

**REPORT
PROGRAM REVIEW**

CAREER AND TECHNICAL EDUCATION

**Diesel Technology
Electrical Systems Technology
Instrumentation
Industrial Millwright Technology
Welding Technology**

Presented by the Program Review Committee

To

Vice-President of Academic and Student Affairs

Great Basin College

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Executive Summary

This review of Great Basin College's five mainstay CTE programs—diesel, electrical, industrial millwright, instrumentation, and welding—shows programs that have come of age, buoyed by excellent instructors and administration, remarkably able students in the 2019-20 class, and continuing support from the gold mining industry.

The gold mining industry's overall support continues with program sponsors donating equipment for both the Elko Campus and the outlying centers. The partnership of companies as demonstrated by the Industry Skills Training Program and Great Basin College has enabled increased employee skills and continued growth of the college's training capabilities.

The CTE program is the recipient of several grants. Both the Perkins Grant and the Trade Adjustment Assistance Community College and Career Training (TAACCT) grant continue to provide support for the program. These grants have allowed the CTE program to develop more intensive individual instruction in areas such as math and also to hire additional faculty.

The CTE College Credit program (formerly Tech Prep) has increased its FTE from 514 in 2016-17 to 914 in 2019-20. In addition to College Credit program classes, several high schools in the service area offer dual credit courses in Electrical Technology and in Diesel Technology. A Women in CTE has been developed as a new recruitment tool for the program.

CTE now has 17 full-time instructors compared to 13 in the last program review. Courses have been added in Winnemucca, and the CTE College Credit program provides important early connections with local high schools.

The last four years have seen associates and certificates degrees holding at an average of 201 each year.

The recommendations (p. 24) represent judgments by the external evaluator who read the preliminary report, then met with the Dean, faculty, students, and the advisory committee. Administration and individual departments may use these recommendations to set their own priorities for improvement.

This review shows the passion and commitment of the CTE instructors, administration, and staff and their focus on students, especially during the difficult months of COVID when most instruction was moved online.

Preliminary Report

Program Review Policy

The purpose of the program review is “to assure academic quality, and to determine if need, student demand, and available resources support their continuation.” (NSHE Title 4, Chapter 14, Section 5)

The periodic program review provides an opportunity for the college to reflect on the quality of instruction within programs, to develop tools to measure program effectiveness, to ensure the viability of degrees and certificates with regard to our graduates' employment opportunities and transferability to other institutions, and to enhance our graduates' ability to be productive and discerning citizens of their communities.

The information gained can inform the college about which programs are serving the constituency well in their present form; which programs need moderate or minor changes regarding structure, instruction, curricula, and/or format; and which programs need to be changed drastically or eliminated altogether. These decisions can be difficult, and the program review process provides GBC with the most current and sound data to influence making such determinations.

PROGRAM INFORMATION

Faculty Summary				
Career and Technical Education Faculty, 2020-21				
Instructor	Years Work Experience in Field	Degree/Training	Years at GBC	Total Years Teaching Experience
Diesel Technology Faculty				
Jensen, Joseph	16	Advanced Certificate, Idaho State University	7	7
Owen, Earl	17	AAS, Ricks College BS, Idaho State University	10	18
Whitehead, Michael	32	Certificate, ASAF Tech School	8	22
Electrical Technology Faculty				
Dykstra, Todd	14	AAS, Electrical Tech., GBC	2	3 (PT)
Garcia, Steve	15	AS, Dixie College BS, MVE Northern AZ	27	27
Hunton, Robert III	10	CT, AAS, Electrical Tech., GBC	3	3
Leyba, Sam	34	Certificate, Northwest Lineman College Certificate, Electrical/Instrumentation, Idaho State University	3	3
Seipp, Kevin	12	AGS, Great Basin College Certificate, Electrical Tech., GBC	5	5
Woolever, Dakota	12	AAS, Elect. Tech., GBC Certificate, GBC	3	3

Industrial Millwright Technology Faculty				
Bruns, Tom	15	AAS, Industrial Millwright Technology, GBC	13	13
Whittaker, Norm	18	B.S., Industrial Technology, Southern Utah U.	15	15
Instrumentation Faculty				
Asusta, Bryan	11	Certificate, Instrumentation Tech., GBC AAS, Electrical Tech., GBC	4	4
Stugelmayer, James	30	JM Perry Technical Institute	9	9
Welding Technology Faculty				
Scilacci, Steven	8	AAS Great Basin College	10	10
Nichols, Matthew	13	AAS Great Basin College	9	6 (3 years part-time at GBC)
Electrical Technology Part-Time Faculty				
Addenbrooke, Bernard	2	AAS Great Basin College – Electrical & Diesel	9	3
Welding Technology Part-Time Faculty				
Meyer, Andrew		BS, UNR		
Contract Training and RPL				
Chidester, Gary			7	7
Ward, Joe	14	AAS, GBC	3	3
Dean of Business and Technology				
Murphy, Bret	29+ (PT)	BT, N. Montana MEd, UNR	37	22

Further Information on Staff

Bryan Asusta, Instrumentation – Bryan earned a Certificate in Instrumentation and an AAS in Electrical at GBC and is now pursuing his BAS in Instrumentation. Bryan worked in instrumentation and electrical technology in mines throughout Nevada beginning with his internship at Barrick Goldstrike in 2006. He has been the field test engineer and project manager on numerous mining projects in Nevada and is

currently the co-owner/manager of STX Automation which offers electrical contracting, consulting, engineering, and project management services to the mining industry

Sheree Beard -- Sheree is the CTE Administrative Assistant. She provides support to the CTE department chair, teaching faculty, and program supervisors, as well as providing administrative support of CTE grants.

Hank Boone – Hank is the CTE Program Teaching Assistant/Recruiter/Advisor at the Ely Center. Among his duties are supervision of students in classroom and laboratory settings and assistance with lab projects; participation in recruitment events; follow up with students who are struggling academically/behaviorally; and provide an intervention plan and/or deliver presentations on student success such as study skills, goal setting, and time management.

Tom Bruns, Millwright – Tom went through the GBC millwright program in 1994-95 and received his AAS from GBC in 2010. Tom has 15 years of hands-on experience.

