WELD TECHNOLOGIES
2014 Program Review
Renee Newell

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If there is a licensure exam for students to work in their field of study, please list the exam and the pass rate. If there are multiple licensure exams in the program, include them all.

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I. Overview

A. Description of Program

The mission of the welding department is to maximize the ability of its students to compete in the 21st century job market. To achieve this goal, the department emphasizes current technology trends in both the welding shop and the classroom environment. The direction of El Camino's welding program will offer a system of weld theory and hands on technical experience. The program prepares students for employment in the field and provides opportunities for currently employed personnel to enhance their skills and achieve a certificate in one or more of the Weld program offerings. Troubleshooting strategies, print reading, working with the Department of Building and Safety (LADBS) for D1.1 certification prepares our students for industry employment. Our programs' direction is to reflect industry's need for skilled, weld technicians and fabricators. Our department is working with other relevant construction technologies departments to strengthen the students' in the field experience in structural fabrication. We are expanding our views on cohort teaching with our Career Advancement Academy. The vision for the welding department is to train weld technicians capable of exceeding minimum entry-level competency requirements for local industries. For example, contextualized learning is effective especially for students who have difficulty with math or English. Students completing the program may expect to enter industry as an advanced apprentice or entry-level weld fabricators.

The 2015 program schedule will include three new classes and stackable certificate programs. These are compartmentalized certificates that reflect industry standards in specific processes. Each of the current program courses will be reviewed and updated to continually prepare students to acquire the skills necessary to complement industry core competencies along with efficiency and automation skill needs. The program evaluation and update process could influence certificate and degree completion rates due to higher student skill and input demand.

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B: Degrees and certificates offered by the Weld program

Associate in Science Degree

To receive an Associate in Science degree from El Camino College, a student must complete at least 60 units in degree applicable college courses that must include general education requirements and course work in an approved transfer major or associate degree program. Course work toward the degree shall be complete with a cumulative grade point average (GPA) of 2.00 or higher. A minimum of 12 of the required 60-degree applicable units successfully completed at El Camino College. A notation of "Graduation with Honors" is earned with a cumulative GPA of 3.5 or higher. Students must file intent to graduate in the evaluations area located in the Admissions Office by the deadline date published in the schedule of classes.
At least 50% of the major requirements for the Associate in Science Degree shall be completed at El Camino College.
Complete the following:
Major Requirements
At least 50% of the major requirements for the Associate of Science degree shall be completed at El Camino College.
8 units from: Welding 1, 10A, 10B;
15 units from: Welding 10C, 40A, 40B, 40C, 45
Total Units: 23
Recommended Electives: Computer Aided Design/Drafting 5, Machine Tool Technology 16, Welding 15, 23, 28, Construction Technology 100
Note: Students granted course credit for Welding 10A or Welding 40A may take an elective to satisfy the unit requirement for the degree and certificate.
Certificates of Achievement
A Certificate of Achievement will be granted upon completion of all program requirements. At least 50% of the courses required for the Certificate of Achievement must be completed at El Camino College.
8 units from: Welding 1, 10A, 10B;
16 units from: Welding 10C, 28, 40A, 40B, 45;
2 units from: Welding 23, 40C
Total Units: 26

Weld 10A	Introduction to SMAW	(4 units)
Weld 10B	Intermediate SMAW	(4 units)
Weld 10C	Advance Career and Certification Lab	(2 units)
Weld 45	Structural Fabrication	(5 units)
Weld 15	Basic Welding for Allied Fields	(3 units)
Weld 40A	Introduction to Gas Tungsten Arc Welding	(3 units)
Weld 40B	Intermediate Gas Tungsten Arc Welding	(3 units)
Weld 23	Advance Arc Welding Specialty Lab	(2 units)
Weld 99	Independent Study	(1-3 units)
Weld 40C	Advanced Gas Tungsten Arc Welding (GTAW) Skills Lab	(3 units)
Weld 23	Advanced Arc Welding Specialty Lab	(2 units)
Weld 28	American Welding Society (AWS) D1.1 Certification Test Preparation	(3 units)

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C: Program alignment with college's mission and alignment with the strategic initiatives.

The mission of El Camino College is 'El Camino College offers quality, comprehensive educatinal programs and services to ensure the educational success of students from our diverse community". Success as defined by the Weld program is aquiring the skills nessasary to aquire and sustain a value carear in the Welding industry. The Department of Labor and Statistics estimates an insurgence of need for highly competent skilled welders or as they refer to them, Weld Technicians. There is such a high level of concern in filling the need for the 580,000 well trained, workforce positions that are opening up in the year 2014, that the National Science Foundation is funding a program of training the Trainers, offering Weld Ed as a resource for instructors to be exposed to the current requirements expected of Weld Technicians. The American Welding Society (AWS) indicates that with an aging workforce, there will be approximately 280,000 positions opening up for skilled starting in the year 2015. A recent New York Times article sites "The insistent hunger for welders in the Gulf Coast region has created an unusually close partnership between the energy industry and local community colleges to train people for disappearing skills.

Fluor and other construction-related companies regularly contribute money, advice and castoff equipment. Exxon Mobil, for example, has pledged $1 million to a consortium of nine community colleges that offer training in the petrochemical field to recruit students and faculty." This makes it only more imperative that our welding department adapts to meet diverse student needs and respond to changes in the welding industry. According to the Department of Labor and Statistics, welding is one of the fastest growing carrears in the nation. The demand for qualifed peope is growing beyound the current ablitly to fill these postions. Students turned technians will have the basic skills nessasary to meet the changing needs of the welding and fabrication industy and secure long term successful careers. President Obama recently proposed a bold plan to make two years of community college free for all Americans who are willing to work hard toward graduation. In addition to America's College Promise, the President's FY 2016 budget request includes a proposal to create a new $200 million American Technical Training Fund that would expand innovative, high-quality technical training programs that are aligned with the workforce needs of employers in high-demand industries.

Our students must be comfortable to operate equipment commonly used in

metal fabrication with the ability to assess their job assignments and apply critical thinking to complete their task. Skilled job opportunities are coming back from China and Mexico since companies have found overseas production to be more costly in mistakes than having the work done in the US. National Skills, USA says that manufacturing in the USA is the 8th or 9th most important economy in the world. They are stressing the need for workers capable of leadership skills and qualities. Manufacturers Alliance for Productivity and Innovation revealed that there is twenty years of growth in the Aerospace market and US manufacturing assessment states the market will outlast the projects that are booked until the year 2028. Gas Tungsten Arc Welders (GTAW) and people with their AWS D1.1 LA City Certification fall into the category of workers that are needed to fill this supply. Students are required to meet increasing standards of excellence through testing, evaluation team success. These program steps are in line with initiative C, A, E, and B.

We are involved in a grant funded program, the Career Advancement Academy, which involves cohort teaching and contextualized learning. Math and the ability to communicate are extremely important to advance in a career as a Weld Technician. Training our CTE students to include additional instructional elements in math and communications is imperative to increase their ability to succeed.

Instructor professional development is another key to program success. Lincoln Electric offers classes at its Cleveland location to keep instructors educated in newest technology and fine-tuning their current techniques. Weld Ed is supported by the National Science Foundation to "train the trainers", one week seminars to share information in updating curriculum to educate our students as Weld Technicians.

Outreach to our industrial community, our contractors to improve program value and promote student development and employment. Both Compton and ECC's Weld Department are currently rewriting the curriculum in our program to include more certificates to reflect the number of lab hours student puts into different techniques and an eight week program to decrease the time they need to complete an Associate's Degree. These are our Stackable certificates. These initiatives are in line with Initatives F, D, C, and B. Alcoa like many other manufacturing companies are paying students as interns to go back to school. Alcoas's CEO says "what makes a business or country competitive is innovation backed by a skilled workforce." We need to reach out to the welding industry and offer the training they need to hire our students. What I've found is an overwhelming

response to the AWS D1.1 LA City Cert will open the door to most employment. Aerospace is a concentration on GTAW welding where the students need enough lab time to pass a series of thin gauge tubing to sheet, x-ray quality test.

D: Status of Previous Recommendations

We are currently updating our shops machinery so that the students' exposure to general fabrication equipment is current and boost their background knowledge during interviews. Knowledge is power and the companies offering paid internships for training want to know what kind of hand tools, weld joint fit-up and fabrication equipment the students know how to operate. The weld department will be submitting a grant for a pipe bender, pipe notcher and additional semiautomatic cutting equipment to accommodate the need. This and the above equipment have been submitted in my CTEA grant.

3) The Great Teachers Seminar is one of the educator's conferences to update their teaching skills and develop new processes and techniques to engage students in the classroom. Instructors also keep up with emerging technologies to keep pace with industry skill demands and apply knowledge gained in these events to class room learning.

4) Instructors in the Weld program continue to develop their skills through active learning programs designed to improve instructor effectiveness. Activates include participation in Faculty Inquiry Partnership Program (FIPP) and the Faculty learning academy.

5) As the curriculum expands to cover new technology, faculty will continue to develop curriculum to match industry demand. The weld department is in the process of hiring a full-time instructor to handle the projected increase in FTES. We will also need to rely on part-time faculty to support the program. With the various changes in our equipment and curriculum, an additional full-time faculty member should have a background to compliment the growing program needs.

a) Reviewing our courses to accommodate the void in class offerings due to the non-repeatability

clause has been a challenge. Our program plan has been to write 45ab as a beginning fabrication and introduce an Intermediate Fabrication class that incorporates computer technology and robotic production. Combination welding courses are also an important component to acquiring a position in welding. To accommodate this, we will split the Weld 1 course into two 4-unit classes.

b) All of the students learning outcomes reflect accommodations needed for every course.

Major Recommendations:

New upgraded equipment that meet industry guidelines for the lab

Safe tools and adequate supplies.

Each student is now required to use approved safety equipment for each class

Instructors have attended OSHA 10 training and will be offering classes to our students.

Instructor training.

Instructors have attended teacher-training events.

Instructor(s) hiring search (Immediate need: Part-time, Long term: Full-time)

1 new trainer has been hired and 2 new part time trainers are going through the review process.

New instructors will be needed with expertise and the minimum educational qualifications to meet the technology need in the expanding offerings of the Weld program

II. Program statistics research data

A: Head count of students in the program

The weld department is at capacity with regard to current enrollment, turning away at least 30% of students wishing to enroll in a weld class. We are offering 19 units as part of our regular load and 6 units offered through our Career Advancement Academy (CAA) program. The department has submitted an application for a Saturday GTAW class. Attendance consists of 7 percent female and 93 percent male students during the period from 2009 through and including 2012. 57.1 percent of students attending welding classes in the daytime, 42.9 percent

attend at nighttime. These statistics are consistent with students who have jobs during the day and attend school at night. We are looking at offering weekend classes to accommodate the students that are currently in the work force looking to improve their skills set or pass a weld test to increase their base pay. The largest age groups, 49 percent of students, are between the ages of 20 and 29 years old. A perfect demographic for the requirements the companies are looking for. The 15 percent of people over 40 enrolled in our program are either looking to improve their base pay by passing a plate groove test or are enrolled in our Gas Tungsten Arc Welding (GTAW) program in the hopes of going into aerospace where there isn't the physical strength needed as there is in pipe welding or iron workers. As stated in my earlier review the opportunities for skilled welders will be vast. One of the Presidents talking points has high skilled jobs coming back from Asia, therefore the huge financial support in training or re-training our workforce to be able to accommodate this influx. Tesla and Space Ex are bringing everything in house. Paid internships are now coming to fruition for companies willing to make an investment, seeking to train individuals in the trade they are looking to fill. With this are aptitude test (math & english), interviews for attitude, and to be able to evaluate whether their new hires will show up to work on time.

