



Program Review - Welding Technology AAS

Mission Statement: The Welding Technology AAS program is designed to prepare the student in the basic processes of oxyacetylene and arc welding plus many specialized welding applications as options to fit the specific needs of the student. In addition, instruction is offered in related support areas such as metallurgy, tooling, drafting, pattern layout and characteristics of materials. Thus the program offers preparation for both entry-level jobs as well as welding inspectors

2017 - 2018

Mission/Purpose

How does the mission/purpose clearly identify why the program exists and how it prepares students?: The Welding program has been at Mountain View since 1971. Mountain View is the only college in the District which offers the Welding AAS. The department's mission is closely aligned with that of the college. We educate an ethnically and academically diverse population of students to help them obtain their educational and career goals. We provide education and training that prepares individuals to quickly enter the workforce.

The Welding and Machinist program provides quality hands on and classroom instruction to students interested in welding and the metal trades in addition to meeting the workforce needs for qualified welders. Students receive training that prepares them for new employment or for promotion. Some students simply use the skills for their own needs i.e., entrepreneurial ventures or projects that don't necessarily serve industry or provide a pay check for the end user.

There are a number of workforce statistics which support the need for welding at Mountain View. Workforce Solutions of Greater Dallas's targeted occupations lists welders and cutters as a local high growth area, projecting 47,600 job openings this year with an average wage of \$17.71 per hour. Welding is a critical job skill to other local high-growth job positions such as plumbers and pipe-fitters, auto body repair technicians, and construction workers. According to the high growth report on Dallas Texas, job growth for welders and cutters will increase 22.4% by 2024 (page 4 , High Growth Annual Report - Final Review)

Career-One-Stop, sponsored by the U.S. Department of Labor, projects job a growth increase of 13 percent for welders and solderers over the next decade. Job growth is also high in several job categories in which welding plays a part, including 17 percent for construction workers and 24 percent for auto body repairers. According to the Department of Labor, opportunities for welders will grow slightly faster than average all occupations in the U.S.

Employment for Machinists, which are included in the welding program, is expected to be good as well, primarily because of the number of job openings arising each year from the need to replace workers who retire or leave the occupation (BLS). According to the Bureau of Labor Statistics, a machinist salary averages over \$27 per hour in the state of Texas. (Machinists Texas Salaries)

What is the scope of the program or department?: The welding program consists of an AAS in Welding Technology. Students can earn a Machinist certificate and certificates in Shielded Metal Arc, Gas Tungsten Arc and Gas Metal Arc Welding. The department has 3 full-time instructors and 7 adjuncts.

The courses are taught on the MVC campus. In early 2018 MVC will offer welding to inmates at the Estes Prison Unit in Venus TX.

Target Population

How has this program been marketed?: The courses under the welding program are marketed primarily through word of mouth. The high demand for the welding program education is reflected in the fact that students are often turned away, as course sections consistently have maximum enrollment. The program is also passively marketed through the college's website, distributed flyers, social media and college/career fairs at the local high schools.

What populations should be targeted to increase the student count and diversity of the program?: In order to increase student headcount, the college must invest in an updated space with additional welding equipment that will allow for additional course sections. The welding program is not unlike most welding programs on a global scale in that it's enrollment is predominantly male. The current female enrollment is approximately 2%. To increase the programs reach to a diverse

population that targets females, the college might attempt to secure a workforce grant directed to recruiting and educating a female population, which may or may not exist in the MVC service area.

Program Enrollment

Is the program consistently attracting new students? If so, why? If not, why not?: The welding program regularly attracts new students as evidenced by its consistent enrollment. As mentioned earlier, Mountain View is the only college in the DCCCD system which offers the Welding AAS. The combination of reputation, local employment demands and limited access to this technology in the District keeps the program strong, frequently with a list of interested students waiting. It is not unusual for faculty to turn interested students away.

What does course enrollment by semester tell you?: The enrollment data reveals that welding has remained strong and consistent from 2013 to present. In both the day and evening programs there has been very little fluctuation, averaging 420 students in the Fall and Spring daytime classes and 120 students in the Fall / Spring evening classes. Summer classes averaged 120 with a slight variation in 2015 in the day with approximately 40 evening students.

Please detail student pass rates for all program courses: Students are constantly given support and guidance by instructors and instructor assistants. Those who consistently attend class and complete the assigned welds in the courses generally pass. Course success rates are much more affected by students who sign up for welding but never show up to attend class.

