

Submission date: February 10, 2020

Program/s in this review: Advanced Welding OEC, Nondestructive Testing Technology OEC, Welding & Nondestructive Testing Technology AAS, Welding OEC, Welding Technology UC, Welding UC

Specialized accrediting agency (if applicable): _____

Campuses where the program is delivered: Anchorage (OECs & AAS), Kenai (Welding Tech UC), Kodiak (Welding UC)

Members of the program review committee:

- Darrin Marshall, Director, Anchorage
- Jacob Kieseling, Assistant Professor, Kenai Peninsula College
- Greg Russo, Term Instructor, Anchorage

1. Centrality of Program Mission and Supporting Role (700 words or less)

The role the program plays in supporting other academic programs

The Welding and Nondestructive (NDT) Technology program is housed within the Transportation & Power Division at CTC. The program works closely with the Diesel Power Technology, offering the WELD 101 class as a required course for diesel programs. The welding program is also 100% aligned with Kodiak College and Kenai Peninsula College. This alignment will allow students starting at remote campus to transfer to Anchorage to fulfil an additional NDT OEC, an AAS in Welding and NDT, or a bachelor degree in Science and Technology.

The core technical curriculum for these programs provides the foundational skills needed for the next generation of welders and NDT technicians. Through a variety of teaching techniques, we provide students with practice in integrating information from the various welding and NDT systems. The Welding and Nondestructive Technology industry is a fundamental component in support of oil, mining, aviation, manufacturing, fishing, and multiple segments of Alaska's economy.

The AAS in Welding and Nondestructive Testing successfully prepares students for the welding and nondestructive industry. Students are trained and must pass (3) three welding qualifications and (2) two nondestructive qualifications to successfully complete their AAS degree or pass 2 welding qualifications to complete the Undergraduate Certificate. The program also offers (3) three (OEC's) Occupational Endorsement Certificates for students meeting the criteria. The Anchorage campus recently received certification to be an American Welding Society Accredited Testing Facility. This will allow our students to grow past the welding qualifications and solidify their AWS Certifications.

Partnerships with outside agencies, businesses, or organizations?

UAA has strong ties within the Welding and Nondestructive Testing sector of Alaska. Alaska Industrial Xray (AIX), both first and second generation owners are UAA alumni, provide our students state of the art training at their newest facility, while teaching WELD A264 and providing hands on experience and expertise which in turn facilitates the requirements for the American Society of Nondestructive Testing (ASNT), Level I for Radiography certification. From time to time, AIX will hire our students, pending graduation. Kakivik, another Nondestructive Testing company which is an Alaska owned company, provides training for our WELD A263 course, and holds summer internships for qualified students. Kinross, the largest privately owned gold mine in Alaska, recruits welding students for internship opportunities. Kinross will visit students on campus, conduct interviews, and meet with Faculty to inquire about select students before offering summer employment contingent upon academic success, safe work ethic, and an appreciation for the sensitivity of cultural and legislative issues pertaining to Mineral Rights and various ecological concerns.

Sources of extramural support and funding for the program?

UAA students have been able to capitalize on the American Welding Society (AWS) Student Scholarships. 3 UAA students have been awarded various scholarships within the last 4 years, which has greatly assisted student's ability to afford the program. AWS has reached out to educators nationwide, for evaluations concerning the effectiveness of their advertising, as there are more scholarships available, than are being applied for.

Our industry members have also been actively investing in our programs. Alaska Industrial X-Ray (AIX) has donated a \$125,000 dollar digital X-Ray machine to enhance our program. AIX also donates several hours of time dedicated to the nondestructive testing program and is an active member of the advisory board. Many other industry members have donated metal for our welding program.