We are increasing our completion levels of our certificate program. The changes that we have implemented and recommended in the curriculum program have assisted in attaining this goal. The data indicates significant student participation within the Weld program over the last 4 years. We need a better system to record the accomplishments of students attending our program beyond the certificate to jobs obtained and the LA City D1.1 Structural Steel Certification. The Welding program is changing to reflect industry-changing demand. The program academic rigors are being extended to provide students a greater opportunity for

employment and career mobility.

B: Course grade distribution

Year	COURSE	Method	We	Grade I 'A'	'B'	'C'	'P'	'D'	'F'	'NP'	Inc P	Inc NP	'DR'	'W'	Total	Succ.	Reten.
2009	WELD-1	Lecture	16	5	11	7	-	-	-	-	-	-	1	-	24	95.8%	95.8%
	WELD-21	Lecture	16	10	9	-	-	-	-	-	1	-	-	3	23	87.0%	87.0%
	WELD-2ABC	Lecture	16	5	8	2	-	-	-	-	-	-	-	2	17	88.2%	88.2%
	WELD-40ABCD	Lecture	16	15	5	3	-	-	-	-	-	-	-	12	35	65.7%	65.7%
2009 Total				35	33	12	-	-	-	-	1	-	1	17	99	81.8%	81.8%
2010	WELD-21	Lecture	16	35	15	4	-	-	10	-	-	-	1	17	82	65.9%	78.0%
	WELD-2ABC	Lecture	16	14	18	11	-	-	6	-	-	-	-	2	51	84.3%	96.1%
	WELD-40ABCD	Lecture	16	44	28	12	-	2	6	-	-	-	2	18	112	75.0%	82.1%
	WELD-99ABC	Indepen	16	4	1	-	-	-	-	-	-	-	-	-	5	100.0%	100.0%
2010 Total				97	62	27	-	2	22	-	-	-	3	37	250	74.4%	84.0%
2011	WELD-21	Lecture	16	40	27	7	-	2	14	-	-	-	3	19	112	66.1%	80.4%
	WELD-2ABC	Lecture	16	14	9	11	-	-	11	-	-	-	-	1	46	73.9%	97.8%
	WELD-40ABCD	Lecture	16	43	19	14	-	3	17	-	-	-	-	4	100	76.0%	96.0%
	WELD-99ABC	Indepen	16	2	-	-	-	-	-	-	-	-	-	-	2	100.0%	100.0%
2011 Total				99	55	32	-	5	42	-	-	-	3	24	260	71.5%	89.6%
2012	WELD-21	Lecture	16	25	13	7	-	1	10	-	-	-	2	3	61	73.8%	91.8%
	WELD-23ABC	Laborato	16	9	5	4	-	-	-	-	-	-	-	2	20	90.0%	90.0%
	WELD-2ABC	Lecture	16	19	9	11	-	1	3	-	-	-	-	7	50	78.0%	86.0%
	WELD-40ABCD	Lecture	16	46	30	13	-	-	16	-	-	-	1	13	119	74.8%	88.2%
	WELD-45AB	Lecture	16	8	11	3	-	-	-	-	-	-	-	2	24	91.7%	91.7%
	WELD-99ABC	Indepen	16	1	-	-	-	-	1	-	-	-	-	-	2	50.0%	100.0%
		Laborato	16	2	1	-	-	-	-	-	-	-	-	-	3	100.0%	100.0%
2012 Total				110	69	38	-	2	30	-	-	-	3	27	279	77.8%	89.2%
2013	WELD-21	Lecture	16	25	15	4	-	9	4	-	-	-	-	4	61	72.1%	93.4%
	WELD-28AB	Lecture	16	8	8	2	-	-	1	-	-	-	-	1	20	90.0%	95.0%
	WELD-2ABC	Lecture	16	7	9	3	-	-	1	-	1	2	-	3	26	76.9%	88.5%
	WELD-40ABCD	Lecture	16	12	6	2	-	4	-	-	-	-	-	-	24	83.3%	100.0%
	WELD-99ABC	Indepen	16	7	-	-	-	-	-	-	-	-	-	1	8	87.5%	87.5%
2013 Total				59	38	11	-	13	6	-	1	2	-	9	139	78.4%	93.5%

C Success rates

Our field does not require an Associates of Science to gain employment. Of the four students who finish their Associates of Weld Technology last semester, two of them finished with their D1.1. Union Pacific railroad hired two of our graduates to jobs that include pension as part of their benefits package. One has open his own off-road fabrication shop with steady work and other students have gone on to pass their pipe certification and are taking contract jobs, earning $15,000/mth. I am trying to establish a format to document our student's rate of employment due to the experience they have received in the lab. Our success rate should be based on

employment rather than undergrad transfer rate. I am active in sharing information on job opportunities and have a success rate of approximately 87%. Acquiring the AWS D1.1 LA City certification would be another standard to rate our student success. Currently in the job market, there is no reason someone with this qualification would not have multiple opportunities for employment. The Iron Workers Union, Local 433, has so many contracts with new and retrofit bridge work, the football stadium and a multitude of contracts with downtown upgrades that is it foregoing the required sponsorship needed to enter and is giving boot camps to get their new recruits on the job site. The LADBS has been there 12 times in the last 6 months administering the written exam for the LA D1.1.

Fifteen percent of the continuing students have gotten entry-level welding jobs that pay $13 - $15 an hour; well above the minimum wage. Students that have the skill are employed at Ace Clearwater, Aero Arc, Triumph Vought, Terminal Island, small production shops and the Local 250, Pipe Union. Several other students are waiting to hear from job applications sent to Space Ex, TTX Railroad Specialist, and the various refineries. The Weld program at ECC has a long history of student success over the last several years. The current employment rate in the United States is around 12% above the national average. According to the Bureau of Labor and Statistics has more jobs available then people to fill them. Success for the ECC Weld program is linked to our ability to provide students with the skills necessary to fill employer's needs and direct students to a meaningful career. The welding industry continues to go through many changes the ECC Weld program is changing to meet the evolution of industry needs. Over the last year, the program has updated every course and two new certificates. The weld program is moving into a new complex has invested heavily in new computer operated equipment. Success is a matter of differentiation, this program is in the process of redefining program direction, and the term success in ways never imagined.

The Weld program at ECC does more than offer training and development we offer opportunities for personal and professional success. As part of our curriculum, we encourage students to envision where they expect to be in two years, what is needed to achieve that vision, opportunity to test for the LA City D1.1, and assistance with their cover letters and resume. Success is not just a matter of grades success is often a matter of direction, change, and expressed passion.

D Retention Rates

The ECC Weld retention rates vary from course to course and from year to year. The averages very between 85 - 95% and the 4-year average retention rate is 93.6%. These high retention rates relates to instructor involvement in student success and program content. Over the past couple of years, program instruction is strengthened by offering prep certification classes and working with the LADBS to administer the D1.1 written exam on campus. We are currently moving forward to accredit our lab to offer the practical testing. Program content is growing to reflect the needs of the industry that saturates the South Bay, including a greater emphasis on Aerospace and equipment maintenance. These additions provide the program a better alignment with industry needs if that meets your success goal supporting our current success rate of 75 to 80 percent. The expectation is that program retentions may fall due to program changes and instruction however, the long-term prospects are very favorable.

E comparison of success and retention rates in face-to-face classes with distance education classes N/A

Historically the Weld program at ECC has not participated in distance education classes.

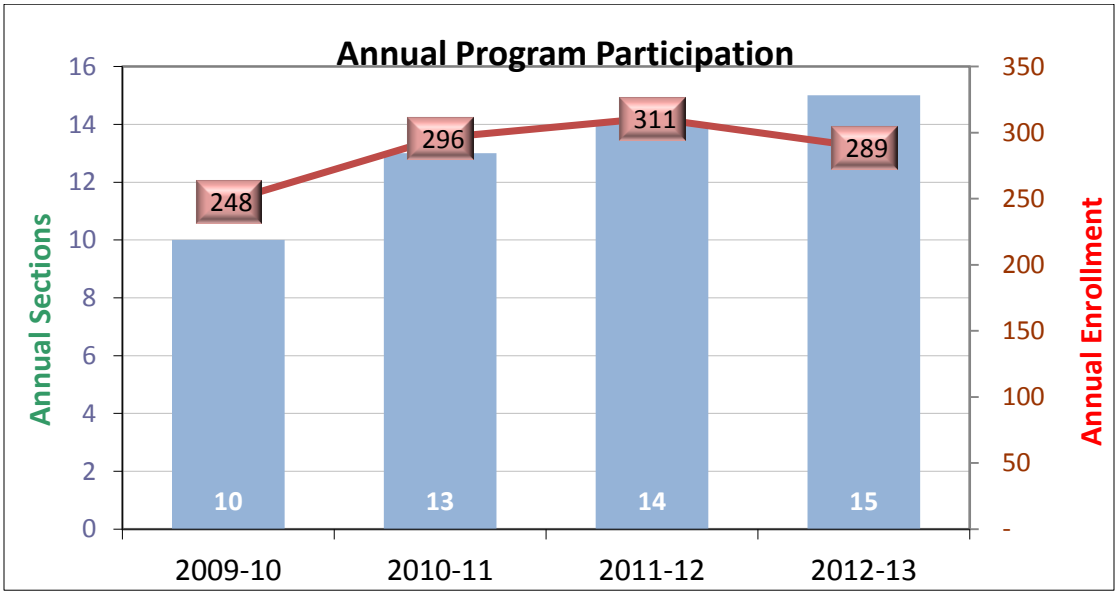
F Enrollment statistics with section and seat counts.

Weld program section and seat counts as illustrated in the tables below are strong. This strength is the result of a strong industry demand and instructional effectiveness. ECC weld department is turning away as many students that we are taking into our classrooms. Spring 2015 night classes turned away 20 students, enough to fill another section if we had the offerings. According to the New York Times article http://www.nytimes.com/2015/03/11/business/economy/as-demand-for-welders-resurges-community-colleges-offer-classes.html?_r=0, "Though the bureau projected that the number of welding jobs would rise 6 percent nationwide in coming years, the American Welding Society recently estimated at least a 10 percent jump over the next decade. In the energy belt, positions are already available. Fluor alone plans to hire 7,000 craft workers over the next three years, including 600 welders, just for its construction projects in Texas and Louisiana."