Passing rates for welding averaged 76 % from 2014 thru 2015 which is within the 75% pass rate goal. Of the programs courses Machine Shop averaged the highest pass rates from 2016 - 17 with 92%. GTAW, the second in the series of courses, scored the lowest average of student pass rates with 72%. GMAW and SMAW averaged 75 and 76% respectively.

In which courses are pass rates a concern? What should/can be done to improve student success?: The welding courses performs within an acceptable range in terms of student success. Student success numbers drop because of the number of students that enroll in a course that never actually show up to class meetings to complete the assignments.

Welding instructors can provide the administration office a list of students that are absent from class meetings after the first week of class, which will allow for an advisor to contact and encourage these missing students to attend the class. Students should also be made aware of drop options, if they are not going to complete courses.

Instructors can also identify struggling students earlier in the program and pair them up with a work assistant to work more closely with them.

Program Outcomes

Describe the extent to which program level SLOs are appropriate and designed for the program?: SLOs are directly related to competencies required in industry. Each class has a specific desired outcome reflective of skill sets and techniques students will likely encounter on the job. SLO's for certificate programs are as follows:

WLDG 1471 - Demonstrate how to correctly select the materials to create a weld on various metals and prepare a welding procedure to join the metals in accordance to either AWS, APL, or ASME.

WLDG 1425 - Demonstrate how to safely set up and duplicate a quality weld and braze joint using the Oxy-Fuel Process. They will also be able to create a quality cut using the Oxy-fuel cutting torch.

WLDG 1434 - Assemble and demonstrate how to properly use a Gas Tungsten Arc. Welding machines on carbon steel, stainless steel, and aluminum in all positions. They will also be able to select the proper filler metal for each.

WLDG 1428 - Prepare carbon steel plates for welding using the Shielded Metal Arc Welding Process and will be able to demonstrate how to make a quality butt, lap, and tee weld in all positions.

WLDG 1430 - Set up a Gas Metal Arc Welding machine and demonstrate how to make quality welds in all positions on both sheet and plate materials.

NDTE 2411 - Identify and test problem welds to prevent weld failure.

What does the trend data tell you about the outcomes? What are the implications?: Trends in the machinist program reflect that students are successfully learning the objectives. While our welding program is very successful, the assessment revealed that a couple of learning objectives needed attention to improve upon results. These areas will be analyzed deeper to identify

actions that can be taken to improve upon student success. Overall the implications from the data suggest that the program is producing successful completers.

Analyze effectiveness of current program assessment processes: The current program assessment process appears to be effective in tracking the yearly data, which then can be utilized for the program review at a later date. The faculty in the welding and machining programs have become more effective in their ability to track the data that is important to the assessment process

Curriculum

To what extent is the curriculum aligned with K-12? If not aligned, identify gaps.: The welding program does align with the Texas Higher Education Coordinator Board (THECB) core CTE K-12 standards. The Common Career Technical Core define what CTE students' knowledge and skills are needed to thrive in a global economy. The Common Career Technical Core has 2 major components: Career Ready Practices and Content Standards.

The Welding and Machining programs have faculty are credentialed in education and experience to establish them as highly knowledgeable to deliver the curriculum in a quality welding and machining program. This aligns the program with CTE Content Standards. Career Readiness is also addressed as students have the opportunity to practice the industry demanded skills in a controlled laboratory setting.

EMPLOYABILITY SKILLS FOR CAREER READINESS - Employability skills for career readiness is an important component of the standards and curriculum in career and technical education programs. The developed curriculum is consistently presented to the program advisory board committee for review. This review allows the college to verify if the appropriate learning content is embedded in each course, to allow the student to prepare to enter the workforce. The student will receive content knowledge and skills development in each course in the curriculum. The combination of these two factors helps the college ensure that the students are prepared to enter the workforce upon program completion.

WORKPLACE READINESS AND CERTIFICATE OF SKILL ATTAINMENT - Students earn certificates as they complete various sequence of courses which are intended to provide the student knowledge and specific skills required by industry.

While graduates are skilled in welding and machinist technologies, many would certainly benefit if they had meaningful contact with career services to enhance their ability to find employment, prepare resumes for industry, and learn employment interviewing techniques.

