

# Comprehensive Program Review Report



## Program Review - Welding

### Program Summary

#### 2021-2022

**Prepared by:** Randy Emery

**What are the strengths of your area?:** 1) All courses within the welding department have up to date SLO's and PLO's. All SLO's and PLO's have been assessed. All assessments have been reviewed both by instructors and our industry partners. Changes to both SLO's and PLO's have been suggested by industry partners and have improved student success and retention.

2) The expanded facility that the welding program now occupies has allow the program to increase both enrollment and safety for students and faculty. Along with increased useable space the Welding program has received new welding power sources and related devices. These new power sources will be critical to continuous program growth. Our welding program has continued to utilize national data from the American Welding Society to maintain and update core SLO's and PLO's.

3) Another of our program's developing strengths is the continuing employment of Adjunct Welding professor Tim Foster. Mr. Foster brings his current industrial experience and network connections to our Welding program. Mr. Foster has been promoted at his industrial employer, this has improved our professional partnership development processes.

4) The Welding program's close connections with the American Welding Society has been a past strength and will continue to be a key factor in future program development. All welding faculty are AWS members and local Central Valley Section officers. I & T Division Chairman and Welding Department head, Randy Emery has been elected AWS District Director for Central California. This will connect our welding program with educational institutions and employers from multiple regions, through out the State of California. Mr. Emery's new position will also scale up scholarship opportunities and professional engagements between College of the Sequoias and the American Welding Society.

5) The above strengths have lead to solid enrollment growth by shortening our student's pathways to completion. This effort has lead to full enrollment of all welding courses and waiting list. This has validated our developing growth plan.

6) The addition of a half time shop technician has added continuity and better management of resources for the Welding program.

7) The Welding program has increase their network of industrial partners by improved outreach. At the core on this outreach is the leadership of lead instructor Randy Emery. Mr. Emery's expanded work with the American Welding Society will ensure industrial relevance to the Welding program and ensure student success improvement.

8) The Welding program has been awarded increased general budget funding that will assist in continuous improvement and growth.

**What improvements are needed?:** 1) Based on Advisory committee and industry feedback, a continuous improvement approach by the Welding program will be needed. At the core of this effort will be industry based skills and practices being taught to students. These skills sets should cover work being done in the Fabrication, Manufacturing and Construction industries.

2) We have a facility that allows us to teach the science of welding and the beginning of application of that science. We need to be able to train



students to use that technology to it's ultimate goal of manufacturing and fabricating usable industry items. For example, we need to move

our curriculum to include the ability to work with a customer to do the following things: estimate the cost, choose the right material (type, load capacity and finish), interpret industrial blueprints, cut, bend and shape material to be used, square, plumb and flush pieces of material to be joined, select and apply appropriate joining process, and then actually fabricate the item.

3) A reliable source of metal for welding practices required by the students needs to be secured and maintained. Improvement in industry based material contributions should be developed and maintained. Increased partnerships between the Welding program and local employers will be critical to achieving this improvement.

4) Improvements are needed in the efforts to attract new Adjunct Welding faculty. We could improve our welding program with the addition of new faculty educators who are engaged in the current modern welding industry.

5) The expansion of engagement by industrial partnership and related industrial groups that will connect students with employment opportunities. This improved industrial engagement will lead to continued student placement and future enrollment growth.

6) Continuous improvement must be implemented within the welding program to maintain valid industrial best practices. This effort shall include adopting new industrial technologies, related tools and equipment. Our program shall continue to base our internal improvements on current data gathered from various national professional organizations. These organizations include the American Welding Society and the Fabricators and Manufacturers Association.

7) Expand curriculum to include more material sciences that related to welding, soldering and brazing. Other expanded curriculum should include basic fabrication design practices such as mechanical drawing and technical related documents.

**Describe any external opportunities or challenges.:** Opportunities:

Industry partnerships cultivated this last year have improved opportunities for our students for job placement after completion of internships during their education. The new facilities are spectacular and have brought the support and interest of multiple new industry partners. The opportunity to continue to evolve the curriculum and expand laboratory practices to include the multiple skills and technology required by industry.