Program Participation (4-year Trend)

WELDING
Years: 2009-10 to 2012-13

	2009-10	2010-11	2011-12	2012-13	4 Yr Average
Annual Enrollment	248	296	311	289	286



G Scheduling of courses

The day and night program provide equal access to instruction. The night program allows full time employed students to increase their skills where the day program is more diverse to accommodate the larger needs to direct students on their career path - first time or those working part-time. We will offer our first weekend course in Spring 2015 to meet the economic and career enhancement demand. All classes are at maximum enrollment, turning away at least 35% of students. Our shop is 65% smaller moving into the new building, therefore, our lab size doesn't allow for the number of students previously enrolled, therefore,

we reduced the maximum enrollment numbers to accommodate the lower number of welding machines available. This is affecting us at a time where the need does not meet the demand. The strong numbers in 2009-10 reflect changes in the U.S. economy and the need for cross training. The decline after 2010 could be a reflection of improvement in the U.S. economy. According to the U.S. Department of Labor by 2014 there will be a need for 780,000 skilled welders with not enough trained people to fill them. Demand in the industry expects to grow by over 16% at the same time. The state has many projects with their metro systems, rebuilding bridges and highway reconstruction, new sports stadium, contracts for downtown construction, which will require highly skilled welders. LADBS stated that the submission for building construction contracts have not been higher since before the downfall in 2008. To achieve this goal, they need trained welders. El Camino College offers a program that applies principles of welding to the practical techniques needed to build their skills. Our program is aware of the need for weld technicians and we are updating our curriculum to keep abreast of the new technology and training methods.

Local 250, pipe welders and boilermakers union is looking to hire 1800 people into their apprenticeship program to gear up for the business from building the new football stadium and hotel contracts downtown, to the "Fracking" pipeline. Our students must be comfortable to operate equipment commonly used in metal fabrication with the ability to assess their job assignments and apply critical thinking to complete their task. Local 433, ironworkers union is providing "boot camp" training to build their workforce. Skilled job opportunities are coming back from China and Mexico since companies have found overseas production to be more costly in mistakes than having the work done in the US. National Skills, USA says that manufacturing in the USA is the 8th most important economy in the world. They are stressing

the need for workers capable of leadership skills and qualities. Manufacturers Alliance for Productivity and Innovation revealed that there is twenty years of growth in the Aerospace market and US manufacturing assessment states the market will outlast the projects that are booked until the year 2028. Gas Tungsten Arc Welders (GTAW) and people with their AWS D1.1 LA City Certification fall into the category of workers needed to fill this supply. The refineries are hiring 1000 people for "hot" watches and contained safety watches. Chevron is currently hiring 10 people to train as multipurpose welders, fitters and fabrication technicians. Most of the refineries are looking for skilled welders that can pass the 6G pipe test and read prints. The D1.1 will get you hired to do fit-up and tacking. Brinderson refinery will hire you to do the cover passes on their pipe if you have your D1.1 LA City certification and will pay the fees for a potential hire to take the 6G at Accurate Testing for the root pass. This will provide many opportunities for program growth, which the program is preparing for now.

Fall Term	2009	2010	2011	2012
Day	41.4%	60.3%	59.5%	43.2%
Night	58.6%	37.4%	40.5%	56.0%
Weekend/Unknown	0.0%	2.3%	0.0%	0.8%

H Improvement Rates

Most of the students attending the ECC Weld program achieve some level of success in the form of certificates or degrees. The program is designed to facilitate student success and instructors provide students with continued support for program completion. Working with the Career Advancement Academy and Women in Technology will forward our program with a diverse attendance in ethnicity, gender and age demographics.

I Additional data compiled by faculty

Demographic and Enrollment Characteristics
Welding
Fall

Will show 0.0% if you did not select Program *AND* Term on the Academics Tab

Fall						ECC Student Population	District Boundary Population
		Term					
		2009	2010	2011	2012	Fall 2012	2010 Census
Term Headcount		154	145	132	138	*23,409*	*556,400*
Gender	F	5.2%	3.4%	2.3%	5.1%	*52.5%*	*51.0%*
	M	94.8%	96.6%	97.7%	94.9%	*47.5%*	*49.0%*
Ethnicity	African-American	15.6%	24.8%	28.0%	26.1%	*17.0%*	*15.1%*
	Amer. Ind. or Alask. Native	0.0%	0.7%	0.8%	0.7%	*0.2%*	*0.2%*
	Asian	11.0%	5.5%	7.6%	7.2%	*16.1%*	*13.6%*
	Latino	35.7%	44.8%	40.2%	45.7%	*44.7%*	*34.5%*
	Pacific Islander	1.3%	1.4%	1.5%	1.4%	*0.5%*	*0.5%*
	White	19.5%	17.2%	17.4%	13.0%	*15.6%*	*32.8%*
	Two or More	1.3%	0.7%	2.3%	4.3%	*3.8%*	*2.9%*
	Unknown or Decline	15.6%	4.8%	2.3%	1.4%	*2.0%*	*0.4%*
Age/ Age Group	<17	0.0%	0.0%	0.0%	0.0%	*0.8%*	*24.2%*
	17	0.0%	1.4%	0.8%	0.7%	*2.0%*	
	18	3.2%	5.5%	4.5%	3.6%	*11.6%*	*2.5%*
	19	8.4%	6.9%	3.8%	8.0%	*14.7%*	
	20	7.8%	5.5%	6.1%	5.8%	*13.1%*	*1.2%*
	21	2.6%	8.3%	6.1%	6.5%	*9.5%*	*1.2%*
	22	3.9%	7.6%	4.5%	4.3%	*7.3%*	*3.9%*
	23	3.9%	2.8%	5.3%	3.6%	*5.6%*	
	24	5.8%	3.4%	4.5%	5.1%	*4.6%*	
	25-29	14.9%	13.1%	19.7%	15.2%	*12.7%*	*7.4%*
	30-39	24.0%	22.8%	19.7%	24.6%	*9.0%*	*14.9%*

	40-49	15.6%	13.1%	13.6%	14.5%	*4.7%*	*15.9%*
	50-64	9.1%	9.7%	10.6%	6.5%	*3.5%*	*18.1%*
	65+	0.6%	0.0%	0.8%	1.4%	*0.8%*	*10.6%*
Class Load	Full-time	8.4%	22.8%	17.4%	3.6%	*29.8%*	
	Part-time	91.6%	77.2%	82.6%	86.2%	*69.2%*	
Academic Level	College degree	11.7%	12.4%	10.6%	8.7%	*12.3%*	
	HS Grad	74.0%	77.9%	76.5%	78.3%	*83.2%*	
	Not a HS Grad	9.1%	7.6%	10.6%	9.4%	*1.4%*	
	K-12 Special Admit	0.0%	0.0%	0.0%	0.0%	*1.1%*	
	Unknown	5.2%	2.1%	2.3%	3.6%	*1.9%*	
Educational Goal	Intend to Transfer	11.7%	13.1%	17.4%	17.4%	*31.4%*	
	Degree/Certificate Only	13.0%	15.9%	12.1%	11.6%	*3.9%*	
	Retrain/recertif.	22.1%	15.2%	15.2%	8.0%	*3.8%*	
	Basic Skills/GED	0.0%	6.9%	4.5%	2.9%	*5.3%*	
	Enrichment	3.9%	2.8%	5.3%	4.3%	*4.1%*	
	Undecided	16.2%	10.3%	10.6%	19.6%	*16.7%*	
	Unstated	33.1%	35.9%	34.8%	36.2%	*35.0%*	

One of the most significant challenges will affect our academic program over the next four years is the need to train our students to be more than a welder but a weld technician that can think and lead in the industry he/she chooses. We are already looking at the need for more classes to achieve this goal, as well as updating our equipment to reflect this. To achieve this goal, the department emphasizes current technology trends in the weld shop and classroom environment, offering daytime, evening and weekend classes. There are more jobs in Welding than can be filled. A 4 year degree is important however the Bureau of Labor Statistics reports that only about 20% of all jobs require a baccalaureate degree or higher. That leaves 80% of all jobs not requiring such a degree. The same report presents that 67% of American jobs require post-secondary technical education. This is what the ECC Weld

program offers. Union Pacific told our ECC student that his Associates degree sealed the deal when offering the position. We need the resources to shape our curriculum to include expensive processes needed to train our students in structural flux core wires, NR232 and duel shield 71M

Quoting the NY Times "Mr. Parks at San Jacinto College said they could barely keep pace. "Most of our students are getting snatched up before they finish their certification," he said. Enrollment in its welding classes has grown by 75 percent since 2010. Two years ago, the college added 10 p.m.-to-2 a.m. classes to meet the demand."

J Recommendations

Additional classes are needed to support our curriculum and the needs of our community. This would include additional funds for supplies and instructor.
The recommendation must be that the Weld program at ECC be an integral part of student success at all levels on the ECC campus. There needs to be more divisional and cross-divisional participation cooperation.
There must be a link between academic success and career placement. The importance of technical education with career opportunities cannot be underplayed as a second choice option to a 4-year degree.
We need more community outreach to industry leaders, learning from the success of the German ingenuity. Germany's success is linked to a dual system of education and training, combining a few days a week of vocational school classroom instruction with on-the-job apprenticeships. We need more partnerships with industry to foster on-the-job apprenticeship programs.

Priority	Recommendations	Cost Estimate	Strategic Initiatives
2	Develop training classes to meet national certification needs	$21500	B,E
4	Instructor training and development	$10000	F,G
5	New full time and part-time instructors	$155000	F,G
11	Innovative equipment	$150000	A,B,F
9	Consumables, FCAW wire	$85,000	A, B ,F

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III Curriculum

A Curriculum review timeline

The ECC Weld program is a CTE program, which requires a two-year cycle on curriculum review. This time line includes 2014 and every two years after. The Weld program review at the unit level includes a complete evaluation every year and reflects changing industry and student needs. The program review includes curriculum review. Course review and updates align with industry and student needs to maintain program relevance. Course instructors and administrators for relevance and demands for improvements review course offerings. These recommendations are evaluated and course updates aligned to meet course and program requirements.

Course	Unit	Time line	Status
Weld			
10A	4	2015-2016	Active
10B	4	2015-2016	Active
15	3	2015-2016	Active
10C	2	2014-2015	Active
40A	3	2015-2016	Active
40B	3	2015-2016	Active
40C	2	2015-2016	Active
45A	5	2014-2015	Active
23	3	2014-2015	Active
28	3	2015-2016	Active

B. Course Revisions and additions

Besides implementing the already written Print reading course in Spring 2016, the weld department will submit 3 new courses. Weld 45ab will be offered as WELD 45A and a new intermediate course WELD 45B will reflect our CNC and robotic technology. The department wishes to include Laser technology in this curriculum as well. Welding and fabrication go hand in hand. The jobs currently offered incorporate both competencies when companies are looking for a weld technician. Weld 1 will be split into two courses (WELD 1A and WELD 1B) for combination welding. Combo welders are in high

demand and ECC cannot ignore this as an intricate part to our stackable certificates. is being Each of the program offerings includes a core focus on training our students to be critical thinkers for industry solutions. Increasingly, certificates reflecting time spent in advance classes will support students' resumes and companies' outlook on the experience they have acquired. Establish short-term certificate programs to reflect the background of knowledge. In the last year each course SLO's have been updated and expanded to include 3 SLO's. New equipment to support course alignment with industry energy efficiency training demands.

