong educational opportunities for our diverse community.

Strategic Goals - 1. Promote student success and achievement 2. Advance academic excellence and scholarship 3. Build community engagement and partnerships
4. Model and foster equity, inclusion, and cultural competency 5. Ensure institutional integrity

Core Themes- Through an inclusive campus and community-wide discussion of Helena College's purpose and goals, three core themes have been identified individually and collectively to define the College's mission. 1) Student Access and Success 2) High Quality Education 3) Community Enrichment

In both first and second year welding programs Helena College meets the above mission by being responsive to a diverse group of students. We offer both day and night sections of welding to allow options for students who have families and are employed. Our population has both traditional and non-traditional students and serves students from a variety of educational backgrounds. We maintain a high level of rigor in both the career and technical courses as well as the related instruction courses (math, writing, and communications) and place a great deal of emphasis on soft skills as well as critical thinking skills; and the skills that are learned in these programs lead to high paying sustainable careers. Students are also usually engaged in community projects to support various needs throughout the greater Helena Community such as restoration of local monuments.

C. Alignment with Community Needs (Academic Programs Only)- Our welding programs align with community service projects as mentioned above, but the faculty also maintain relationships with local employers such as the Local 11 Boilermakers Union, Montana Rail Link, Montana Hydraulics, Northside Welding, etc. The faculty hold advisory board meetings to seek input regarding industry need and also are members of other local advisory boards for industry.

D. Student Participation and Success- Over the past five years, our program has evolved to include the first year night welding section and we continue to have our day welding first and second year programs. Our program capacity is on average 90% full and our average course completion rate is 90%. Over a five-year average, the average graduation rate for full-time students was 52%. The average retention rate of full-time students over a five-year average in this program is 73%. Students in the welding program are highly successful and are able to attain A.W.S. certifications upon entering the workforce. Due to the cost of testing, not all students are required to test but they are given the opportunity. Helena College is currently exploring ways to allocate resources to cover the cost of testing for all students.

E. Student Learning Outcomes and/or Program Goals- Upon completion of the welding program the student should be able to:

1. Demonstrate knowledge of industry standards for safety and compliance
2. Demonstrate the proper use of manufacturing equipment
3. Apply proper techniques for analyzing and producing drawings
4. Demonstrate an understanding of welding processes, codes, and procedures
5. Differentiate manufacturing processes and their applicability
6. Enter the workforce with entry level skills
7. Exhibit good work ethic with an emphasis on safety and professionalism.

F. Curriculum and Instruction (Academic Programs Only) – Based on recommendations from our advisory board and due to suggested curriculum guidelines associated with the TAAACCT Grant, the welding program made changes in equipment, technology, and curriculum to update and improve the program. As indicated in the degree-planning sheet the program is now a comprehensive two-year welding/fabrication program.

G. Faculty/Staff Profile - We currently have two full-time instructors. Glen Zeigler is a Certificate of Applied Science Graduate of the Helena Vocational Technical Center, was employed in the workforce, and became a member of the Helena College faculty in the fall of 2009. Glen received his Tenure in spring of 2017. Phillip Holcombe attended Montana State University and was in the Mechanical Engineering program prior to transferring to Helena College to get his Associate of Applied Science degree in Welding Technology in 2016. Phil has been employed by local industry and became a member of the Helena College faculty in the fall of 2016.

H. Fiscal and Physical Resources – The first and second year welding programs have continued to be funded by tuition, student fees, state funding, and grant monies. Support from our partnership with Miller Electric comes in the way of equipment upgrades. In the last five years the welding program has received equipment upgrades and has been able to purchase new equipment including a programmable press brake, shear, forming roll, four updated plasma cutters, a CNC burn table, a CNC orbital welder, a submerged arc welder, a new ironworker, and two new band saws. Add avg. instructional cost per student, \$5002 which is similar to average \$5269.

I. Recommendations and Preliminary Implementation Plan – The welding programs continue to be very strong programs for Helena College and very desirable to students and to our community. In the last five years we restructured the program to include welding processes instruction in the first year with an emphasis in fabrication in the second year. We will continue to explore how we can improve the curriculum to give our students an advantage in the workforce. We have also increased dual enrollment opportunities in the area of welding by offering new



courses that can be taught at the high school (i.e. technical mathematics, technical writing, WLDG 107 and WLDG 112). We will continue to explore how to engage high school students by offering dual enrollment courses and increasing offerings as able. By creating partnerships with local and area high schools we can encourage enrollment in the welding programs. Helena College is also leveraging grant monies to hold events including Fabrication

Fridays and Women in Gear to also encourage interest in the areas of manufacturing and welding. We will also continue to meet with our advisory boards and respond as able to local and regional workforce needs.

Add augmented welding systems and increase technology to keep up with the times. Try to partner with high schools to increase concurrent enrollment and grow the welding program.

J. Program Review Data Summary - See attached.

K. Appendix (Additional data or exhibits) – Degree Planning Sheets