ALLAN HANCOCK COLLEGE

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PROGRAM REVIEW

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2015-2016

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PROGRAM REVIEW

Welding

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PROGRAM REVIEW

Status Summary - Plan of Action-Post Validation

During the academic year, 2003, 2004 completed program review. The self-study and validation teams developed a final plan of action-post validation based on information in the self study and the recommendations of the validation team. For each plan, indicate the action taken, the result of that action, and the current status of the plan, if it is incomplete.
(If any plan was made and action not taken, please state the rationale for not pursuing that particular item.)

PLAN OF ACTIONACTION TAKEN, RESULT AND STATUS

Plan of action	Results and status
Compare success rate of students who get employment before completing A.S. Degree in Welding Technology to those who complete the program process need to be developed.	A system to track student employment has not been developed, however, students and employers are currently being referred to the colleges Career Job Placement Center for assistance with the hope of developing data to help track student employment.
Create more short term courses to better meet the needs of the students in all areas of the Welding program.	Several short term courses were created to give options to student educational goals.
Increase outreach program to target minorities and women populations that are still under represented in the Welding program.	A very successful outreach program has been incorporated in to the program and is ongoing.
Review curriculum design for possible changes including creating more short term courses and how courses might be packed to award small-unit number certificates.	Several courses were updated from half a unit to a one unit to help students reach their educational goals.
Look at adding math component to existing Welding courses.	A shop math course has been developed to meet industry demands.
Pursue possibilities of obtaining storage containers to house excess equipment that will free up lab space and provide secure material storage.	The problem of storage was solved by the acquisition of two storage containers. However they will not be able to be moved to the new facilities so the problem persists.
Request a budget augmentation to offset the increase cost of instructional supplies and materials during the next budget cycle.	The budget continues to be a problem. Welding materials are very expensive and it is very hard for the program to keep up with inflation.
Request a position for an instructional assistant that could provide technical support for Machine, Welding, CADD, Auto Body, and Drafting. Also, put forth a recommendation to hire a full time Machine technology instructor who could also have some responsibility as a Welding instructor in the Welding program.	Several positions for Industrial Tech have been secured; including a permanent part time welding lab assistant for welding, part time lab assistant for Auto Tech full time Welding instructor ; full time Machine instructor ; and full time Auto Tech instructor. The full time position for the secretary was decreased to 25 hours a week and then increased to 30 hours a week to serve the Department.

Progress Made Towards Past Program/Department Goals

The department has been able to document student learning outcome programs under Welding Technology. The department has also linked all classes to program level assessment goals. We have also assessed the data for the student learning outcomes of each course as it relates to the programs objectives. That ties in with the overall mission of the college to promote student success in the field of welding technology. The welding department has met regularly with the welding advisory committee and implemented suggestions to improve the program in order to meet industry standards and local demands for the work force. The welding department has worked to increase student achievement in obtaining certification and Associate degrees in Welding Technology. The welding department has also worked to keep up with the welding industry by modernizing lab equipment to meet the current standards in the field of welding and to improve the facilities. The program goals relate to the mission of the college by focusing on career and technical education which is a mission of the college. This gives the students the skills to be successful in the job market. This department offers an associate's degree which focuses on general education which is also in line with the mission of the college and the districts strategic plan. This coupled with student learning outcomes has helped developed a plan for student success.

Allan Hancock College Program Review

Comprehensive Self-Study

Program review is intended to be a reflective process that builds on the extensive information gathered for the Annual Updates and lays out the program's major directions for the future. (Place your responses in the expandable text boxes below each question.)

I. Program Mission *(must align with college mission statement)*

Describe the need that is met by the program or the purpose of the program. For CTEA programs only, show that "the program does not represent an unnecessary duplication of other vocational or occupational training programs in the area." (Sample: *The Health, Physical Education, and Recreation Division is committed to providing excellent education opportunities to our students for their affective, cognitive and psychomotor development as they pursue sport, recreation, physical education, health education and wellness. We will encourage our students to further and sustain their individual endeavors toward the regular, lifelong pursuit of physical activity and a healthy lifestyle.)*

The mission of the Welding Technology Program at Allan Hancock College is one of a commitment to providing excellent opportunities for education in the career and technical field of welding to fulfill the needs of our diverse community and to enhance student learning by encouraging and helping students from our diverse community to further their chosen careers. This program trains and prepares student to enter the job market as qualified and competent entry level employees. The Welding Technology Program trains student in areas of critical thinking and problem solving to industry standards and it provides help to local employers or their employees who need training. The Welding Technology Program forms partnerships with industry partners that may provide employment to students that complete the program.

The Welding Technology Program at Allan Hancock College does not represent an unnecessary duplication of other vocational or occupational training programs in the area.

II. Progress Made Toward Past Program/Departmental Goals

Summarize the progress the program/department has made toward achieving its goals during the past six years. Discuss briefly the quality, effectiveness, and strengths of the program as reflected in its Annual Updates. Show the relationship between the program goals, the mission of the college, the district strategic plan, and the impact on student development and success.

The department has been able to document student learning outcomes and has also linked all classes to program level assessment goals. Data has been assessed for the student learning outcomes of each course as it relates to the programs objectives; this ties in with the overall mission of the college to promote student success in the field of welding technology. The department continues to meet with the welding advisory committee 2-3 times a year and has implemented suggestions to improve the program in order to meet industry standards and local demands for the work force. The program has accepted suggestions from the advisory comity such as the one stated in the November 12, 2012 minutes which asks for a full time instructor and to improve the program in order to meet industry standards and to meet local demands for the work force as stated in the October 2, 2013 minutes were committee members ask for more emphasis on TIG (Gas Tungsten Arc Welding) welding by the program and for more advanced classes be added to the program offering. The

Need for the development of more advanced courses is also evident in the SLO's Course Statistics and Evidence for Course 6 in The Spring of 2012's course analysis The weakness of the course indicates "The weakness of my course has indicated more hands on gas tungsten welding (TIG) techniques." The program works to continue to increase the number of students completing certificates and Associates degrees in Welding Technology and to continue to keep up with the welding industry by modernizing lab equipment to meet current standards in the field and to improve the facilities. The programs goals align with the mission of the college which is to provide quality educational opportunities that enhance student learning and the creative, intellectual, cultural and economic vitality of our diverse community by focusing on career and technical education which gives the student the skills to be successful in the job market, therefore strengthening the cultural and economic vitality of our diverse community. Work continues to increase the number of students completing certificates and Associate degrees in Welding Technology and to continue to keep up with the welding industry by modernizing lab equipment to meet current standards in the field and to improve the facilities. The program goals relate to the mission of the college by focusing on career and technical education which gives the student the skills to be successful in the job market. The Welding Technology program offers an associate's degree which focuses on general education with an opportunity to transfer to a four year institution which is also in line with the mission of the college and the districts' strategic plan. This coupled with student learning outcomes has helped develop a plan for student success in Welding Technology. The recommendations made for this program during the last full review included;

1. A comparison of success rates of students who are employed before completing an A.S. Degree in Welding Technology to those who complete the degree.	1. The completion rate for the program appears low, but we do not have accurate numbers. We recently have had a high degree of accurate information on the number and type of AWS certification earned by students which is what industry is looking for in employees.
2. Create more short term courses to better meet the needs of the students.	2. Several different short term courses have been created implemented and are doing well in the Welding program.
3. Increase outreach programs to target minorities, women and populations that are underrepresented.	3. The outreach to the High Schools and Junior High Schools has been very successful but it requires support from our industry partners, volunteers and classified staff.
4. Review curriculum design for possible changes; including creating more short term courses and how courses might be packaged to award small-unit number certificates.	4. Several classes have been created and several classes updated to meet student demand.
5. Look at adding math component to existing Welding courses.	5. A math course is required for the certificate program and there is a math requirement for the degree in Welding.

6. Pursue possibility of obtaining storage containers to house excess equipment that will free up lab space and provide secure material storage.	6. Storage containers were secured.
7. Request a budget augmentation to offset the increased cost of instructional supplies.	7. The budget problem now is bigger than it was for the last Program Review, because of the rise in cost of welding goods.
8. Request a position for an assistant that could provide technical support for Machine, Welding, CADD, Auto Body, and Drafting. Also, put forth a recommendation to hire a full time Machine technology instructor who could also have some responsibility as a Welding instructor in the welding program.	8. The position of a permanent part-time lab assistant for the Welding lab has been secured. The position of a full time Machine technology instructor has been secured. The position of a full time Welding instructor has been secured.

Of those recommendations made, a total of eight have been accomplished. Examples include acquiring storage space for supplies and equipment; completion of an outside welding/forging lab; increased outreach through the use of a mobile welding trailer that participates in approximately ten career fairs a year and helps in increasing the number of nontraditional students that learn more about our program. An annual high school welding competition has been designed as an integral part of the welding program with ten high schools participating each year sending about 100 local students for the competition and involving local industry partners as judges, volunteers and financial supporters.

III. Analysis of Resource Use and Program Implementation

Describe the program's current allocation and use of human, physical, technology, and fiscal resources. Are resources sufficient and appropriate to meet program needs? Can program resources be reallocated to better meet student needs?

Welding programs current resources allocation.	**Programs possible reallocation of resources.**
Human Resources	
1. One full time welding instructor.	1. Two full time welding instructors.
2. Seven part time welding instructors.	2. Three part time welding instructors.
3. One part time welding instructor assistant.	3. One full time welding instructor assistant.
4. One part time Industrial Technology secretary.	4. One full time Industrial Technology secretary.

1. Finally as a result of the hard work of the faculty, along with the support of the college and partners in industry, the welding program has a full time welding instructor who will insure we meet the needs of the students.

2. We currently have seven part time instructors who are very hard working and very good instructors but have limited time to serve our students in a way that a full time instructor would be able to serve the students and the program.
3. A significant change has been the approval of a permanent part-time welding lab assistant. This staff position has been a huge asset to the welding department as part of the human resources that are critical to running the many classes. In terms of support for the eight welding instructors, the lab assistant also maintains inventory to reduce costs, cleans the lab, ensures the safety of the students and performs preventive maintenance and repairs on the machines and equipment.
4. A full time Industrial secretary would be a huge asset to the Industrial Technology programs and to students. This role is essential in the ordering of supplies, materials, equipment and supporting the part time and full time instructors.

Physical Resources

5. Move to new building will increase lab space which will allow the program to better serve student needs.	5. Ability to retain some of old building O lab space would allow the Welding program to offer more advanced classes.

5. The current physical needs of the program will be met with the addition of the new Industrial Technology building. With the addition of more work space there is the possibility to run more advanced classes to meet the needs of employers and to better serve student needs. With the possibility of retaining some of the lab space in the old Industrial Technology building, the program will have the ability to run new courses to better prepare our students for future challenges.

Technology Resources

6. The recent purchase of new welding equipment will allow the program to outfit every booth in the new building with a welding machine. The new machines, even though they are of a lesser duty cycle, are more energy efficient and will enhance learning in proven successful classes.	6. The Department is in need of replacing old and worn out equipment, and is also in need of bringing in new equipment to expose students to new technology.

6. The welding advisory committee has been advocating that more advanced skill be taught in the welding program and that would require newer welding equipment, because some of the equipment in the lab is old and in need of repair or replacement.

Fiscal resources

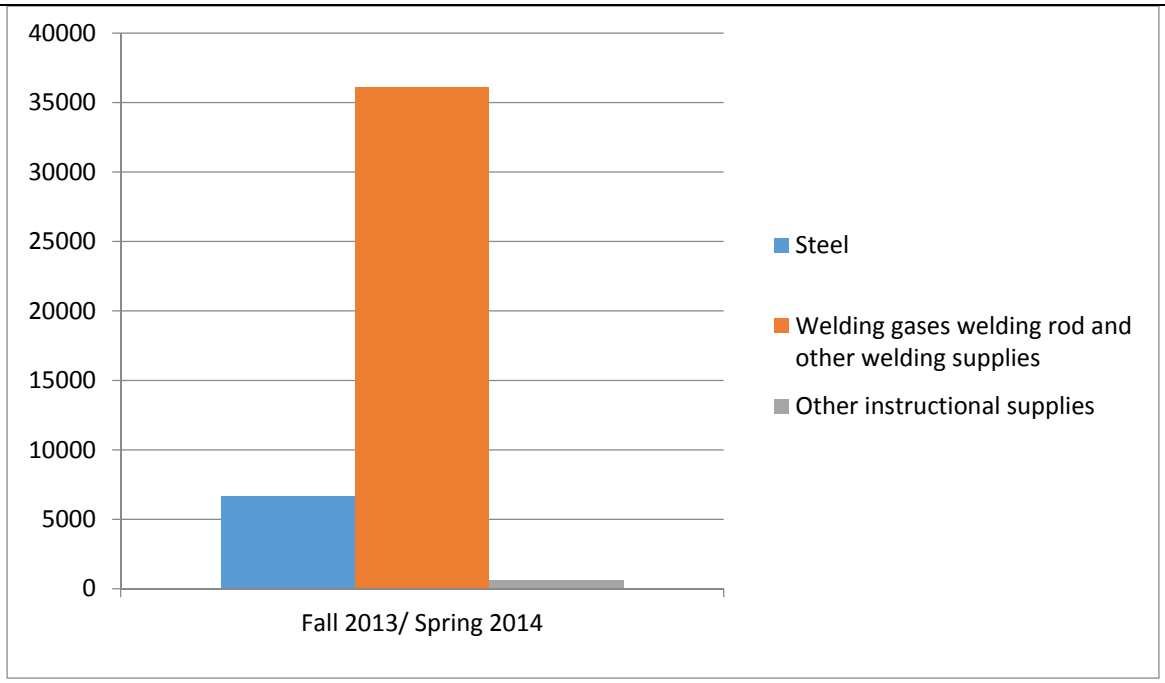
7. The program struggles with the current budget allocation which does not include the very expensive welding consumables.	7. The program budget needs to include welding gases, rod and steel to accurately support the program.

8. Students have difficulties in finishing their educational goals in a timely manner.	8. The program needs to bring back classes that were taken out during budget cuts and needs to develop new courses to keep up with technology and to serve current employment needs.

7. The Welding Technology program's current budget allocation is insufficient to run the programs' lab at the level of training and for the number of classes needed to successfully achieve student learning outcomes and meet the employment needs of this industry. The consumable supplies associated with running the labs for the welding classes have been rising dramatically (local vendors estimate that gas has risen 50% and steel prices have risen 15% in the past five years) and the budget allocation has not matched the rise in inflation.

The program has a need to replace some classes that were taken out of the schedule to help with the budget problems. The removal of these classes has added 2-3 semesters for students to complete the program. One of the concerns from past reviews was that the program needs a full slate of classes in the fall of 2011. What is missing now is a full slate of classes for the fall of 2014. To meet the budget needs of this program, an average amount of $11,000 per year has been transferred into the Welding Technology account from various sources including the District Welding Trust Fund; the College's operating object code and Community Education. This amount does not include other funding sources such as the Equipment Prioritization, excess Lottery Funds or CTEA grants. The current resources are inadequate but are being allocated to best meet student needs through coordination of the full time welding instructor, the instructional aide and the department secretary on batching orders, reducing delivery charges, maintaining inventory and getting competitive bids. As reported in past reviews the budget concerns are still the one thing that makes it difficult to run the welding program. The major costs of the Welding Technology Program have never been included in the welding budget (welding gases and steel). For years the program received funds from VTEA/CTEA to pay for those costs. Now that the program is not allowed to use funds from CTEA to help with those costs it is much more difficult to meet the needs of the students.

Instructional supplies, Welding gases, welding rod other welding supplies and steel usage during Fall 2013/ Spring 2014



The chart above illustrates how the welding gasses, steel and welding rod compare in the budget when compared to instructional supplies for the welding program.

Estimated costs for the **Welding Instructional supply budget for 2013/2014 year;**

- Welding & Cutting-including Lottery instructional supplies$13,100 (*note: these funds vary every year)*
- Instructional Supplies $5,500
- Instructional Supplies/Material Fee $13,100
- Office/ instructional Supplies $350
- Repairs(Labor-Diagnostic) $100
- Equipment $530

Total: $ 33,000

Welding instructional supplies purchased for 2013/2014 year;

- Steel and other metals $6,700
- Welding rod welding gases &welding supplies $36,100
- Other welding instructional supplies $600

…… **Total:** **$43,500**

Welding instructional supply budget short fall for the 2013/2014 fiscal year: ($11,000)

Even though lab fees have been added, underfunding is still the most pressing need in the Welding Technology program. The budget numbers above do not include emergency repairs. This past year, $6,000 was spent on repairing the Brake Shear and those funds were transferred from our District Trust Fund as well as some emergency repair funds from the college. Funds are also needed to support the current level of classes. In addition, the program has a need to replace classes that were taken out of the schedule when courses were cut thus causing students to take longer for completion of certificates or degrees by 2-3 additional semesters. Adding more classes, will mean more material costs therefore, increasing the necessary program budget. Of concern from past reviews was that the program needed a full slate of classes. What is missing now is a full slate of classes to better serve Welding Technology students.

IV. Program SLOs/Assessment

What are your program student learning outcomes? Have each of these been assessed since the last comprehensive program review? How are they measured? What did the assessment data indicated about the strengths and weaknesses of your program? What changes do you plan based on these data?

WLDT106

- **SLO1** - Develop basic welding skills using both the shielded metal arc and oxyacetylene process in the flat position. **Assessment:** Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.
- **SLO2** - Flame weld thin sheet steel in the flat and horizontal positions. **Assessment**: Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.
- **SLO3** - Perform SMAW process on mild steel. **Assessment:** Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.

WLDT107

- **SLO1** - Be familiar with all welding positions and basic welding electrodes used in industry. **Assessment:** Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.
- **SLO2** - Perform SMAW welding in all positions. **Assessment:** Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.
- **SLO3** - Identify, fit and weld all five basic joints. **Assessment**: Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.

WLDT301

- **SLO1** - Plan and follow through to completion a pre-defined project. **Assessment**: Students are required to complete an approved project that is designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO2** - Fabricate a project using the welding shop facility and equipment. **Assessment**: Students are required to complete an approved project that is designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO3** - Use shop equipment and tools in a safe manner as would be required by industry. Function in welding facility in a safe manner. **Assessment**: Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.

WLDT306

- **SLO1** - Understand the techniques and methods of metal assembly and fabrication. Appreciate the interpretation of shop drawings and working drawings. **Assessment**: Students are required to complete an approved project that is designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO2** - Design and fabricate projects of metal. Identify and apply AWS standards and codes to the work place. **Assessment**: Students are required to complete an approved project that is designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO3** - Solve problems associated with fabrication expansion and construction.