C Course Deletions and Inactivation's

Technology continually moves forward, often leaving in its wake what was new just a moment ago outdated and diminished in value. This is true more today than at any time in history. To keep up with changing industry demands and student needs the Weld program has developed new courses to support their training needs. The program has made room for these by dropping Weld 2 and Weld 5. To accommodate the growth of industry and the loss of space in the new building we will need to add course offerings.

D. Course and number of selections offered in distance education.

Currently there are no offerings for distance education in the Weld program. The program focuses on continuing education for industry professionals.

E. Program meeting student transfer and career needs.

The Weld program at ECC does not focus on transfer, however, the program supports this as an option. The primary program focus is on jobs. The ECC Weld program is in line with technical training programs in comparable colleges and career education centers. The program is moving in a more progressive technology based approach to student success. The ECC Weld program offers several certificates and a degree option for continuing students, which supports career success.

Weld industry response

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The number one complaint that many organizations that require weld technicians is they are unable to find enough qualified technicians to fill their organizational needs. With the influx of our current building trends in structural and aerospace, the workload outweighs the qualified workforce. This remains true even if the applicants have completed formal weld training programs and have not acquired the certifications needed to qualify for the projects being welded. Even automated processes need a certified welder, certified in the process being run, to operate the machine. The ECC weld program is addressing this industry concern through program updates, addition of current technology and equipment, hands on/fabrication learning resources and updating classroom-teaching methods.

Weld Industry Change

The Weld industry has experienced a great many changes over the years, however the current rate of exceeds that of any other time in the nation's history. This accelerated rate of change is the result of several factors the most noted of which the outsourcing of manufacturing that proved a costly venture that did not deliver the returns expected. Fracking, new bridge construction and reinforcement, construction contracts, updated railways, aerospace contracts and public demand is changing the skill requirements for Weld technicians. These skills needs have expanded to include the need for vast amount s of technology-based skills including CNC programming, computer print production, system automation, laser welding, and fabrication. Advancements in technology and new technician skill sets can provide viable solutions both in the short and long term.

Advance technology and industry equipment

One thing that industry, technology, academics, and social activate has in common into days global economy is efficiency and global impact. That is why no matter what the function or application the equipment must operate with maximum efficiency, with the smallest carbon footprint, while sustaining the needs of the user. Weld industry's equipment offerings have changed dramatically over the last few years. These changes are influenced heavily by changes in industry demand and the need to address global petroleum and aerospace needs. The influence of evolving technology has and will continue to

play an important role in the skill needs of Weld technicians. Many of the equipment offerings from Weld manufactures integrate advanced technology and filler metal design.

Our Advisory Committee recommends our welders to demonstrate multi-process or have certifications in combination welding skills, fabrication and fit-up skills, strong print reading skills, CAD/Fanuc or solid works exposure, oxy-fuel cutting techniques, and ironworking, flux core skills in large diameter wire.

ECC Weld program response to industry Demands

Through most of the 1980s, the number of welders nationwide topped 550,000. By 2013, there were just 343,000, according to the Bureau of Labor Statistics. To keep pace with industry the Weld program is focused on current occupational demand for Weld Technicians. This is expanding rapidly due to large construction projects coming down the pipeline and estimated retirements. According to the Federal Bureau of Labor Statistics there are 580,000 jobs opening up in the year 2014. President Obama recently proposed a bold plan to make two years of community college free for all Americans who are willing to work hard toward graduation. In addition to America's College Promise, the President's FY 2016 budget request includes a proposal to create a new $200 million American Technical Training Fund that would expand innovative, high-quality technical training programs that are aligned with the workforce needs of employers in high-demand industries. The optimal adjective is "skilled." The National Science Foundation supports the 580,000 positions available for skilled welders and are supporting the Weld Ed program to make sure we have the Weld Technicians that are desperately needed in the next couple of years.

Our students must be comfortable to operate equipment commonly used in metal fabrication with the ability to assess their job assignments and apply critical thinking to complete their task. Combination welders are in high demand - a difficult task since each process requires a different style, rhythm and technique. Fabrication, print reading, lay out and fit-up skills that require a deeper understanding of math is another direction our students could excel in. Automation and laser technologies are future processes already starting to dominate in select industries.

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Both Compton and ECC's Weld Department are compartmentalizing the curriculum to include more certificates to reflect the number of lab hours student puts into different techniques and an eight week program to decrease the time they need to complete an Associate's Degree or our certificate program. Stackable certificates to emphasize a students' specified study or to point out his/her abilities as a Combo welder. Students in our program have gone on to Ace Clearwater, Kinisharyo Light Rail, Aero Arc, Triumph Vought, Nexus Metalwerx- manager, CAT Specialty Contractor, Union Pacific, Pipe and Ironworkers union, Electro Mechanic Technician at US Hybrid Corp., Hansen's Welding and many more companies across the nation. We have approximately 140 students currently enrolled at ECC and we will be looking into accommodating for the growth that is expected. We are involved in a grant funded program, the Career Advancement Academy, which involves cohort teaching and contextualized learning. Overwhelmingly supported by our Advisory Committee, math and the ability to communicate are extremely important to advance in a career as a Weld Technician. I am excited about the future changes that will come from our learning curve in approaching construction trades with this concept. The next 5 years will be crucial to the training of skilled welders to step into the advance positions opening up in the aerospace, biomedical, transportation and construction technologies. Each course in the Weld program will build on the previous course to develop each student into highly valued resources for Weld industry employers. Students advancing through the program will develop an in-depth understanding of the science behind Welding. This understanding will help guide students to problem resolution and enable good decision-making when evaluating problems in the field. Each class on the way to completion will look back at the history behind Welding, to better understand industry trends and future needs. Fabrication is a key component to success in the weld industry. Every class along the way to program completion will seek to have students come up with creative solutions to complex problems.

The state has many projects with their metro systems, rebuilding bridges, reconstruction of highways, large contracts for sports arenas and building construction that will require highly skilled welders. To achieve this goal, they need trained welders. El Camino College offers a program that applies principles of welding to the practical techniques needed to build their skills. Our program is aware of the need for weld technicians and we are updating our curriculum to keep abreast of the new technology and training methods.

El Camino College serves a diverse community composed of numerous special populations that are served by having the use of modern welding equipment and awareness of the market needs. Industry is

looking for weld technicians. The welding faculty is attending training sponsored by the National Science Foundation, Weld Ed, to be advised on what Industry is expecting from our graduates and the impact we have as educators. We are involved with the Career Advancement Academy to introduce welding to an "at risk" population of youth and seek out "natural' talent. We work with the Women in Industry and Technology program to increase the weld department's exposure to women in the trades.

Program Evolution

Changes in the Weld program structure must change to keep pace with changing weld industry skill sets requirements. For this reason, the program is introducing changes through added courses and updating existing courses. Welding and fabrication go hand in hand. The jobs currently offered incorporate both competencies when companies are looking for a weld technician. Print reading should be implemented in Spring 2016. Weld 45ab will be offered as WELD 45A and a new intermediate course WELD 45B will reflect our CNC and robotic technology with the desire to include the increasingly used Laser technology. Combo welders are in high demand and ECC cannot ignore this as an intricate part to our stackable certificates. WELD 1A and WELD 1B will fill the void for combination welding. Each of the program offerings includes a core focus on training our students to be critical thinkers for industry solutions. Increasingly, certificates reflecting time spent in advance classes will support students' resumes and companies' outlook on the experience they have acquired. Companies are scrambling to find the technicians needed to keep their production moving or they are creating paid internships to train them. Currently, aerospace companies such as Ace Clearwater and Honeywell are trying to find enough Gas Tungsten Arc welders to accommodate the new orders in progress. Union Pacific just hired 3 welders to cover the Southern California territory and are looking at more employees that are ready to retire. Burlington Northern Santa Fe are looking to hire 18 welders where they are going to train in Kansas City to fill their employment voids. Both the Pipe Welders and Ironworkers union are desperate to recruit qualified welders. The weld department at El Camino should be ready to train this next generation of welders. We are updating our Structural Fabrication class and introducing a blue print reading class into curriculum. I am actively involved with the Weld Ed program, as well as doing additional training with Lincoln Electric, who is a sponsor of Weld Ed.

Our courses tend to overfill and the number of booths we have available limits us. We should offer more classes to accommodate the growing need for weld technicians. Fluor and other construction-related

companies regularly contribute money, advice and castoff equipment. Exxon Mobil, for example, has pledged $1 million to a consortium of nine community colleges that offer training in the petrochemical field to recruit students and faculty. Alcoa like many other manufacturing companies are paying students as interns to go back to school. Their CEO says "what makes a business or country competitive is innovation backed by a skilled workforce". We need to reach out to the welding industry and offer the training they need to hire our students. There is an overwhelming response to the AWS D1.1 LA City Structural Steel Certification to open the door to most employment. Aerospace is a concentration on GTAW welding where the students need enough lab time to pass a series of thin gauge tubing to sheet, x-ray quality test.

What are the completion success and employment rates for the students?

Fifteen percent of the continuing students have gotten entry-level welding jobs that pay $13 - $15 an hour; well above the minimum wage. Students that have the skill are employed at Ace Clearwater, Aero Arc, Triumph Vought, Terminal Island, small production shops and the Local 250, Pipe Union. Several other students are waiting to hear from job applications sent to Space Ex, TTX Railroad Specialist, and the various refineries. The Weld program at ECC has a long history of student success over the last several years. The current employment rate in the United States is around 12% above the national average. According to the Bureau of Labor and Statistics has more jobs available then people to fill them. Success for the ECC Weld program is linked to our ability to provide students with the skills necessary to fill employer's needs and direct students to a meaningful career. The welding industry continues to go through many changes the ECC Weld program is changing to meet the evolution of industry needs. Over the last year, the program has updated every course and two new certificates. The weld program is moving into a new complex has invested heavily in new computer operated equipment. Success is a matter of differentiation, this program is in the process of redefining program direction, and the term success in ways never imagined.

The Weld program at ECC does more than offer training and development we offer opportunities for personal and professional success. As part of our curriculum, we encourage students to envision where they expect to be in two years, what is needed to achieve that vision, opportunity to test for the LA City D1.1, and assistance with their cover letters and resume. Success is not just a matter of grades success is often a matter of direction, change, and expressed passion.

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Program need

The addition of course work or updating training methods alone will not prepare our students to meet industry demands. We are looking at introducing a nondestructive testing class to open other opportunities for students who wish to go into weld inspection. Because weld inspection goes hand in hand with any type of critical weldments and inspectors need to have at least two years welding experience. We are also working with Compton College to get approval for a testing center for the practical exam of 2G, 3G or 4G testing.