Gary Chidester, contract training and RPL –Gary is the instructor for contract training classes, a position funded by Nevada Gold Mines. These classes are non-credit.

Sidnie Creamer, CTE College Credit Coordinator – Sidnie graduated from University of Nevada, Reno with a Bachelor of Science in Geology in 2016 and started working at GBC in 2017 as the Tech Prep Coordinator. Tech Prep (now referred to as CTE College Credit) is part of the federally funded Perkins Grants. Its main purpose is to expand and improve the transition from high school CTE programs to college CTE programs.

Todd Dykstra, Electrical – Todd teaches part-time in the Electrical Program, He earned his AAS in Electrical in 2018; Todd is also a laboratory technical assistant. Todd worked 14 years for Rio Tinto Mine before coming to GBC.

Steve Garcia, Electrical – Steve, who has taught for GBC for 27 years, started out working as a manager for an electrical company. He has a Bachelor's in Construction Management and a Master's in Education from Northern Arizona University. Steve came into the program two years after it was started by Lou Tempel. Classes were held in a 3-bay garage. The program has been in the new DCIT facility for the last eight years, which has increased the strength of the program. Steve has been instrumental in creating hybrid and online classes for electrical technology. Steve is an NCCER master trainer and also holds a Nevada Electrical Contractor's license.

Terry Gilliland – Terry has been the Welding Technology CTE Lab Assistant since August 2018. He provides general support for the program.

Jonica Gonzalez – Jonica is the CTE Advisor/Placement/Retention Coordinator. She has been in that position since December 2017. Her first position at GBC was as the CTE College Credit Coordinator.

Robert Hunton III, Electrical – Robert worked for several mining companies after being honorably discharged from the U.S. Navy. His work included instrumentation and electrical equipment troubleshooting. He came to GBC in 2018 and is currently the evening instructor in the electrical program.

Joe Jensen, Diesel – Joe worked at Caterpillar for a number of years before coming to GBC. His work experience with Cat included training from that company. He came to the college with 16 years of experience in the field of diesel mechanics.

Jessica Johnson – Jessica is the CTE Program Teaching Assistant/Recruiter/Advisor at the Winnemucca Center. Among her duties are supervision of students in classroom and laboratory settings and assistance with lab projects; participation in recruitment events; and follow up with students who are struggling academically/behaviorally. She provides an intervention plan and/or deliver presentations on student success such as study skills, goal setting, and time management.

Sam Leyba, Electrical – Sam worked with electrical and instrumentation systems for 34 years before coming to GBC. He has over 550 hours of electrical line worker training and is a journeyman in instrumentation and electrical technology. He is the owner of First Creek Electric in Ely, NV, and has been teaching at the Ely Center since 2018.

Andrew Meyer, Welding

Rachel Mcanany, Assistant to the Dean of Business and Technology – Rachel has served as the Assistant to the Dean since 2017. In addition to providing administrative support, she coordinates and trains part-time instructors and employees as needed, as well as supervises support staff.

Bret Murphy—Bret taught all aspects of the Diesel Technology program at GBC for 22 years. He started the Skills USA club on campus in 1984. He holds a Bachelor’s degree in Diesel Technology from Montana State Northern and a Master’s degree in Educational Leadership from UNR. His current title is Dean of Business and Technology; he oversees the CTE programs and the Business and Computer Technology programs. The Dean position was created in April 2004 due to the growth in student enrollments and increased faculty.

Matt Nichols, Welding – Matt worked as a welder at Round Mountain Gold for five years, then at Joy Global for seven years. He taught as a part-time instructor in the welding program for several years before he was hired as a fulltime instructor.

Earl Owen, Diesel – Earl’s degree is in vocational education and corporate training. He taught high school for eight years and in the diesel industry for 17 years before being hired as a fulltime diesel instructor at GBC.

Steve Scilacci, Welding—Steve worked as a welder for P&H MinePro (now Komatsu) and other similar industries for eight years before being hired as a fulltime welding instructor at GBC.

Kevin Seipp, Electrical – Kevin worked in the electrical technology field for 12 years before joining the GBC Electrical Systems program in 2016. In addition to teaching in the program, Kevin is in the process of earning his BAS degree.

Jim Stugelmayer, Instrumentation Technology – Jim graduated from J.M. Perry Technical Institute and has been teaching instrumentation theory to electricians and engineers for the past 30 years. He has taught at GBC for 8 ½ years.

Joe Ward, Welding, Elko – Joe is a part-time instructor at the Elko campus. He has worked for Komatsu Mining full-time since 2007. He earned an AAS in Welding Technology from GBC in 1999.

Mike Whitehead – Mike has worked in the diesel industry for 28 years, working as a diesel trainer for Fiat Powertrains, Navistar, and other companies. He was hired as a diesel instructor at GBC in 2013 and is located at the Ely Center.

Norm Whittaker, Industrial Millwright Technology – Norm worked for GBC for fifteen years; prior to that he worked for Barrick for 18 years. He holds a Bachelor’s degree in Industrial Technology from Southern Utah University. Norm was also involved in the start-up of the RPL (Recognition of Prior Learning).

Dakota Woolever, Electrical, Winnemucca – Dakota earned both a certificate in Instrumentation Technology and an AAS in Electrical Systems Technology from GBC. He has 12 years’ experience with local mining companies. Dakota was hired as an electrical instructor for the Winnemucca Center in 2019.