2. Program Demand (including service to other programs), Efficiency, and Productivity (7 year trend; 1400 words or less)

The United States has a huge Welding and Non Destructive Technician deficit according to the entire industry. Alaska is no different and the data from the Department of Labor shows there are 97 annual openings in the Welding fields through exiting labor force exits alone. Multiple welding and NDT industry owners and managers are saying they do not have enough employees to fill their need of at least 41 annual openings. Alaska's welding workforce is grossly under staffed if the gas pipeline is started. On average, our Welding and NDT program has 69 students enroll and, although not all are successful, this is still a number too small to fill Alaska's Welding and NDT technician positions. We are increasing our recruiting efforts, our connections with local industry members, and our connections with local welding union members to help our enrollment numbers and student success.

Fox News 13 aired a story on November 19, 2019 discussing the shortage of welding technicians. Within the story, Randy Kelley of Tampa Tank Inc., predicts a shortage of 400,000 welders by 2024. This may not be an exact number of needed welders but it does show the urgency that the industry will be facing within the next 3 years.

We have been working on several initiatives in Welding/NDT to put our FTES/FTEF numbers back on an increase. One initiative has been our recruiting efforts in which all of our instructors, our director, and our Student Success Coach have been to high schools, competitions, and as well as offering weld qualifications to local secondary welding students. All of these efforts seems to be having an influence. We have increased the number of enrolled students and reduced the number of sections offered. Our Student Success Coach has been incredibly influential in increasing our graduation rates and streamlining our process to decrease our dropout rate. The Welding/NDT program is built with a team of motivated individuals and, through all of our efforts, I believe that we will continue to increase the efficiency of our programs. One of the inhibiting factors to increasing FTES/FTEF is that the welding classes only have room for safe and productive education for 18 students and the NDT room only accommodates 12. We are looking into housing our NDT program at aviation to increase classroom capacity, lab space, and potentially integrate their NDT materials and machinery with ours to create more robust programs.

Graduation rates are an incredibly valuable number but I believe our graduation rates could be misread and maybe a bit misleading. Graduation rates for technical programs nationwide are typically lower. Our program mandates on the job training because work experience is essential for maximum educational benefit in the Welding and Non Destructive Testing fields. We have many students employed by the first semester and the vast majority of students employed by the 3rd semester. Unfortunately, many of the students drop out for multiple reasons and opt for a paycheck rather than finish their education. Students start our program to get an education in the industry and job that pays well and both may be achieved before graduation. Our graduation rate is predicted to be 25 on the anchorage campus which shows a marked increase and that our efforts to guide students through the degree and OEC's is working.

To date, our Cost per SCH is higher than our tuition. In 2016, our enrollment was at a peak and dropped off the following year. We are unsure of the cause of this trend but we are starting to see a rebound. We are aware of the lack of profitability and we are starting a process to counter this problem. We are trying to increase our enrollment through better recruiting efforts. We have also reduced the number of sections to increase our class size. We are working with secondary welding programs to offer increased dual enrollment.

We have recently started an American Welding Society Accredited Testing Facility. This will give us the opportunity for our students to achieve top tier, nationally recognized certifications. These certifications gives our students a huge advantage as entry-level welding students. The Accredited Testing Facility will also give us the opportunity to offer certification tests to our welding industry members. Offering certifications to our industry members will bring in revenue to help assist future purchases. These certifications also bring in industry members to our facility, which generates awareness and allows us to show off our fantastic welding and NDT program's latest equipment.

3. Program Quality, Improvement and Student Success (1500 words or less)

Specialized Accreditation Process and Status

Each of the two specific disciplines associated with the Department, welding, and nondestructive testing, has different governing bodies associated with code, validity, and recognition. For welding, these bodies include; the *American Welding*

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Society (AWS), the American Society of Mechanical Engineers (ASME), and the American Petroleum Institute (API). For nondestructive testing, the governing body is the American Society for Nondestructive Testing (ASNT). Though domestic in name, these codes are internationally recognized and utilized as well.