- **Assessment:** Students are required to complete an approved project that is designed to demonstrate their ability to perform the basic skills taught in the program.

WLDT307

- **SLO1** - Weld a variety of metal using the GMAW process. **Assessment**: Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO2** - Know the four basic transfer modes in GMAW welding. **Assessment:** Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.

- **SLO3** - Set up the GMAW process equipment. **Assessment:** Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.

WLDT308

- **SLO1 -** Diagnose gas tungsten arc welding equipment. **Assessment**: Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.

- **SLO2** - Learn power supply variables. **Assessment**: Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.

- **SLO3 -** Set up the GTAW process equipment. Weld Ferrous and non-Ferrous metal with the GTAW process. **Assessment:** Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.

WLDT312:

- **SLO1** - Use safe shop procedures. **Assessment:** Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.

- **SLO2** - Flame cut and fit pipe using standard templates. Prepare pipe for welding. **Assessment:** Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO3 -** Use shop equipment and tools in a safe manner as would be required by industry. **Assessment**: Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.

WLDT315:

- **SLO1** - Assemble components into final products by reading and interpreting blue prints and schematics. Extract material list from shop drawings and blue prints as required.

- **Assessment**: Students are required to complete an approved project that is designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO2** - Flame cut weld, machine and fabricate parts and sub-assemblies. Design and prepare working drawings. **Assessment:** Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO3** - Use shop equipment and tools in a safe manner as would be required by industry. **Assessment:** Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.

WLDT316

- **SLO1** - Students will have working knowledge of metallurgy. **Assessment:** Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.

- **SLO2** - Students will do basic layout, fitting and cutting operation.

- **SLO3** - Student will operate basic shop equipment in a safe manner. **Assessment:** Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.

- **SLO4** - Students will cut and fit ferrous materials in preparation for welding to course standards. **Assessment:** Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.

WLDT317

- **SLO1** - Identify, understand and use basic welding equipment. **Assessment**: Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO2** - Learn to set-up welding equipment. **Assessment**: Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.

- **SLO3 -** Learn to work safely in the welding shop environment. **Assessment**: Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.

WLDT319

- **SLO1** - Identify, understand and use basic welding equipment. **Assessment**: Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO2** - Learn to set-up welding equipment. **Assessment:** Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.

- **SLO3** - Learn to work safely in the welding shop environment. **Assessment:** Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.

WLDT330

- **SLO1** - Weld in all positions to specific certification standards. **Assessment:** Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO2** - Cut, fit and grind as needed to complete test specimens.

- **SLO3** - Test at or above 80% proficiency. **Assessment:** Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.

WLDT331

- **SLO1** - Weld in all positions to specific certification standards. **Assessment:** Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO2** - Cut, fit and grind as needed to complete test specimens.

- **SLO3** - Test at or above 80% proficiency. **Assessment**: Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.

WLDT335

- **SLO1** - Weld in all positions using the Flux Core Arc Welding Process. **Assessment:** Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO2** - Identify, fit and weld the five basic weld joints used in the welding industry.

- **Assessment:** Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.

- **SLO3** - Set up the F.C.A.W. process equipment. **Assessment:** Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.

- **SLO4** - Function in a welding facility in an efficient and safe manner. **Assessment**: Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.

- Adding the Student Learning Outcomes (SLO's) has helped classes to be more reflective of the welding industries' needs. Most classes have been assessed and some SLO's are due to be updated to include any new classes or classes that have not been taught in several years. The programs eight welding instructors need to coordinate so that instructors teaching the same class test to the same assessment and in this way all assessment of the different SLO's would have been met within the allowed time frame. It has been determined that a few of the SLO's need to be updated and new classes being developed as a result of recommendations from welding advisory and labor data need to be added to the list of classes needing SLO's assessment. The programs eight welding instructors need to come together and assess their student learning outcomes so that the best method of assessment can be developed. We anticipate that the new eLumen platform will be easier to use and enable us to complete our assessment work. There will be opportunity to revisit the SLO's that are in place and to add those that are missing. The strength indicated by the data is that students are acquiring the necessary skill to be successful. The weakness indicated by the data is that we need more equipment and supplies because some students and instructors are becoming frustrated by the lack of equipment and supplies available. The changes we plan on making as a result of the data are to continue to find the best assessment methods and to acquire the necessary supplies and equipment to instruct our students with.

V. Trend Analyses/Outlook

Using the information already gathered in the AUs (e.g., enrollment and achievement data; student learning outcomes assessment and analysis; input by advisory boards; existing articulation agreements; labor market trends) summarize the major trends, challenges, and opportunities that have emerged in the program since the last program review

Labor market analyses have caused programs to take a better look at what students are able to do upon completion of all vocational programs. More analysis will be required as there will likely be fewer workers with the skill levels necessary to compete in the job market. The cost of training has skyrocketed in the last year or two and caused changes in what we use and how much we can do.

While retention numbers of students are up, the number of nontraditional students has gone down even with increased and systemic changes that include full participation in five high schools and eight middle school career fairs last year. A welding trailer built and stocked with consumables by our Industry Partners is our best outreach vehicle and with equal participation between males and females, it is our hope to increase those numbers through "hands-on" learning in the welding booth. Also the High School Welding competition typically brings 5-10% females to the school with hopes of those students choosing the Welding Technology Program when they graduate. The outreach money has been discontinued and the welding trailer is fully funded by the generosity of our welding partners. This may limit the recruiting opportunities in the future. Budget problems, funding for outreach and new equipment continues to be problematic for the Welding Technology program.

The demand for welders has increased in the recent years with the knowledge that many current welders are starting to reach retirement age, which will open spots for well-trained welders. http://archive.firstcoastnews.com/news/article/278995/0/Shortage-of-welders-sparks-interest-in-training.

This article states that "*In 2008, there was a nationwide shortage of about 250,000 welders, and that figure has remained relatively constant to this day:* says Jason Walsh, who heads the welding technology program at Front Range Community College in Colorado. There were 337,300 jobs for welders, cutters, solderers and brass workers in 2010, according to the U.S. Department of Labor. By 2020 that number is expected to have grown 15%. As a result, enrollment in welding courses at Front Range has increased -from about 60 students each semester nine years ago, when Walsh started teaching there, to 350 this year. The article goes on to say that "*We have pipelines that stretch from Utah to Pennsylvania, from Canada to Texas,*" Walsh said, "*and that requires a lot of welders*." One of those welders is a former student who, at 19, is training in underwater welding in Florida. He's making $80,000 a year doing so.

In another article published by the **United States Department of Labor Bureau of Labor Statistics** under the Occupational Outlook Handbook: http://www.bls.gov/ooh/construction-and-extraction/structural-iron-and-steel-workers.htm
The following **Quick Facts on Structural Iron and Steel Workers are listed:**

- 2012 Median Pay: $46,140 per year
- $22.18 per hour
- Entry-Level Education: High school diploma or equivalent
- Work Experience in a Related Occupation: None

- On-the-job Training: Apprenticeship
- Number of Jobs, 2012: 58,100
- **Job Outlook, 2012-22: 22% (Much faster than average)**
- Employment Change, 2012-22: 12,700

What Structural Iron and Steel Workers Do: Structural iron and steel workers install iron or steel beams, girders, and columns to form buildings, bridges, and other structures. They are commonly referred to as ironworkers.
Work Environment: Ironworkers perform physically demanding and dangerous work, often working at great heights. As a result, workers must wear safety harnesses to reduce the risk of falling.
How to Become a Structural Iron and Steel Worker: Although most structural iron and steel workers learn through an apprenticeship, some learn on the job. Certifications in welding and rigging can be helpful.

In addition, Allan Hancock College's Industrial Technology Department is currently the LEA for the Plumbers and Pipefitters Apprenticeship Program. The trades union of Plumbers and Pipefitters work with our department and in many cases, students begin with our courses before they apply or begin their training.

Pay: The median annual wage for structural iron and steel workers was $46,140 in May 2012.
Job Outlook: Employment of ironworkers is projected to grow 22 percent from 2012 to 2022, much faster than the average for all occupations. The need to rehabilitate, maintain, and replace an increasing number of older roads and bridges is expected to drive employment growth, as will the ongoing construction of large projects, such as high-rise buildings. Job opportunities should be best in metropolitan areas, where most large construction projects take place.

The State of California Employment Development Department Projections of Employment by Occupation for 2010-2020 for Welders, Cutters, Solderers, and Brazers (SOC Code : 51-4121) in California Use hand-welding, flame-cutting, hand soldering, or brazing equipment to weld or join metal components or to fill holes, indentations, or seams of fabricated metal products. Employers are usually looking for candidates with postsecondary vocational training.

Occupational Wages for California in 2013 1st quarter
$19.78 Hourly; Mean hourly wages: $14.33; Hourly by Percentile 25th $14.33
Median $18.42 75th $23.29
Occupational Projections of Employment (also called "Outlook" or "Demand")
Estimated Year-Projected Year Employment 2010-2020
Change Annual Avg. Openings 820
Estimated Employment 21,700 Projected Employment 24,100
Employment change Number 2,400 Employment change Percent 11.1
http://www.labormarketinfo.edd.ca.gov/cgi/databrowsing/occEplorerQSDetails.asp?search

The State of California Employment Development Department Projections of Employment by Occupation for 2010-2020 for Welders, Cutters and Solderers and Brazers for **Santa Barbara County** to be **210** for 2010 with **10** annual Job openings per year.
http://www.labormarketinfo.edd.ca.gov/commcolleges/Projections.asp

From 2008 to 2013 the welding program at Allan Hancock College has consistently ranked higher than the college average on retention and student success. This statistic shows evidence that we are providing a needed service to our students and to our industry partners by providing our community (and students) with an opportunity to learn valuable skills. In the student survey, when asked if they would recommend the course to other students, the response was a favorable average 1.72 on a scale of 1 (highly satisfied) to 5 (highly unsatisfied). Students clearly see the value in the Welding Technology program.

From the list of SLO's it is clear to see that the classes in the welding program range from beginning to advanced. As testimony to the work we are doing in the welding department the classes fill in the first few weeks of enrollment and always have waitlists of students who want to or need to take that class again emphasizing the popularity of the program and the strong interest in our students in the Program. Welding Technology is committed to producing well trained welders to meet the demands of our community.

As applicable, please address the breadth, depth, currency, and cohesiveness of the curriculum in relation to evolving employer needs and/or transfer requirements, as well as other important pedagogical or technology-related developments.

The program progresses from basic to advanced welding courses. The first class usually taken by students is the beginning welding class WLDT 106 in which the theory, basic welding principles and techniques are taught starting with oxy-acetylene welding, then (SMAW) shielded metal arc welding with a brief introduction to (GMAW) gas metal arc welding and (GTAW) gas tungsten arc welding. After the beginning class there are several classes that welding students can take to gain a better grasp of the basic processes introduced in the Beginning class.

The advanced welding class WLDT 107 is a continuation of the WLDT 106 and it concentrates on (SMAW) shielded metal arc welding process emphasizing position welding using a variety of electrodes used in industry starting with horizontal welding and moving on to vertical, and finally overhead using the (SMAW) shielded metal arc welding process.

The gas metal arc welding (GMAW) class WLDT 307 is another option open to students after the beginning class. Gas metal arc welding is a semiautomatic welding process and is one of the fastest growing areas of welding, important in all commercially produced metals. This class provides students with the theory and practical applications of gas metal arc welding and the operations of gas metal arc welding equipment.

The gas tungsten arc welding (GTAW) class WLDT 308 is another class that students can take after the beginning welding class. In this class students receive an introduction to the theory and practical application of gas tungsten arc welding and the operation of gas tungsten arc welding equipment. GTAW is one of the most expensive welding methods and the method that requires the most skill but it is also the skill that pays the highest. Because of the high level of weld quality GTAW is in high demand especially, but not exclusively in the aerospace industry.

Another class that is available to our students after they become comfortable with the skills obtained in the advanced welding class is the pipe fitting and welding class WLDT 312. It is a course designed to familiarize students with the highly specialized pipe fitting and welding industry and to provide the opportunity for students to develop the skills necessary for entering and advancing in the pipe welding field. Because of the high degree of skill required, pipe welders and fitters are well paid and in high demand.

In addition to being able to weld a good welder also has to be able to layout and fabricate projects. In the layout and fabrication class WLDT 306 students learn to interpret working and shop drawings. Students sketch fabrication and layout schemes, jigs and/or assembly of small projects and these are skills that are very important in metal fabrication.

The metal fabrication class WLDT 315 provides the student with the opportunity to combine previously learned skills into a system requiring the use of prints, tolerances and specifications. Students typically build a project starting with raw materials simulating a job situation complete with a cost analysis.

Another class that makes our students successful in the job market is the certification class. The WLDT 330 Welding certification class provides the advanced welding student with the practical application of welding procedures and techniques in preparation for certification in the following areas shielded metal arc welding (SMAW), gas metal arc welding (GMAW), or gas tungsten arc welding (GTAW). These

meet the codes as provided by the American Welding society, American Petroleum Institute, and the American Society of Mechanical Engineers Standards. Students need to be proficient in SMAW, or GMAW, or GTAW to pass the certification test therefore WLDT 107, or 307, or 308 are pre requisites for this class. Because certification requires a high degree of skill the WLDT 331 Advanced Certification Lab, the WLDT 333 Welding Certification-SMAW class and the WLDT 334 Welding certification-GMAW courses are offered to encourage individuals who are near or at completion of preparation for taking their certification tests either for employment or the completion of their school program.

In addition there are courses offered to suit individual needs including WLDT 335 Flux Core Arc Welding. This is an area of gas metal arc welding (GMAW) in which direction a lot of industry has moved to and the need for skilled employees in this area exists.

Also offered on a periodic basis is the Mini Mig (WMAW) a one unit class that gives students a better understanding of smaller welding machines and their capabilities. This is also very useful for the Auto Body students.

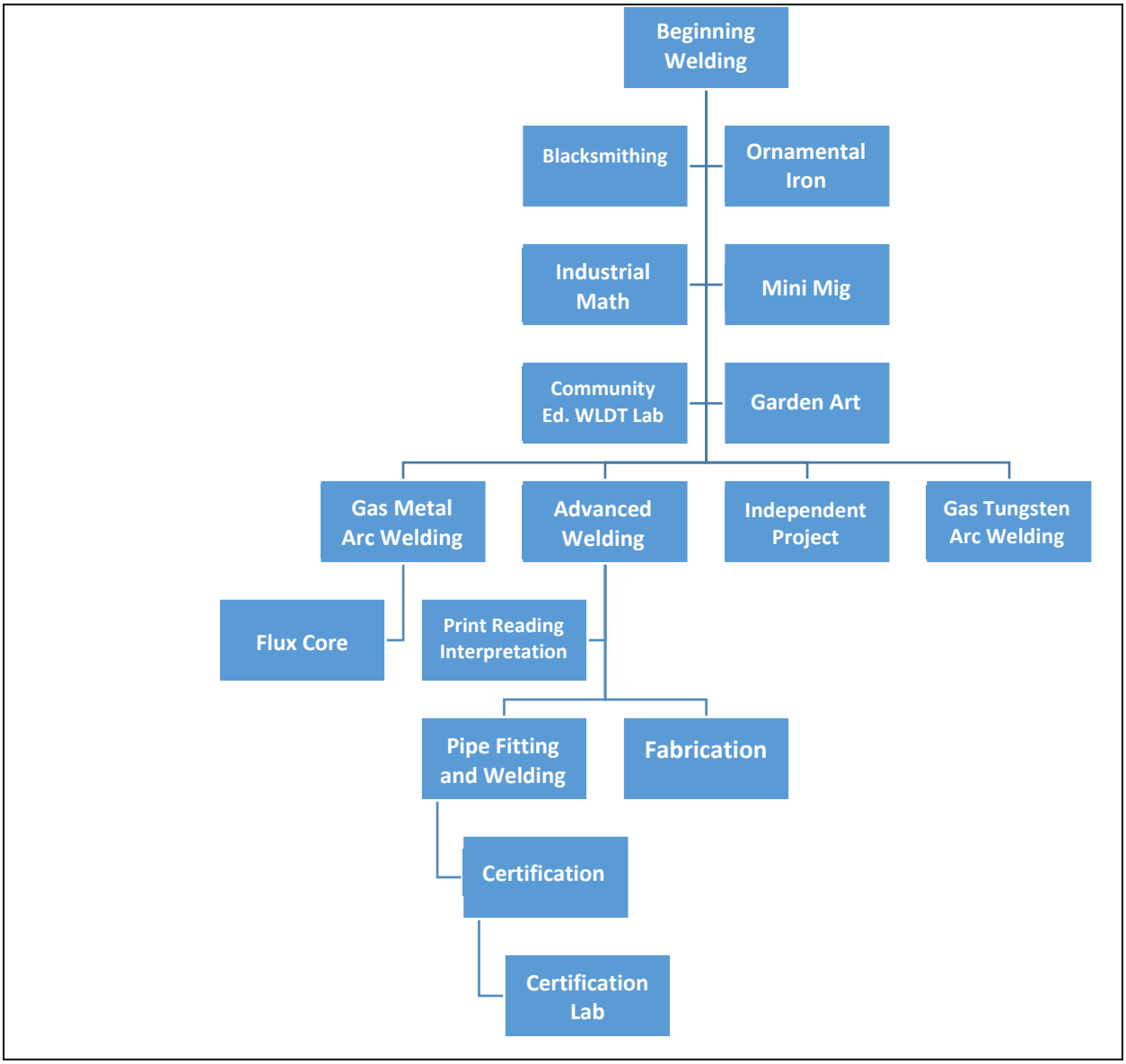
We also have a Blacksmithing Projects course where students produce projects that incorporate blacksmithing techniques and it is extremely popular. In addition, there are several classes that address the welding skills involved in making art in support of students who want to explore their creative side.

The welding program is strong but is not as state of the art as it needs to be. Even though the program will be moving into its new facilities soon, there is a long list of equipment that should be purchased to keep current with industry standards. It will have the potential to produce finished welders in a timelier manner and help students achieve their educational goals on time. The needs of the curriculum are as follows;

- There is not a sufficient budget to operate enough classes to acquire the necessary set of skills.
- There is a need to increase the level of training in pipe welding as recommended by the Welding Advisory Board and our partners in industry.
- There is a need to increase the training in (GTAW) gas tungsten arc welding to increase student welding skills which will make them more competitive in the job market because these are advanced skills currently being sought out by industry.