To what extent is the curriculum aligned with transfer institutions? If not aligned, identify gaps.: Welding is primarily offered at the Associates and certificate level, where industry advisory board members have confirmed as a desired level of education . There are very few Bachelor of Science degrees in welding in the US, and none could be identified in Texas.

Program Structure

What internships, practicums, and service learning opportunities are included with this program?: The welding program currently does not have service learning opportunities for its students.

If no opportunities exist, what suggestions do you have to improve/increase those opportunities?: Because of the nature of welding it is difficult to identify companies that are willing to take the time to work with inexperienced welders. Welders work with expensive materials typically required in processes connected to a time element.

List all articulation agreements with four year institutions. If none exist, please explain.: Mountain View College does not have established articulation agreements for the welding program, as a welding education has historically terminated at the AAS degree level. There are few Bachelor of Science degrees in the country. Those BS Welding programs that do exist are primarily associated with an engineering pathway. The state of Texas does not have a four-year institution that offers welding as a program pathway.

Are resources sufficient to meet identified needs and goals for the next three years? Explain.: There are insufficient resources available for the welding programs. The program is in need of updated facilities for classrooms and additional (updated) equipment to better serve the educational demand of the community and industry employers.

Additionally, the program requires basic welding equipment, i.e. mask, and gloves etc. that beginning students can borrow. At the onset, before students are able to experience enough of the program to determine if it is a good fit for them, they must purchase safety and other equipment simply to participate in the class. For some students, after completing the first level class, they come to the realization that welding is not for them. Yet they are required to make a substantial investment in equipment to begin the series.

There is a need to source a workforce grant to fund the establishment of an introductory welder's kits that students could borrow (check out) for utilization in their first welding course. The availability of an introductory welder's kit would alleviate some of the financial burden that new students may face, which could deter the student from attending class. This initial

equipment cost could be keeping some students who sign up for the class from attending the class.

Program Evaluation Needs

Please explain how online offerings are sufficient to meet the program's needs for student success.: The instruction of welding and machining involves learning technical knowledge and skills. The knowledge is departed upon the student in a lecture format. The technical skill aspect requires actual hand-on practice to learn the skills. The faculty has stated that in their opinion there is not an acceptable format to provide the hands-on learning of these skills in an online modality. Therefore, Mountain View College does not offer online course sections for welding and machining.

How have changes in service delivery required changes in staff skills?: It has been necessary for staff to remain current on advancements in technology, techniques, tools, machinery related to welding and machining. This has required staff to reach beyond the classroom learning materials to industry professionals and organizations to keep abreast of the latest industry trends and information.

How are staff being trained, retained, and developed?: All full time staff have access to professional development funds through the college. Recently, that faculty have been trained on the latest updates welding processes, specifically Mig, Stick, and Tig welding . While there are over 30 different types of welding processes, these are among the most popular.

This training was extremely relevant to the welding program because of the popularity in which these processes are used today. It has equipped the instructors to offer a superior level of education to enhance the learning opportunities of MVC.

Instructors also regularly choose students who have demonstrated advanced skills to work as assistants. This gives students more confidence in their skills, and reinforces the knowledge and skills obtained in the classroom. Additionally, the student has the opportunity to practice communication skills, as they assist other students.

What staff development opportunities have been utilized in the past five years?: the full time staff are consistently interacting with industry professionals and lending their expertise to projects which keep them up to date and current with welding practices. Some of the developmental activities they've participated in the last 5 years include:

Course: Become your Company's most valuable asset.

Learn to:

Increase productivity.

Improve quality and safety.

Succeed in the global market place.

ONLINE SEMINAR -----August 2017

. Attended Welding Seminars on training welders for the Keystone project and the shortage of welders that we are encountering. Pipeliners Local Union 798 Training Center in Tulsa, Oklahoma-----August 2016

Toured the Ship Yard Of Viking Longships in Cologne, Germany to see what welding practices and applications that they are using. They too are having difficulties finding employees that can pass their stringent welding procedures-----August 2015

Visited the Saganaw, Texas Trinity Industry facility to see what assistance we at MVC can be to help them with their welding workforce. At the time of my visit, they were in need of 250 FCAW welders-----October 2014

Welded at the Nuclear Power Plant ship yard in New Orleans.

Trained welders on a modern hard facing to repair an air craft.

Welded on the Brown & Root pipeline in Oklahoma City.

When were faculty teaching courses through distance education last trained?: The welding and machine programs are all done in the classroom or welding lab. Distance education is not applicable to the welding and machining programs at Mountain View College.