The Transportation and Power Division's Welding and Nondestructive Testing Department has successfully acquired national certification through the American Welding Society, and is recognized both domestically and internationally as an Accredited Test Facility (ATF). In addition to this certification by the American Welding Society, the American Society of Mechanical Engineers recognizes and reciprocates the applicability of many welding certifications under AWS.

The Department can now provide students, outside industry, local, and remote communities the opportunity to become nationally certified welders, by lawfully proctoring welding performance qualifications under the provisions outlined in our quality assurance manual. These tests are conducted, interpreted, and either approved or disapproved by the Department's AWS Certified Welding Inspector's, who are also Faculty. The results of these tests are sent to AWS, and stored on their National Database for Certified Welders. This database is applicable to ASME, and though not applicable to API, many of the welder performance qualification tests within AWS and ASME are very similar to most API certifications.

The University of Alaska Anchorage's AWS Accredited Test Facility undergoes unofficial internal audits, at the request of the Accredited Test Facility Manager, in preparations for official internal and external audits conducted by AWS, at yearly and bi-yearly schedules. Currently, UAA's ATF is in "active" status, and is recognized by AWS as being "in good standing".

Currency of the Curriculum

For the nondestructive testing portion of the course, the curriculum in use is published by ASNT, and therefore its publishing's are kept current and in use by faculty.

For the welding portion of the course, the previous curriculum was reviewed, and a change in curriculum was implemented. The new curriculum administered to students was chosen from the *National Center for Construction Education and Research (NCCER)* and implemented in 2017.

Availability and Indications of Quality of Distance Offerings

The department has developed and will be implementing its first online course, "Technical Drawings for Welders". The creation, implementation, and utilization of this course further strengthens students engaged in welding programs outside of UAA, such as Kenai Peninsula College, and Kodiak College with continuity of courses which lead to UAA's Associate of Applied Science degree in Welding and Nondestructive Testing, UC's, or Occupational Endorsement Certificates.

At the time of this report, the first online course, Technical Drawings for Welders, is live and seems to be going well. There are 10 students enrolled. The audio and visual department has agreed to supply a video crew to help assist in video production. I believe that the class will gain interest since it can be beneficial for the Kenai Peninsula College, Kodiak, and Anchorage welding students. However, we are in the initial stages of collecting data or supporting statements as to the successes and failures of the course. An end of semester student review, grades, and other statistical review will be conducted.

Program Student Learning Outcomes Assessment

The program uses assessment strategies designed to determine student's preparation to succeed in the welding and NDT industry. Success in achieving national qualifications indicates progress in gaining knowledge of welding and NDT systems, the ability to perform a proper weld in many positions, and the ability to properly diagnose a metal component using several NDT methods.

The program utilizes faculty developed assignments to indicate sufficient progress in oral and written communications, and in quantitative skills to serve as a foundation for progression in their careers. Assessments of students able to demonstrate technical knowledge and critical thinking necessary for success in the welding and NDT industry are also implemented. Our analysis of these measures indicates that students are progressing toward their goals. As an outside indication that our students are important to the industry, the program added an AWS Accredited Testing Facility to better validate what our students are capable.

Students are required to pass 3 weld qualification tests and 3 nondestructive tests before he or she is able to graduate. These tests are recorded and assessed on an annual basis. It is important to note, that while a very few percentage of students take welding courses solely for personal enrichment, the majority of students do in fact meet most of the Student Learning

Outcomes (SLOs). For the majority of the welding students polled, welding certification required for employment is their primary concern within their studies. Collective data from academic testing, quizzes, etc. are purposely removed from this review, due to the recent integration of the new aforementioned curriculum across all of the welding courses.

