

Eastern Wyoming College

**Instructional Program Review
2016 - 2017**

Program: Welding & Machine Tooling

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EASTERN WYOMING COLLEGE Instructional Program Review

Program Name: Welding and Joining Technology & Machine Tool Technology

Part I: Statistical Data from the past three years:

	2013-2014	2014-2015	2015-2016	5-Year Average
Annualized FTE Enrollment	214.3	204.7	195.9	209.9
Annualized FTE Faculty	8.4	7.2	9.8	9.2
# Students	127	125	131	137
# Graduated	76	79	73	69

FTE = Full-time equivalent Notes:

Modes of Delivery:

online compressed video face-to-face

Advisory Committee Members

Academic

Dr. Michelle Landa, EWC Vice President, Lynn Wambolt, EWC Academic Services, John Hansen, EWC Foundation, Andy Espinoza, Welding Department Head

EWC Welding Instructors Lynn Bedient, Stan Nicolls, Joel Alworth & Dean Gorsuch

Business Partners

Tom Briggs, Western Sugar; Bryce Schlagel, Schlagel Manufacturing; Wade Bruch, Pinnacle Bank; Alan Dahl, B&C Steel & Dave Traverso, Cloud Peak Energy;

Revisions in Curriculum since Last Review

2016 – Established Douglas campus credit-program

2017 – Topics course -Integration of 3D Printing Technology in CAD courses

2017 –Topic Course – HLC certification of adjunct instructors

Description of State and National Trends (if applicable)

United States	Employment		Percent Change	Job Openings
	2015	2024		
Welding, Soldering, & Brazing Workers	397,900	412,300	4%	14,400
Machinists	477,500	506,150	6%	28650
Wyoming	Employment		Percent Change	Job Openings
	2016	2017		
Welding, Soldering, & Brazing Workers	1979	2010	2%	30
Machinists	706	580	-15%	36

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition*, Welders, Cutters, Solderers, and Brazers, <https://www.bls.gov/ooh/production/welders-cutters-solderers-and-brazers.htm> (visited March 28, 2017).

Note: the data for the State Employment Trends and the National Employment Trends are not directly comparable. The projection period for state data is from 2016-2017, while the projection for national data is from 2015-2024. Job Opening refers to the average annual Job openings due to growth and net replacement.

State and National Wages Welding, Soldering, & Brazing Workers

Location	Pay Period	Year or Period				
		10%	25%	Median	75%	90%
United States	Hourly	\$ 12.01	\$ 14.51	\$ 18.34	\$ 21.94	\$ 27.46
	Yearly	\$ 24,990	\$ 30,180	\$ 38,150	\$ 45,640	\$ 57,120
Wyoming	Hourly	\$ 15.90	\$ 18.39	\$ 26.09	\$ 33.90	\$ 40.68
	Yearly	\$ 33,080	\$ 40,330	\$54,270	70,510	\$ 84,620

United States Bureau of Labor Statistic – May 2015 Wyoming State Occupational Employment and Wage Estimate
<https://www.bls.gov/ooh/production/welders-cutters-solderers-and-brazers.htm> (visited March 29, 2017).

State and National Wages (Machinists)

Location	Pay Period	Year or Period				
		10%	25%	Median	75%	90%
United States	Hourly	\$ 12.13	\$ 15.38	\$ 19.49	\$ 24.40	\$ 29.47
	Yearly	\$ 25,230	\$ 31,990	\$ 40,550	\$ 50,750	\$ 61,290
Wyoming	Hourly	\$ 13.50	\$17.55	\$23.32	\$28.38	\$32.36
	Yearly	\$ 28,270	\$ 35,630	\$ 43,510	\$ 51,990	\$ 61,920

United States Bureau of Labor Statistic – May 2015 Wyoming State Occupational Employment and Wage Estimate
<https://stats.bls.gov/oes/current/oes514041.htm#ind>

Wage data are collected by each state through the Occupational Employment Statistics (OES) survey, conducted by the Bureau of Labor Statistics (BLS) at the U.S. Department of Labor. National wage estimates are developed by BLS. State and national occupation information is classified using the Standard Occupation Classification (SOC) system.

Part II: Narrative Analysis

Description of Community Need:

The major downturn in the Wyoming Economy has significantly impacted the Eastern Wyoming College Service Area. Declines in the Energy Extraction and Transportation fields have reduced the availability of employment opportunities in this state—which has had a direct impact on the employment outlook for students in the EWC Welding and Joining Technology (WJTK) program.