Student Enrollment

Non-Annualized FTE, Career Technical Education					
	2015-16	2016-17	2017-18	2018-19	2019-20
Diesel	92.6	103.3	76	98.9	96.6
Electrical	193.5	157.8	122.3	196.5	220.2
Industrial Mill	77.5	75.7	68	76.6	63.1
Instrumentation	39.7	59.3	53.3	58	60.1

Welding	121.7	82.2	79.3	89.3	82.7
Totals	524.9	478.3	398.9	519.3	522.7

Completers & Graduates

Career Technical Education (CTE) Degrees/Certificates					
	2015-16	2016-17	2017-18	2018-19	2019-20
AAS Diesel Technology	18	17	25	17	24
CRT Diesel/Technical Arts	39	36	26	26	35
AAS Electrical Technology	36	27	31	31	44
CRT Electrical Technology	47	45	37	47	58
AAS Industrial Millwright	10	11	12	15	9
CRT Industrial Millwright	14	16	17	17	15
CRT Instrumentation Technology	17	21	23	17	23
BAS Instrumentation	7	5	7	3	4
AAS Welding Technology	11	9	7	6	4
CRT Welding Technology	21	13	13	13	6
Totals by Year	220	200	198	192	222

Industry Skills Certificates of less than 30 Credits

	2015-16	2016-17	2017-18	2018-19	2019-20
Industrial Millwright NCCER Core Level	21	18	20	19	14
Industrial Millwright NCCER Level I	21	18	20	19	14
Industrial Millwright NCCER Level II	7	3	4	4	13
Industrial Millwright NCCER Level III	6	2	4	1	13
Industrial Millwright NCCER Level IV	5	2	5	2	12
4G Welding	3	0	0	2	9
Pipe Welding	10	5	9	11	7

Facilities & Equipment

The 36,400 square foot Diekhans Center for Industrial Technology (DCIT) was completed in 2008 on the Elko campus. The DCIT houses classrooms and labs for electrical, instrumentation and industrial millwright programs as well as general classrooms, faculty offices, and the college tutoring center.

Funding exists for planning for a 4000-square foot remodel for welding. Full funding is dependent on the legislature.

In Winnemucca, the Electrical Technology program has just moved into a temporary shop. A new building will be built to house the Electrical Program and Health Sciences.

The Diesel Program in Ely is offered at Whitepine High School while the Electrical Program is housed at GBC's Ely Center in the garage area.

There is a competitive process for all programs at GBC to apply for equipment money. CTE has been generously rewarded in this process.

Measures of Student Satisfaction & Success

What is contained in the following table, **Follow-up Data**, is a sample of survey results. Questions were related to employment and to satisfaction with skills acquired while enrolled in the CTE Program.

Follow-up Data

Follow-Up Status, CTE Graduates Telephone Survey		
	Yes	No
Employed	49	16
Actively searching for employment	53	11
Curriculum current and relevant to employment	43	7
Variety of technologies taught sufficient to be successful in workplace	44	5
Critical thinking, problem-solving, creativity, communication, and analysis skills learned enough to progress in chosen career	41	6

How the Program Supports the Mission of the College

"Great Basin College enriches people's lives by providing student-centered, post-secondary education to rural Nevada. Educational, cultural, and related economic needs of the multicounty service area are met through programs of university transfer, applied science and technology, business and industry

partnerships, developmental education, community service, and student support services in conjunction with certificates and associate and select baccalaureate degrees” (<https://gbcnv.edu/about/mission.html>).

The courses and programs of career and technical education at Great Basin College are aimed at training students for entry-level employments or to upgrade skills for positions they already hold. The Career and Technical Education program works in concert with local businesses and industries.

There is no better example than the MTC Program.

MTC

GBC approached local mining companies in the late 1980s and promptly formed a partnership with Newmont Gold called the Skills Improvement Program, which trained 200 Newmont employees in the late 1980s and early 1990s. With the success of this program, it became evident that other mining companies and companies that support mining could benefit from a workforce training program, and thus began the Manpower Training Cooperative (now called the Maintenance Training Cooperative (MTC). The MTC is made up of mining industry representatives, businesses and college personnel. This cooperative controls the awarding of the MTC scholarship which provides scholarships to students who are interested in GBC’s CTE programs. Currently, the MTC scholarship has increased to \$5,000 plus paid working student internships for the duration of the student’s time in the program. The number of scholarships per year has varied, but most years there are about 75 scholarships awarded. To date there have been over 1460 scholarships awarded worth over 5.5 million dollars.

In addition, the Native American MTC Program provides a \$5000 scholarship for CTE students and peer mentor groups.

MTC Scholarships		
Year	# of Scholarships	Yearly Total
2016	75	\$ 380,000.00
2017	60	\$ 300,000.00
2018	74	\$ 370,000.00
2019	77	\$ 385,000.00
2020	74	\$ 370,000.00
2016-2020 Totals	360	\$ 1,805,000.00

Sponsors of the MTC program have donated more than \$5 million in equipment and support. The mining industry funded six annual teaching contracts until these positions were funded through the college. The

program has expanded and now includes diesel, electrical, instrumentation, industrial millwright and welding technologies with 17 full-time instructors. (This includes a Manufacturing Machining Program instructor in Pahrump. That program is not included in this report.)

The following companies participate in the MTC Elko Program: Nevada Gold Mines, Florida Canyon, SSR Marigold, Kinross Bald Mountain and Kinross Round Mountain, and Sandvik & Greymont. Other Elko businesses that have provided student internships are Smith Detroit Diesel, Riverton, Gallagher Ford, CED, RAM Enterprises, I&E Electric and Kenworth.

The ELY MTC group consists of KGHM-Robinson, Wheeler Machinery, Komatsu, and Fiore Gold. The Ely group of sponsors provides advertising dollars and a small MTC group budget.

Industry Skills Training

Recognition of Prior Learning (RPL) assessments continue at GBC with Gary Chidester conducting testing and teaching the classes.

In 2006 Newmont Gold Corporation and GBC partnered to develop a skills standard assessment that would establish a baseline skill level for mobile maintenance personnel. The *Recognition of Prior Learning* (RPL) is used to assess the skills of industrial millwright technicians. Once an employee has been assessed, a customized training plan is developed outlining the skills/classes that employee needs to improve their skills. Prior to this, employees were taking classes they didn't need because the company didn't know what skills the employee had or what skills they needed.

The RPL program was designed to gauge the training needed by mine employees, but most of the training over the past five years has been mostly in the Millwright area. The CTE department schedules any requested contract classes. Gary Chidester conducts most of the RPLs and teaches associated classes. Over the past five years, he has completed 78 RPLS and taught 126 classes.

The Industry Skills Training program and MTC are exemplary in the partnership of companies and Great Basin College—enabling steady increases in employee skills and further maturing of the college's training capabilities.