The associate degree and certificate curriculum in welding technology is designed to provide comprehensive occupational training in all common types of welding methods as it relates to today's welding and fabrication industries, which is in line with the college's commitment to our students and to the vitality of our community.

The course outlines of record for many classes have been recently updated to reflect the ever changing technology in the welding field.



WELDING TECHNOLOGY CLASS FLOW CHART at ALLAN HANCOCK COLLEGE

VI. Long-Term Program Goals and Action Plans (Aligned With the College Educational Master Plan)

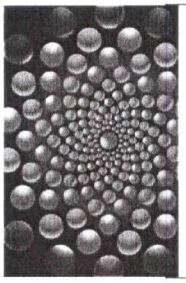
Describe the long-term plans for changing or developing new courses and programs, other actions being taken to enhance student success, and the need for professional development activities and other resources to implement program goals. Be sure to show how these plans are related to assessment results. (Plan should cover five-year period and include target dates and resources needed.)

In order for the welding program to continue to be successful there is a need in the program to update the course curriculum, as well as update the course outlines of record and to develop new courses consistent with the recommendations of the staff and the Welding Advisory Committee. The biggest need in the program is to increase the welding programs budget to meet the demands of the rising cost of materials necessary to run the welding classes. The need to continue to participate and to support in our local outreach is crucial to our program to recruit nontraditional and disadvantaged students to our program. The program also needs to keep up with current technology and train our students with the latest

equipment and techniques. In summary the department needs to keep the welding program running strong as follows.

1. Increase the budget to include the material and gases usage in to our current budget allocation by fall 2015.
2. Develop new courses to have advanced and beginning courses in which the skill level to certify and enter the workforce is easier to achieve and to keep up with industry demands of qualified employers by fall 2019. Examples would include;
    a. GTAW, Beginning GTAW, Intermediate GTAW and advanced GTAW
    b. Pipe welding. (Introduction to pipe welding, intermediate pipe welding and advanced pipe welding.)
3. If we are going to remain competitive in training the best welders in the industry we should look at incorporating some of the cutting edge technology that is out in industry with the use of robotic welders and other automated technology. We can start by introducing more technology by incorporating the Plasma-cam, programmable break bender, the large programmable shear and other equipment that makes businesses in the welding industry more competitive in to our classes, and upgrade the equipment to keep up with technology by fall 2019.
4. Have accessible computers in lab for students to have access to programs such as AutoCAD, MasterCam and SolidWorks so they can incorporate cross disciplinary skills such as engineering drawing to incorporate in welding classes such as layout fabrication interpretation in the welding lab by fall 2015.
5. Keep up with current trends of employers seeking skilled employees and certifications.
6. Keep track of potential employees to fill current trade needs. Industry is asking for people with advanced welding skill and experience. The Welding Advisory Community members and our local community industry partners echo this need along with the phone calls we receive from local employers who call looking for employees. By fall2019.
7. Have a designated welding specimen test room where students can see how successful they are in relation to their welding skills.
8. Have a designated pipe welding area where students can practice advanced pipe fitting and welding skills to meet the demand industry by fall 2019.
9. Incorporate the use of welding simulators to save on consumable materials.

ASSESSMENT PLAN

	**ASSESSMENT SCHEDULE** **6 Year** **Spring 2014-Fall 2020**	**AHC Program Student Learning Outcomes** **Welding Technology** **6 Year Assessment Schedule**

The attached template provides a framework for a program/discipline to plan a 6 year schedule for assessing its student learning outcomes, completing the SLO assessment cycle and attaining the status of ***sustainable continuous quality improvement*** in institutional effectiveness. This plan may be updated over the next 6 years as new contingencies or interpretations arise.

PROGRAM: **Welding Technology**

Our program is pleased to present our ***plan*** to: assess our SLOs, review the results of that assessment; and discuss changes to our curriculum, pedagogy or operations based on the results.

Program/ discipline coordinator or team leader Gabriel Marquez (Name) _____ (Signature) 5/8/2015 (Date)

I have reviewed this plan and agree that it provides sufficient detail and is a feasible approach to comprehensively assess the program SLOs.

Department chair Eric Mason (Name) _____ (Signature) 5/11/2015 (Date)

I have reviewed this plan and agree that it provides sufficient detail and is a feasible approach to comprehensively assess the program SLOs.

Dean Larissa Nazarenko (Name) _____ (Signature) 05/08/15 (Date)

	**ASSESSMENT SCHEDULE** **6 Year** **Spring 2014- Fall 2020**	**Program: Welding**	page _1___ of _9____

Use one row for each Program and Course SLO

SLO	To be assessed in semester:	Assessment method (s)	Team to review assessment results	Resources needed to conduct assessment	Individual responsible for assessment report	Date we expect to complete review
WLDT106 Beginning Welding **SLO1** - Develop basic welding skills using both the shielded metal arc and oxyacetylene process in the flat position.	Spring 2014 Fall 5015 Spring 2017 Fall 2018 Spring 2020	Perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	Continually repair and improve welding equipment, and increase welding budget to reflect rise in cost of welding supplies.	Instructor of record for the semester	Every semester after finals
WLDT106 **SLO2** - Flame weld thin sheet steel in the flat and horizontal positions.	Fall 2014 Spring 2016 Fall 2017 Spring 2019 Fall 2020	Perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT106 **SLO3** - Perform SMAW process on mild steel.	Spring 2015 Fall 2016 Spring 2018 Fall 2019	Perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals

WLDT107 Advanced Welding **SLO1** - Be familiar with all welding positions and basic welding electrodes used in industry.	Spring 2014 Fall 5015 Spring 2017 Fall 2018 Spring 2020	Perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	Continually repair and improve welding equipment, and increase welding budget to reflect rise in cost of welding supplies.	Instructor of record for the semester	Every semester after finals
WLDT107 **SLO2** - Perform SMAW welding in all positions.	Fall 2014 Spring 2016 Fall 2017 Spring 2019 Fall 2020	Perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT107 **SLO3** - Identify, fit and weld all five basic joints.	Spring 2015 Fall 2016 Spring 2018 Fall 2019	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT301 Selected Welding Projects **SLO1** - Plan and follow through to completion a pre-defined project.	Spring 2014 Fall 5015 Spring 2017 Fall 2018 Spring 2020	Students are required to complete an approved project that is designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	Continually repair and improve welding equipment, and increase welding budget to reflect rise in cost of welding supplies Buy for the program specialized fabrication equipment	Instructor of record for the semester	Every semester after finals
WLDT301 **SLO2** - Fabricate a project using the welding shop facility and equipment.	Fall 2014 Spring 2016 Fall 2017 Spring 2019 Fall 2020	Students are required to complete an approved project that is designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals

WLDT301 **SLO3** - Use shop equipment and tools in a safe manner as would be required by industry. Function in welding facility in a safe manner.	Spring 2015 Fall 2016 Spring 2018 Fall 2019	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 306 Layout & Fabrication Interpretation **SLO1** - Understand the techniques and methods of metal assembly and fabrication. Appreciate the interpretation of shop drawings and working drawings.	Spring 2014 Fall 5015 Spring 2017 Fall 2018 Spring 2020	Students are required to complete an approved project that is designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	Continually repair and improve welding equipment, and increase welding budget to reflect rise in cost of welding supplies Buy for the program specialized fabrication equipment	Instructor of record for the semester	Every semester after finals
WLDT 306 **SLO2** - Design and fabricate projects of metal. Identify and apply AWS standards and codes to the work place.	Fall 2014 Spring 2016 Fall 2017 Spring 2019 Fall 2020	Students are required to complete an approved project that is designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 306 **SLO3** - Solve problems associated with fabrication expansion and construction.	Spring 2015 Fall 2016 Spring 2018 Fall 2019	Students are required to complete an approved project that is designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals

WLDT 307 GMAW **SLO1** - Weld a variety of metal using the GMAW process.	Spring 2014 Fall 5015 Spring 2017 Fall 2018 Spring 2020	Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	Continually repair and improve welding equipment, and increase welding budget to reflect rise in cost of welding supplies.	Instructor of record for the semester	Every semester after finals
WLDT 307 **SLO2** - Know the four basic transfer modes in GMAW welding.	Fall 2014 Spring 2016 Fall 2017 Spring 2019 Fall 2020	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 307 **SLO3** - Set up the GMAW process equipment.	Spring 2015 Fall 2016 Spring 2018 Fall 2019	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 308 TIG Welding **SLO1 -** Diagnose gas tungsten arc welding equipment.	Spring 2014 Fall 5015 Spring 2017 Fall 2018 Spring 2020	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	Continually repair and improve welding equipment, and increase welding budget to reflect rise in cost of welding supplies.	Instructor of record for the semester	Every semester after finals
WLDT 308 **SLO2** - Learn power supply variables.	Fall 2014 Spring 2016 Fall 2017 Spring 2019 Fall 2020	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals

WLDT 308 **SLO3 -** Set up the GTAW process equipment. Weld Ferrous and non-Ferrous metal with the GTAW process.	Spring 2015 Fall 2016 Spring 2018 Fall 2019	Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 312 Pipe Fitting & Welding **SLO1** - Use safe shop procedures.	Spring 2014 Fall 5015 Spring 2017 Fall 2018 Spring 2020	Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.	Program SLOs Coordinator, FT Faculty Instructor	More specialized welding equipment is necessary. A new beveling machine is needed.	Instructor of record for the semester	Every semester after finals
WLDT 312 **SLO2** - Flame cut and fit pipe using standard templates. Prepare pipe for welding.	Fall 2014 Spring 2016 Fall 2017 Spring 2019 Fall 2020	Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 312 **SLO3 -** Use shop equipment and tools in a safe manner as would be required by industry.	Spring 2015 Fall 2016 Spring 2018 Fall 2019	Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 315 Metal Fabrication **SLO1** - Assemble components into final products by reading and interpreting blue prints and schematics. Extract material list from shop drawings and blue prints as required.	Spring 2014 Fall 5015 Spring 2017 Fall 2018 Spring 2020	Students are required to complete an approved project that is designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	Continually repair and improve welding equipment, and increase welding budget to reflect rise in cost of welding supplies Buy for the program specialized fabrication equipment	Instructor of record for the semester	Every semester after finals

WLDT 315 **SLO2** - Flame cut weld, machine and fabricate parts and sub-assemblies. Design and prepare working drawings.	Fall 2014 Spring 2016 Fall 2017 Spring 2019 Fall 2020	Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 315 **SLO3** - Use shop equipment and tools in a safe manner as would be required by industry.	Spring 2015 Fall 2016 Spring 2018 Fall 2019	Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 316 Metal Yard Sculptures **SLO1** - Students will have working knowledge of metallurgy.	Spring 2014 Spring 2016 Spring 2018 Spring 2020	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	Continually repair and improve welding equipment, and increase welding budget to reflect rise in cost of welding supplies.	Instructor of record for the semester	Every semester after finals
WLDT 316 **SLO2** - Students will do basic layout, fitting and cutting operation.	Fall 2014 Fall 2016 Fall 2018 Fall 2020	Instructor will evaluate the quality of work.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 316 **SLO3** - Student will operate basic shop equipment in a safe manner in the shop.	Spring 2015 Spring 2017 Spring 2019	Students take written safety test and must demonstrate while working in the lab that they can work safely	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals

WLDT 316 **SLO4** - Students will cut and fit ferrous materials in preparation for welding to course standards.	Fall 2015 Fall 2017 Fall 2019	Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 317 Ornamental Iron 1 **SLO1** - Identify, understand and use basic welding equipment.	Spring 2014 Fall 5015 Spring 2017 Fall 2018 Spring 2020	Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	Continually repair and improve welding equipment, and increase welding budget to reflect rise in cost of welding supplies.	Instructor of record for the semester	Every semester after finals
WLDT 317 **SLO2** - Learn to set-up welding equipment.	Fall 2014 Spring 2016 Fall 2017 Spring 2019 Fall 2020	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 317 **SLO3 -** Learn to work safely in the welding shop environment.	Spring 2015 Fall 2016 Spring 2018 Fall 2019	Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 319 Blacksmithing Projects **SLO1** - Identify, understand and use basic welding equipment.	Spring 2014 Fall 5015 Spring 2017 Fall 2018 Spring 2020	Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	Continually repair and improve welding equipment, and increase welding budget to reflect rise in cost of welding supplies.	Instructor of record for the semester	Every semester after finals
WLDT 319 **SLO2** - Learn to set-up welding equipment.	Fall 2014 Spring 2016 Fall 2017 Spring 2019 Fall 2020	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals

WLDT 319 **SLO3** - Learn to work safely in the welding shop environment.	Spring 2015 Fall 2016 Spring 2018 Fall 2019	Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 330 Welding Certification **SLO1** - Weld in all positions to specific certification standards.	Spring 2014 Fall 5015 Spring 2017 Fall 2018 Spring 2020	Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	New Testing equipment is needed to show the success or failures of welding process and continual testing and learning.	Instructor of record for the semester	Every semester after finals
WLDT 330 **SLO2** - Cut, fit and grind as needed to complete test specimens.	Fall 2014 Spring 2016 Fall 2017 Spring 2019 Fall 2020	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 330 **SLO3** - Test at or above 80% proficiency.	Spring 2015 Fall 2016 Spring 2018 Fall 2019	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 331 Advanced Welding Certification Lab **SLO1** - Weld in all positions to specific certification standards.	Spring 2014 Fall 5015 Spring 2017 Fall 2018 Spring 2020	Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	New Testing equipment is needed to show the success or failures of welding process and continual testing and learning.	Instructor of record for the semester	Every semester after finals
WLDT 331 **SLO2** - Cut, fit and grind as needed to complete test specimens.	Fall 2014 Spring 2016 Fall 2017 Spring 2019 Fall 2020	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals

WLDT 331 **SLO3** - Test at or above 80% proficiency.	Spring 2015 Fall 2016 Spring 2018 Fall 2019	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 335 Flux Core Arc Welding **SLO1** - Weld in all positions using the Flux Core Arc Welding Process.	Summer 2014 Summer 2018	Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor	Continually repair and improve welding equipment, and increase welding budget to reflect rise in cost of welding supplies.	Instructor of record for the semester	Every semester after finals
WLDT 335 **SLO2** - Identify, fit and weld the five basic weld joints used in the welding industry.	Summer 2015 Summer 2019	Students are required to perform a number of welding projects that are designed to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
WLDT 335 **SLO3** - Set up the F.C.A.W. process equipment.	Summer 2016 Summer 2020	Students are required to perform a number of welds to demonstrate their ability to perform the basic skills taught in the program.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals
SLO4 - Function in a welding facility in an efficient and safe manner.	Summer 2017	Students take written safety test and must demonstrate while working in the lab that they can work safely in the shop.	Program SLOs Coordinator, FT Faculty Instructor		Instructor of record for the semester	Every semester after finals

REVIEW OF PREREQUISITES, COREQUISITES AND ADVISORIES – SUMMARY

Course Prefix No	**CURRENT** Prerequisite/Coreq/Advisory/ Limitation on Enrollment	**LEVEL OF SCRUTINY** (Statistics,Content Review, UC/CSU Comparison, Student Survey – list all)	**RESULT** (I.e., current PCA is established, should be dropped/modified or new PCA is established)	**ACTION TO BE TAKEN** (None, APP-Major or Minor)
WLDT 106		CSU		
WLDT 107	Prereq: WLDT 106	CSU		
WLDT 306	Prereq: WLDT 106			
WLDT 307	Prereq: WLDT 106			
WLDT 308	Prereq: WLDT 106			
WLDT 312	Prereq: WLDT 107			
WLDT 315	Prereq: WLDT 107			
WLDT 330	Prereq: WLDT 107 or WLDT 307 or WLDT 308			
WLDT 331	Prereq: WLDT 330			
WLDT 381	Adv.: MATH 511 eligible			
WLDT 199				

PLAN OF ACTION - PRE-VALIDATION
Six Year

DEPARTMENT: Industrial Technology PROGRAM: Welding

List below as specifically as possible the actions which the department plans to take as a result of this program review. Be sure to address any problem areas which you have discovered in your analysis of the program. Number each element of your plans separately and for each, please include a target date. Additionally, indicate by the number each institutional goal and objective which is addressed by each action plan. (See Institutional Goals and Objectives)

RECOMMENDATIONS TO IMPROVE **STUDENT LEARNING OUTCOMES** AND ACHIEVEMENT	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Addition of courses to offer full program offering to ensure that students can finish welding program degree or certificate in two years whether they are night or day time students. Will continue to invite and work with counselor to improve student success and completion.	Goal SLS2	Fall 2019

RECOMMENDATIONS TO ACCOMMODATE CHANGES IN **STUDENT CHARACTERISTICS**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Enrollment Changes Careful consideration will be taken to determine whether material fees should be increased.	Goal IR4	Fall 2019
Demographic Changes Continue to participate in outreach functions to encourage and entice nontraditional and disadvantaged students in to the welding program.	Goal E1	Fall 2019 and on-going

RECOMMENDATIONS TO IMPROVE THE **EDUCATIONAL ENVIRONMENT**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Curricular Changes Curriculum will be developed to improve skill building and to ensure student success. More classes will be developed to teach more advanced skill in classes where the skill level is difficult to achieve in one semester for certification in TIG welding and pipe welding where a higher degree of skill is necessary.	Goal SLS1 Goal SLS2 Goal SLS4	Fall 2019
Co-Curricular Changes No co-curricular changes at this time.		
Neighboring College and University Plans Will continue to work with instructors from Cuesta College who participated in High School welding competition and one of which is on the Welding Advisory Committee.	Goal IR3	Fall 2019
Related Community Plans Invite community partners and industry leaders for them to see and get involved with the existing technical education opportunities at Allan Hancock College.	Goal E1	Fall 2019

RECOMMENDATIONS THAT REQUIRE ADDITIONAL RESOURCES	Theme/Objective/ Strategy Number AHC from Strategic Plan	TARGET DATE
Facilities Take advantage of the new facilities to better serve our students and the college by adding the much needed classes and continue to improve the facilities to keep up with technology and industry standards to better serve students and the community by making every booth in the lab able to be used for all the welding processes taught at Allan Hancock College. It would give the welding department the ability to offer the classes students need in the evening as well as in the day to finish their educational goals in the two years. Storage in old building metal containers will continue until more suitable storage is devised so new building is not cluttered. The purchase of six storage lockers approximately $600. For each for instructors to keep instructional tools and materials for the different classes should alleviate some of the storage issue. Old lab space should be used for educational space requiring heavy electrical usage since it is already equipped.	Goal SLS3 Goal SLS4 GoalIR4 Goal IR3	Fall 2019
Equipment Have a plan with advisory board recommendations to continually replace, upgrade or add two new pieces of equipment per year approximately $15,000 each, to better serve our students needs by teaching with the latest equipment and methods to keep up with industry. Purchase two welding simulators approximately $12,000 plus an additional $4,000 for the software licenses to give students that need extra time to acquire welding skills and an opportunity to practice without supervision. This would be located in a common area such as the library and for high school outreach. Purchase hydraulic press approximately $15,000 to test weld specimens. Purchase two AutoCAD licensees approximately $5,000 to incorporate technology into The Welding program by installing the software on the two computers in the lab designated for student use. Items that would incorporate innovation being taught at the college would be items such as the installation of a welding robot to teach the latest technology used in industry. Small items also like welding chambers $ 4,000 and positioners $ 4,000 would teach students more advanced welding skills.	Goal IR3 Goal IR4	Fall 2019
Staffing Find and hire a second full time welding instructor or several part time instructors to teach the additional classes to help students reach their educational goals in a timelier manner. Lab assistant and department secretary full time positions should be sought. A continuation of the use of student workers to assist in the operation of the lab should continue because it is vital to the operation of the program and will help ensure safety in the lab with proper storage and handling of materials.	Goal IR1 Goal E2	Fall 2019

EXHIBITS

STUDENT DATA SUMMARY

Data analysis is a critical component of program review. The three categories below should be used as guidelines in developing a summary of the student data.