Randy Emery's position as the American Welding Society's Central Valley Section Chairman / District Director as created many opportunities for student engagement in this critical professional organization. Welding instructor Chris Huff has also continued as our American Welding Society's Central Valley Section's Publicity Chairman. This faculty engagement will expose our students to all professional events and scholarship opportunities supported by our local American Welding Society's Section.

As a result of past engagement between the Welding program and local industry student placement opportunities have expanded. Instructor outreach must be supported and improved to maintain growth of these critical actions.

**Challenges:**

Community recovery from the current COVID-19 pandemic will continue to be a challenge to the Welding program operations. Our priority continues to be the health and safety for all students, staff and faculty.

Efforts to achieve a sustainable funding formula will make the industry base online learning programs available to more and a greater variety of students in the welding program.

The greatest external challenges are the flip side of the opportunities. That is, industry expects this education program to be flexible enough to offer the changing training that they require for their employees. Flexibility continues to be a challenge.

The industry based online learning program added into the instructional base for the welding cohort continues to show student improvement and greater success.



A final and key challenge that seems to be present every year is building our base of local industry partners. Due to many conditions most local employers are reluctant to engage in a partnership with education.

**Overall SLO Achievement:** Students have shown positive improvement in SLO achievement between the 2019-20 and 2020-21 years. (80.7% vs 81.4%) Multiple new and continuing partnerships with local construction and manufacturing industrial partners have continue to offer our students great opportunities in the welding industry. SLO achievement has also improved due to the increase use of the American Welding Society's Online Learning system. The number of course certificates has shown continuous growth, except the period more effective by COVID-19 conditions, (2019-20).

The data indicates 2020-21 has shown an achievement recovery with 74 Awards and 59 recipients being reported.

**Changes Based on SLO Achievement:** Based on the student success associated with the AWS Online Learning System It has also been determined that industrial engagement and student success is directly related. This effort will be expanded to include more local industry partners and strategies to connect students to the welding industry. Project based learning, internships and other on the job experiences will be pursued by the welding faculty.

This expansion effort will also include more active engagement by trade related organizations including local labor unions and the American Welding Society, Central Valley Section.

Overall PLO Achievement:

Academic year 2020 / 2021 has shown an increasing level of success for those students completing welding certificate and A.S. Degrees. With the constant input from our industry partners we work to keep our PLO's up to industry expectations to have relevant skills being offered to our students. One key indicator of our PLO high achievement rate and relevancy, has been increased employment of completing students. The continuous improvement of our PLO's have also led to data supported increases in total awards earned by students over a three year period.

(see attachment)

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(see attachment)

**Changes Based on PLO Achievement:** Our welding program will maintain our continuous improvement approach to our PLO's. and the student achievement results. This effort will be based on a wide variety of industrial input regarding regional best practices.

**Outcome cycle evaluation:** The welding department has assessed all courses and reviewed all assessments as listed in trackdat. The evaluations have allowed the welding program to involve our industry partners and have assured that our courses and program have been kept up to date. The welding department will use our culture of continuous improvement to grow faculty curriculum management skills and other best practices.

## Action: 2021/2022 Upgrade existing thermal cutting equipment and technologies for industrial training

Upgrade Plasma and Oxy-Fuel equipment to meet current industry standards

**Leave Blank:**

**Implementation Timeline:** 2021 - 2022

**Leave Blank:**

**Leave Blank:**

**Identify related course/program outcomes:**

**Person(s) Responsible (Name and Position):** Randy Emery, Welding Educator, I & T Division Chairman

**Rationale (With supporting data):** Regional advisory partners have continuously suggested increased training efforts with a focus on CNC cutting processes. This action will lead to increased employment opportunities for completing students. The successful implementation of this action would also attract existing industrial participants who will seek ongoing training.