Workforce Training (WT)

The WT is a hybrid online electrical training program that takes employees four years to complete. Steve Garcia and Bob Byram developed this program per Round Mountain Gold's request. Students/employees receive online electrical theory training based on GBC's AAS Electrical Systems Technology program. Once a month, students attend class at GBC to take tests and receive hands-on instruction.

GBC electrical instructors coordinate with supervisors at the mines to monitor student progress and to outline on-the-job learning outcomes. Students attend class once a month. Supervisors have signed off on delivered curriculum and also monitor student progress in the workplace. This relationship between supervisors and GBC instructors reinforces the online and hands-on training for the students.

The Workforce Training program (WT) is offered to any mine that is interested. Currently, Round Mountain Gold, Robinson (Ely), and Turquoise Ridge (Winnemucca) participate in the program.

Perkins Grants

GBC receives Carl Perkins CTE grant funding from the federal government through the Nevada Department of Education. This grant supports the entire CTE program. Funds in the past years have helped to support the CTE College Credit Coordinator's Office including staff, supplies, and travel. The Carl Perkins grant also provides professional development funding for CTE instructors, and over the years, the grant has helped purchase equipment for the diesel, millwright, and welding programs. CTE has also been able to upgrade or purchase new technology equipment for classrooms.

TAACCCT grant

GBC applied for and received two TAACCCT (Trade Adjustment Assistance Community College and Career Training) grants for our CTE areas. The first was in FY 2012 and totaled \$350,000 over four years. The programs involved were Diesel (yrs. 1-4), Welding (yr. 1), Electrical (yrs. 2, 3, 4). With TAACCCT funding, the CTE program hired a second Millwright instructor and an intensive/intrusive adviser to assist with getting all program area students an individual learning plan if faculty felt they were falling behind in courses. This funding also provided an embedded math instructor in all the above programs except electrical. The math instructor developed challenge exams for each program area. If a student passed, she or he was able to waive Math 116. Students in the electrical program had access to and took the challenge exam without needing math instruction.

In addition, TAACCCT grant funds allowed the Instrumentation program to develop a hybrid online program.

Other Funds

The legislature approved CTE Enhancement funds to replace soft money that was funding five instructors: two in electrical, one in diesel, one in instrumentation, and one in millwright. Currently, no instructional positions are funded by soft money.

Online Education

All areas of CTE are online/hybrid instruction with just a few days spent in the lab because of Covid. Programs use Zoom for virtual instruction but see very low participation on those days.

Support for GBC Students:

JOIN, Nevada Job Connect, Vocational Rehabilitation

GBC has worked with Job Opportunities in Nevada (JOIN) to help train displaced workers. JOIN has sponsored many students in GBC's Commercial Driver's License (CDL) program. Nevada Job Connect and Vocational Rehabilitation have also sponsored students through the CDL program and through our CTE programs. The CTE program also works with the Veterans' Resource Center when students fall under its umbrella.

Bachelor of Applied Science (BAS)

In 1997 GBC established a Bachelor of Applied Science (BAS) degree program. In the beginning, the BAS program had one emphasis, Management in Technology; this was created specifically for Associate of Applied Science students who were either in management or were considering management careers. This BAS was very popular, and because of this popularity, five emphasis areas were created. However, only Instrumentation, Land Surveying, Digital Information, and Management in Technology remain. The BAS Management in Technology has since been renamed the BAS in Management and Supervision.

Intercollegiate Skills Competition

GBC has had a SkillsUSA club since 1984, and it continues to thrive today. The SkillsUSA club is made up of students from GBC's technical areas and typically has 30 or more students competing each year. A delegation from GBC has gone to the national competition just about every year since the club's inception. In 1988, one student won the second-place national medal in Diesel Equipment Mechanics. In 2014, GBC students placed sixth in Extemporaneous Speaking and eighth in Electrical Motor Control. In 2015, GBC took eighth in Welding Singles and placed in the top twenty in all other competitions.

Due to Covid restrictions, the SkillsUSA club was not active in 2020. However, students were able to compete in spring 2019. Club enrollment was roughly 20 students at that time. At the State conference, GBC had a state champion in Industrial Motor Controls (electrical), Welding Fabrication (a three-student team), Welding Sculpture, and Diesel Engines. These students were invited to compete on the national stage at the National Leadership and Skills Conference (NLSC) in Louisville, KY in June of 2019. There, the Industrial Motor Controls student placed 7th in the nation. The other students did not fare as well, but all competed admirably.

How the program integrates with other departments and programs at GBC

A major point of interaction is with the English, mathematics, and science departments, all of which offer programs in the basic skills required for the trained technician. A math instructor is embedded into the CTE courses where he is available to offer help with specific concepts that students might be struggling with. Most CTE students take PHYS 107 (Technical Physics I), and the instructor works closely with them. The English instructors teach ENG 103, 107, and 108 classes that are oriented specifically to

CTE students. Students earning the certificate satisfy the English requirement with ENG 103 (English Fundamentals for Technical Writing) while the degree-seeking students take ENG 107/108 (Technical Communication I and II).

Students who apply for the CTE program must take the Accuplacer test or submit SAT/ACT scores. Students register between May and July so that if an English 103 course is necessary, students have the opportunity to take that course in the summer enabling them to enroll into ENG 107 in the fall. Few students can take advantage of this, however, because of their work schedules. English 103 provides remediation for students not prepared for ENG 107. Upon successful completion of ENG 103, those students enroll in ENG 107.

Recruitment Approaches

CTE College Credit

The transition from Tech Prep to CTE College Credit was completed in summer 2016. With the Tech Prep programs, GBC had local articulation agreements with high schools. With CTE College Credit, GBC now has statewide articulation agreements because all high school CTE programs teach to state standards.

Students can earn up to 21 free college credits for select CTE courses taken in high school. GBC students have saved over \$348,000 in tuition from 2016 – 2020 by taking these courses and applying for the CTE College Credit.

In ordinary circumstances, CTE College Credit and area mines sponsor “Mining Rocks” twice a year for high school students to learn about the various careers available in mining; in addition, the students take a tour of an active mine site. CTE College Credit also sponsors “Career Launch,” a half hour lunchtime presentation about different careers available in different CTE areas. During these extraordinary times of Covid, CTE College Credit has moved to completely virtual presentations. These include live Zoom and Google Meets presentations. Students are texted immediately before the start of the presentations. Presentations are during times when students tend to participate at higher rates.