Is staffing adequate for your program?: The welding department has 3, highly knowledgeable, seasoned and competent full time instructors and 5 adjuncts. The machinist program has 2 adjunct instructors. Because of its high demand, and the maturity of the full-time instructors, potential full-time instructors need to be identified, as to be positioned for future opportunities.

How are the skills of your current staff members meeting the needs of your area?: The staff is highly skilled. The three full-time welding instructors have published thirteen books and publications between them. Also, the faculty regularly identify students with advanced capabilities and groom them to work as instructional assistants.

What additional training is needed?: No additional training is needed at this time.

Are facilities adequate to facilitate teaching and learning? Explain why or why not.: The facilities and equipment that we have

do not meet the current demand of the welding program. The welding and machining programs cannot grow under its current conditions.

The welding lab and classrooms combined are 1600 square feet. This program requires at least 2500 to 3000 square feet. The program includes a metallurgy and a testing process which requires its own classroom space. We can only accommodate 25 students in the program under the current conditions. With more space, this program could easily grow to 200 students per semester.

Additional updated equipment is needed. In the last 40 years, 28 new welding processes and machines have been added to the welding program. Although 7 machines were purchased in the past 5 years, older machines are frequently breaking down, which detract from the faculty's ability to deliver the prescribed curriculum of various courses. The program advisory committee, which consists of industry employers, has encouraged Mountain View College to update the classroom spaces and equipment to meet the needs of the students

What innovative ideas/suggestions do you have to improve student success with your program?: The Welding and Machining have the following suggestions:

- Establish an introductory welder's kit for students to utilize in their first course in the MVC welding program. The college needs to investigate if there is state/federal funding available or if industry partners can be established to fund the effort.
- Seek out state/federal funding to recruit female welders and machinist to Mountain View College.
- Establish a welding/machining metallurgy program. This program would provide students preparation to receive metallurgy related certification. In the state of Texas, students must go to Houston to get a CPI license. Outside of Houston, the closest facility is in Oklahoma City. If MVC had a metallurgy lab, then MVC would have the ability to certify all of successful completers, which would have the potential to double the starting salary when entering the industry.
- Bonding welding represents a growing sector in the welding industry. Bonding welding would represent an opportunity to create a new program to serve a growing industry.

Based on assessments and needs, define your program's plan for the next three years.: The program will maintain a standard of excellence and continue to impress upon Administration that it requires more space to meet the academic need for welding and machinist industries in the DFW area.

Conclusions and Recommendations

Detail the program's strengths, and the opportunities for continued success and improvement.: The welding program is a strong program that maximizes the utilization of existing resources to deliver a superior education. The faculty is highly skilled and experienced in delivering program curriculum. In an effort to improve the welding and machining program, the college can seek outside funding to diversify the student body and to provide access to an introductory welder's kit. Additionally, the program can work more closely with the program advisory committee members to establish internships and work-based learning opportunities.

Detail the program's weaknesses and threats (internal or external) that impact effectiveness: The welding shop has not been updated since 1971. This shop needs to be updated to the 21st century standards, which can accommodate a greater number of students with updated learning resources.

Detail recommendations to enhance effectiveness and improve student learning: Mountain View College's Welding and Machining programs are highly effective. Students are taught industry standards and leave the program with the skills necessary to access immediate employment. Students who come to class and complete all of the assignments develop the skills that industry employers are demanding..

Provide an action plan to enhance the program's effectiveness.: The Welding and Machining programs will continue to work through the program assessment process in an effort to improve upon student success rates. Additionally, the Welding and Machining programs will communicate program needs to the administration at Mountain View College in an effort to better serve the existing and future students. Updated facilities and equipment is high on the list of immediate needs to recruit and serve a diverse student body and industry employers.

Related Documents:

[2017-2018 Target Occupations List.pdf](#)

[BLS](#)

[Career-One-Stop Occupational Profile](#)

[High-Growth-Annual-Report-Final-Review-12-17.pdf](#)

[Machinist Texas Salaries.docx](#)

[Welding - CourseSuccess.pdf](#)

[Annual Program Review Data Profile - Welding \(005\).pdf](#)

[Occupation Detail Report - Welding.xlsx](#)

[Regional Wage & Employment Projections Welders, Cutters, Solderers, and Brazers.pdf](#)

[Welding - Occupational Outlook](#)

[Welding Employment.xlsx](#)