How well the program is doing on Student Success and what it is doing to facilitate it

Welding is a perishable skill. Often, instructors allow actively enrolled and attending students in good-standing the opportunity to practice either welding processes in which they are deficient in, or welding processes in which they wish not to deteriorate, the opportunity to engage in such welding process during laboratory hours, using donated or otherwise unpurchased steel and consumables. This, of course, comes with the understanding this is a privilege, and not a right, and that their supplement training comes second to the active class's laboratory time and training. This has shown to greatly assist students that may have chosen not to take a weld qualification test or a national welding certification test at the end of their respective course, and allow the student more time to prepare. However, these opportunities only exist when an intensive course (a 4 day / 5 week block-style course) ends well before the semester ends.

Academic advising is routed to, and conducted by our Student Success Coach. Faculty have regular meetings to discuss the intricacies associated with the types of courses suggested to be taken in unison, as to remain engaged in the same type of welding process in multiple classes, versus the dynamics of other course's offerings, and their respective times and dates. Our graduation rates are up from last year although enrollment is down slightly. This reinforces that our Student Success Coach is having a positive impact.

Student accomplishments such as successful institution honors, exit exam pass rates and subsequent enrollment

This year, one of our graduating students was one of 23 students invited to present a class assignment to UAA's 35th Annual Student Showcase, which is an annual celebration and contest of the work completed at UAA by undergraduate, graduate, and middle college students. Of the 40 applicants, 23 were invited, and our welding student placed highly in the competition and was the first student to submit from the Community and Technical College in over 20 years. She has recently, post-graduation, completed her employment with Kakivik Asset Management, on the North Slope, and has accepted employment with Schlumberger Oilfield Services.

Enrollment has decreased, negligibly, partly associated with public concerns originating from the university's financial concerns, but more so, with main oil and gas companies, such as British Petroleum, selling shares and leaving Alaska's North Slope. However, having nearly flat enrollment is a good thing since the university wide trend is dropping by 12%.

4. Program Duplication / Distinctiveness (300 words or less)

The UAA Welding and NDT Technology program offers an Associates of Applied Science degree and OEC's. The UAA Welding program is 100% aligned with Kodiak College and Kenai Peninsula College Undergraduate Certificates. UAA's welding instructors have traveled to Dillingham to assist in their welding classes which shows the dedication to work with all welding programs in the UA system.

The Anchorage campus is the only program that offers nondestructive testing and the Accredited Testing Facility. The nondestructive testing is an important part of the industry and is a perfect complement to UAA's welding program. Understanding the weldment must be crucial to understanding metal composition and nondestructive testing methods. Also, welding procedures can only be certified through an Accredited Testing Facility which gives anchorage students top tier benefit to industry. The Anchorage campus houses the only online welding blue print class that benefits multiple welding programs.

5. Summary Analysis (500 words or less)

The Transportation & Power Division at UAA houses Welding & Nondestructive Testing Technology, Automotive Technology and Diesel Power Technology programs. These programs provide valuable workforce development in a high demand career fields. Enrollments are strong, and the programs enjoy strong partnerships with local business support. Each of the programs in the division are strong in their own right, but stronger because of inter-program cooperation and collaboration. Like much of UAA, the division has felt the budget contractions over the past 2-3 years. The division has lost staff positions, and one faculty position directly related to the Welding Technology. Through these actions, the programs have remained strong through collaborative efforts in course scheduling, recruitment, and retention efforts.

Kenai Peninsula College, Kodiak College and UAA work closely together to continue student success. The campuses are 100% aligned and allow a student to grow from one campus to another. The mobility gives students the option to seamlessly gain an OEC, UC, AAS, or a bachelorette degree.

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Welding and NDT Technology Program staff and faculty are committed to providing a quality education that enhances student opportunity for career opportunities. The program provides students understand the gravity of what role they play to our local economy and student success. We are committed to self-evaluation through alignment with ASNT, AWS, API, and ASME. Program continues to be recognized by industry partners, resulting in generous donations of equipment and tools; each of these donations serve to enhance the learning process at reduced cost to students.

Faculty and staff related to the Welding and NDT Technology Program have worked as a team to improve efficiency over the past 7 years. Program faculty are committed to keeping the program current as technology moves forward.