**Priority:** High

**Safety Issue:** Yes

**External Mandate:** No

**Safety/Mandate Explanation:**



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## **Equipment - Instructional - Torchmate 4800 (4'x8') CNC Plasma Cutting System**

The Torchmate 4000 series CNC plasma cutting systems by Lincoln Electric® are single source engineered plasma cutting tables

developed to deliver exceptional repeatability, accuracy, and precise speed. Rapid delivery and setup time will get your machine

up and running quickly. Our industry-leading support and low operational costs ensure you spend more time cutting projects and

limiting business downtime. (Active)

**Why is this resource required for this action?:** Budget Augmentation request:

This action represents a continuous need by the industry to recruit new employees with training covering automated thermal cutting processes. Our current thermal cutting equipment is outdate and does not meet current industrial standards for CNC cutting systems.

This resource is required for this action to meet the following District Goals, Objectives and Student Learning Outcomes.

District Goal #1. College of the Sequoias will increase student enrollment relative to population growth and educational and workforce development needs. Workforce development needs for CNC Cutting systems training has been confirmed by the advisory committee.

District Objective 2.1: Increase the percentage of students who earn an associate degree or certificate (CTE and non-CTE) by 5 percentage points over three years.

District Objective 2.4: By 2021, increase the percentage of CTE students who achieve their employment objectives by 5 percentage points (job closely related to field of study and median change in earnings).

District Objective 4.3 - College of the Sequoias Board of Trustees, administration, faculty, and staff will engage in best practices and staff development to sustain effective operational systems for institutional assessment and continuous improvement.

WELD 276, Outcome update: Upon completion of this course students will be able to program, setup and operate a basic CNC cutting system to industrial standards.

**Notes (optional):** Our current CNC equipment does not meet industrial standards for production equipment and needs constant repair. This upgrade will bring our training capabilities up to current industry acceptable levels.

**Cost of Request (Nothing will be funded over the amount listed.):** 34000

## *Link Actions to District Objectives*

District Objectives: 2018-2021
<b>District Objective 1.1</b> - The District will increase FTES by 1.75% over the three years
<b>District Objective 2.1</b> - Increase the percentage of students who earn an associate degree or certificate (CTE and Non-CTE) by 5 percentage points over three years
<b>District Objective 2.4</b> - By 2021, Increase the percentage of CTE students who achieve their employment objectives by 5 percentage points
<b>District Objective 4.3</b> - College of the Sequoias Board of Trustees, administration, faculty, and staff will engage in best practices and staff development to sustain effective operational systems for institutional assessment and continuous improvement.

## **Action: 2020 - 2021/ Continued: Provide students with a state of the art welding industry base quality control training**

Establish accepted quality control curriculum for the the welding industry and related applications. Design a welding quality control laboratory to be located with-in the existing welding laboratory. Select standard equipment needed to operate a basic welding



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quality control laboratory. Install needed equipment and obtain all needed training for welding instructors.

**Leave Blank:**

**Implementation Timeline:** 2021 - 2022

**Leave Blank:**

**Leave Blank:**

**Identify related course/program outcomes:** Weld 162 #3 At the end of the course students will be able to complete industry developed welding procedures sheets. (WPS)

Weld 181 #5 Upon completion of this course students will be able to interpret the concepts and perform some of the destructive weld testing used by the welding industry.

**Person(s) Responsible (Name and Position):** Randy Emery, Welding Educator, I & T Division Chairman

**Rationale (With supporting data):** Regional advisory partners have continuously suggested increased training efforts with a focus on quality control. This action will lead to increased employment opportunities for completing students. The successful implementation of this action would also attract existing industrial participants who will seek ongoing training.

**Priority:** High

**Safety Issue:** No

**External Mandate:** No

**Safety/Mandate Explanation:**

## Update on Action

### Updates

**Update Year:** 2020 - 2021

09/26/2021

**Status:** Continue Action Next Year

This action will be a continuing effort to expand our basic welding inspection laboratory. We have established our core welding inspection laboratory shell and basic equipment. We hope to add upgraded equipment and devices as time and funding permits. This will allow the program to scale up the effort to expand "In Process Quality Control" for welding students.