Virtual tours of the GBC campus and CTE facilities have taken the place of live tours. Because of low participation rates of virtual tours, CTE College recorded the tour videos and had greater rates of participation. In addition to recorded videos, the use of social media has been the biggest recruitment tool. Facebook Live posts and a YouTube video series are other ways to reach prospective students, but the most convenient method is a digital newsletter. The newsletter has a 70% open rate and shares all GBC information and events with secondary teachers and other contacts in one monthly email.

Great Basin College recognizes several high school programs state-wide that lead to the five Career and Technical Education (CTE) programs mentioned earlier. Great Basin College actively recruits at all of the high schools within its 10-county service area. Some of the most successful students have come from high schools in remote locations such as Round Mountain and Eureka High Schools. Four high school

programs - Agriculture, Ag Mechanics, Welding and Auto Shop - feed into GBC's technical programs. These high school programs do not fit our technical programs perfectly; however, at the entry level, they are compatible with GBC's first-year classes.

There are several ways in which students can receive college credit for classes taken while they are still high school students. The first of these is CTE College Credit. CTE College Credit is a collaborative effort between college instructors and high school instructors where both agree that the class taught in high school is equivalent to the college level. The student pays a ten-dollar fee for a GBC transcript with the CTE College Credit class posted on it.

In the period from 2016 - 2020, 811 high school students applied for CTE College credit. Of those, 461 earned over 2,000 credits. Total cost savings to the students over those years was \$348,044.

The second way in which high school students can earn college credit is through dual credit classes. Dual credit is given when a high school student takes a high school class that is taught by a GBC instructor. This class counts towards the student's high school credits, and because it is a GBC class, it also counts towards GBC credit. Although English and math classes have been taught as dual credit classes for many years, CTE classes in electrical technology and diesel technology are now offered at White Pine High School in Ely. Electrical technology is offered at Lowry High School in Winnemucca. The table below shows headcount and FTE of dual enrollment students from 2016 through 2020.

Year	Headcount	FTE
2016-17	1540	514.7
2017-18	1621	580.9
2018-19	1977	786.63
2019-20	2299	914.97

Other recruiting

Scholarships and funds for non-high school students

At GBC, students entering the CTE programs can apply for Pell Grants by completing the Free Application for Federal Student Aid (FAFSA). Qualifying students who meet the income standards will receive aid to help them pay for their technical education. Other sources for low income CTE students are college scholarships, JOIN, MTC scholarships, Boys and Girls Club scholarships, and a scholarship from the Native American MTC Program.

Recruiting Native Americans

Nevada Gold Mines has a Native American liaison position. The person holding this position contacts the tribe to inform Native American students about opportunities in the CTE program. Students come to the

GBC campus for workshops and tours. Assistance is provided in filling out applications. Summertime Zoom workshops in the English refresher, Math refresher, and technology training are available. The college financial aid office helps these students utilize all funding resources available to them.

Native American alumni are available to mentor current Native American students with the goal of increasing retention. Currently only two students are utilizing mentoring.

Women in CTE

The CTE Program began exploring ways to recruit female students and continues to do so. Members from a team comprised of GBC faculty met with a focus group of female students to learn why they (the students) are motivated to pursue a degree in technical education; what social support these students have or may need to join the CTE program; and, finally to understand what influence any previous work and educational experience has on their motivation to join the program.

In Fall 2017, 22 female students were enrolled in the CTE program; 16 of those students applied for graduation in May 2018. In fall of 2018, 15 females were enrolled in the program; five females were enrolled in 2019, and nine were enrolled in 2020.

Curriculum/competencies/learning outcomes & syllabi

The content of this report's three appendices reveals CTE's curricular approaches. Appendix A—Career Technology Education Mission Statements—has two common threads: meeting industry needs for trained workers and providing challenging and rewarding careers for students.

Please see Appendix B for Student Learning Outcomes in each of the five disciplines and Appendix C for learning outcomes from a sample of CTE syllabi.

The outcomes, whether at the program/discipline level or individual syllabi, possess the following characteristics:

1. Attention to the conceptual background (textbook knowledge).
2. Emphasis on hands-on skills and documented achievement of these skills.
3. Troubleshooting as an essential skill.
4. Consistent and constant emphasis on safety

Less universal are:

Stated criteria for successful task achievement, such as demonstrated in the statements:

1. Align shafts to ***within + or - 0.001"*** using three different methods of alignment.
2. Wire a reversing AC motor control and ***run a motor***.

Strengths and Weaknesses of the Program

Introduction

The instructors generally consider themselves qualified and experienced with more than adequate experience in their field. With some exceptions the instructional space and equipment are excellent, though there is an ongoing need for more and up-to-date equipment in these rapidly changing fields and for updated curriculum, including continuing on-line course development. There is often a frustration in not having enough time to help students to learn everything that would help them in their employment.

Program Strengths

- The necessity for online instruction is both a strength and a weakness. The Covid pandemic, resulting in heavier virtual instruction, has been the cause of programs developing online/hybrid components much more quickly than planned.
- Diesel program has expanded to Ely and has dual credit students from White Pine High School
- BUS 110 instruction embedded in several programs
- ENG 103 created specifically for CTE certificate programs
- Enrollment in some programs (instrumentation) increasing and highest it has been in others (electrical)
- Additional positions added since last review
- Recruiting increasing online presence
- Template for course review of instrumentation technology with two courses having been reviewed using the template
- Departments have the newest software to maintain currency in diagnostics and training (diesel).
- Programs in GBC centers mirror those in Elko

Program Weaknesses

- Instructors voiced frustration with the necessity for a heavy virtual component to classes which resulted in lost hands-on time.
- Another weakness is funding. Lack of funding means lower recruiting opportunities. The diesel program, for example, is showing lower enrollment because of lost recruiting.
- Lack of funding also means a slowdown in building. The welding program has funding for planning for new facilities, but money for the building is dependent on the legislature and is currently on hold.
- Lower scores in practical tests because of lack of lab time (millwright)
- Lack of enough lab aides

Needs: Equipment, Instructional Resources

An examination of yearly equipment awards shows that the CTE program is often awarded the amounts it requests. For example, the FY 2020-21 equipment request awards show Electrical Technology being awarded \$115,091; Instrumentation Technology was awarded \$19,684; and Welding Technology was awarded \$21,584. Millwright was awarded \$11,727.