Many of my Gas Tungsten Arc Welders are hired on a contingency 90-day basis, employment based on the ability to pass the D17.1 and various other x-ray quality welds in order to qualify to start welding for that particular company. We focus our attention on certification and preparing for interviewing exams. El Camino has many industrial connections that consider our students for employment. The welding curriculum focuses on improving the education of our students to reflect the skills needed to excel in industry and the employers are appreciative of that fact. Many of the new curriculum classes being implemented are expected to improve on student satisfaction, as well as increasing their employability. Additional equipment required to support the automation and software component will be reflected in the program student learning outcomes.

F Related recommendations

The Weld program needs to include links to other industry and technology programs and other ECC divisions. A link with the math, engineering, humanities, business, and arts will find a good it with the application of hands on learning and real world problem solving offered by the Weld program. Weld technicians often go on to become engineers, educators, business professionals, sales representatives, designers, programmers, architects, and designers. The Weld program is a great source for creative though development and real world applications of science and industry.

The Weld curriculum needs to expand to include a national certification program for students completing the program. The national certification must provide students with a competitive advantage in the workforce. This national certification will be included as a two-unit course upon completion of the core Weld program. There is also a need to collaborate with the HVAC department and the chilled water systems class to help prepare welding students for jobs in chilled water system support.

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Priority	Recommendations	Cost Estimate
1	Pipe bender & notcher	$4500
1 B	Scanner and support supplies	$1400
2	Develop training classes to meet national certification needs	$21500
3	System commissioning tools and resources	$45000
6	Laser welding machines	$12000
8	Programing software	$8000

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IV: Assessment of Student and Program Learning Outcomes (SLOs & PLOs)

Program: **Welding**	**Number of Courses:** 12	**Date Updated:** 09.18.2014	**Submitted by:** 4519 Renee Newell, ext. 3308

ILOs	**1. Critical Thinking** *Students apply critical, creative and analytical skills to identify and solve problems, analyze information, synthesize and evaluate ideas, and transform existing ideas into new forms.*	**2. Communication** *Students effectively communicate with and respond to varied audiences in written, spoken or signed, and artistic forms.*	**3. Community and Personal Development** *Students are productive and engaged members of society, demonstrating personal responsibility, and community and social awareness through their*	**4. Information Literacy** *Students determine an information need and use various media and formats to develop a research strategy and locate, evaluate, document, and use information to accomplish a specific purpose. Students demonstrate an understanding of the legal, social, and ethical aspects related to information use.*

PLOs	**PLO to ILO Alignment** *(Mark with an X)*			
	1	**2**	**3**	**4**
PLO #1 Success in the Welding Industry Success in the Welding Industry Upon completion of the Welding program, students will be able to demonstrate knowledge of the skills needed for success in the welding industry.	X			
PLO #2 Safety Knowledge and Skills Upon completion of the Welding program, whether in the certificate program or degree program, students will acquire and be able to use specific safety knowledge and skills relating to welding discipline and will be able to apply those skills to specific job requirements.				X
PLO #3 Attaining Certificates, Degrees, Transferring and Attaining Job Upon completion of the Welding program, students will successfully earn a certificate/graduate/transfer to 4 year universities and will successfully compete for jobs in which they can apply their knowledge and communicative skills acquired in welding program.	X			

A. SLO Alignment

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	SLO to PLO Alignment *(Mark with an X)*			COURSE to ILO Alignment **FOR OFFICE USE ONLY**			
	P1	**P2**	**P3**	**1**	**2**	**3**	**4**
WELD 1 Introduction to Welding: SLO #1 Students will be able to demonstrate basic knowledge of welding concepts.	X		X	X			X
WELD 1 Introduction to Welding: SLO #2 Welding students will produce quality welds utilizing various welding techniques.	X		X				
WELD 1 Introduction to Welding: SLO #3 Students will be able to demonstrate the safe set up and operation of welding equipment using all applicable personal protective equipment.		X	X				
WELD 10A Introduction to Shielded Metal Arc Welding (SMAW): SLO #1 Students will be able to demonstrate the safe set up and operation of welding equipment using all applicable personal protective equipment.		X	X	X			X
WELD 10A Introduction to Shielded Metal Arc Welding (SMAW): SLO #2 Safe operation of manual and semi-automatic base metal cutting tools.	X		X				
WELD 10A Introduction to Shielded Metal Arc Welding (SMAW): SLO #3 Students will have a basic understanding how heat affects their weldment.	X						
WELD 10B Intermediate Shielded Arc Metal Welding (SMAW): SLO #1 Welding students will produce quality welds utilizing various welding techniques.	X		X	X			X
WELD 10B Intermediate Shielded Arc Metal Welding (SMAW): SLO #2 Students will understand Blueprint symbols and their relationship to the weldment.	X		X				
WELD 10B Intermediate Shielded Arc Metal Welding (SMAW): SLO #3 Student will exhibit knowledge in electrode identification, weldability of metals, joint design and power sources.	X		X				
WELD 10C Advanced Certification and Career Preparation Lab: SLO #1 Student will perform destructive test on a qualification plate exam (guided bend tests).	X		X	X			X
WELD 10C Advanced Certification and Career Preparation Lab: SLO #2 Students will have working knowledge of manual and semi-automatic tooling used in industry.	X		X				
WELD 10C Advanced Certification and Career Preparation Lab: SLO #3 Student will safely operate equipment and exhibit shop safety throughout course.		X					
WELD 15 Basic Welding for Allied Fields: SLO #1 Welding Concepts Students will be able to demonstrate basic knowledge of welding concepts.			X				

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WELD 15 Basic Welding for Allied Fields: SLO #2 Safe Setup & Operation Students will be capable of the safe set up and operation of welding equipment.		X		X			X
WELD 15 Basic Welding for Allied Fields: SLO #3 Welding Process Selection Capability to choose an electrode or process that suits the metal thickness, joint fit up, and alloy composition.	X		X				

SLOs	**SLO to PLO Alignment** *(Mark with an X)*			**COURSE to ILO Alignment** ***FOR OFFICE USE ONLY***			
	P1	**P2**	**P3**	**1**	**2**	**3**	**4**
WELD 23 Advanced Arc Welding Specialty Lab: SLO #1 3G and 4G Positions Welding students will produce quality weld in the 3G And 4G positions.	X		X	X			
WELD 23 Advanced Arc Welding Specialty Lab: SLO #2 Joint Fit-Up Students will have a developed understanding of the importance of joint fit up.	X		X				
WELD 23 Advanced Arc Welding Specialty Lab: SLO #3 D1.1 Certification At the completion of this course, students will be prepared to take the practical exam for their D1.1 certification.	X		X				
WELD 28 American Welding Society (AWS) D1.1 Certification Test Preparation: SLO #1 Preparing for Certification Exams Students will be able to locate and use charts, index and table of contents to answer open book questions to prepare for the exam.	X		X	X			
WELD 28 American Welding Society (AWS) D1.1 Certification Test Preparation: SLO #2 D1.1 Written Exam Prep At the completion of this course, students will be prepared to take the written exam for their LA City D1.1 Structural Steel certification.	X		X				
WELD 28 American Welding Society (AWS) D1.1 Certification Test Preparation: SLO #3 Welding Procedure Specifications Capability to process Welding Procedure Specifications (WPS), which provides direction to the welder or welding operators for making sound and quality production welds as per the code.	X		X				
WELD 40A Gas Tungsten Arc Welding (GTAW), Gas Metal Arc Welding (GMAW): SLO #1 TIG Weld Concepts Students will be able to express a basic knowledge of TIG welding concepts.	X			X			X
WELD 40A Gas Tungsten Arc Welding (GTAW), Gas Metal Arc Welding (GMAW): SLO #2 GTAW Gases Students will be able to demonstrate a knowledge of the gases used for the GTAW processes.							
WELD 40A Gas Tungsten Arc Welding (GTAW), Gas Metal Arc Welding (GMAW): SLO #3 Constant Current Welding Students will be able to correctly set up and use a constant current welding machine.		X					
WELD 40B Intermediate Gas Tungsten Arc Welding (GTAW): SLO #1 Safely set up weldment and GTAW equipment.		X		X			X
WELD 40B Intermediate Gas Tungsten Arc Welding (GTAW): SLO #2 Correctly adjust welding parameters to produce quality weldments in and out of position.	X		X				

WELD 40B Intermediate Gas Tungsten Arc Welding (GTAW): SLO #3 Produce GTAW weldment according to administered blueprint.	X		X				

SLOs	**SLO to PLO Alignment** *(Mark with an X)*			**COURSE to ILO Alignment** ***FOR OFFICE USE ONLY***			
	P1	**P2**	**P3**	**1**	**2**	**3**	**4**
WELD 40C Advanced Gas Tungsten Arc Welding (GTAW): SLO #1 Apply the proper safety procedures and precautions required when working with GTAW.		X		X			X
WELD 40C Advanced Gas Tungsten Arc Welding (GTAW): SLO #2 Use the appropriate equipment and materials to develop the welds and weld joints illustrated on a job sheet.			X				
WELD 40C Advanced Gas Tungsten Arc Welding (GTAW): SLO #3 Produce a quality "out of position" weldment and adjust his welding parameters accordingly.	X						
WELD 45 Structural Fabrication: SLO #1 Safe Setup & Operation Students will be able to demonstrate the safe set up and use of various welding and cutting apparatus.		X		X			X
WELD 45 Structural Fabrication: SLO #2 Job Skills Students will be prepared to demonstrate job skills required for fabrication layout.	X						
WELD 45 Structural Fabrication: SLO #3 Measuring Tools Students will be able to correctly use measuring tools necessary for fabrication projects.	X						

B. SLO and Assessment Timeline: Four-Year Cycle

Program Name	Welding

SLO Assessment Timeline: Create Your 4-Year Assessment Plan

Directions: Starting in academic year 2014-2018, SLOs are assessed over a four-year cycle at ECC. Because program review will start occurring in calendar years (i.e. Spring to fall semester), the grid below is organized by calendar year rather than academic year. Plan out your program's assessments so that all SLOs (both course- and program-level) are assessed at least once every four years.

Year	Semester	Course-Level SLOs Assessed	Program-Level SLOs Assessed
Year 1 of 4-Year SLO Cycle *(3 years before Program Review)*	Spring	None due	**PLO 1**
	Fall	Weld 45	**Program Level 1** Prepare welders for job skills requiring fabrication layout.
Year 2	Spring	Weld 40A	**PLO 1** Students will be able to express a basic knowledge of TIG welding concepts.

of 4-Year SLO Cycle *(2 years before* *Program Review)*	Fall	None due	.

Year 3 of 4-Year SLO Cycle *(1 year before* *Program Review)*	Spring	Weld 15 Weld 23 Weld 40B	**Program Level 2** Students will be capable of the safe set up and operation of welding equipment. During the semester they will successfully acquire basic skills required to meet industry standards.
	Fall	None due	
Year 4 of 4-Year SLO Cycle *(Year of* *Program Review)*	Spring	Weld 23	**PLO 2** Students will have a developed understanding of the importance of joint fit up
	Fall	Weld 10C	**PLO 1** Students will be capable of the safe set up and operation of welding equipment.

C Percent of course and program SLO statements that have been assessed.