NOTE: **The following statements are based on a Likert Scale of 1 (highly satisfied) to 5 (not satisfied at all) from the Program Review Class Climate evaluation provided by IRP on March 17, 2014.**

State at least three positive factors about the discipline/program identified by students. Include the number (or percentage) of students responding and any implications for planning.

- Out of the 66 responses on question #1 regarding the quality of the instruction of the program, the average response was 1.85 between highly satisfied and satisfied (scale 1 to 5). This is the result of the instructors who represent all facets of industry and have many years of experience.

- Out of the 64 responses on question #4 regarding the way the program meets each student's educational goals, the average response was 1.94. The program offers several certificates and an associate's degree and because of strong advisory committee involvement keeps current with industry standards.

- Out of the 64 responses on question #6 regarding the clarity of course and learning objectives the average response was 1.95. This is due to the consistent and relevant SLO's for all classes.

State at least three negative factors about the discipline/program identified by students. Include the number (or percentage) of students responding and any implications for planning.

- Out of the 53 responses on question 3 the average rating of 2.68 shows a possible disconnect between counselors and the program. Student shared their concerns on either not getting support of information from high school or AHC counselors. We hope to address this at the upcoming High School Counselor Workshop on April 4th and also through some new items that have been developing from CTEA funding. Also with the new building, the Industrial Technology Program will invite small groups to tour/learn more about the program and learn more about the annual High School Welding Competition which will be held on May 10th this year.

- Out of the 65 responses on question 8, the average rating of 2.71 is one of the lowest rated questions in the student survey. Due to continuing budget cuts and the lack of opportunity to add classes, the Welding Program has had to limit the number of course offerings in the years. This has affected students that want to complete their certificates or graduate in a timely manner. Our hope is with the expansion of the new building and the addition of labs, that we can expand those offerings to meet the needs of students in the Welding Program.

- Out of the 67 responses on question #11 that ranked the current physical facilities and space at 2.63, we hope to address this with the move in to the new Industrial Technology Complex the summer of 2014.

- Out of the 48 responses on question # 14 on course assistance through tutorial services we have addressed that for spring 2014 and admit that we have additional work to do on serving our students. With help from the Learning Assistance Program (LAP) we have hired our first welding tutor to aid a student with learning disabilities and physical challenges (left handed) in our welding booths. We continue to learn how to make improvements to students that find our lab classes challenging.

State any other information (use responsive numbers) that you obtained from student data (e.g. focus groups, questionnaires, or SGIDs) that may be of special interest to the self-study team. What planning implications will result from this information?

- The Welding Technology students seem focused on completing their certificates. In the responses, 54.8% of the students had taken 15 or more credits. The majority of students work while attending school and 56.9% of them take 9 or more credits attributed to the fact that classes are held in the daytime and evenings.

- Approximately 1/3rd of students enrolled are interested in the certificate of achievement and 1/3rd are interested in the associate degree, thus reflecting the skill set needed for employment in this industry.

Program Review

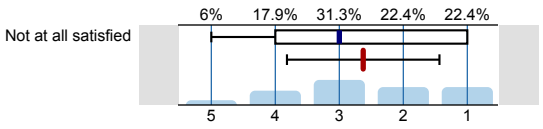
Program Review Paper Surveys ()
No. of responses = 68
For the Period:

Survey Results

Part I. Please indicate how satisfied you are, in general, with the following aspects of the Welding Technology Program.

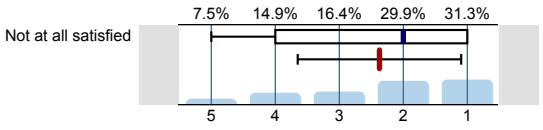
Quality of instruction within the program	Not at all satisfied	0%	6.1%	10.6%	45.5%	37.9%	Highly satisfied	n=66 av.=1.85 md=2 dev.=0.85
The way textbooks and other materials used in courses within the program help me learn	Not at all satisfied	0%	14.5%	16.1%	41.9%	27.4%	Highly satisfied	n=62 av.=2.18 md=2 dev.=1
Advice about the program from counselors	Not at all satisfied	13.2%	11.3%	28.3%	24.5%	22.6%	Highly satisfied	n=53 av.=2.68 md=3 dev.=1.31 ab.=11
The way this program meets your educational goals	Not at all satisfied	4.7%	0%	15.6%	43.8%	35.9%	Highly satisfied	n=64 av.=1.94 md=2 dev.=0.97
Contribution towards your intellectual growth	Not at all satisfied	1.5%	3%	26.9%	35.8%	32.8%	Highly satisfied	n=67 av.=2.04 md=2 dev.=0.93
Clarity of course goals and learning objectives	Not at all satisfied	3.1%	6.3%	12.5%	39.1%	39.1%	Highly satisfied	n=64 av.=1.95 md=2 dev.=1.03
Feedback and assessment of progress towards learning objectives	Not at all satisfied	0%	4.4%	19.1%	45.6%	30.9%	Highly satisfied	n=68 av.=1.97 md=2 dev.=0.83
The availability of courses offered in the program	Not at all satisfied	13.8%	3.1%	38.5%	29.2%	15.4%	Highly satisfied	n=65 av.=2.71 md=3 dev.=1.2 ab.=1
The content of courses offered in the Welding Technology Program	Not at all satisfied	8.5%	8.5%	25.4%	32.2%	25.4%	Highly satisfied	n=59 av.=2.42 md=2 dev.=1.21 ab.=2
The coordination of courses offered in the Welding Technology Program and courses offered in other departments that may be required for your major	Not at all satisfied	13.8%	8.6%	15.5%	39.7%	22.4%	Highly satisfied	n=58 av.=2.52 md=2 dev.=1.31 ab.=6

The physical facilities and space (e.g., classrooms, labs)



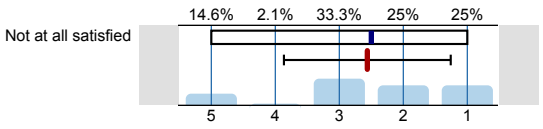
n=67
av.=2.63
md=3
dev.=1.19

Instructional equipment (e.g., computers, lab equipment)



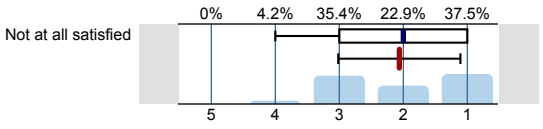
n=67
av.=2.37
md=2
dev.=1.28

Presentation of classes via the college's Blackboard course management system



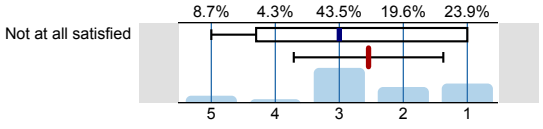
n=48
av.=2.56
md=2.5
dev.=1.3
ab.=20

Course assistance through tutorial services (e.g through the Tutorial Center, Math Lab, Writing Center)



n=48
av.=2.06
md=2
dev.=0.95
ab.=19

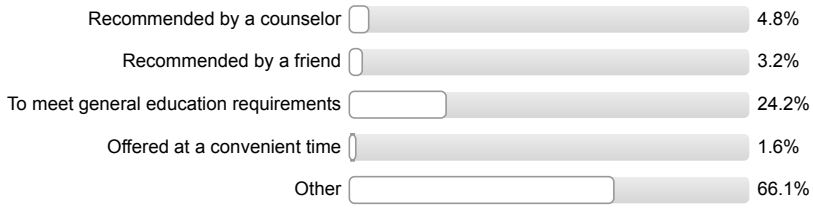
Availability of appropriate resources in the libraries



n=46
av.=2.54
md=3
dev.=1.17
ab.=20

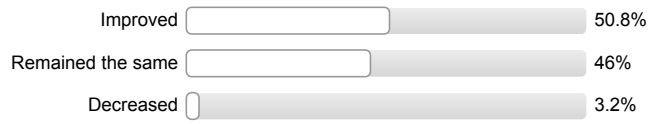
Part II. Please answer the following questions about the Welding Technology Program.

Which of the following best describes your reason for taking this and other courses in the Welding Technology Program?



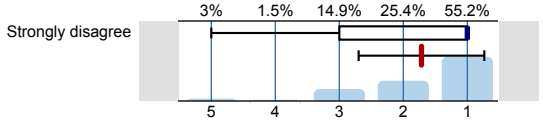
n=62

Compared to the beginning of the semester, your attitude about the Welding Technology Program has



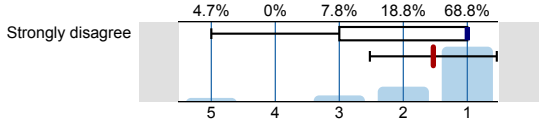
n=63

I would recommend taking courses in the Welding Technology Program.



n=67
av.=1.72
md=1
dev.=0.98

I plan on taking additional courses in the Welding Technology Program.

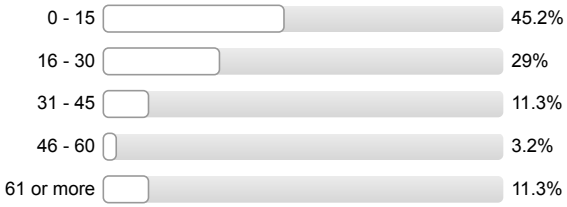


n=64
av.=1.53
md=1
dev.=0.99

Part III. Background Questions

How many units have you completed prior to this semester?

n=62

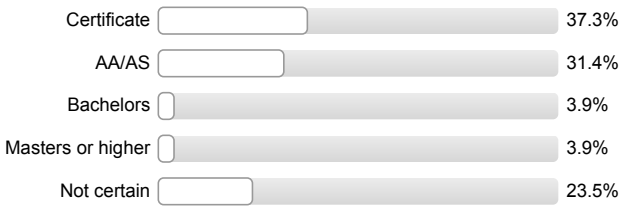


In how many units are you currently enrolled?

n=65

What is your final academic goal?

n=51

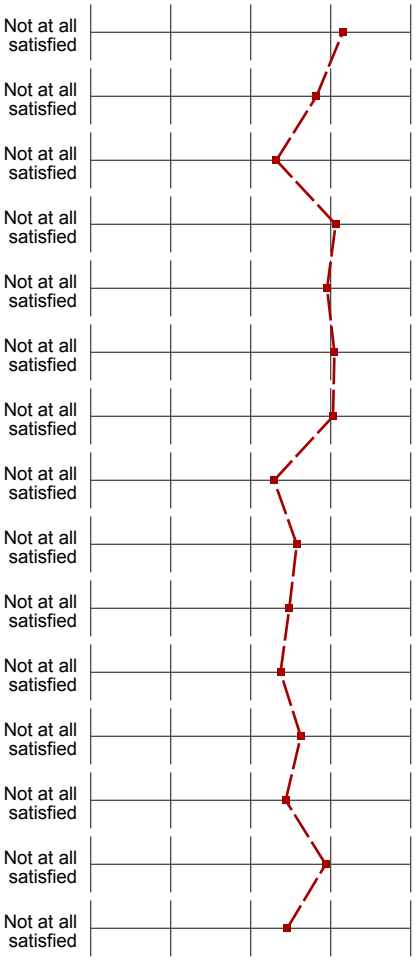


Profile

Subunit: IR General Surveys
Name of the instructor: Program Review
Name of the course: (Name of the survey) Program Review Paper Surveys

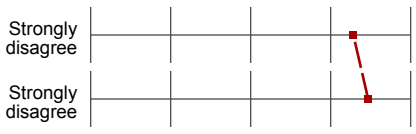
Values used in the profile line: Mean

Part I. Please indicate how satisfied you are, in general, with the following aspects of the Welding Technology Program.



	Not at all satisfied	Highly satisfied				
Quality of instruction within the program			n=66	av.=1.85	md=2.00	dev.=0.85
The way textbooks and other materials used in courses within the program help me learn			n=62	av.=2.18	md=2.00	dev.=1.00
Advice about the program from counselors			n=53	av.=2.68	md=3.00	dev.=1.31
The way this program meets your educational goals			n=64	av.=1.94	md=2.00	dev.=0.97
Contribution towards your intellectual growth			n=67	av.=2.04	md=2.00	dev.=0.93
Clarity of course goals and learning objectives			n=64	av.=1.95	md=2.00	dev.=1.03
Feedback and assessment of progress towards learning objectives			n=68	av.=1.97	md=2.00	dev.=0.83
The availability of courses offered in the program			n=65	av.=2.71	md=3.00	dev.=1.20
The content of courses offered in the Welding Technology Program			n=59	av.=2.42	md=2.00	dev.=1.21
The coordination of courses offered in the Welding Technology Program and courses offered in other departments that may be required for your major			n=58	av.=2.52	md=2.00	dev.=1.31
The physical facilities and space (e.g., classrooms, labs)			n=67	av.=2.63	md=3.00	dev.=1.19
Instructional equipment (e.g., computers, lab equipment)			n=67	av.=2.37	md=2.00	dev.=1.28
Presentation of classes via the college's Blackboard course management system			n=48	av.=2.56	md=2.50	dev.=1.30
Course assistance through tutorial services (e.g through the Tutorial Center, Math Lab, Writing Center)			n=48	av.=2.06	md=2.00	dev.=0.95
Availability of appropriate resources in the libraries			n=46	av.=2.54	md=3.00	dev.=1.17

Part II. Please answer the following questions about the Welding Technology Program.

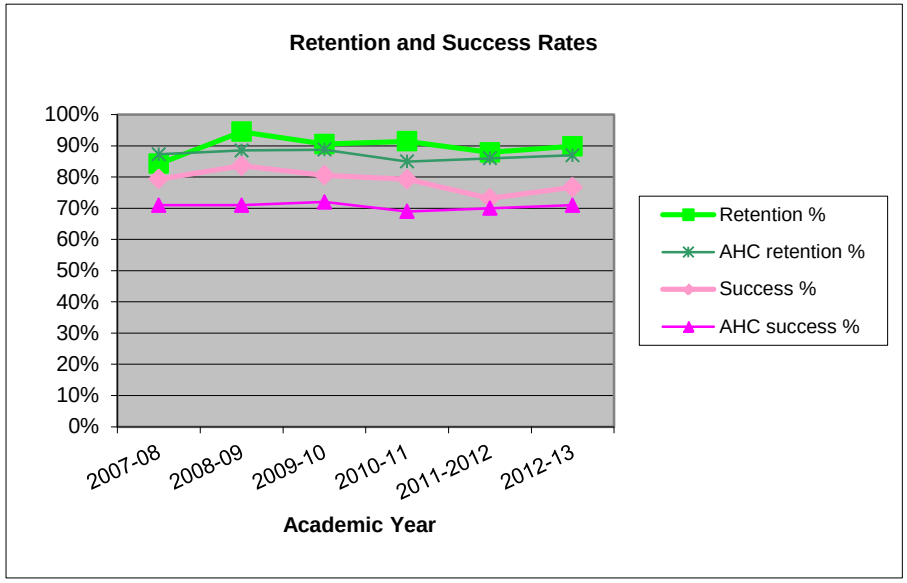


	Strongly disagree	Strongly agree				
I would recommend taking courses in the Welding Technology Program.			n=67	av.=1.72	md=1.00	dev.=0.98
I plan on taking additional courses in the Welding Technology Program.			n=64	av.=1.53	md=1.00	dev.=0.99

Program Review Trend Data: Student Outcomes

Program	Topcode
Welding	095650

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment	324	293	340	420	339	344	343	6%	9
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained	273	277	308	384	298	309	308	13%	9
Retention %	**84%**	**95%**	**91%**	**91%**	**88%**	**90%**	**90%**	**7%**	**0**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better	257	245	274	333	248	264	270	3%	3
Success %	**79%**	**84%**	**81%**	**79%**	**73%**	**77%**	**79%**	**-3%**	**0**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0



* Excludes zero unit labs.

Enrollment is count of students who were enrolled after the drop date.

Retained is count of students enrolled after drop date who did not receive a "W" or incomplete.

Success is number of students with a grade of "C" or better or "CR".