However, “Qualified” welders and machinists are still in high demand on a regional basis. Political changes at the national level are bolstering renewed confidence in the resurgence of the Coal and Oil industry in the Rocky Mountain region. Pipeline projects are on track in regional states of North Dakota, South Dakota and Nebraska.

While a significant number of EWC welding students have found employment in the mining, gas & oil, and railroad industries – many of our students are anchored in the farm and ranch culture of Eastern Wyoming and Western Nebraska. They take their education back home where they apply their skills on a daily basis.

Despite more competition from newly established welding programs around the state, enrollment in the EWC Welding and Joining Technology (WJTK) program has held fairly steady, ranging between 125 and 131 for the past three years, compared to a five-year average of 137.

The decline of readily available jobs in the mining industry may actually account for the improvement in program graduation numbers, as fewer students are able to take their first-year of education to the coalmines for high-paying salaries. Graduation rates over the past three years have all surpassed the five-year average of 69.

In addition to traditional college course offerings, this program is a Certified American Welding Society Test Center.

In the past three years the AWS TEST CENTER has provided the following.

- 11 Prepare and bend tests sent to us from various companies.
- 7 Prepared by companies for us to bend only.
- 10 Pipe tests given bent at EWC for various companies.
- 24 plate tests given and bent at EWC for companies and individuals.
- 4 Test trainings at EWC for 30 hours.
- 2 Welder evaluations.

95% of the testing and training is for Companies 5% for individuals.

Program impact on College Enrollment

The Welding and Joining Technology program continues to be a key component of Eastern Wyoming College. With a five year, average of 200 Annual Full-Time Enrollment, welding and machining accounts for 9% of the college's total FTE. Offering an average of 275 credit hours per year – the WJTK program makes up almost 8% of the Annual Credit Hours offered by this institution.

Assessment of Student Learning:

Full-time degree/certificate seeking students continue to do well on their practical hands-on welding certifications, but written test results continue to disappoint. The average on the exit exam for certificate students hovers around the 70% mark. This has been the case for many years.

We feel the decision to schedule Technical Math and Technical Writing classes in the new Career Technology Center building has the potential to increase student success in General Education courses and could result in increased testing results.

However, we believe these dismal results stem from the fact that this testing has no impact on the students. Because it does not affect grades or graduation status, some students don't take the test seriously. Their poor results diminish the stronger scores of other students. Thus, we do not believe the overall average truly reflects the program's success.

In order to more accurately assess student success – faculty members have drafted an outline for a "Comprehensive Exit Evaluation" that used the written scores as just one component. Other factors will include Performance Qualifications and Personal Strengths like attendance, attitude and dependability. Our plan is to take this proposed qualification tool to the WJTK Advisory Council for feedback before deciding to adopt it.

We would like to use the results of the Comprehensive Testing process to establish a "class ranking" structure. The results of this method of testing give a more rounded view of the student's true performance, attitude and skills. This information will be much more valuable on a transcript, job recommendation or scholarship request form, than just a percentage on a written test.

Third Certification Option

We have also bantered about the idea of developing a third Certificate Option. There is a general consensus among the faculty that too many of our students simply are not prepared (or motivated) to earn the two-year AAS degree. Many do well their first year working towards a Welding Certificate, but have no interest in coming back to work toward the degree.

Others take advantage of the opportunity to complete their Machine Tool Technology Certificate in the second year but do not have the academic preparedness to complete the academic requirements for an AAS. They end up leaving our program with two certificates, but it can still be viewed negatively because of their failure to earn the AAS.

Even if they can't earn the AAS, second year students still take advanced welding and machining classes. Some may choose to come back to power through the AAS –but most simply take their certificate and leave for the job market. After two years at EWC many student only have a one-year certificate that doesn't fully represent the depth of training they actually received.

The best way we could increase retention is to offer a second-year alternative to the AAS track. If returning students have the opportunity to earn an “Advanced Welding” or “Fabrication” certificate – they will have spent a productive and useful second year and leaving with a more accurate recognition of the education they received.

We realize there are challenges in creating a new certificate (course revisions, financial aid consideration, and faculty workload concerns) but we believe it can be done with a minimum of additional equipment and material costs. The opportunity to keep those 10-12 students who have no intention to come back for year two would improve enrollment, as well as retention and completion rates. More importantly, it would give our students evidence of success as they enter an ever-more competitive job market.

Of course, through the advising process, we will strive to identify those students who are well suited for the AAS track. We recognize the value of a degree and for those who can handle it – but advising unprepared (or unmotivated) students in that direction only serves to cast a shadow of failure on the students – and on the program.