Lab assistants were funded, but then cut out of budget. Substitutes and lab assistants would be an asset to departments.

Planning, Departmental

See Appendix A, Strategic Plan, Goals and Objectives for each department in CTE.

**GREAT BASIN COLLEGE
CAREER AND TECHNICAL EDUCATION DEPARTMENT
5 YEAR PROGRAM REVIEW
APRIL 8, 2021**

ASSIGNED REVIEWER:

Mark Wilson – Current Process Maintenance Superintendent for Kinross Bald Mountain Mine. I have 40 years of Mining experience all in the Maintenance World. I graduated from Oklahoma State Tech with an AA in Diesel and Heavy Equipment Technology. Deans Honor roll. I have supported this program as an advisor and worked with them to set up a 4-year electrical program during my tenure with Round Mountain Gold Corp. As noted in the Great Basin College CTE Program Review – Preliminary Report, the purpose of the program review is to “assure academic quality, and to determine if need, student demand, and available resources support their continuation.” (NSHE Title 4, Chapter 14, section 5). I have reviewed the **March 2021 CTE Program Review – Preliminary Report**, and met with administration, faculty, staff, students, and advisory board members as outlined in the **CTE 5 Year Program Review Agenda**.

DETERMINATION AND RECOMMENDATIONS

I have found the March 2021 Preliminary CTE Program Review to be an accurate assessment of the strengths, weaknesses, and needs of the Great Basin College CTE Program.

I have found every CTE program area to be viable, strong programs that have good industry demand for student graduates.

Findings and results of interviews conducted.

FACILITIES AND EQUIPMENT

A tour of the Elko campus revealed that all program areas had adequate classroom space and for most programs, adequate lab and shop space. A well-designed and functional facility.

The Winnemucca and Ely Electrical Technology program need more training aids to practice on.

The instructors received high ratings from there students that all said that they would recommend the class to new students looking at getting a technical education.

ADMINISTRATION

Visits with Bret Murphy, Dean of CTE Programs and Kevin Seipp, Department Chair provided valuable insight to where the CTE is going and future plans for the department. Both Dean Murphy and Kevin Seipp have technical backgrounds that give them a good perspective of the needs and challenges each CTE program has.

FACULTY

It is evident from our meeting with faculty members that GBC is very fortunate to have a dedicated and experienced group of faculty with years of experience in each program area of instruction. They all are passionate about their roles as instructors, mentors, and as members of the GBC community. The faculty support the GBC Mission Statement to “provide superior, student-centered, post-secondary education in rural Nevada.”

STUDENTS

Due to COVID, the student interviews were conducted using Zoom. I was able to interview seven students from Diesel, Electrical, Instrumentation, and Millwright, and one who was a past graduate and had a job at a geothermal power plant. All were supportive of the school and felt that they had received and were currently receiving quality educations.

A discussion was held about the accelerated degree program, which allows the students to get their AAS degree in a one school year time frame. All students agreed that it was a challenge to complete their General Education academic course work while doing their technical program studies. Most all agreed that more time would be better, especially more open lab time. Students did say that due to COVID the on-line general education courses could be done easier because they could do it on their own time rather than having to be in classroom at a certain time during the week.

The students also appreciated the General Education faculty approach of making sure their academic classes supported the technical course work by using embedded math, English writing, and communication classes that related to their program areas of study. My experience also supports these efforts. If the students can see how their math and communication classes are important to their careers, they will make the effort to complete those classes.

ADVISORY COMMITTEE MEMBERS

GBC is very fortunate to have strong group of advisory members. Many of GBC’s programs could not function without the generous support of advisory members.

The Maintenance Training Cooperative (MTC) is a good example of how industry can support the college and students. MTC currently awards \$5000.00 scholarships to around 75 students per year. MTC sponsors have donated equipment, funded teaching contracts and employment opportunities for students and graduates.

The consensus from advisory people in attendance at our program review meeting was that this kind of support would continue. The demand for student graduates in all program areas is high. Nevada Gold Mines have been major partners with cooperative agreements and training partnerships with GBC.

PROGRAMS

DIESEL TECHNOLOGY PROGRAM

Diesel program facilities appear adequate with good training aids and equipment to train on. Students were satisfied with program and faculty. Several students commented that they thought the program would benefit from having more diagnostics and troubleshooting. Local diesel equipment employment is strong with the mining industry and trucking industry being the most significant local employment opportunities. Diesel program goals are reasonable goals for a successful program looking to keep up with changing technologies and industry demands. Students and Staff expressed the need for more modern and updated training aids such as engines fuel injection and Diesel Exhaust System training.

ELECTRICAL PROGRAM

A very strong program that has good enrollment and good industry demand for graduate. The Workforce Training hybrid online training program partnerships that work with employers such as Round Mountain Gold do an on-the-job four- year training program. Employees do all hands-on training at job sites and take online GBC classes as well as attending periodic instruction at GBC. Electrical program goals are looking to increase course offerings through distance learning, developing an alternative energy course, and acquiring additional laboratory equipment. Reasonable goals and achievable outcomes for a program with projected strong growth.

INDUSTRIAL MILLWRIGHT

The Millwright Training program has strong local industry support, especially at the mines. The program had good enrollment but has declined over the past few years. This last year, enrollment dipped low enough that there were not enough students to support two instructors, and the instructors were assigned to alternate work assignments. It would be advisable to create a recruiting plan to bring the student enrollment up through collaboration with the recruiting group and instructors. The instructors should work with the advisory board members to visit the local and distant high schools in the region. This should help maintain the program at GBC.

INSTRUMENTATION

This program has a good demand as workplace electronics continue to grow to operate most plant processing equipment. The mines employ a large number of graduates. Recent purchase of high-end training components will strengthen the instrumentation program. Student numbers appear to be increasing in this course over prior years. Instrumentation program goals are quite extensive and will need to be implemented as resources are found to add classes and hire part-time faculty. Goal 2: maintaining curriculum to keep pace with advancing technologies in this field of study is a never – ending endeavor.