In 2013, all of the Weld program course SLO's were updated and two additional SLO's were added. There are currently no overdue SLO assessments and at the start of the new cycle of assessments. Over the next year, the SLO's will be assessed for effectiveness as the time SLO time line for each course is approached.

Course Name/Course ID	Total Course SLOs	Total Assessment Method Descriptions	Course SLOs Without Assessment Method Descriptions	Last Assessment Data & Analysis	Last Action	Last Follow-Up
SMAW intro Weld 10A	3	3	0			
Intermediate SMAW Weld 10B	3	3	0			
Advance Structural Weld Weld 10C	3	3	0			
Prep course for D1.1 written exam Weld 23	3	3	0	2013		
Advance SMAW lab Weld 28	3	3	0			
Intro to GTAW Weld 40A	3	3	0	2013		
Intermediate GTAW Weld 40B	3	3	0			
Advance GTAW lab Weld 40C	3	3	0			
Intro to Fabrication Weld 45	3	3	0			
Basic Welding for Allied Fields Weld 15	3	3	0	2013		
	3	0	0			

D SLO and PLO assessment

In 2013 each of the SLO's and PLO's have been reviewed and updated to meet changing program requirements. Each course originally referenced only one SLO; in 2013 two additional SLO's assessments were added. At the same time as the SLO updates, the SLO/ PLO assessment time lines followed suit. Each of the SLO's and PLO's were assessed by both the Compton center and El Camino College collage Weld program faculty to arrive at SLO's and PLO's that complemented program direction.

E Level of program ACCJC rubric

Awareness

Within the Weld department, there is a keen awareness of the importance of aligning the course and program SLO's with actual student needs. Each department member aligns course work to align with SLO outcomes and communicates to student's course outcomes and directions. The primary goal of the Weld programs is student long-term career success. Over the last year each of the courses in the Weld program had their SLO's updated and expanded from one to three SLO's. Each of the SLO's were fully reviewed and updated to reflect industry demands and student needs. Each instructor in the program strives for student success and the SLO's are there divining rod.

Development

Program instructors have accepted personal responsibility for student success and alignment with course requirements with SLO intent. Each course in the Weld program has undergone an evaluation by instructors and staff. At the beginning and end of ever semester, all Weld instructors review course direction and student outcomes to ensure student success in career advancement. Over the last year three new instructors have

been added to the program that come direct from industry with the skills required to meet changing industry demand and prepare our students for career success. The SLO's help keep the program focused on student success.

Proficiency

Student success in the Weld program is linked to applied experiences. Over the last year, the Weld program has invested in the technology necessary to support changes in the industry. Student learning outcomes are an interregnal part of each course and help drive program direction toward technological advancements and efficiency.

Sustainable continuous quality improvements

Faculty, students, and advisory committee members are in open dialog regarding student needs for career success. Over the last year, the Weld program has added 2 new stackable certificates and 8 new courses. The program is moving into a new facility in 2015. New equipment have been acquired and learning resources have been dramatically increased. The Weld program is focusing on quality, technology solutions, and student career success. The Weld program is at a more than sustainable level due to new instructors with strong industry background, the focus on student and instructor diversity, updates in program instruction, program course additions and high industry demand for qualified Weld technicians.

F Related recommendations

SLO's and PLO's are only a part of the story, technology, internal and external departmental cooperation along with industry cooperation is another. We need to expand the SLO's and PLO's to include dimension of internal and external cooperation between

departments and divisions within ECC and industry leaders. Let us expand to include inter-cooperation learning outcomes. The Weld department and the engineering department would for example be a great fit.

V Analysis of Student Feedback

A. Results of student surveys

The Weld program has undergone many changes in the last few months. These improvements include course additions updates and changes in how the program delivers course instruction and student's assessments. Based on feedback received by instructors students are generally pleased with the program changes and are enthusiastic about the learning opportunity. The program direction toward energy management and efficiency provides students opportunities for high demand jobs. These opportunities are driving student engagement. Students in the Weld program are provided and ongoing opportunity to provide program and course feedback both during and after the completion of the course. The feedback received reflects the acceptance of program direction and the importance to students acquiring the skills necessary to maintain a competitive advantage in the job market. During the final weeks of the spring 2014 semester, several students participated in an oral interview to evaluate student satisfaction. All to the student's surveyed reported the program direction; program updates and course structures complemented their program-desired direction and were very enthusiastic about the pursuit of a career in welding.

B Implications of survey results

Student satisfaction, through analysis of student success and completion rates indicate high levels of both success and completion. The weld program at ECC needs to continue the drive toward technology and leadership skills. Based on student feedback and the analysis of industry needs these are the drivers of student career success and program prosperity.

C Related recommendations

What we need in the weld program is student intern and externships with industry leaders. Let us develop pathways to job placement and career advancement. Student long-term success is measured in job security and success.

VI. Facilities and Equipment

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Renee Newell

A Existing program facilities and equipment

The existing Weld facilities are inadequate for current program needs. The Weld facilities and equipment are outdated and do not meet the current student needs. The Weld program at ECC is in a state of immediate and long team change. Industry demand is for technicians that have the skills and abilities to meet the evolving needs of industry include operating a vast arayh of hand tools and semiautomatic equipment. The Weld program at ECC must adapt and evolve to provide students with access to the technological drivers to meet industry demands for leadership and management. Program graduates must have a solid foundation in the fundamentals of welding along with a foundation in fabrication and print reading.

B Immediate (1-2 year) needs

The Weld program will move into a new facility in 2015. This new facility will need to support program changes that focus on technology in a space that is two-thirds smaller than the one we currently occupy. With a new building comes a renovated and rejuvenated weld program. The updated weld program will require new state of the art equipment and supportive resources along with the support for smaller class sizes due to the lack of booths available in the given disciplines taught.

Students must have the hands on and classroom experience to understand and implement fabrication and print reading codes. The only way to do this is to provide students direct access to the equipment and technology used by the weld industry to comply with AWS Standards. This requires the purchase of new equipment designed in laser technology and fabrication standards of the 21st century. Supportive resources including computer programs and hand tools are required for students to meet the challenges of becoming a weld technician and

leader in the industry.

Existing equipment in the Weld program provide students the opportunity to develop their basic welding skills and meet minimum standards for student projects.. Existing equipment includes manual and semiautomatic equipment that students use to develop their techniques and troubleshooting skills. With the smaller space we have lost the option to hold onto the older equipment yet in industry this older equipment could be the one you use to test. We will need a space to set up and utilize some older equipment that will need to be stored during our move to the new location.

C Long-range needs (2-4 years)

The Weld program needs to invest in technology that will provide for the integration of all aspects of fabrication and industrial skills. This will enable students to use the lab as a source for expanding real time learning. Students need exposure to and given hands on experience for doing noncritical repairs on welding equipment as it breaks down. Allowing students to perform non-critical repairs provides them with a critical thinking opportunity, and solidifies the failure of equipment with the ease of repair. This skill will prove vital in their future careers as welding professionals; easily developed under the instruction provided in the classroom**.** We no longer live in a world untouched by technology and the day is now when fully educating our students as weld technicians should be reflected in the weld program.

VII Technology and Software

A Review of adequacy and currency of program technology

We live in a time like no other with in the history of humanity. Today our students have at their fingertips the combined knowledge of our species and the resources necessary to see

and comprehend the nature of the universe with in which we are confined and beyond. The key to accessing the limitless possibilities that stands before us is the integration of curiosity, ingenuity, imagination, and the extension of our knowledge base and sensory perceptions made possible due to emerging technology. Success of our students is interdepended on their ability to understand, apply, and manipulate technology to maximize system reliability and efficiency.

With the link between technology and student success the weld program would be amiss and in conflict with goals and objectives of ECC if the continued integration and upgrading of technology used in the classroom and lab did not keep pass with industry trends and demands. For students to maximize their value to customers and employers they must a high comfort level with technology and software used in the welding industry.

B Immediate (1-2 year) needs

In the next 1 to 2 years, the weld program technology and software needs revolve around the ability for students to effectively create and fabricate projects to support their resumes. The classroom resources need to include system interface devices smart system interfaces i.e. iPad or tablets. The goal is to provide each students access to such devices to prepare them for the world of automation and print capabilities. AutoCAD software system support at the equipment level will include pipe programs and fabrication print set up. Additionally system level hardware and software will include both open source and proprietary.

C 2-4 year needs

The Weld program provides a unique opportunity for new and continuing students to acquire the knowledge necessary to place them into a position of advantage in the workplace. We will be increasing our pipe bending, notching and cutting equipment. Certifying the lab to do the practical exams of the D1.1 will allow our students the convenience of completing a college education as well as obtaining the vital certification needed in industry. ECC's weld department will include automation and laser trends surfacing in industry needs.

D Recommendations

Investments in the Weld program is investments the future of our students. Expansion into adaptive technology provides many needed solutions and is critical to student success.

VII. Staffing

A Current staffing

Increase number of part time instructors to reflect increase of student population in the program. Two (2) part time instructors with strong trade experience need to be hired. Expand current course offerings to include a complete nighttime and weekend program for students wanting to enter the trade and those wanting to improve their skills.

With consideration to increasing student demand for classes in this trade, pending staffing changes, and current staffing levels, the program is unable to keep up with demand. Additional staffing will be required to address increasing class size and need to provide supervision for all the students in the lab. Safety is our biggest concern for the students. The program needs additional (adjunct) faculty for the night program.

Current instructors will need to update their skills in automation, CNC programing, management, and applied equipment. To acquire and maintain these skills will require

advanced training. Resources will need to be made available to accommodate these needs. As the program moves forward, there will be an ongoing need for additional instructors to support program growth.

The current staff is expanded to include instructors with a variety of industries skills and diverse experiences necessary to keep the program in pace with industry demand and complement student diversity. We hope to continue development though both online and on ground learning opportunities.

Currently, we are addressing our staffing needs by hiring two adjunct instructors. The weld department needs to hire another full time instructor to support growth in our program. The weld shop will be moving into our new facility that is more compact. The new facility can accommodate two separate lab classes offering Gas Tungsten Arc Welding and Shielded Metal Arc/ Flux Cored Welding to cover the growth we will need to provide our community. A full-time faculty member will cost approximately $80,000. Long range goals will be accommodated with two full-time faculty. With the boom in hiring for aerospace, we need to focus on training our superior Gas Tungsten Arc welders into an aerospace weld technicians that can pass the grueling test required for entrance into our major aerospace producers located in the Southern California area. There will be a lab only component to this change. If our program is allowed more growth, we will seek out adjunct faculty to fill in the voids. Resources for staffing development will need to be included in the annual budget each year to enable program and student success. These changes will require student adjustment to new teaching techniques and program emphasis. The expectation is a wider more diverse population of students seeking long-term career success.

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B justification of programs' staffing needs long term and short term

The program staffing in the next two years will include instructors with experience in automation system setup, CNC programing, and a wide variety of skills in welding technologies. Our Flux Core program will require more classes, which in turn will require a new instructor. With all the bridge work that is coming to Southern California, a instructor with a strong background with the Iron workers is a necessity to assist our students in acquiring the D1.5 certification. These required skill levels would require a unique level of knowledge from a wide diverse set of instructors. The program will need at least two part-time instructors with these advanced skills. Utilizing our new equipment to the fullest will need to be developed.