**Impact on District Objectives/Unit Outcomes (Not Required):**

## Resources Description

**Equipment - Instructional** - Quality control training for the welding industry requires very specific technical equipment. To be successful with this action the welding program will need to obtain various equipment. This equipment may consist of, Non-Destructive testing devices including, Magnetic Particle testing, Ultra Sonic testing, and related devices. (Active)

**Why is this resource required for this action?:** Budget Augmentation request:

This action represents a continuous need by the industry for quality control professionals. If the action is successful and scaled up, program growth and local industry need will lead to student success.

This resource is required for this action to meet the following District Goals, Objectives and Student Learning Outcomes.

District Goal #1. College of the Sequoias will increase student enrollment relative to population growth and educational and workforce development needs. Workforce development needs for welding quality control training are confirmed by advisory committee.

District Objective 2.1: Increase the percentage of students who earn an associate degree or certificate (CTE and non-CTE) by 5 percentage points over three years.

District Objective 2.4: By 2021, increase the percentage of CTE students who achieve their employment objectives by 5 percentage points (job closely related to field of study and median change in earnings).

Welding 181 #5: Upon completion of this course students will be able to interpret the concepts and perform some of the destructive weld testing used by the industry.

**Notes (optional):** Equipment purchases will be based on industry research and advisory committee feedback and



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suggestions.

**Cost of Request (Nothing will be funded over the amount listed.):** 5000

## Link Actions to District Objectives

District Objectives: 2018-2021

**District Objective 1.1** - The District will increase FTES by 1.75% over the three years

**District Objective 2.1** - Increase the percentage of students who earn an associate degree or certificate (CTE and Non-CTE) by 5 percentage points over three years

**District Objective 2.4** - By 2021, Increase the percentage of CTE students who achieve their employment objectives by 5 percentage points

## Action: 2020-2021 / Continued: Maintain/improve welding instruction, course offerings for welding program.

Maintenance of course offerings and improvements to scheduling, curriculum covered to industry standards with increase pool of adjunct instructors.

**Leave Blank:**

**Implementation Timeline:** 2020 - 2021

**Leave Blank:**

**Leave Blank:**

**Identify related course/program outcomes:** All SLO's / PLO's taught by full time or part-time instructors.

**Person(s) Responsible (Name and Position):** Randy Emery, Welding Educator, I & T Division Chairman

**Rationale (With supporting data):** Maintaining and active pool of adjunct welding instructors is critical to maintain and grow the highly successful welding program.

Data does support the need for replacement part-time position. All welding courses fill rapidly and have waiting list. Industry partners / advisory committee members are constantly requesting and searching for highly qualified and trained welding technicians.

**Priority:** High

**Safety Issue:** No

**External Mandate:** No

**Safety/Mandate Explanation:**

## Resources Description

**Adjustment to Base Budget** - Funding amount required to maintain our American Welding Society's, learning management system. (Active)

**Why is this resource required for this action?:** Budget Augmentation request.

Funding for this learning management system is directly linked to district objective 2.2 by giving greater opportunity to complete course requirements to finish their welding certificate and or associate degree.

This advanced LMS will continue to be critical to deliver our Welder training program in a Hybrid format. This Hybrid format will allow increased enrollment during and after the COVID-19 pandemic.

District objective 2.4, this computer base LMS will allow more students to have access and gain knowledge of industry-relevant technical data and skill requirements. This LMS will expose more welding students to the use of computer technology as being demanded by the welding industry.

Students will have access to this LMS 24 hours a day 7 days a week, allowing students to learn and train at their own individual pace.

Weld 162 SLO #3 at the end of this course students will be able to complete and demonstrate an understanding of industry developed welding procedure sheet, WPS. This skill is also listed as a PLO.



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The requested LMS represents and will give students lessons in the latest industry types and uses of this important document, WPS.

Welding 171 SLO #3, at the end of this course students will be able to explain and demonstrate the operational principles of a gas metal arc welding machine and process.