Program Review Trend Data: Student Outcomes

Program	Topcode	Course
Welding	**095650**	**WLDT 106**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment	88	89	122	133	113	143	115	63%	10
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained	69	86	111	122	97	121	101	75%	9
Retention %	**78%**	**97%**	**91%**	**92%**	**86%**	**85%**	**88%**	**8%**	**0**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better	64	70	93	86	81	89	81	39%	4
Success %	**73%**	**79%**	**76%**	**65%**	**72%**	**62%**	**71%**	**-14%**	**0**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 107**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment	45	64	59	57	45	49	53	9%	-1
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained	34	50	57	55	37	45	46	32%	0
Retention %	**76%**	**78%**	**97%**	**96%**	**82%**	**92%**	**87%**	**22%**	**0**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better	32	41	49	47	31	40	40	25%	0
Success %	**71%**	**64%**	**83%**	**82%**	**69%**	**82%**	**75%**	**15%**	**0**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 301**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment	3	16	12	16	16	16	13	433%	2
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained	2	11	10	13	16	15	11	650%	2
Retention %	**67%**	**69%**	**83%**	**81%**	**100%**	**94%**	**82%**	**41%**	**0**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better	2	11	10	12	13	14	10	600%	2
Success %	**67%**	**69%**	**83%**	**75%**	**81%**	**88%**	**77%**	**31%**	**0**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 306**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment	14	18	24		17	21	19	50%	N/A
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained	9	17	22		13	21	16	133%	N/A
Retention %	**64%**	**94%**	**92%**	**N/A**	**76%**	**100%**	**85%**	**56%**	**N/A**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better	9	11	22		7	19	14	111%	N/A
Success %	**64%**	**61%**	**92%**	**N/A**	**41%**	**90%**	**70%**	**41%**	**N/A**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 307**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment	23	11		19	17	19	18	-17%	N/A
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained	21	11		19	16	16	17	-24%	N/A
Retention %	**91%**	**100%**	**N/A**	**100%**	**94%**	**84%**	**94%**	**-8%**	**N/A**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better	20	11		18	13	12	15	-40%	N/A
Success %	**87%**	**100%**	**N/A**	**95%**	**76%**	**63%**	**84%**	**-27%**	**N/A**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 308**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment	25	22	35	19	22	18	24	-28%	-1
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained	20	22	28	18	21	17	21	-15%	-1
Retention %	**80%**	**100%**	**80%**	**95%**	**95%**	**94%**	**91%**	**18%**	**0**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better	17	22	23	18	19	16	19	-6%	-1
Success %	**68%**	**100%**	**66%**	**95%**	**86%**	**89%**	**84%**	**31%**	**0**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 309**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment				21			21	N/A	N/A
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained				17			17	N/A	N/A
Retention %	**N/A**	**N/A**	**N/A**	**81%**	**N/A**	**N/A**	**81%**	**N/A**	**N/A**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better				17			17	N/A	N/A
Success %	**N/A**	**N/A**	**N/A**	**81%**	**N/A**	**N/A**	**81%**	**N/A**	**N/A**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 312**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment	14	15	24	21	21	23	20	64%	2
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained	13	13	19	17	18	23	17	77%	2
Retention %	**93%**	**87%**	**79%**	**81%**	**86%**	**100%**	**88%**	**8%**	**0**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better	12	13	18	17	15	23	16	92%	2
Success %	**86%**	**87%**	**75%**	**81%**	**71%**	**100%**	**83%**	**17%**	**0**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 315**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment	5			16	18	17	14	240%	N/A
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained	5			14	18	16	13	220%	N/A
Retention %	**100%**	**N/A**	**N/A**	**88%**	**100%**	**94%**	**95%**	**-6%**	**N/A**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better	5			14	17	16	13	220%	N/A
Success %	**100%**	**N/A**	**N/A**	**88%**	**94%**	**94%**	**94%**	**-6%**	**N/A**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 316**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment				40	17	13	23	N/A	N/A
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained				36	16	12	21	N/A	N/A
Retention %	**N/A**	**N/A**	**N/A**	**90%**	**94%**	**92%**	**92%**	**N/A**	**N/A**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better				36	16	12	21	N/A	N/A
Success %	**N/A**	**N/A**	**N/A**	**90%**	**94%**	**92%**	**92%**	**N/A**	**N/A**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 317**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment						3	3	N/A	N/A
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained						3	3	N/A	N/A
Retention %	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**100%**	**100%**	**N/A**	**N/A**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better						3	3	N/A	N/A
Success %	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**100%**	**100%**	**N/A**	**N/A**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 319**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment				41	36		39	N/A	N/A
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained				38	31		35	N/A	N/A
Retention %	**N/A**	**N/A**	**N/A**	**93%**	**86%**	**N/A**	**89%**	**N/A**	**N/A**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better				35	23		29	N/A	N/A
Success %	**N/A**	**N/A**	**N/A**	**85%**	**64%**	**N/A**	**75%**	**N/A**	**N/A**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 330**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment	8		17	11	15	20	14	150%	N/A
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained	6		15	11	13	19	13	217%	N/A
Retention %	**75%**	**N/A**	**88%**	**100%**	**87%**	**95%**	**89%**	**27%**	**N/A**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better	6		15	11	12	19	13	217%	N/A
Success %	**75%**	**N/A**	**88%**	**100%**	**80%**	**95%**	**88%**	**27%**	**N/A**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 331**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment	1		2	5	2	2	2	100%	N/A
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained	0		1	5	2	1	2	N/A	N/A
Retention %	**0%**	**N/A**	**50%**	**100%**	**100%**	**50%**	**60%**	**N/A**	**N/A**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better	0		1	5	1	1	2	N/A	N/A
Success %	**0%**	**N/A**	**50%**	**100%**	**50%**	**50%**	**50%**	**N/A**	**N/A**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program	Topcode	Course
Welding	**095650**	**WLDT 335**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment				22			22	N/A	N/A
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained				17			17	N/A	N/A
Retention %	**N/A**	**N/A**	**N/A**	**77%**	**N/A**	**N/A**	**77%**	**N/A**	**N/A**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better				16			16	N/A	N/A
Success %	**N/A**	**N/A**	**N/A**	**73%**	**N/A**	**N/A**	**73%**	**N/A**	**N/A**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

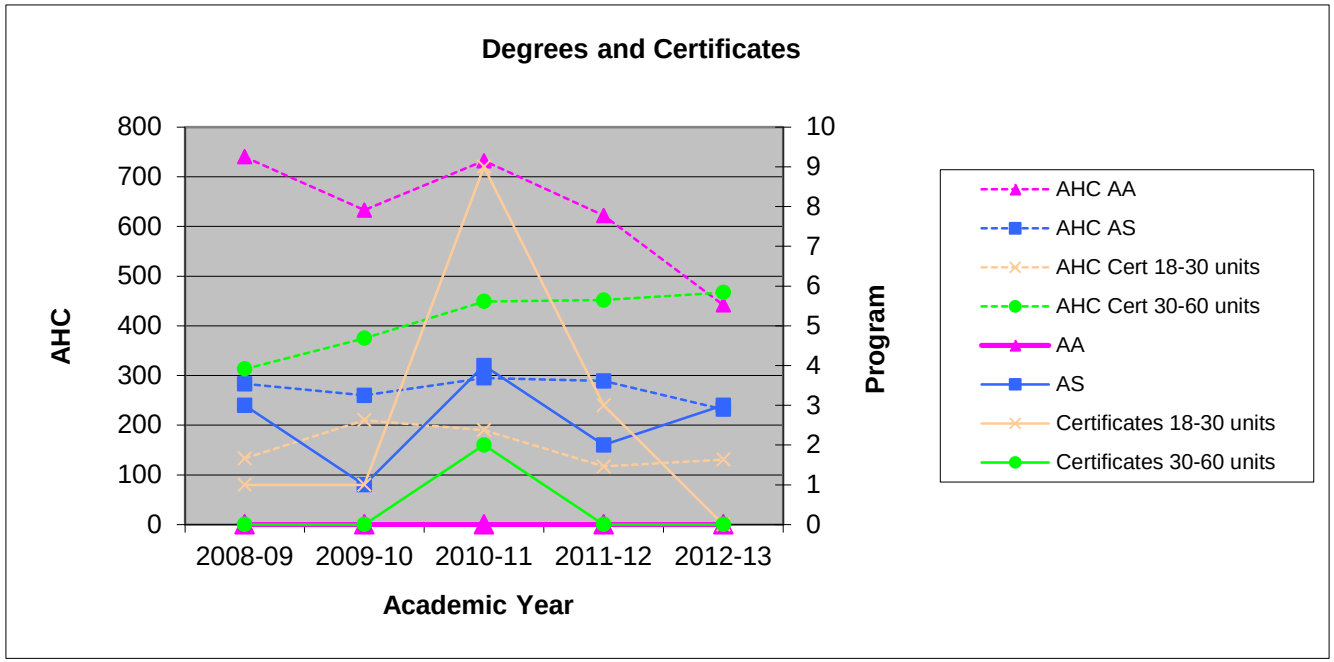
Program	Topcode	Course
Welding	**095650**	**WLDT 399**

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Enrollment	98	68	45				70	-100%	N/A
AHC Duplicate Enrolls	67818	69800	69476	75652	69449	66952	69858	-1%	23
Retained	97	67	45				70	-100%	N/A
Retention %	**99%**	**99%**	**100%**	**N/A**	**N/A**	**N/A**	**99%**	**N/A**	**N/A**
AHC retention %	87%	89%	89%	85%	86%	87%	87%	0%	0
Passed C or better	90	66	43				66	-100%	N/A
Success %	**92%**	**97%**	**96%**	**N/A**	**N/A**	**N/A**	**95%**	**N/A**	**N/A**
AHC success %	71%	71%	72%	69%	70%	71%	71%	0%	0

Program Review Trend Data: Student Outcomes

Program	Topcode
Welding	**095650**

	Academic Year (Summer to Spring)					5 Year Average	5 Year % Change	Linear Trend Slope
Degrees/Certificates	2008-09	2009-10	2010-11	2011-12	2012-13			
AA	**0**	**0**	**0**	**0**	**0**	**0**	**N/A**	**0**
AHC AA	740	633	732	622	442	634	-40%	-61
AS	**3**	**1**	**4**	**2**	**3**	**3**	**0%**	**0**
AHC AS	283	260	295	289	232	272	-18%	-7
Certificates 18-30 units	**1**	**1**	**9**	**3**	**0**	**3**	**-100%**	**0**
AHC Cert 18-30 units	133	210	190	117	131	156	-2%	-10
Certificates 30-60 units	**0**	**0**	**2**	**0**	**0**	**0**	**N/A**	**0**
AHC Cert 30-60 units	313	375	449	452	467	411	49%	39



Program Review Trend Data: Credit Student Characteristics

All AHC Credit

	Fall Semester												6 Year	Linear
	2007		2008		2009		2010		2011		2012		%	Trend
Ethnicity	#	%	#	%	#	%	#	%	#	%	#	%	Change	Slope
Asian/Filipino/Pac Isl	583	**5%**	640	**5%**	598	**5%**	759	**5%**	676	**6%**	685	**6%**	17%	22
Black	371	**3%**	350	**3%**	298	**3%**	352	**3%**	392	**4%**	376	**3%**	1%	6
Hispanic	4045	**34%**	4323	**35%**	4306	**37%**	4975	**38%**	5212	**48%**	5359	**49%**	32%	283
White	5126	**45%**	5168	**45%**	5089	**44%**	5406	**45%**	4481	**41%**	4303	**40%**	-16%	-167
Other/Unknown	1290	**12%**	1238	**11%**	983	**11%**	736	**9%**	203	**2%**	160	**1%**	-88%	-257
Gender														
Female	6032	**54%**	6190	**53%**	5987	**53%**	6173	**53%**	5761	**53%**	5561	**51%**	-8%	-99
Male	5330	**46%**	5453	**47%**	5209	**47%**	5970	**46%**	5194	**47%**	5319	**49%**	0%	-2
Unknown	53	**0%**	76	**0%**	78	**1%**	85	**1%**	9	**0%**	3	**0%**	-94%	-13
Enrollment Status (Units)														
Full-time (12 or more)	3118	**29%**	3492	**27%**	3526	**70%**	3966	**69%**	3459	**32%**	3325	**31%**	7%	39
Part-time	8297	**71%**	8227	**73%**	7748	**30%**	8262	**31%**	7505	**68%**	7558	**69%**	-9%	-153
Age														
Under 20	2927	**14%**	3127	**26%**	2979	**27%**	3245	**26%**	3005	**27%**	2986	**27%**	2%	6
20 to 24	3358	**37%**	3579	**29%**	3815	**31%**	3920	**34%**	3711	**34%**	3796	**35%**	13%	77
25 to 34	2255	**22%**	2363	**20%**	2323	**20%**	2618	**21%**	2332	**21%**	2319	**21%**	3%	15
35 to 54	2344	**22%**	2168	**21%**	1762	**18%**	2034	**16%**	1627	**15%**	1498	**14%**	-36%	-159
55 and over	530	**5%**	476	**5%**	394	**4%**	410	**3%**	289	**3%**	284	**3%**	-46%	-51
Unknown	1	**0%**	6	**0%**	1	**0%**	1	**0%**	1	**0%**	0	**0%**	-100%	-1
Total	10732	**100%**	11415	**100%**	11719	**100%**	11274	**100%**	10965	**100%**	10883	**100%**	1%	-30

Program Review Trend Data: Credit Student Characteristics

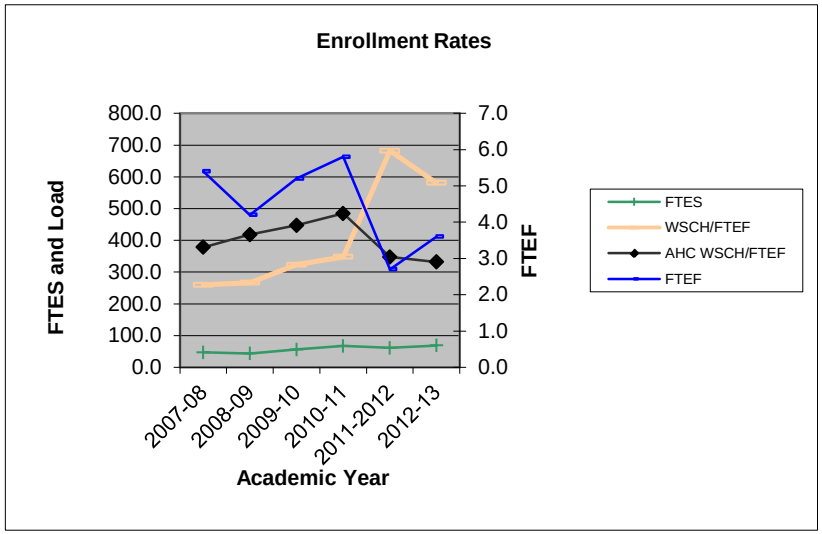
Program	Topcodes
Welding	**095650**

	Fall Semester												6 Year % Change	Linear Trend Slope
	2007		2008		2009		2010		2011		2012			
Ethnicity	#	%	#	%	#	%	#	%	#	%	#	%		
Asian/Filipino/Pac Isl	4	**3%**	0	**0%**	6	**4%**	7	**4%**	4	**3%**	5	**3%**	25%	1
Black	2	**2%**	1	**1%**	0	**0%**	2	**1%**	3	**2%**	5	**3%**	150%	1
Hispanic	30	**24%**	40	**35%**	51	**32%**	61	**39%**	51	**40%**	77	**48%**	157%	8
White	73	**58%**	61	**54%**	85	**54%**	78	**50%**	67	**53%**	68	**42%**	-7%	0
Other/Unknown	16	**13%**	12	**11%**	15	**10%**	8	**5%**	2	**2%**	6	**4%**	-63%	-2
Gender														
Female	10	**8%**	9	**8%**	23	**15%**	13	**8%**	5	**4%**	9	**6%**	-10%	-1
Male	115	**92%**	105	**92%**	134	**85%**	141	**90%**	122	**96%**	154	**96%**	34%	7
Unknown	0	**0%**	0	**0%**	0	**0%**	2	**1%**	0	**0%**	0	**0%**	N/A	0
Enrollment Status (units)														
Full-time (12 or more)	18	**14%**	39	**34%**	38	**24%**	50	**32%**	33	**26%**	39	**24%**	117%	3
Part-time	107	**86%**	75	**66%**	119	**76%**	106	**68%**	94	**74%**	122	**76%**	14%	3
Age														
Under 20	38	**30%**	44	**39%**	42	**27%**	44	**28%**	37	**29%**	30	**19%**	-21%	-2
20 to 24	25	**20%**	26	**23%**	46	**29%**	52	**33%**	44	**35%**	64	**40%**	156%	7
25 to 34	13	**10%**	17	**15%**	20	**13%**	28	**18%**	24	**19%**	47	**29%**	262%	6
35 to 54	35	**28%**	14	**12%**	38	**24%**	24	**15%**	19	**15%**	16	**10%**	-54%	-3
55 and over	14	**11%**	13	**11%**	11	**7%**	8	**5%**	3	**2%**	4	**2%**	-71%	-2
Total	125	**100%**	114	**100%**	157	**100%**	156	**100%**	127	**100%**	161	**100%**	29%	6

Program Review Trend Data: Enrollment Patterns

Program	Topcode
Welding	**095650**

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	324	293	340	420	339	344	343	6%	9
Sections	32	26	22	26	21	21	25	-34%	-2
Average class size	10	11	15	16	16	16	**14**	**62%**	**1**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES	47.2	43.6	56.1	67.2	61.1	69.0	57.4	46%	4.9
WSCH	1402.2	1119.5	1680.4	2017.5	1841.5	2091.0	1692.0	49%	169.9
FTEF	5.4	4.2	5.2	5.8	2.7	3.6	4.5	-33%	-0.4
WSCH/FTEF	259.7	266.5	323.2	347.8	682.0	580.8	410.0	124%	82.2
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12



* Excludes zero unit labs.

Enrollment is count of students who were enrolled after the drop date.