C Related recommendations

The addition of automation and laser technologies is the path we are starting to follow. Having our Fabrication classes reflect this new technology and incorporating Entrepreneurial theology will be a trend for the future. Our pursuit for Weld technicians will provide the opportunity to provide students with the unique skills necessary to secure a long-term career in the Welding industry. Not keeping pace with industry demands is unacceptable with student success as our goal. The Weld industry is one of the fastest growing industries in the United States. These factors tie together into student success. We need to advance our program to meet these expected needs do to otherwise would not be in the best interests of our students, staff or ECC as a whole.

Priority	Recommendations	Cost Estimate	Strategic Initiatives
1	Educational resource supplies/text	$3000	A,B,F

1 B	Laser welding equipment	$140000	A,B,F
3	Develop training classes to meet national certification needs	$21500	B,E
2	Forming tools and resources	$45000	A,B,F
4	Instructor training and development	$10000	F,G
5	New full time and part-time instructors	$25000	F,G
6	Programing software	$8000	A,B,F
7	Laptop/pad	$9000	A,B,F
8	Develop training videos	$40000	A,B,F

IX. Future Direction and Vision

A Changes within field/industry that impact program in next 4 years

The Weld program is developing program content to compliant industry trends and demands. For the program to develop in the needed direction to support student success requires the integration of technology into the program. This integration requires automation technology to the existing curriculum and add certificates of achievement to complement these changes. This high demand for technology-based skills requires that the collage update and add courses that complement this demand. In our continuing contact with industry officials, concern about writing and reading skills in general, continues to top the list of concerns. This was borne out again in an outside survey that was included in the program review report.

With the importance of reading and writing skills continually reinforced during interactions with industry, an advanced course in reading and writing is recommended as a long-term goal, also possibly as a distance education course. This course will be designed for practitioners who are developing promote ability skills. All employers are competing for the same, relatively small pool of qualified technicians. In order to meet this demand, the weld program should increase its efforts to develop students who are more qualified and more marketable in the selection process.

With the increase of student population, demand for technology based training, and projected retirements, the program needs two additional part time instructors. The labs are full and the current full time instructors are unable to safely watch all the students in the lab. Safety is our biggest concern for the students.

B. Direction and vision of program

The direction of El Camino's welding program will be the certification of our students to prepare them for industry. We are updating our curriculum to reflect the need for skilled, weld technicians. Our department is working with other relevant construction technologies departments to strengthen the students' in the field experience in structural fabrication. We are expanding our views on cohort teaching with our Career Advancement Academy. The vision for the welding department is to train weld technicians capable of not only passing companies entry-level math test but excelling in their scores. Contextualized learning is effective especially for students who have difficulty with math or English.

The biggest change that will affect our academic program over the next four years is the need to train our students to be more than a welder but a weld technician that can think and lead in the industry he/she chooses. We are already looking at the need for more classes to achieve this goal, as well as updating our equipment to reflect this. To achieve this goal, the department emphasizes current technology trends in the weld shop and classroom environment, offering daytime and evening classes, using technology as a tool to student success. However, the core program focus is on student personal and professional leadership is a goal that extends from the program to the students future. Career skills are not sufficient for a meaningful and successful career.

C related recommendations.

What is more important than the whole human in education. Our mission is not program or professional success our mission is our students. My simple recommendation is a reevaluation of our priorities and the creation of cross department and division cooperation. Integration and assimilation; Students need exposure to and given hands on experience for doing noncritical repairs on welding equipment as it breaks down. Allowing students to perform non-critical repairs provides them with a critical thinking opportunity, and solidifies the failure of equipment with the ease of repair. This skill will prove vital in their future careers as welding professionals; easily developed under the instruction provided in the classroom.

X Prioritized Recommendations

A Single and prioritized list of recommendations

Priority	Recommendations	Cost Estimate	Strategic Initiatives
1	Educational resource supplies/text	$3000	A,B,F
1 B	Laser welding equipment	$140000	A,B,F
3	Develop training classes to meet national certification needs	$21500	B,E
2	Forming tools and resources	$45000	A,B,F
4	Instructor training and development	$10000	F,G
5	New full time and part-time instructors	$25000	F,G
6	Programing software	$8000	A,B,F
7	Laptop/pad	$9000	A,B,F
8	Develop training videos	$40000	A,B,F

B Evaluation of list of priorities

The priorities of the recommendations are listed from the immediate need. For student to have long-term success they must meet or exceed employer minimum requirements. A significant minimum requirement for many employers is national certification.

X Conclusion

The Weld program at ECC is in a state of dramatic change to meet industry demands as they relate to student success are driving the program to new hights. Each course in the program is being updated and new courses and certificates are being added to drive student success. The Weld program at ECC prepares students not just for a job, the program prepares students for a career that could provide each student with a life time of meaningfull and rewarding employment.The mission of El Camino College is ‘
“El Camino College offers quality, comprehensive educatinal programs and services to ensure the educational success of students from our diverse community”. This requires instructors that have the skills to apply these technologies in the classroom and the resources necessary to provide students the opportunity to have first hand application of these technologes. Educating our students as Weld technicians, allowing them hands on experience with noncritical repairs. The Weld industry available jobs according to the Bureau of Labor Statistics will grow by more than 20% over the next few years. We need to provide the technical skills that are in high industry demand while enabling leadership within our students.

XII Career and technical education supplemental questions.

1. How strong is the occupational demand for the program?

Current occupational demand for Weld Technicians is expanding rapidly due to large construction projects coming down the pipeline and estimated retirements. According to the

Federal Bureau of Labor Statistics there are 580,000 jobs opening up as of this year 2014. The American Welding Society projects an additional 280,000 jobs becoming available in the next couple of years, because the average age of certified welders is 54 years old working in skilled positions. The optimal adjective is "skilled." The National Science Foundation supports the 580,000 positions will be available for skilled welders and are supporting the Weld Ed program to make sure we have the Weld Technicians needed in the next couple of years.

2. How has the demand changed in the past 5 years and what is the outlook for the next 5 years?

Skilled job opportunities are coming back from China and Mexico since companies have found overseas production to be more costly in mistakes than having the work done in the US. National Skills, USA says that manufacturing in the USA is the 8th most important economy in the world. They are stressing the need for workers capable of leadership skills and possessing qualities that involve critical thinking. Manufacturers Alliance for Productivity and Innovation revealed that there is twenty years of growth in the Aerospace market and US manufacturing assessment states the market will outlast the projects that are booked until the year 2028. Gas Tungsten Arc Welders (GTAW) and people with their AWS D1.1 LA City Certification fall into the category of workers needed to fill this supply. There are six bridge projects starting in our surrounding area. The largest is a six year contract in San Pedro that will be actively seeking welders with their D1.5 certifications in semi-automatic wire NR232 and 305.

Both Compton and ECC's Weld Department are currently rewriting the curriculum in our program to include more stackable certificates to reflect the number of lab hours student puts into different techniques and an eight week program to decrease the time they need to complete an Associate's Degree. Three of my students completed their AS degrees last Spring. One of these students just was hired at Union Pacific. We have approximately 160 students currently enrolled at ECC and we will be looking into accommodating for the growth that is expected. We are involved in a grant-funded program, the Career Advancement Academy, which involves cohort teaching and contextualized learning. Math and the ability to communicate are extremely important to advance in a career as a Weld Technician. I am excited about the future changes that will come from our learning curve in approaching construction trades with this concept. The next 5 years will be crucial to the training of skilled welders to step into the advance positions opening up in the aerospace, transportation and construction technologies.

Current occupational demand for Weld Technicians is expanding rapidly due to large construction projects coming down the pipeline and estimated retirements. According to the Department of Building and Safety 2014 was the first year to exceed the number of building permits applied for since the year 2008.

Occupations shown in report include:

47-2221 Structural Iron and Steel Workers 47-2152 Pipefitters, and Steamfitters
49-9044 Millwrights

Demand over the past 5 years (2008-2013):

Region	2008 Jobs	2013 Jobs	Change	% Change	Median Hourly Earnings
State	27,404	55,392	(28,012)	(17%)	$22.30
Los Angeles County	5,970	25,603	(20,067)	(17%)	$22.09
Nation	319,481	402,919	(186,562)	(70%)	$20.11

47-2011	Boilermakers	12%	15%	10%	18%
541310	Architectural Services	12%	13%	12%	10%
541330	Engineering Services	7%	5%	9%	9%
47-2221	Structural Iron and Steel Workers	5%	5%	0%	9%
49-9044	Millwrights	6%	8%	10%	7%
	Total	7%	6%	6%	9%

Source: EMSI (Economic Modeling); all available counties include Los Angeles, Orange, San Diego, Riverside, San Bernardino, Ventura, and Kern. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2014-15 Edition.* Completions for 2012-2013 come from the California Community College Chancellor's Website.

3. What is the district's need for the program?

The weld department at El Camino College should be ready to train this next generation of welders. We are updating our Structural Fabrication class and introducing a Print reading class into curriculum. I am actively involved with the Weld Ed program, as well as doing additional training with Lincoln Electric, who is a sponsor of Weld Ed. Our courses tend to overfill and we will be even more limited by the number of booths we will have going forward. We should offer more classes to accommodate the growing need for weld technicians. Alcoa like many other manufacturing companies are paying students as interns to go back to school. Their CEO says "what makes a business or country competitive is innovation backed by a skilled workforce". We need to reach out to the welding industry and offer the training they need to hire our students. What I've found is an overwhelming response to the AWS D1.1 LA City Cert will open the door to most employment. Aerospace is a concentration on GTAW welding where the students need enough lab time to pass a series of thin gauge tubing to sheet, x-ray quality test. Aerospace contracts are booked out until the year 2020. Southern California is saturated with these companies. Biomedical companies are employing laser welders.

4. What is the state's need for the program?

The state has many projects with their metro systems, rebuilding bridges, construction contracts (2014 had the most filed since the year of 2008), nuclear plant reopening and reconstruction of highways that will require highly skilled welders. The Southern California's Aerospace industry is bursting at its seams and has contracts into the year 2020. To achieve this goal, they need trained welders. El Camino College offers a program that applies principles of welding to the practical techniques needed to build their skills. Our program is aware of the need for weld technicians and we are updating our curriculum to keep abreast of the new technology and training methods.