This LMS has multiple lessons and practical exercises for students to be able to understand the operating principals. and industry applications for GMAW which is the most used welding process today.

PLO for all welding process taught OFW, SMAW, GMAW, FCAW, GTAW include demonstrating proficiency in applying these processes. The requested LMS offers the latest industry-developed training lessons for understanding the science of these welding processes.

The welding industry has embraced all areas of technology from computer-based controls on welding machines, computer-based plans and blueprints. This LMS is the very latest in industry-driven technology for understanding and practicing welding science and welding applications.

The welding program has extensive and personal connections to local, state and national industry partners it is though these partners recommendations that we request this LMS.

The licenses for this instructional program will continue to be purchased thus request for funding must continue  
**Notes (optional):** This LMS will allow greater flexibility by the instructors to deliver remote training that will meet and exceed critical SLO's.

**Cost of Request (Nothing will be funded over the amount listed.):** 4000

## Link Actions to District Objectives

District Objectives: 2018-2021

**District Objective 1.1** - The District will increase FTES by 1.75% over the three years

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## Action: 2020 - 2021 / (New Action), Expand Course Offerings in the Welding Program:

Identify, confirm develop with industry partners high priority new welding courses.

**Leave Blank:**

**Implementation Timeline:** 2020 - 2021

**Leave Blank:**

**Leave Blank:**

**Identify related course/program outcomes:** This action involves the development of new courses and course content. This action will lead to the development of new course and program outcomes. Also listed below are existing outcomes that may apply to this action.

Weld 171 #4: At the end of this course students will be able to demonstrate the application of principles of operation of all types of GMAW welding apparatuses available in class.

Weld 276 #2: Upon completion of this course students will be able to produce and explain and follow a set of functional fabricating plans.



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Weld 172 #3: Upon completion of this course students will be able to utilize their welding procedure sheet to complete all welding lab assignments

**Person(s) Responsible (Name and Position):** Randy Emery, Welding Educator, I & T Division Chairman

**Rationale (With supporting data):** A thoughtful and well planned expansion of welding course offerings will increase student success. This action will be industry driven and confirm proven industrial need. This action will improve and develop our industry / education partnerships, leading to positive future growth.

**Priority:** High

**Safety Issue:** No

**External Mandate:** No

**Safety/Mandate Explanation:**

## Update on Action

### Updates

**Update Year:** 2020 - 2021

09/26/2021

**Status:** Continue Action Next Year

Due to COVID-19 status this action has been limited. The Welding program will continue to engage in industry outreach and collect information from industrial partners. Our increase engagement with the American Welding Society will scale up our networking results though out Central California.

**Impact on District Objectives/Unit Outcomes (Not Required):**

## Resources Description

**Personnel - Faculty -** This action represents a continuous need by CTE programs to grow to match industry need.

This resource is required for this action to meet the following District Goals.

District Goal #1. College of the Sequoias will increase student enrollment relative to population growth and educational and workforce development needs. Workforce development needs for welding quality control training are confirmed by advisory committee.

District Objective 2.1: Increase the percentage of students who earn an associate degree or certificate (CTE and non-CTE) by 5 percentage points over three years.

District Objective 2.4: By 2021, increase the percentage of CTE students who achieve their employment objectives by 5 percentage points (job closely related to field of study and median change in earnings).

(Active)

**Why is this resource required for this action?:** New or existing faculty will be required to engage with local industry and related advisory resources to complete this action. This action will also require unknown time commitments by participating faculty, that may include travel and other expenses.

**Notes (optional):** This action will require extra faculty work, engaging in local industry and researching the creations of new courses.

**Cost of Request (Nothing will be funded over the amount listed.):** 5000

## Link Actions to District Objectives

District Objectives: 2018-2021

**District Objective 1.1** - The District will increase FTES by 1.75% over the three years

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**District Objective 2.4** - By 2021, Increase the percentage of CTE students who achieve their employment objectives by 5



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percentage points
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