Program Review Trend Data: Enrollment Patterns

Program	Topcode	Course
Welding	**095650**	**WLDT 106**

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	88	89	122	133	113	143	115	63%	10
Sections	5	4	6	6	5	6	5	20%	0
Average class size	**18**	**22**	**20**	**22**	**23**	**24**	**21**	**35%**	**1**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES	17.1	17.3	23.7	28.4	24.1	31.1	23.6	82%	2.7
WSCH	528.0	444.0	732.0	877.8	745.8	961.4	714.8	82%	91.9
FTEF	1.8	1.1	2.2	2.2	0.9	1.5	1.6	-17%	-0.1
WSCH/FTEF	293.3	403.6	332.7	399.0	828.7	640.9	483.0	119%	88.0
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 107**

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	45	64	59	57	45	49	53	9%	-1
Sections	3	4	3	3	2	2	3	-33%	0
Average class size	**15**	**16**	**20**	**19**	**23**	**25**	**19**	**63%**	**2**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES	8.7	10.5	11.5	12.2	9.6	10.5	10.5	21%	0.2
WSCH	270.0	324.0	354.0	376.2	297.0	323.4	324.1	20%	5.9
FTEF	0.9	1.2	1.1	1.1	0.4	0.4	0.9	-56%	-0.1
WSCH/FTEF	300.0	270.0	321.8	342.0	742.5	808.5	464.1	170%	113.7
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 301**

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	3	16	12	16	16	16	13	433%	2
Sections	3	4	3	5	4	4	4	33%	0
Average class size	**1**	**4**	**4**	**3**	**4**	**4**	**3**	**300%**	**0**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES	0.2	1.0	0.8	1.2	1.2	1.2	0.9	500%	0.2
WSCH						11.5	11.5	N/A	N/A
FTEF						0.1	0.1	N/A	N/A
WSCH/FTEF	N/A	N/A	N/A	N/A	N/A	115.0	115.0	N/A	N/A
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 306**

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	14	18	24	0	17	21	16	50%	0
Sections	1	1	1		1	1	1	0%	N/A
Average class size	**14**	**18**	**24**	**N/A**	**17**	**21**	**19**	**50%**	**N/A**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES	1.8	2.3	3.1		2.2	2.7	2.4	50%	N/A
WSCH	56.0	72.0	96.0		68.0	84.0	75.2	50%	N/A
FTEF	0.3	0.3	0.3		0.1	0.1	0.2	-67%	N/A
WSCH/FTEF	186.7	240.0	320.0	N/A	680.0	840.0	453.3	350%	N/A
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 307**

	Academic Year (Summer to Spring)						6 Year	6 Year %	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	Change	Slope
Enrollment	23	11	0	19	17	19	15	-17%	0
Sections	2	2		1	1	1	1	-50%	N/A
Average class size	**12**	**6**	**N/A**	**19**	**17**	**19**	**14**	**65%**	**N/A**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES	4.5	2.1		4.1	3.8	4.6	3.8	2%	N/A
WSCH	138.0	66.0		125.4	117.3	141.0	117.5	2%	N/A
FTEF	0.7	0.7		0.4	0.2	0.6	0.5	-14%	N/A
WSCH/FTEF	197.1	94.3	N/A	313.5	586.5	235.0	285.3	19%	N/A
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 308**

	Academic Year (Summer to Spring)						6 Year	6 Year %	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	Change	Slope
Enrollment	25	22	35	19	22	18	24	-28%	-1
Sections	2	2	2	1	1	1	2	-50%	0
Average class size	**13**	**11**	**18**	**19**	**22**	**18**	**17**	**44%**	**2**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES	4.9	4.3	6.8	4.1	4.7	3.8	4.8	-22%	-0.2
WSCH	150.0	60.0	210.0	125.4	145.2	118.8	134.9	-21%	0.4
FTEF	0.2	0.1	0.7	0.4	0.2	0.2	0.3	0%	0.0
WSCH/FTEF	750.0	600.0	300.0	313.5	726.0	594.0	547.3	-21%	-11.1
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 309**

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	0	0	0	21	0	0	4	N/A	1
Sections				1			1	N/A	N/A
Average class size	**N/A**	**N/A**	**N/A**	**21**	**N/A**	**N/A**	**21**	**N/A**	**N/A**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES				0.9			0.9	N/A	N/A
WSCH				26.7			26.7	N/A	N/A
FTEF				0.1			0.1	N/A	N/A
WSCH/FTEF	N/A	N/A	N/A	267.0	N/A	N/A	267.0	N/A	N/A
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 312**

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	14	15	24	21	21	23	20	64%	2
Sections	1	1	1	1	1	1	1	0%	0
Average class size	**14**	**15**	**24**	**21**	**21**	**23**	**20**	**64%**	**2**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES	2.7	2.9	4.7	4.3	4.5	4.9	4.0	81%	0.4
WSCH	84.0	90.0	144.0	132.0	138.6	151.8	123.4	81%	13.5
FTEF	0.4	0.4	0.4	0.4	0.2	0.2	0.3	-50%	0.0
WSCH/FTEF	210.0	225.0	360.0	330.0	693.0	759.0	429.5	261%	117.7
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	095650	WLDT 315

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	5	0	0	16	18	17	9	240%	4
Sections	1			1	1	1	1	0%	N/A
Average class size	**5**	**N/A**	**N/A**	**16**	**18**	**17**	**14**	**240%**	**N/A**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES	1.3			4.5	5.0	4.7	3.9	262%	N/A
WSCH	40.0			137.6	154.8	146.2	119.7	266%	N/A
FTEF	0.5			0.5	0.4	0.4	0.5	-20%	N/A
WSCH/FTEF	80.0	N/A	N/A	275.2	387.0	365.5	276.9	357%	N/A
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	095650	WLDT 316

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	0	0	0	40	17	13	12	N/A	4
Sections				2	1	1	1	N/A	N/A
Average class size	**N/A**	**N/A**	**N/A**	**20**	**17**	**13**	**17**	**N/A**	**N/A**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES				1.9	0.8	0.7	1.1	N/A	N/A
WSCH				59.6	25.2	20.8	35.2	N/A	N/A
FTEF				0.2	0.0	0.0	0.1	N/A	N/A
WSCH/FTEF	N/A	N/A	N/A	298.0	N/A	N/A	298.0	N/A	N/A
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 317**

	Academic Year (Summer to Spring)						6 Year	6 Year %	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	Change	Slope
Enrollment	0	0	0	0	0	3	1	N/A	0
Sections						1	1	N/A	N/A
Average class size	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**3**	**3**	**N/A**	**N/A**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES						0.2	0.2	N/A	N/A
WSCH							N/A	N/A	N/A
FTEF							N/A	N/A	N/A
WSCH/FTEF	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 319**

	Academic Year (Summer to Spring)						6 Year	6 Year %	Linear Trend
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	Change	Slope
Enrollment	0	0	0	41	36	0	13	N/A	4
Sections				2	2		2	N/A	N/A
Average class size	**N/A**	**N/A**	**N/A**	**21**	**18**	**N/A**	**19**	**N/A**	**N/A**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES				2.0	1.6		1.8	N/A	N/A
WSCH				61.0	50.6		55.8	N/A	N/A
FTEF				0.2	0.1		0.2	N/A	N/A
WSCH/FTEF	N/A	N/A	N/A	305.0	506.0	N/A	405.5	N/A	N/A
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 330**

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	8	0	17	11	15	20	12	150%	3
Sections	1		1	1	1	1	1	0%	N/A
Average class size	**8**	**N/A**	**17**	**11**	**15**	**20**	**14**	**150%**	**N/A**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES	1.6		3.3	2.4	3.2	4.3	3.0	169%	N/A
WSCH	48.0		102.0	72.6	99.0	132.0	90.7	175%	N/A
FTEF	0.1		0.4	0.4	0.2	0.2	0.3	100%	N/A
WSCH/FTEF	480.0	N/A	255.0	181.5	495.0	660.0	414.3	38%	N/A
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 331**

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	1	0	2	5	2	2	2	100%	0
Sections	1		1	1	1	1	1	0%	N/A
Average class size	**1**	**N/A**	**2**	**5**	**2**	**2**	**2**	**100%**	**N/A**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES	0.1		0.3	0.7	0.3	0.3	0.3	200%	N/A
WSCH							N/A	N/A	N/A
FTEF							N/A	N/A	N/A
WSCH/FTEF	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 335**

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	0	0	0	22	0	0	4	N/A	1
Sections				1			1	N/A	N/A
Average class size	**N/A**	**N/A**	**N/A**	**22**	**N/A**	**N/A**	**22**	**N/A**	**N/A**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES				0.8			0.8	N/A	N/A
WSCH				23.3			23.3	N/A	N/A
FTEF				0.0			0.0	N/A	N/A
WSCH/FTEF	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program	Topcode	Course
Welding	**095650**	**WLDT 399**

	Academic Year (Summer to Spring)						6 Year Average	6 Year % Change	Linear Trend Slope
Item	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13			
Enrollment	98	68	45	0	0	0	35	-100%	-21
Sections	12	8	4				8	-100%	N/A
Average class size	**8**	**9**	**11**	**N/A**	**N/A**	**N/A**	**9**	**N/A**	**N/A**
AHC avg class size	21	21	24	29	25	27	25	28%	1
FTES	4.4	3.1	2.1				3.2	-100%	N/A
WSCH	88.2	63.5	42.4				64.7	-100%	N/A
FTEF	0.5	0.4	0.2				0.4	-100%	N/A
WSCH/FTEF	176.4	158.8	212.0	N/A	N/A	N/A	182.4	N/A	N/A
AHC WSCH/FTEF	378.1	418.3	447.4	484.5	347.6	331.9	401	-12%	-12

Program Review Trend Data: Summary by Location and Distance Learning

Program	Topcode
Welding	095650

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Enrollment	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Santa Maria Day	99	85	123	140	125	137	118	38%	9
Santa Maria Eve	225	208	214	280	214	207	225	-8%	0
Lompoc Valley Center							N/A	N/A	N/A
Distance Learning							N/A	N/A	N/A
All Other							N/A	N/A	N/A

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Retention Rate	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Santa Maria Day	77%	93%	88%	91%	90%	88%	88%	14%	0.01
Santa Maria Eve	88%	95%	93%	91%	86%	91%	91%	3%	0.00
Lompoc Valley Center							N/A	N/A	N/A
Distance Learning							N/A	N/A	N/A
All Other							N/A	N/A	N/A

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Success Rate	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Santa Maria Day	70%	78%	83%	80%	75%	82%	78%	17%	0.01
Santa Maria Eve	84%	86%	79%	79%	72%	73%	79%	-13%	-0.03
Lompoc Valley Center							N/A	N/A	N/A
Distance Learning							N/A	N/A	N/A
All Other							N/A	N/A	N/A

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
FTES	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Santa Maria Day	18.5	14.4	21.6	28.2	24.9	27.6	23	49%	2
Santa Maria Eve	28.8	29.1	34.5	39.0	36.2	41.4	35	44%	3
Lompoc Valley Center							N/A	N/A	N/A
Distance Learning							N/A	N/A	N/A
All Other							N/A	N/A	N/A

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
WSCH	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Santa Maria Day	564.0	342.0	642.0	807.0	736.1	831.5	654	47%	77
Santa Maria Eve	838.2	777.5	1038.4	1210.5	1105.4	1259.4	1038	50%	93
Lompoc Valley Center							N/A	N/A	N/A
Distance Learning							N/A	N/A	N/A
All Other							N/A	N/A	N/A

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
FTEF	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Santa Maria Day	2.2	1.6	2.1	2.2	1.2	1.7	2	-23%	0
Santa Maria Eve	3.2	2.6	3.1	3.6	1.4	1.9	3	-41%	0
Lompoc Valley Center							N/A	N/A	N/A
Distance Learning							N/A	N/A	N/A
All Other							N/A	N/A	N/A

	Academic Year (Summer to Spring)						6 Year	6 Year	Linear Trend
Productivity Load	2007-08	2008-09	2009-10	2010-11	2011-2012	2012-13	Average	% Change	Slope
Santa Maria Day	256.4	213.8	305.7	366.8	613.4	489.1	374	91%	69
Santa Maria Eve	261.9	299.0	335.0	336.3	789.6	662.8	447	153%	99
Lompoc Valley Center	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Distance Learning	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

ISLO/PSLO Summary Map by Course

Outcomes for: **Welding Technology Program Outcomes**

Selected owner: **Welding Technology**

List of ISLOs/PSLOs:

A WLDT PSLO - Pass at least one welder qualification test (3G-verticle or 4Goverhead) using at least one basic process.

B WLDT PSLO - Pass the GMAW and SMAW processes to the American Welding Societies D1.1 Structural Welding Code.

C WLDT PSLO - Have competency in blueprint reading.

D WLDT PSLO - Have a working knowledge of metallurgy.

E WLDT PSLO - Be able to do a basic layout, fitting and cutting operation.

F WLDT PSLO - Operate basic welding equipment in a safe manner.

G WLDT PSLO - Weld, cut and fit ferrous and non-ferrous materials to industry standard.

H WLDT PSLO - Course doesn't map to degree or certificate.

	Welding Technology Program Outcomes							**Welding Technology Program Outcomes**	
	A	B	C	D	E	F	G	H	**Totals:**
WLDT106				2		1			**3**
WLDT107						3			**3**
WLDT301						3			**3**
WLDT306			2		1				**3**
WLDT307						3			**3**
WLDT308						3			**3**
WLDT312						3			**3**
WLDT315			1			2			**3**
WLDT316								2	**2**
WLDT317								3	**3**
WLDT319								3	**3**

	Welding Technology Program Outcomes							Welding Technology Program Outcomes	
	A	B	C	D	E	F	G	H	**Totals:**
WLDT330	1					2			**3**
WLDT331	1					2			**3**
WLDT335									
WLDT381									
Totals:	**2**		**3**	**2**	**1**	**22**		**8**	

Course Statistics and Evidence

Course Group: **Welding Technology Course Group**
Outcomes Group: **Welding Technology Program Outcomes**

Statistics		
# Catalog Courses:	15	WLDT106, WLDT107, WLDT301, WLDT306, WLDT307, WLDT308, WLDT312, WLDT315, WLDT316, WLDT317, WLDT319, WLDT330, WLDT331, WLDT335, WLDT381
# Catalog Courses with CSLOs:	14	WLDT106, WLDT107, WLDT301, WLDT306, WLDT307, WLDT308, WLDT312, WLDT315, WLDT316, WLDT317, WLDT319, WLDT330, WLDT331, WLDT381
# Catalog Courses without CSLOs:	1	WLDT335
# Catalog Courses whose CSLOs are mapped to PSLOs:	13	WLDT106, WLDT107, WLDT301, WLDT306, WLDT307, WLDT308, WLDT312, WLDT315, WLDT316, WLDT317, WLDT319, WLDT330, WLDT331
# Catalog Courses whose CSLOs are NOT mapped to PSLOs:	2	WLDT335, WLDT381
# Catalog Courses whose CSLOs are mapped to ISLOs:	14	WLDT106, WLDT107, WLDT301, WLDT306, WLDT307, WLDT308, WLDT312, WLDT315, WLDT316, WLDT317, WLDT319, WLDT330, WLDT331, WLDT381
# Catalog Courses whose CSLOs are NOT mapped to ISLOs:	1	WLDT335
# Catalog Courses with Planned Assessments:(Term-specific)	14	WLDT106, WLDT107, WLDT301, WLDT306, WLDT307, WLDT308, WLDT312, WLDT315, WLDT316, WLDT317, WLDT319, WLDT330, WLDT331, WLDT381
# Catalog Courses without Planned Assessments(Term-specific)	1	WLDT335
# Catalog Courses with Assessment Data:(Term-specific)	14	WLDT106, WLDT107, WLDT301, WLDT306, WLDT307, WLDT308, WLDT312, WLDT315, WLDT316, WLDT317, WLDT319, WLDT330, WLDT331, WLDT381
# Catalog Courses without Assessment Data:(Term-specific)	1	WLDT335
# Catalog Courses with a Completed CIP:(Term-specific)	11	WLDT106, WLDT107, WLDT301, WLDT306, WLDT308, WLDT312, WLDT315, WLDT316, WLDT317, WLDT330, WLDT381
# Catalog Courses without a Completed CIP:(Term-specific)	4	WLDT307, WLDT319, WLDT331, WLDT335
Terms in which CSLOs were defined or modified:(Term-specific)	Summer 2013, Spring 2013, Fall 2012, Spring 2012, Fall 2011	

Active Courses

Course: 1.	WLDT106 Beginning Welding
Owner:	Welding Technology
Course Groups:	All Course Group - 100 Level Courses, Auto Body Technology (A.S.), Electronics Technology: Mechatronics (A.S. & Certificate), Engineering Technology w/Emph. Megatronics (A.S. & Certificate), INDUSTRIAL TECHNOLOGY DEPARTMENT, Machining & Manufacturing Technology (A.S. & Certificate), Welding Technology (A.S. & Certificate), Welding Technology Course Group, Welding Technology: Metal Fabrication (Certificate), Welding Technology: Pipe Welding Technology (Certificate)
CSLOs:	• WLDT106 SLO1 - Develop basic welding skills using both the shielded metal arc and oxyacetlyne process in the flat position. • WLDT106 SLO2 - Flame weld thin sheet steel in the flat and horizontal positions. • WLDT106 SLO3 - Perform SMAW process on mild steel.
PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Have a working knowledge of metallurgy. • WLDT PSLO - Operate basic welding equipment in a safe manner.
ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.
Planned Asmts:(Term-specific)	• Spring 2013 Sec A welding 106 final • Spring 2013 Sec C Arc Welding Lab • Fall 2012 Sec C Arc Welding Lab
Terms with Scores:(Term-specific)	• Fall 2012 • Spring 2013
Course Analysis:(Term-specific)	**Fall 2012** • [What did the assessment data indicate about the strengths of your course?]We are producing welders! • [What did the assessment data indicate about the weaknesses of your course?]Nothing. • [What changes have you made/do you plan to make based on the data? What resources would you need, if any, to make these changes?]Nothing at this time.
Course: 2.	WLDT107 Advanced Welding
Owner:	Welding Technology

Course Groups:	All Course Group - 100 Level Courses, Electronics Technology: Mechatronics (A.S. & Certificate), Engineering Technology w/Emph. Megatronics (A.S. & Certificate), INDUSTRIAL TECHNOLOGY DEPARTMENT, Welding Technology (A.S. & Certificate), Welding Technology Course Group, Welding Technology: Metal Fabrication (Certificate), Welding Technology: Pipe Welding Technology (Certificate)
CSLOs:	• WLDT107 SLO1 - Be familiar with all welding positions and basic welding electrodes used in industry. • WLDT107 SLO2 - Perform SMAW welding in all positions. • WLDT107 SLO3 - Identify, fit and weld all five basic joints.
PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Operate basic welding equipment in a safe manner.
ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.
Planned Asmts:(Term-specific)	• Fall 2012 Sec B Final Project & Instructor Observation • Fall 2012 Sec B exam
Terms with Scores:(Term-specific)	• Fall 2012
Course Analysis:(Term-specific)	**Fall 2012** • [What did the assessment data indicate about the strengths of your course?]I had approximately 28% above standard and 50% at standard. • [What did the assessment data indicate about the weaknesses of your course?]22% stopped showing up after the drop deadline and I had a few students below standard. • [What changes have you made/do you plan to make based on the data? What resources would you need, if any, to make these changes?]emphasize the importance of showing up to class and taking advantage of every lecture and lab time.
Course: 3.	WLDT301 Selected Welding Project
Owner:	Welding Technology
Course Groups:	All Course Group - 300 Level, INDUSTRIAL TECHNOLOGY DEPARTMENT, Welding Technology Course Group
CSLOs:	• WLDT301 SLO1 - Plan and follow through to completion a pre-defined project. • WLDT301 SLO2 - Fabricate a project using the welding shop facility and equipment. • WLDT301 SLO3 - Use shop equipment and tools in a safe manner as would be required by industry. Function in welding facility in a safe manner.
PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Operate basic welding equipment in a safe manner.
ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.
Planned Asmts:(Term-specific)	• Fall 2012 Sec A Final Project
Terms with Scores:(Term-specific)	• Fall 2012
Course Analysis:(Term-specific)	**Fall 2012** • [What did the assessment data indicate about the strengths of your course?]All but one student met or exceeded the standard for this class. • [What did the assessment data indicate about the weaknesses of your course?]None • [What changes have you made/do you plan to make based on the data? What resources would you need, if any, to make these changes?]Nothing at this time.
Course: 4.	WLDT306 Layout Fabrication Interpretat
Owner:	Welding Technology
Course Groups:	All Course Group - 300 Level, Electronics Technology: Mechatronics (A.S. & Certificate), Engineering Technology w/Emph. Megatronics (A.S. & Certificate), INDUSTRIAL TECHNOLOGY DEPARTMENT, Welding Technology (A.S. & Certificate), Welding Technology Course Group, Welding Technology: Metal Fabrication (Certificate), Welding Technology: Pipe Welding Technology (Certificate)
CSLOs:	• WLDT306 SLO1 - Understand the techniques and methods of metal assembly and fabrication. Appreciate the interpretation of shop drawings and working drawings. • WLDT306 SLO2 - Design and fabricate projects of metal. Identify and apply AWS standards and codes to the work place. • WLDT306 SLO3 - Solve problems associated with fabrication expansion and construction.
PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Have competency in blueprint reading. • WLDT PSLO - Be able to do a basic layout, fitting and cutting operation.

ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.

Planned Asmts:(Term-specific)	• Spring 2013 Sec A welding 306 layout fabrication interpretation • Spring 2012 Sec A Final Project & Instructor Observation
Terms with Scores:(Term-specific)	• Spring 2012 • Spring 2013
Course Analysis:(Term-specific)	**Spring 2012** • [What did the assessment data indicate about the strengths of your course?]Most of the students were able to complete the task given in the amount of time provided. • [What did the assessment data indicate about the weaknesses of your course?]Some students did not have enough time or were not as prepared enough to be in the class. • [What changes have you made/do you plan to make based on the data? What resources would you need, if any, to make these changes?]I believe that the class needs to be longer, and that the assessments from the lower level classes will provide information about the performance s in those classes that prepare students for higher level classes.
Course: 5.	WLDT307 G.M.A.W. Welding
Owner:	Welding Technology
Course Groups:	All Course Group - 300 Level, Electronics Technology: Mechatronics (A.S. & Certificate), Engineering Technology w/Emph. Megatronics (A.S. & Certificate), INDUSTRIAL TECHNOLOGY DEPARTMENT, Welding Technology (A.S. & Certificate), Welding Technology Course Group
CSLOs:	• WLDT307 SLO1 - Weld a variety of metal using the GMAW process. • WLDT307 SLO2 - Know the four basic transfer mode in GMAW welding. • WLDT307 SLO3 - Set up the GMAW process equipment.
PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Operate basic welding equipment in a safe manner.
ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.
Planned Asmts:(Term-specific)	• Fall 2012 Sec A Final
Terms with Scores:(Term-specific)	• Fall 2012
Course: 6.	WLDT308 T.I.G. Welding
Owner:	Welding Technology
Course Groups:	All Course Group - 300 Level, Electronics Technology: Mechatronics (A.S. & Certificate), Engineering Technology w/Emph. Megatronics (A.S. & Certificate), INDUSTRIAL TECHNOLOGY DEPARTMENT, Welding Technology (A.S. & Certificate), Welding Technology Course Group
CSLOs:	• WLDT308 SLO1 - Diagnose gas tungsten arc welding equipment. • WLDT308 SLO2 - Learn power supply variables. • WLDT308 SLO3 - Set up the GTAW process equipment. Weld Ferris and non-Ferris metal with the GTAW process.
PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Operate basic welding equipment in a safe manner.
ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.
Planned Asmts:(Term-specific)	• Spring 2012 Sec A Final Project & Instructor Observation
Terms with Scores:(Term-specific)	• Spring 2012
Course Analysis:(Term-specific)	**Spring 2012** • [What did the assessment data indicate about the strengths of your course?]Assessment data indicates strength of course overall is classroom, lectures, instruction, and demonstration. • [What did the assessment data indicate about the weaknesses of your course?]The weakness of my course has indicated more hands on gas tungsten welding techniques. • [What changes have you made/do you plan to make based on the data? What resources would you need, if any, to make these changes?]The changes I would make based on the data are tig welding techniques (walking the tig cup)
Course: 7.	WLDT312 Pipe Fitting & Welding
Owner:	Welding Technology

Course Groups:	All Course Group - 300 Level, INDUSTRIAL TECHNOLOGY DEPARTMENT, Welding Technology (A.S. & Certificate), Welding Technology Course Group, Welding Technology: Pipe Welding Technology (Certificate)
CSLOs:	• WLDT312 SLO1 - Use safe shop procedures. • WLDT312 SLO2 - Flame cut and fit pipe using standard templates. Prepare pipe for welding. • WLDT312 SLO3 - Use shop equipment and tools in a safe manner as would be required by industry.

PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Operate basic welding equipment in a safe manner.
ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.
Planned Asmts:(Term-specific)	• Fall 2012 Sec A pipe fitting test
Terms with Scores:(Term-specific)	• Fall 2012
Course Analysis:(Term-specific)	**Fall 2012** • [What did the assessment data indicate about the strengths of your course?]All students met or exceeded the standards of the class. • [What did the assessment data indicate about the weaknesses of your course?]None. • [What changes have you made/do you plan to make based on the data? What resources would you need, if any, to make these changes?]Students would benefit from updated beveler equipment.
Course: 8.	WLDT315 Metal Fabrication
Owner:	Welding Technology
Course Groups:	All Course Group - 300 Level, Electronics Technology: Mechatronics (A.S. & Certificate), Engineering Technology w/Emph. Megatronics (A.S. & Certificate), INDUSTRIAL TECHNOLOGY DEPARTMENT, Welding Technology (A.S. & Certificate), Welding Technology Course Group, Welding Technology: Metal Fabrication (Certificate)
CSLOs:	• WLDT315 SLO1 - Assemble components into final products by reading and interpreting blue prints and schematics. Extract material list from shop drawings and blue prints as required. • WLDT315 SLO2 - Flame cut weld, machine and fabricate parts and sub-assemblies. Design and prepare working drawings. • WLDT315 SLO3 - Use shop equipment and tools in a safe manner as would be required by industry.
PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Have competency in blueprint reading. • WLDT PSLO - Operate basic welding equipment in a safe manner.
ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 1 - Communication • ILO 1 - Communication: Communicate effectively using verbal, visual and written language with clarity and purpose in workplace, community and academic contexts. ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.
Planned Asmts:(Term-specific)	• Fall 2012 Sec A semester project
Terms with Scores:(Term-specific)	• Fall 2012
Course Analysis:(Term-specific)	**Fall 2012** • [What did the assessment data indicate about the strengths of your course?]In this class student completed the task of joining techniques and processes on their projects. All students were successful. • [What did the assessment data indicate about the weaknesses of your course?]None • [What changes have you made/do you plan to make based on the data? What resources would you need, if any, to make these changes?]Not at this time.
Course: 9.	WLDT316 Metal Yard Sculptures
Owner:	Welding Technology
Course Groups:	All Course Group - 300 Level, INDUSTRIAL TECHNOLOGY DEPARTMENT, Welding Technology Course Group
CSLOs:	• WLDT316 SLO1 - Students will have working knowledge of metallurgy. • WLDT316 SLO2 - Students will do basic layout, fitting and cutting operation. • WLDT316 SLO3 - Student will operate basic shop equipment in a safe manner. • WLDT316 SLO4 - Students will cut and fit ferris materials in preparation for welding to course standards.
PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Course doesn't map to degree or certificate.

ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.
Planned Asmts:(Term-specific)	• Fall 2012 Sec A Final Project & Instructor Observation
Terms with Scores:(Term-specific)	• Fall 2012

Course Analysis:(Term-specific)	**Fall 2012** • [What did the assessment data indicate about the strengths of your course?]All students exceeded the standards in this course. • [What did the assessment data indicate about the weaknesses of your course?]None. • [What changes have you made/do you plan to make based on the data? What resources would you need, if any, to make these changes?]No changes at this time.
Course: 10.	WLDT317 Ornamental Iron 1
Owner:	Welding Technology
Course Groups:	All Course Group - 300 Level, INDUSTRIAL TECHNOLOGY DEPARTMENT, Welding Technology Course Group
CSLOs:	• WLDT317 SLO1 - Identify, understand and use basic welding equipment. • WLDT317 SLO2 - Learn to set-up welding equipment. • WLDT317 SLO3 - Learn to work safely in the welding shop environment.
PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Course doesn't map to degree or certificate.
ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.
Planned Asmts:(Term-specific)	• Fall 2012 Sec A Final Project and Instructor Observation
Terms with Scores:(Term-specific)	• Fall 2012
Course Analysis:(Term-specific)	**Fall 2012** • [What did the assessment data indicate about the strengths of your course?]All students met the standards of the course. • [What did the assessment data indicate about the weaknesses of your course?]None • [What changes have you made/do you plan to make based on the data? What resources would you need, if any, to make these changes?]Nothing at this time.
Course: 11.	WLDT319 Blacksmithing Projects
Owner:	Welding Technology
Course Groups:	All Course Group - 300 Level, INDUSTRIAL TECHNOLOGY DEPARTMENT, Welding Technology Course Group
CSLOs:	• WLDT319 SLO1 - Identify, understand and use basic welding equipment. • WLDT319 SLO2 - Learn to set-up welding equipment. • WLDT319 SLO3 - Learn to work safely in the welding shop environment.
PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Course doesn't map to degree or certificate.
ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.
Planned Asmts:(Term-specific)	• Spring 2012 Sec B Final Project & Instructor Observation
Terms with Scores:(Term-specific)	• Spring 2012
Course: 12.	WLDT330 Welding Certification
Owner:	Welding Technology
Course Groups:	All Course Group - 300 Level, INDUSTRIAL TECHNOLOGY DEPARTMENT, Welding Technology (A.S. & Certificate), Welding Technology Course Group
CSLOs:	• WLDT330 SLO1 - Weld in all positions to specific certification standards. • WLDT330 SLO2 - Cut, fit and grind as needed to complete test specimens. • WLDT330 SLO3 - Test at or above 80% proficiency.
PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Pass at least one welder qualification test (3G-verticle or 4Goverhead) using at least one basic process. • WLDT PSLO - Operate basic welding equipment in a safe manner.

ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.
Planned Asmts:(Term-specific)	• Spring 2012 Sec B Final Project & Instructor Observation
Terms with Scores:(Term-specific)	• Spring 2012

Course Analysis:(Term-specific)	**Spring 2012** • [What did the assessment data indicate about the strengths of your course?]All students met the standards. • [What did the assessment data indicate about the weaknesses of your course?]None. • [What changes have you made/do you plan to make based on the data? What resources would you need, if any, to make these changes?]Nothing at this time.
Course: 13.	WLDT331 Adv Weldng Certification Lab
Owner:	Welding Technology
Course Groups:	All Course Group - 300 Level, INDUSTRIAL TECHNOLOGY DEPARTMENT, Welding Technology (A.S. & Certificate), Welding Technology Course Group
CSLOs:	• WLDT331 SLO1 - Weld in all positions to specific certification standards. • WLDT331 SLO2 - Cut, fit and grind as needed to complete test specimens. • WLDT331 SLO3 - Test at or above 80% proficiency.
PSLOs:	Outcomes Group: Welding Technology Program Outcomes Welding Technology Program Outcomes • WLDT PSLO - Pass at least one welder qualification test (3G-verticle or 4Goverhead) using at least one basic process. • WLDT PSLO - Operate basic welding equipment in a safe manner.
ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion.
Planned Asmts:(Term-specific)	• Spring 2012 Sec B Final Project & Instructor Observation
Terms with Scores:(Term-specific)	• Spring 2012
Course: 14.	WLDT335 Flux Core Arc Welding
Owner:	Welding Technology
Course Groups:	Welding Technology Course Group
Course: 15.	WLDT381 Industrial Mathematics
Owner:	Welding Technology
Course Groups:	All Course Group - 300 Level, INDUSTRIAL TECHNOLOGY DEPARTMENT, Machine Technology Department Course Group, MT/AB/AT/ET/WLDT381 - INDUSTRIAL MATHEMATICS, Welding Technology (A.S. & Certificate), Welding Technology Course Group, Welding Technology: Metal Fabrication (Certificate), Welding Technology: Pipe Welding Technology (Certificate)
CSLOs:	• WLDT381 SLO1 - Solve practical dealing with fractions, percentage, ratio, horsepower, and the right triangle. • WLDT381 SLO2 - Select the correct method for solving an applied problem using mathematics. • WLDT381 SLO3 - Solve a programming problem using trigonometry. • WLDT381 SLO4 - Explain the difference between cartesian and polar coordinates. • WLDT381 SLO5 - Formulate a decision after comparing mathematical data.
PSLOs:	Outcomes Group: Machine Technology Program Outcomes Machine Technology Program Outcomes • MT PSLO3 - Possess essential academic skills in reading, writing, math, using and locating information and basic computer competency. • MT100 SLO7 - Possess a variety of basic and high-tech skills consistent with modern manufacturing processes.
ISLOs:	Outcomes Group: Institutional Learning Outcomes (ILOs) ILO 2 - Critical Thinking & Problem Solving • ILO 2 - Critical Thinking & Problem Solving: Explore issues through various information sources; evaluate the credibility and significance of both the information and the source to arrive at a reasoned conclusion. ILO 5 - Quantitative Literacy • ILO 5 - Quantitative Literacy: Use mathematical concepts and models to analyze and solve real life issues or problems.
Planned Asmts:(Term-specific)	• Spring 2013 Sec A Final Exam • Fall 2012 Sec A Final Exam
Terms with Scores:(Term-specific)	• Fall 2012 • Spring 2013

Course Analysis:(Term-specific)	**Spring 2013** • [What did the assessment data indicate about the strengths of your course?]A lot of students are doing well. About more than a third of them are consistently exceeding standards! • [What did the assessment data indicate about the weaknesses of your course?]Unfortunately a lot of students are also doing poorly. I think this is mostly do to personal issues outside of the class, causing poor attendance or lack of time to do homework. • [What changes have you made/do you plan to make based on the data? What resources would you need, if any, to make these changes?]I am not going to be making any changes as I am no longer the teacher for this class. However, if I was returning, I would continue adding more in class work done together as a class. This would further encourage attendance.

COURSE REVIEW VERIFICATION

Discipline: Welding Technology

Year: Fall 2014

As part of the program evaluation process, the self-study team has reviewed the course outlines supporting the discipline/program curriculum. The review process has resulted in the following recommendations:

1. The following course outlines are satisfactory as written and do not require modification (list all such courses):
   WLDT 335 WLDT 317 WLDT 300
   WLDT 334 WLDT 318 WLDT 305
   WLDT 333 WLDT 319 WLDT 309
2. The following courses require minor modification to ensure currency. The self study team anticipates submitting such modifications to the AP&P, FALL 2014 SPRING 2015:
   WLDT 335

3. The following courses require major modification. The self study team anticipates submitting such modifications to the AP&P committee, FALL 2015 SPRING 2016:
   WLDT 106 WLDT 306 WLDT 312 WLDT 330
   WLDT 107 WLDT 307 WLDT 315 WLDT 331
   WLDT 301 WLDT 308 WLDT 316

GRADUATION REQUIREMENTS: General Education (GE), Multicultural/Gender Studies (MCGS) and Health & Safety (H&W) Courses.

The following courses were reviewed as meeting an **AHC GE** requirement. The AP&P GE Criteria and Category Definitions (GE Learning Outcomes) forms were submitted to the AP&P for review on: none

The following courses were reviewed as meeting the **MCGS** requirement. The AP&P MCGS Criteria and Category Definitions (MCGS Learning Outcomes - To Be Developed) forms were submitted to the AP&P for review on: none

The following courses were reviewed as meeting the **H&W** requirement. The AP&P H&W Studies Criteria (To Be Developed) and Category Definitions (H&W Learning Outcomes - To Be Developed) forms were submitted to the AP&P chair for review on: none

Course Review Team Members:

Signature [signature] Date 12/17/2014

Signature AP&P Chair Sofia Ramirez-Celpi Date 20 Jan 2015

Signature Academic Dean [signature] Date 1/5/2015

APPENDICES

Date Prepared:_____
Date Reviewed: Spring 2005
Date Reviewed:_____
PCA Established: Spring 1995

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DEPARTMENT: **INDUSTRIAL TECHNOLOGY AND PUBLIC SAFETY**

PREFIX & NO.: WLD T 106

CATALOG TITLE: Beginning Welding

SCHEDULE TITLE: Beginning Welding

UNITS: 3

WEEKLY LECTURE HOURS: 2

WEEKLY LAB HOURS: 4

TOTAL NUMBER OF WEEKS: (if other than 16)

GRADING OPTION: Credit/No Credit

CATALOG DESCRIPTION
A study of the theory, practice, and application of various metal joining processes, including oxyacetylene welding, brass brazing, flame cutting, and electric arc processes, and an introduction to both TIG and MIG welding.

COURSE GOALS To encourage and enable students to:
1. use gas and electric welding equipment safely.
2. develop basic welding skills using both the shielded metal arc and oxyacetylene process in the flat position.
3. weld and brass braze light sheet metal.
4. perform basic flame cutting operations.
5. have some insight into the gas tungsten and gas metal arc welding processes.

INSTRUCTIONAL OBJECTIVES At the end of the course, students will demonstrate the ability to
1. flame weld thin sheet steel in the flat position, employing edge, butt, lap, and tee splints.
2. weld mild steel in the flat position using various electrodes on butt, lap, tee, and other common welding joints.
3. brass braze light sheet metal.
4. flame cut various thickness of plate steel using the oxyacetylene process.
5. function in a welding facility in a safe manner.
6. use the gas metal arc welding process to weld light gauge mild steel sheet.
7. use the gas tungsten welding process to weld light gauge aluminum.
8. evaluate each job to determine which welding process should be used based on the following criteria:
   A. which process would do the least damage to the project;
   B. how much strength is required;
   C. which process will be the least expensive;
   D. which process will give less clean up time;
   E. what processes are available at the time;
   F. are there any specs that would determine what is to be used.