WELDING

The Welding program has had steady enrollment numbers the past four years. Industry demand in the local area is good. The lab fees for the welding program need to increase to cover the rising cost of materials and lab supplies. This program seems to be in high demand and jobs are readily available.

AREAS OF CONCERN

- The Ely and Winnemucca training classes need more training materials for project and test labs.
- A plan needs to be put into place to assess the cost of lab fees for different departments. Some may have too much money and others not enough.

FINAL SUMMATION

The CTE Department has a long history of providing well-trained graduates at the college as verified by current advisory board members as we discussed the various CTE programs.

CTE has maintained good relationships with area high schools. Several dual credit agreements and articulation agreements have helped provide a good pipeline of prospective students that has allowed programs to grow and increase course offerings.

I would submit that the 2021 CTE Preliminary Report is an accurate representation of program activities, enrollment numbers, and graduation numbers. The administration, faculty and staff are dedicated to keeping the CTE department on a successful course to provide well-trained graduates and continuing valuable industry partnerships.

Mark Wilson

CTE Program reviewer

COMMENDATIONS AND RECOMMENDATIONS

Commendations

- I have found the March 2021 Preliminary CTE Program Review to be an accurate assessment of the strengths, weaknesses, and needs of the Great Basin College CTE Program.
- I have found every CTE program area to be viable, strong programs that have good industry demand for student graduates.

Recommendations

- Look into a new course related to the trades called Engineering Technology; this would focus on a Project Management type program that would encompass all the trades.

- Have a vice chair for the CTE committee or make a guideline for the new person stepping into the role of chairperson. Would be nice to have a vice chairperson for a year to learn the role and take over the next year. A smooth transition would keep the program flowing better without having to learn the new role and responsibilities or have them written in a guideline that stays updated.
- There should be extra effort on recruiting students from surrounding states.
- Should solicit more training aids from industrial suppliers and manufactures for students to train on.

Appendix A

CTE Mission Statements

Diesel Technology: Providing industry of the future with an outstanding diesel technologies program, endorsed by industry and professional organizations alike. Teaching quality skills and knowledge to the entry level job seeker, along with journeyman level technicians.

Electrical Systems Technology: To prepare graduates with the technical skills—the theoretical and applied foundation -- for rewarding careers in the electrical system technology field through a learning environment that supports intellectual curiosity, academic achievement, and personal growth.

Industrial Millwright Technology: Provide a training program in Industrial Millwright Technology that is recognized by industry and professional organizations such as National Center for Construction and Educational Research (NCCER) as state-of-the-art and that is sought after by students of all ages.

Instrumentation Technology: To provide a training program in Industrial Instrumentation and Automation Technology that is recognized by industry and professional organizations as comprehensive and state-of-the-art. The result of this is a sought-after career for students and those in need of a new career.

Welding Technology: Great Basin College is dedicated to welding training and education excellence. Our mission is to provide students with the training necessary for entry-level and continuing education to prepare them to meet the career, citizenship, and lifelong learning challenges that they will face in the ever-changing global society and economy.

Appendix B

Strategic Plan Goals & Objectives For CTE Programs, 2019-2020

The following CTE department goals and objectives are taken from GBC's Strategic Plan for 2014-2021, which may be viewed on line at <http://gbcnv.edu/planning/public.cgi>

Diesel Technology

- Goal 1: To have Great Basin College recognized as a leader in training for heavy equipment technology
Objective 1.1: Develop a professional relationship with industry to promote interest from within and outside our immediate area.
- Goal 2: Maintain a curriculum that is aligned with a rapidly changing industry.
Objective 2.1: Maintain commitment to state-of-art training.
- Goal 3: Maximize hands on training for students
Objective 3.1: Standardize training aids to streamline workstations

Electrical System Technology

- Goal 1: Maintain an effective and up-to-date curriculum.
Objective 1.1: Enhance curriculum and instructional delivery.
[Includes studying the effectiveness, e.g., of a.m. vs. p.m. classes, different ratios of classroom to laboratory as well as relevance of curriculum.]
Objective 1.2: Investigate feasibility of enhanced distance delivery offerings.
- Goal 2: Maintain quality program
Objective 2.1: Secure National Center for Construction Education and Research. (NCCER) accreditation. (This objective has been realized.)
- Goal 3: Respond to the training needs of the community and region.
Objective 3.1: Develop an alternative energy program.
- Goal 4: Maintain resources for a successful program.
Objective 4.1: Acquire funding for additional laboratory equipment, including advanced labs.

Industrial Millwright Technology

- Goal 1: Continually improve curriculum so students can achieve their certificate and/or associate degree and NCCER certification.
Objective 1.1: Update teaching materials. [Update any teaching material that is older than five years.]

Goal 2: Increase GBC's Industrial Millwright Technology enrollment to an optimum size.

Objective 2.1: Increase enrollment in millwright program through recruitment

Objective 2.2: Add new contract classes so students can obtain their Associate's Degree.

Increase classes for associates degree not paid for by the mines.

Objective 2.3: Develop contract training with other companies in industry.

Instrumentation

Goal 1: Have Great Basin College recognized as a leader in training for Instrumentation Technology.

Objective 1.1: Obtain professional accreditation with the Instrument Society of America (ISA) to promote interest from outside our immediate area.

Objective 1.2: Develop an instrumentation program that focuses on technology being used across the instrumentation industry worldwide.

Objective 1.3: Create a training platform that is adaptable for technicians at local mines via IAV and/or internet.

Objective 1.4: Create new classes in AutoCad technology.

Objective 1.5: Hire adjunct faculty members to provide necessary classes for remote site-specific training as well as teach standard curriculum requirements

Objective 1.6: Track success of graduates.

Objective 1.7: Create a training program utilizing the Delta V labs for student practical assessments, that include configuration, wiring, calibration, and troubleshooting of industrial process instrumentation.