Local 250, pipe welders and boilermakers union is looking to hire 1800 people into their apprenticeship program to gear up for the business they are getting from building the new football stadium and hotel contracts downtown- this also affects the recruitment at the Glaziers union to support the windows. The Pile Drivers Union has 5 bridge contracts in our local area. College of the Canyons is starting a Laser certification program to support the Biomedical Industry that is booming in Valencia. Our students must be comfortable to operate equipment commonly used in metal fabrication with the ability to assess their job assignments and apply critical thinking to complete their task. Skilled job opportunities are coming back from China and Mexico since companies have found overseas production to be more costly in mistakes than having the work done in the US. National Skills, USA says that manufacturing in the USA is the 8th most important economy in the world. They are stressing the need for workers capable of leadership skills and qualities. Manufacturers Alliance for Productivity and Innovation revealed that there is twenty years of growth in the Aerospace market and US manufacturing assessment states the market will outlast the projects that are booked until the year 2028. Gas Tungsten Arc Welders (GTAW) and people with their AWS D1.1 LA City Certification fall into the category of workers that are needed to fill this supply. The refineries are hiring 1000 people for "hot" watches and contained safety watches. Most of the refineries are looking for skilled welders that can pass the 6G pipe test. The D1.1 will get you hired to do fit-up and tacking. Brinderson refinery will hire you to do the cover passes on their pipe if you have your D1.1 LA City certification. They will

go even further and pay for you to take your 6G at Accurate Testing for the root pass. With all the Bridge construction the D1.5 certification will be a valuable asset.

5.How does the program address needs that are not met by similar programs in the region?

El Camino College serves a diverse community composed of numerous special populations that will be served by having the use of modern welding equipment and awareness of the market needs. Industry is looking for weld technicians. The welding faculty is attending training sponsored by the National Science Foundation, Weld Ed, to be advised on what Industry is expecting from our graduates and the impact we have as educators. We are involved with the Career Advancement Academy to introduce welding to an "at risk" population of youth and seek out "natural' talent. We work with the Women in Industry and Technology program to increase the weld department's exposure to women in the trades. We are looking at introducing a nondestructive testing class to open other opportunities for students who wish to go into weld inspection. Because weld inspection goes hand in hand with any type of critical weldments and inspectors must have at least two years welding experience to get their credential. We are also working with Compton College to get approval for a testing center for the practical exam of 2G, 3G or 4G testing. The only programs in the area that can effectively provide similar course offerings are Mount San Antonio College in Walnut CA and Los Angeles Trade Technical College in Los Angeles CA. Long Beach City College in Long Beach CA has been going back and forth about closing their program. This leaves ECC as a premier location for those seeking a career in Weld Technologies. The Weld program at ECC has gone through a major make over during the last

few years and is staged to move into a new building in early 2015. Program renovations to include automation, fabrication and laser technologies combined with resources available through grants and system updates linked to the move to a new facility provides an unprecedented opportunity to meet student and industry needs far beyond any other programs in the region.

6. Are the students satisfied with their preparation for employment?

Students have expressed high levels of satisfaction concerning program content and the drive to provide students with a higher level of competence to meet evolving industry demands. Our field does not require an Associates of Science to gain employment. We had four students graduate with their Associates of Weld Technology last Spring 2014. As a part of the Trades, our success rate should be based on employment and not transfer rates. I am active in sharing information on job opportunities and have a success rate of approximately 80%. Acquiring the AWS D1.1 LA City certification would be another standard to rate our students' success. Currently in the job market, there is no reason someone with this qualification could not have full time employment. I am trying to establish a format to document our student's rate of employment due to the experience they have received in the lab.

The updates to the program are the result of industry demand for technicians that can perform the tasks necessary to maximize system efficiency. Students are supportive of the implementation of technology in the classroom and in the lab exercises and are generally very enthusiastic about the changes in the program direction. Many students near program completion have expressed a desire to continue their development with the new program offerings.

Instructors in the Weld program score highly among students in semester student reviews and the instructors have developed a teaching style that complements student-learning skills. The programs direction to incorporate the use of technology in the classroom supports student interest and promotes student learning. The addition of the ECC library learning resources center as a learning tool for students provides students the opportunity to develop their skills and abilities outside the classroom.

7.Are the employers in the field satisfied with the level of preparation of our graduates?

Our advanced students are finding jobs in the job market. Students during this semester have acquired employment from Ace Clearwater, Aero Jet, Aero Arc, Triumph Vought, and the Local 250, Pipe Union. Many Gas Tungsten Arc Welders and Shielded Metal Arc Welders are employed to utilize their first months on the job training to pass the D17.1 certification. We focus our attention on certification and preparing for interviewing exams. El Camino has many industrial connections that consider our students for employment. The welding curriculum is focused on improving the education of our students to reflect the skills needed to excel in industry and the employers are appreciative of that fact. Many of the new classes being introduced into the curriculum will improve on student satisfaction, as well as their future employers. The Weld program advisory committee members have expressed the need to develop students with the skills necessary to meet the rapidly changing industry demand for fabrication and lightgauge. Many of the advisory committee members have emphasized the frustration they have experienced trying to find qualified technicians even at the entry level. After a review recent program changes and the awareness of program direction change committee members expressed overwhelming support for the program direction and expressed their commitment to support the program. Online resources have been added to provide students access to job openings and the resources necessary to develop a resume and prepare students for the interview process.

Qualified and entry-level technicians are in high demand. The Weld program will leverage this opportunity by providing students with a high quality education in the skills deemed critical for technician success by Weld industry leaders. To meet this goal requires the program to embrace technology, develop programs that reflect industry needs for laser, CNC, fabrication and hand tool knowledge.

8. What are the completion, success, and employment rates for the students?

Albany, NY -- (ReleaseWire) -- 09/18/2014 -- Transparency Market Research has released a new market report titled "Welding Products Market - Global Industry Analysis, Size, Share, Growth, Trends and Forecast, 2014 - 2020". According to the report, the global welding products market was valued at USD 17.47 billion in 2013 and is expected to reach USD 23.78 billion by 2020, expanding at a CAGR of 4.5% between 2014 and 2020.

Increasing demand for welding products from automobile as well as building and construction industries is anticipated to augment market growth during the forecast period. Welding is used extensively in the automobile industry to manufacture a wide range of components and perform complex operations. The wind industry is a potential growth area for the welding products market, especially in emerging economies of Asia Pacific. Additionally, the construction of new wind turbines is expected to generate higher revenues for the welding products market. Shortage of skilled labor in manufacturing industries is estimated to restrain market growth, especially in developed economies. Additionally, high labor costs have adversely affected the profit margins of manufacturing companies.

Browse Full Report with TOC:
http://www.transparencymarketresearch.com/welding-products.html

Key technology segments of welding products include arc welding, resistant welding, oxy-fuel welding and laser beam welding. The versatility of arc welding technique plays a key role in its overall appeal to end-users, thereby challenging the market share of other welding technology segments. Arc welding accounted for slightly less than 40% share of the welding products market in 2013, followed by resistant welding, oxy-fuel welding, laser beam welding and others.

Weld Employment Demand: 2012-2022

Region	2012 Jobs	2022 Jobs	Change	% Change	Median Hourly Earnings
All Available Counties	13,359	16,739	3,380	25%	$22.07
State	24,379	31,152	6,773	30%	$24.33
Los Angeles County	5,320	6,526	1,206	23%	$24.17
Nation	285,910	344,233	58,323	20%	$20.11
7.5 mile zip radius	770	939	169	22%	$22.39

Weld Employment Demand: 2013-2018

Region	2013 Jobs	2018 Jobs	Change	% Change	Median Hourly Earnings
7.5 mile zip radius	803	881	78	10%	$22.39
State	25,736	28,739	3,003	15%	$24.33
Los Angeles County	5,540	6,110	570	10%	$24.17
Nation	692,346	319,343	26,997	10%	$22.11

Source: EMSI (Economic Modeling); All available counties include Los Angeles, Orange, San Diego, Riverside, San Bernardino, Ventura and Kern. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2014-15 Edition.* Completions for 2012-2013 come from the California Community College Chancellor's Website.

9. What is the role of the advisory committee and what impact does it have on the program?

The advisory committee provides a direct link between industry needs and the ECC Weld program direction. Advisory council members are active participants in the ECC Weld program development and provide classroom support. ECC staff and advisory members meet throughout the year and review program direction and industry needs to make sure that the program is on track to meet industry changing trends and demands. The advisory committee provides the weld program with direction, program feedback, classroom assistance, instructional resources and student preparation and employment support.

Advisory committee discussion

A review of the program has been presented to the advisory committee. The advisory committee members discussed the changes to the program and the importance of implementing emerging technologies into the program. The advisory board is used to exchange and gather information, many of the questions posed result in innovation and respond to employment needs. We are looking to build our membership to reflect all the welding techniques used in the field. We use members of the board for additional information of equipment and state of the art training. We are looking to increase our coverage of companies participating on our board.

The advisory committee agreed on the importance of laser, fabrication and automation systems into the program; however, the consensus was that Weld programs needed to

maintain their focus on the fundamentals of Welding. The committee agreed that the introduction of a Print Reading class is crucial.

The committee agreed that students need to develop basic skills to use common hand tools used in the industry. The committee agreed that many of those completing Weld programs do not have the basic hand tools skills necessary to work effectively in the industry. The Weld department is currently working with the HVACR department on a course in basic had tools in response to committee input. Members agreed to support this direction through classroom participation.

Program direction:

The direction of El Camino's welding program will be the certification of our students to prepare them for industry. We are updating our curriculum to reflect the need for skilled, Weld Technicians. Our department is working with other relevant construction technology departments to strengthen the students' in the field experience in structural fabrication. We are expanding our views on cohort teaching with our Career Advancement Academy. The vision for the welding department is to train weld technicians capable of not only passing companies entry-level math test but also excelling in their scores. Contextualized learning is effective especially for students who have difficulty with math or English.

The biggest change that will affect our academic program over the next four years is the need to train our students to be more than a welder but a weld technician that can think and lead in the industry he/she chooses. We are already looking at the need for more classes to achieve this goal, as well as updating our equipment to reflect this. To achieve this goal, the department emphasizes current technology trends in the weld shop and classroom environment, offering daytime and evening classes. The trend is training students to be Weld Technicians, critical thinking, problem solving individuals who are not afraid to lead. Included in this training is allowing our students to perform noncritical repairs to equipment as it fails. This hands on training supports a well-rounded educational experience.

The classroom needs to be a smart room so we can make use of the video material to utilize Instructor's power points as a contextualized tool. The committee generally agreed on the importance of the direction of the program into areas of higher levels of competencies in electronics, efficiency, and automation. The committee further stressed the importance of a continued focus on the Weld fundamentals and critical thinking skills. Towards this goal, the Welding instructional team will drive to a greater level of cooperation and course alignment to meet industry qualification requirements. The committee agreed that successful applicants must demonstrate and apply critical thinking skills, work well in teams, have good

communication skills, excellent writing skills, and have applied expense with the tools of the trade.

10. If there is a licensure exam for students to work in their field of study, please list the exam and the pass rate:

We offer the prep course for the written part of the LA City D1.1 structural steel certification exam. At the end of the semester the Department of Building and Safety sends a representative to administer the 3-hour test on campus. Last semester 14 students took the exam and 14 students passed. Once we settle into our new location, we will be certifying our shop to administer the practical 3G/4G exam to complete the requirements of the D1.1 certification. We are currently looking to hire an Ironworker as an instructor for the D1.5 semi-automatic 232 & 305 flux core wire. This certification will guarantee job placement with the bridge contracts and metro link.