Activities in Support of Student Recruitment and Retention:

Our greatest tools for student recruitment and retention are our faculty. From day one, we immersed students in a culture of hard work, dependability and dedication to craft. Although students are assigned specific advisors, the reality is that all faculty know and work with almost every student. We communicate in and out of the classroom on a daily basis. Not every student successfully completes our program, but very few just slip away unnoticed.

Outstanding students are recognized and, whenever possible, rewarded with Departmental scholarships. Our faculty have contacts with Regional Industries that may provide part-time employment and internships in the fields of energy extraction and transportation,

We feel the decision to schedule Technical Math, Technical Writing and Freshman Foundations classes in the new Career Technology Center building has the potential to increase student success in General Education courses and could result in improved written test results.

Welding students traditionally have not taken advantage of college tutoring services, so we believe a logical step is to schedule dedicated tutoring services in the new building (perhaps using department work-study students) to provide academic assistance in a more comfortable and accepting atmosphere.

Strengths of the Program and Faculty

Students continue to do well in job applications, getting jobs, and proving themselves to be reliable employees once they have been hired. Historically, EWC students have performed well in competitions at the state and the national levels.

Our faculty continue to attend and successfully complete training and certification schools in welding and machine tooling around the country. The very nature of vocational education dictates that instructors have a real-world background in the fields they are teaching. Our students know their instructors have the experience to “talk the talk” and “walk-the-walk.”

The program has built a strong reputation both regionally and nationally. The current faculty work well together as a team and substantially complement each other in and out of the classroom. Faculty members are well qualified with appropriate degrees, certifications, and industry experience.

Douglas Welding Program

The decision to establish a credit granting Welding program on the Douglas campus was never totally supported by the Welding faculty on the EWC campus. We questioned the wisdom of creating more competition among ourselves, when new and/or rejuvenating programs in Cheyenne, Scottsbluff and Sheridan are already challenging us. Of course, the fact that the Douglas program didn't produce the number of FTE that were expected made the decision to curtail that program obvious. While there may be occasional uses for the Douglas facility for Workforce Development training, EWC needs to commit fully to growing the program in our new CTEC home. The Torrington campus needs to be the top priority.

Part III: Program Goals

Our intentions are:

- To be the first place that industry looks for the finest trained and highest skilled workers.
- Maintain our reputation as the premier welding educational center in Wyoming by not losing site of the philosophies and techniques that have made us successful for over 30 years.
- Promote the opening of EWC's Career Technology Center as an opportunity to increase full-time student enrollment, as well as Workforce Development offerings.
- Commit to participating more activity in student recruitment efforts.
- Prepare for increased enrollments by identifying potential new full-time and/or adjunct instructors.
- Work within budget and staffing limitations to address the changing technologies in the welding and machining fields.
- Begin planning for new programs and courses in a systematic and thoughtful manner.
- Carefully manage faculty/student ratios in shop classes to ensure quality instruction for all students.
- Enhance communications and coordination with the EWC Agriculture Program.

Advisory Committee Recommendations:

Do not lose sight of what has brought the program to its current level:

1. Maintenance welding
2. Structural welding
3. Pipe welding

In response to industry requirements, move to more:

1. Automation
 - Computer Aided Cutting (CAC)
 - Robotic Welding
 - Fabrication

Department Head Recommendations:

There has been significant changes in personnel in the past two year, which has forced the members of the Department to redefine their roles and responsibilities. This will intensify next year with the opening of the Career and Technical Education Center.

The retirement of Leland Vetter in 2015, and the decision by Tim Anderson to leave EWC the following year, has created something of a leadership void. Fortunately, the faculty are professionals who choose to work together to protect the integrity of the program. While there has been very little disruption to the day-to-day functioning of the program – this could change as we move into CTEC.

I believe now is the time to be clearly define job descriptions and expectations. It should be spelled out openly so that everyone in the department knows who is responsible for what. Faculty carry full-teaching loads, in addition to other departmental responsibilities. The expectations to take on more duties will continue as pressure builds to grow the program and adapt to new techniques and technologies.

Stan Nicolls has managed the department clerical duties of budget management, ordering, inventory and shop maintenance. Lynn Bedient and Joel Allworth have worked together on academic concerns like scheduling, advising, program development and evaluation. In his first year, Dean Gorsuch has been busy completing this education and preparing for AWS certifications. He has proven to be a good fit for this department, bringing enthusiasm to the building.