Goal 2: Maintain a teaching curriculum that keeps pace with the rapidly evolving field in instrumentation; Commitment to state-of-the art training; attend professional conferences; annual inventory evaluation of textbooks, lab equipment, and tools in order to provide a real-world training atmosphere.

Goal 3: Build a lab that teaches the fundamentals of thermal dynamics of industrial burners, boilers, and furnaces.

Objective 3.1 Present plan to the foundation through Matt McCarty

Goal 4: Procure a performance learning platform through Emerson for training on Rosemount instrumentation and Delta V control system.

Objective: 4.1 Access funding for the purchase of the PLP (performance learning platform)

Welding Technology

Goal 1: New Welding Facility for GBC's Elko Campus.

Objective 1.1: Obtain and develop new welding shop facilities.

Goal 2: Increase enrollments in the GBC Welding Department.

Objective 2.1: Develop comprehensive recruitment plan for the GBC Welding Program

Goal 3: Keep curriculum and equipment in line with current technologies.

Objective 3.1 Update and improve curriculum and existing equipment for the GBC Welding Program

APPENDIX C

Student Learning Outcomes For CTE Programs

Diesel Technology

Diesel Technology is a complex field and demands highly skilled technicians. Completion of the program prepares students with specialized training in the repairing, maintaining, troubleshooting, reconditioning, and rebuilding of diesel vehicles and equipment. GBC's program includes extensive classroom lecture and laboratory training on state-of-the-art equipment, as well as training in customer service and report writing.

Graduates of the AAS in Diesel Technology Program will have the knowledge and skills to:

- Analyze and solve problems related to heavy equipment operation.
- Identify diesel engine design and maintain, repair, and troubleshoot them.
- Demonstrate proper use of tools related to the repair and maintenance of heavy equipment.
- Identify, repair, and maintain mobile equipment with hydraulic systems.
- Perform safely in the work environment, meeting and obeying all workplace safety requirements.

Electrical Systems

This program prepares graduates to work in diverse industries including mining, manufacturing, power plants, power distribution, construction, sales, machine control, water resource management, and gaming.

Graduates of the Electrical Systems Technology AAS degree program will have the knowledge and skills to:

- Analyze and interpret graphical information found on schematics, blueprints, and diagrams.
- Identify, use, and maintain motor and computer-based control systems.
- Have a firm understanding of theories that apply to the electrical trade.
- Interpret and apply the National Electrical Code to electrical installations.
- Demonstrate the proper use of tools used in the electrical field and industry.
- Design, construct, and troubleshoot various electrical systems used in commercial and industrial settings.
- Perform safely in the work environment, meeting and obeying all workplace safety requirements.

Instrumentation

The knowledge and skills taught in the Instrumentation Technology Certificate of Achievement Program were developed through a study of industry requirements for the trade, particularly with the association, Instrumentation Systems and Process Automation. Additional input was given by the advisory board, and members of local industries, mines, and government agencies.

Graduates of the Instrumentation Certificate Program will have the knowledge and skills to:

- Understand the role of measurement and control in industrial processes.
- Interpret measurement and control terminology.
- Compare the methods of devices used in temperature, pressure, level, flow, and analytical measurement.
- Understand the operation and components of a feedback control loop.

- Apply ISA standards to interpret symbols and documentation.
- Connect, calibrate, and operate various measurement and testing devices.
- Interpret manufacturer's instructions to correctly install and maintain pneumatic instruments.
- Build and tune a feedback control loop and apply the concepts of PID control.
- Calibrate and align pressure and temperature transmitters, calculating span and range values for various applications.
- Perform safely in the work environment, meeting and obeying all workplace safety requirements.

Graduates with a BAS with an emphasis in instrumentation will be able to:

- Interpret and apply the concepts of process control as related to current industry standard.
- Appraise and interpret measurements of temperature, pressure, flow and levels.
- Evaluate and install, maintain, calibrate, program, and replace the control and monitoring equipment used in industrial process automation.
- Apply critical thinking skills, time management, and analytical thinking to solve technical problems while demonstrating knowledge of the industry terminology and nomenclature needed to communicate with industry technicians.
- Demonstrate knowledge of business practices and principles at a level sufficient for either operating their own business or to serve as a manager for a business entity.
- Perform safely in the work environment, meeting and obeying all workplace safety requirements.

Industrial Millwright

Graduates of the Industrial Millwright Technology Program will have the knowledge and skills to:

- Think critically to solve workplace problems.
- Communicate clearly and effectively both in writing and orally.

- Read and interpret standard blueprints and drawings of industrial equipment.
- Align shafts using laser and dial indicator methods of alignment.
- Identify and correct cavitation in fluid handling pumps.
- Set up a preventative maintenance schedule for industrial equipment.
- Rebuild and replace components in fluid and air handling systems.
- Replace bearings and seals in a non-destructive manner.
- Take electrical measurements on single- and three-phase power equipment.
- Replace defective components in a fluid power system.
- Identify failure causes in industrial equipment using vibration analysis and the root cause analysis tree.
- Identify and correct unbalance in rotating equipment.
- Rebuild industrial gear trains.
- Remove and replace standard industrial couplings.
- Identify metals according to standard hardness test.
- Complete precision hole location using hand layout and DRO methods.
- Perform safely in the work environment, meeting and obeying all workplace safety requirements.

Welding

Graduates of the Welding Technology Associate of Applied Science Degree Program will have the knowledge and skills to:

- Make satisfactory welds in all positions using the following welding processes:
 - Shielded Metal Arc Welding (SMAW)
 - Gas Metal Arc Welding (GMAW)
 - Flux Cored Arc Welding (FCAW)
 - Gas Tungsten Arc Welding (GTAW)
- Make satisfactory cuts with the following processes:
 - Oxygen Fuel Cutting (OFC)
 - Plasma Arc Cutting (PAC)
 - Air Carbon Arc Cutting (ACC)
- Interpret welding blueprints and welding symbols.
- Perform pipe layouts.
- Utilize basic welding metallurgy.
- Perform safely in the work environment, meeting and obeying all workplace safety requirements.

Appendix D
Sample Syllabi

[Electrical Systems Technology – ELM 142B Raceways](#)

[Instrumentation Technology – IT 201 Blueprint Reading and Measurement Fundamentals](#)