The stellar reputation of this program has made recruitment simple in the past. The network of former students' has all but guaranteed near-full enrollment. However, we cannot rely on this in the future as more and more competition springs up around the area. Instructors will have to be actively involved in the recruitment process in order to continue the growth we have seen in the program. We already have a close working relationship with the EWC Recruiting Office and our instructors are always willing to represent the program on and off campus.

The opening of the new CTEC Building will provide a great recruiting tool, but along with it will come pressure to increase enrollment by introducing new technology and curriculum. There will be great temptation to innovate the entire program in the guise of keeping it relevant to today's workplace.

Poorly planned change could directly contradict the long-held philosophy that has made this the premier "Maintenance Welding" program in the region. We have intentionally avoided trends and fads, opting instead for a traditional "under the hood" approach where students are expected to learn

the facts in the classroom, then refine and demonstrate their abilities in the shops. Just like in the workplace, we value and expect punctuality, reliability, efficiency and quality results.

We are prepared to handle the expected enrollment growth that should occur because of the new facility. By design, faculty are expected to teach any almost any course. The additional of a new Welding Shop gives us more work stations and added flexibility in scheduling – but it doesn't free up hours in the day.

Joel, Lynn and Dean are all overloaded, while Stan teaches over 20 credit hours a year in addition to his other departmental roles. I hope that the new Vocational Technology Instructor will be able to fill in some of the teaching gaps for both the Welding/Machining and Ag programs.

If the machining program is to grow, we will need to find a highly qualified machine fabrication instructor, which could free up current faculty to teach additional welding courses. If possible, we should develop a pool of reliable adjunct instructors. The physical addition of more shop space will not be of great benefit if we don't have the faculty to teach more classes.

I think it is paramount that we continue to nurture the industry/company contacts that have already been established – while seeking out new companies throughout the EWC service area. The Welding Trailer could be used strategically to provide the training throughout eastern Wyoming. I would like to see the expansion of community programs in the welding area because instructors will need to continue working on AWS certifications and keeping up with the latest changes in their field.

Specific Departmental Recommendations:

1. Meet as a department on a regular basis to discussed questions or concerns, and to schedule and plan as necessary.
2. Develop strong lines of communication in order to enable each member of the department to do their job in the most organized and efficient manner.
3. Explore new curriculum directions while still valuing the strong fundamental programs that we currently have. In support of the advisory council recommendations, we need to look at technology and innovation including robotics, computer aided cutting, and emerging technologies.
4. Establish the “Comprehensive Student Evaluation” tool.
5. Recruit and support adjunct instructors to help us expand into some of these other areas.
6. Plan for the expansion of the Machining Program by hiring a highly qualified Machine Tool Technology instructor with a background in CNC.
7. Explore the process for developing a third certificate program
8. Manage the logistics of the move into the new CTEC facility. The first year will be an exercise in adaptation and adjustments. We will need to be flexible and cooperative as all the EWC vocational programs come together under one roof.

Vice President Academic Services Recommendations:

The faculty and department head make some significant assessments of the Welding and Joining Technology program. I agree with the observations of the need to improve and most importantly the value of the faculty in the continuing success of the program. Eastern Wyoming College is fortunate to have such dedicated and experienced personnel. I support the creation of a new certificate and the recommendation to hire the Vo-Tech Instructor to allow the current faculty to excel in teaching excellence without being overburdened.

The Welding and Joining Technology program continues to be a key component of Eastern Wyoming College. While the welding and machining program accounts for 9% of the college's total FTE, and 8% of the Annual Credit Hours offered by this institution, WJTK has the highest degree/certificate completion rate of the college. EWC conferred 233 degrees/certificates in fiscal year 2015/2016, 31% of those were for students in the welding and machining program, which matches the five-year average. Within the program itself, the completion rate hovers just over 50%, in as much as this is the highest rate of programs in the college, in fact the overall five-year average of the college is only 22%, it is not a sufficient number to fulfill the mission of the college.

As indicated above, the faculty are aware and working on a remedy. I commend the dedication of the faculty to continuous improvement. The strategies mentioned above are a good start toward achieving goals. It would benefit the faculty to work with John Cline and the assessment committee to work on proven methods of assessing student learning. Quantifiable results will help the faculty to understand any needs for improvement.

The college recognizes the Welding and Joining Technology program as a premier program within the institution. Growing the program, maintaining the level of excellence, and increasing the number of completions are a priority and the college should support this program and the faculty's pursuit of success.