COURSE OUTLINE

	WEEKS
1. Introduction to the Class and Safety	2
A. general shop safety	
B. grinders and other welding shop equipment	
C. gas welding equipment safety	
D. electric welding safety	
2. Oxyacetylene Welding	5
A. set-up and operation of gas welding equipment	
B. gas welding procedures	
C. how to weld a corner joint without rod	
D. how to weld lap joints using filler rod	
E. how to weld tee joints using filler rod	
F. how to weld butt joints using filler rod	
G. brazing: brass brazing light gauge sheet steel	
H. the oxyacetylene cutting torch	
3. Electric Welding	10
A. welding power supplies	
B. types of arc welding joints	
C. electrodes	

APPROPRIATE READINGS (Other than Textbook)
Jeffas, Larry and Johnson, Harold W. Welding Principles and Applications.

OUTSIDE ASSIGNMENTS
1. Students will be responsible for homework assignments which may include:
   A. outside reading
   B. films or reading assignments in the L.R.C.
2. Weldments as listed on individual progress charts.
3. Welding assignment outside of class.

EVALUATION
1. The student will perform a series of weldments for the instructor.
2. The student will be subject to a manipulative test.
3. The student will be given a series of written examinations based on material given in the textbook and/or lectures.

Sample test question: What is duty cycle and why is it important?

TEXTS AND SUPPLIES
Adopted text: Althouse, Turnquist, Bowditch and Bowditch. Modern Welding.

Other Materials:
1. Welding hood.
2. Gloves.
3. Pliers.
4. Safety glasses.
5. Goggles.

Date Prepared:
Date Reviewed: Fall 2001
Date Reviewed: Spring 2005
PCA Established:

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DEPARTMENT: **INDUSTRIAL TECHNOLOGY AND PUBLIC SAFETY**

PREFIX & NO.: WLD T 107

CATALOG TITLE: Advanced Welding

SCHEDULE TITLE: Advanced Welding

UNITS: 3

WEEKLY LECTURE HOURS: 2

WEEKLY LAB HOURS: 4

TOTAL NUMBER OF WEEKS: (if other than 16)

GRADING OPTION: Credit/No Credit Option

PREREQUISITE: WLD T 106

CATALOG DESCRIPTION
A continuation of WT 106, emphasizing position welding of a variety of ferrous metals, using a variety of electrodes used in industries.

COURSE GOALS To encourage and enable students to:
1. be familiar with all welding positions and basic welding electrodes used in industry.
2. identify and develop an appreciation and application of basic joint designs.

INSTRUCTIONAL OBJECTIVES At the end of the course, students will demonstrate the ability to:
1. weld in all positions using common welding electrodes popular in industry.
2. identify, fit and weld the five basic weld joints used in the welding industry.
3. pass welding tests and exams with at least an eighty percent proficiency.
4. function in a welding facility in an efficient and safe manner.

COURSE OUTLINE

	WEEKS
1. Introduction to the class	1
2. Safety	3
A. general shop safety	
B. grinders and other welding shop equipment	
C. cutting safety and operations	
D. electric arc welding safety	
3. Electric welding	13
A. welding power supplies	
A.C. machines	

transformers
generators

B. D. C. machines
transformers
generators

C. duty cycle
polarity

D. electrode selection and uses

APPROPRIATE READINGS

Althouse, Andrew D. Modern Welding. Goodheart-Wilcox Co. 1984.

OUTSIDE ASSIGNMENTS

1. Students will do assignments listed on progress chart.
2. Homework assignments as determined by the instructor.
3. Written and manipulative exams.

EVALUATION

1. The student will perform a series of weldmants as determines by the instructor.
2. The student will do manipulative test welding out of positions.
3. The student will take written test concerning chapters and lectures given in class.

Sample Test Question: What are the advantages of using E-6011 electrodes, and when should it be used?

TEXTS AND SUPPLIES

Adopted text: Althouse, Turnquist, Bowditch. Modern Welding.

Other Materials:
1. Welding hood.
2. Welding gloves.
3. Cutting goggles.
4. Pliers.

Date Prepared: Spring 1999
Date Reviewed: Spring 2014
Date Reviewed: Spring 2005
PCA Established: Spring 2014
Date DL Conversion Approved

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Auto Body or Automotive or Machine Tool or Welding
Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: **INDUSTRIAL TECHNOLOGY**

PREFIX & NUMBER: WLDT 300

CATALOG COURSE TITLE: Shop Math and Measurement

BANNER COURSE TITLE: Shop Math and Measurement

UNITS: 3

TOTAL NUMBER OF CONTACT HOURS: 48-54

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	3	48 - 54	3
Lab:	0	0 - 0	0
Total Contact Hours:	3	48 - 54	3

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*
None

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success is highly unlikely. Must be included if the course* has *a prerequisite.)*
Upon entering this course, the student should be able to:
None (no prerequisite for this course)

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*
Upon entering this course, the advisory skills are to:
None (no advisory for this course)

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

An introduction to the mathematics used in the Industrial Technology programs. Students will learn to solve problems using fractions, decimals, percentage, ratios and basic geometric shapes. Students will learn about the Cartesian coordinate system and how to use a variety of basic and precision measuring tools from rulers and tape measures to calipers and micrometers. This course is not open to students who have received credit for AB 381, AT 381, ET 381, MT 381, or AB/AT/ET/MT 300.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on l6 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
Basic Measuring Tools	2
Precision Measuring Tools	2
Fractions	1
Decimal Fractions	1
Percentage	2
Areas & Volumes	2
Ratio & Proportion	2
Geometric Fundamentals	2
Trigonometry at Work	2

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. Solve problems dealing with fractions, percentage, ratios.
2. Understand and interpret decimal numbers and fractions.
3. Select the correct method for solving an applied problem using mathematics.
4. Define the properties of basic geometric shapes.
5. Identify locations using the Cartesian coordinate system.
6. Use a variety of basic and precision measuring tools.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction
1. Lecture presentations and classroom discussions. 2. Video and audio presentations followed by group discussion. 3. Instructor-guided individual and group projects.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Outside Assignments
1. Maintain notebook on weekly class topics. 2. Use the Internet to research quality documentation. 3. Complete and submit regular worksheets. Sample Writing Assignment: In at least one paragraph, discuss the relationship between quality and documentation in manufacturing.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Written examinations for textbook chapters graded for accuracy and content. 2. Notebooks graded for accuracy and content. 3. Comprehensive final exam graded for accuracy and content. Sample Essay Question: Describe the importance of sketches.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: Applied Mathematics, Phagan, ISBN 9781605252780, 2010, Edition 4

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Solve problems dealing with fractions, percentage, ratios.
2. Understand and interpret decimal numbers and fractions.
3. Select the correct method for solving an applied problem using mathematics.
4. Define the properties of basic geometric shapes.
5. Identify locations using the Cartesian coordinate system.
6. Use a variety of basic and precision measuring tools.

Date BOT Approved: Dec. 10, 2013
Date Reviewed:
Date Reviewed:
PCA Established:
Date DL Conversion Approved

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Welding

Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: INDUSTRIAL TECHNOLOGY

PREFIX & NUMBER: WLDT 305

CATALOG COURSE TITLE: Welded Sculptural Projects

BANNER COURSE TITLE: **WELDED SCULPTURAL PROJECTS**

UNITS: 1

TOTAL NUMBER OF CONTACT HOURS: 32-36

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	.5	8-9	.5
Lab:	1.5	24-27	.5
Total Contact Hours:	2	32-36	1

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*
None

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success are highly unlikely. Must be included if the course* has *a prerequisite.)*
Upon entering this course, the student should be able to:
None (no prerequisite for this course)

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*
Upon entering this course, the advisory skills are to:
None (no advisory for this course)

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

The course is an introduction to fundamentals of conceptualizing sculptural forms and fabricating these forms using shop machines and tools. Students will develop skill techniques of cutting, forming, forging, welding and finishing ferrous metal.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on l6 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
1. Review and discuss safety rules and regulations. Tour the shop with an introduction to shop machines and tools to cut, shear, roll, bend, forge, and drill metal.	8
2. Design sculptural forms using readily available ornamental iron components. Create a simplistic sculpture using basic shop equipment.	
3. Conceptualize and fabricate a stylistic metal form using found metal such as industrial scrap, household discards etc.	
4. Explore the blacksmithing technique of creating sculptural forms by air puffing welding metal forms into three dimensional sculptures.	
5. Design and fabricate a sculpture using cutting, rolling, bending and welding machines.	
6. Demonstrate use of manual and machine hammers in conjunction with gas forges to form metal.	
7. Demonstrate metal finishing processes of polishing, heat and chemical patination, texturing, and commercial colorizing.	
8. Review learned skills and processes and complete projects.	

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. Safely operate shop machines and tools.
2. Create and finish a unique sculptural form.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction
1. Demonstrations with students reciprocating.

2. Continual critiquing of student progress.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Outside Assignments
1. Visit art and craft galleries paying special attention to design and fabrication techniques. 2. Investigate and create a sketch book on outstanding sculptural examples.

METHODS OF EVALUATION (*List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Observation of student progress in learning and applying skills and processes demonstrated and discussed in class. 2. Grading of student projects.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: None

Supplemental Readings and/or Other Materials: Periodicals and books displaying metal sculptural forms.

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Understand and follow procedures in the safe and proper use of shop equipment.
2. Enhanced ability to visualize a desired sculpture and determine proper tools and or machines to fabricate the form.
3. Learn the mechanics of joining metal with welding machines.

Date Prepared: Fall 2000
Date Reviewed: Spring 2005
Date Reviewed:
PCA Established: Fall 2000

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DEPARTMENT: **INDUSTRIAL TECHNOLOGY AND PUBLIC SAFETY**

PREFIX & NO.: WLD T 306

CATALOG TITLE: Layout and Fabrication Interpretation

SCHEDULE TITLE: Layout Fabrication Interpretation

UNITS: 3

WEEKLY LECTURE HOURS: 2

WEEKLY LAB HOURS: 2

TOTAL NUMBER OF WEEKS: (if other than 16)

GRADING OPTION: Credit/No Credit Option

PREREQUISITE: None

CATALOG DESCRIPTION
Enables student welders to interpret working drawings and shop drawings. Students will sketch fabrication and layout schemes for welding and jigs and/or assembly of small projects.

COURSE GOALS To encourage and enable students to:
1. understand the techniques and methods of metal assembly and fabrication.
2. appreciate the interpretation of shop drawings and working drawings.
3. appreciate the layout problems caused by expansion and contraction of metals.

INSTRUCTIONAL OBJECTIVES At the end of the course, students will demonstrate the ability to:
1. design the layout and fabrication for projects of metals.
2. identify and apply A.W.S. standards and codes to the work place.
3. solve problems associated with fabrication expansion and construction problems.
4. evaluate the correctness of shop drawings for errors and omissions.
5. design a welding fixture that will address an expansion problem.

COURSE OUTLINE

	WEEKS
1. Communications Between The Designer and The Fabricator - AWS Standards and Building Codes	2
2. Types of Prints and Drawings	3
3. Fabrication Techniques	5
A. pipe	
B. plate	
C. structural steel	

4. Process and Procedures 3
   A. materials list
   B. fabrication sequencing
   C. use of jigs and fixtures
5. Design of Jigs and Fixtures 3
   A. locating devices
   B. holding devices
   C. compensating devices

APPROPRIATE READINGS

1. Bennett-Sly. Blue Print Reading for Welders. Fourth edition.
2. Jensen-Hinex. Interpreting Engineering Drawings.

OUTSIDE ASSIGNMENTS

Sample Assignments:

1. Students will write a report on the procedures necessary to convert a set of prints into a finished product (written).
2. Students will design and draw plans for a given project.
3. Students will visit and report on the fabrication procedures at a fabrication facility.

EVALUATION

Evaluation is based on:

1. the ability to interpret drawings and specifications.
2. the ability to write reports.
3. the ability to develop a material and cut list.
4. the ability to synthesize the fabrication process.

TEXTS AND SUPPLIES

Adopted text: O'Con-Carr. Metal Fabrication - A Practical Guide. Printice Hall, 1985.

Other Materials:
1. Films provided by the instructor.
2. Drawing supplies.
3. Notebook/pen/pencil.
4. Safety glasses.

Date Prepared: Fall 1988
Date Reviewed: Spring 2005
Date Reviewed:
PCA Established:

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DEPARTMENT: **INDUSTRIAL TECHNOLOGY AND PUBLIC SAFETY**

PREFIX & NO.: WLD T 307

CATALOG TITLE: G.M.A.W. Welding

SCHEDULE TITLE: G.M.A.W. Welding

UNITS: 3

WEEKLY LECTURE HOURS: 2

WEEKLY LAB HOURS: 4

TOTAL NUMBER OF WEEKS: (if other than 16)

GRADING OPTION: Credit/No Credit Option

PREREQUISITE: WLD T 106

CATALOG DESCRIPTION
Provides students with the theory and practical applications of gas metallic arc welding (G.M.A.W.) and the operation of gas metal arc welding equipment.

COURSE GOALS To encourage and enable students to:
1. operate gas metal arc welding equipment.
2. diagnose gas metal arc welding equipment.
3. use the basic technique of gas metal arc welding.
4. weld both ferrous and non-ferrous metals with gas metal arc welding equipment.
5. do minor repair on gas metal arc welding equipment.

INSTRUCTIONAL OBJECTIVES At the end of the course, students will demonstrate the ability to:
1. weld aluminum, steel and stainless steel in all positions using gas metal arc welding equipment.
2. weld with gas metal arc welding equipment using
   A. short arc transfer technique
   B. spray arc transfer technique
   C. globular transfer technique
   D. cored wire welding
3. set-up, adjust and correct as necessary to produce the desired welds.
4. assemble and disassemble gas welding equipment.
5. evaluate G.M.A.W. welds for their quality and appearance and be able to make the necessary corrections.

COURSE OUTLINE

	WEEKS
1. Refresher In:	4
A. safety in G.M.A.W. welding	

B. handling of compressed gasses
C. use of gasses for G.M.A.W.; CO^2, Argon, Helium, Mixtures

2. Equipment Set-Up of: 4
   A. G.M.A.W. welding machine (Micro)
   B. G.M.A.W. welding machine (core)
   C. G.M.A.W. (cobromatic)
   D. G.M.A.W. Dual Shield
3. G.M.A.W. Welding of: 9
   A. mild steel plate
   B. mild steel pipe
   C. aluminum plate
   D. stainless steel plate
   E. stainless steel pipe

APPROPRIATE READINGS

1. Alcoa. Aluminum. 1972.
2. Kaiser Aluminum. Welding. 1967.
3. Lincoln Electric. Gas Metal Arc Welding Guide. 1987.

OUTSIDE ASSIGNMENTS

This class will be concerned with the basic techniques in G.M.A.W. welding including setting up of and understanding of the working of such equipment.

Sample Assignments:

1. Read Chapter 3.
2. Answer questions in handout.
3. Study G.M.A.W. troubleshooting guide.
4. View film 901 on G.M.A.W. welding and be prepared to answer questions on it.
5. Complete project #14 on Progress Chart.

EVALUATION

1. Welding projects will be judged in accordance with accepted industrial standards.
2. Where practical, welds will be subjected to destructive testing.
3. Written exams, midterm and final exam.
4. Practical midterm and final exam.

Sample test question:
Small pin holes appear in a weld; what is the problem, what caused the problem, and how would you correct it?

TEXTS AND SUPPLIES

Adopted text: 1. L-Tec Welding and Cutting Systems. Mig Welding Handbook. 1987
2. Althouse, Turnquist, Bowditch, and Bowditch. Modern Welding. 1987.

Other Materials: 1. Welding gloves.
2. Welding goggles.
3. Safety glasses.
4. Appropriate clothing.

Date Prepared: Fall 1988
Date Reviewed: Fall 2001
Date Reviewed: Spring 2005
PCA Established:

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DEPARTMENT: **INDUSTRIAL TECHNOLOGY AND PUBLIC SAFETY**

PREFIX & NO.: WLD T 308

CATALOG TITLE: T.I.G. Welding

SCHEDULE TITLE: T.I.G. Welding

UNITS: 3

WEEKLY LECTURE HOURS: 2

WEEKLY LAB HOURS: 4

TOTAL NUMBER OF WEEKS: (if other than 16)

GRADING OPTION: Credit/No Credit Option

PREREQUISITE: WLD T 106

CATALOG DESCRIPTION
Provides students with the theory and practical applications of gas tungsten arc welding and the operation of gas tungsten arc welding equipment.

COURSE GOALS To encourage and enable students to:
1. operate gas tungsten arc welding equipment.
2. diagnose gas tungsten arc welding equipment.
3. use the basic technique of gas tungsten arc welding.
4. weld both ferrous and non-ferrous metals with gas tungsten arc welding equipment.
5. do minor repair on gas tungsten arc welding equipment.
6. learn power supply variables.

INSTRUCTIONAL OBJECTIVES At the end of the course, students will demonstrate the ability to:
1. weld aluminum, steel and stainless steel in all positions using gas tungsten arc welding equipment.
2. set up, adjust and correct as needed to produce a desired weld.
3. function in a welding facility in a safe manner.
4. assemble and disassemble gas tungsten equipment.
5. evaluate and correct T. I. G. welds.

COURSE OUTLINE

	WEEKS
1. Refresher in:	4
A. safety in T.I.G. welding	
B. handling of compressed gasses	
C. use of gasses for T.I.G.; Argon, Helium, Mixtures	

2. Equipment Set-Up of: 4
   A. basic T.I.G. machine
   B. basic arc welding with T.I.G. modification equipment
   C. T.I. G. with high frequency
   D. T.I.G. without high frequency
3. T.I.G. Welding of: 9
   A. mild steel plate
   B. mild steel pipe
   C. aluminum plate
   D. aluminum pipe
   E. stainless steel plate
   F. stainless steel pipe

APPROPRIATE READINGS (Other than Textbook)

1. Alcoa. Aluminum. 1972.
2. Kaiser Aluminum. Welding. 1967.
3. G.T.A.W. Handbook. 1985.

OUTSIDE ASSIGNMENTS

This class will be concerned with the basic techniques in T.I.G. welding including setting up of and understanding of the working of such equipment.

Sample Assignments:
1. Read Chapter 9.
2. Answer questions in handout on Chapter 9.
3. Study G.T.A.W. troubleshooting guide.
4. View film 906 on T.I.G. welding and be prepared to answer questions on it.
5. Complete project #2 on T.I.G. Progress Chart.

EVALUATION

1. Welding projects will be judged in accordance with accepted industrial standards.
2. Where practical, welds will be subjected to destructive or non-destructive testing.
3. Written exams, midterm and final exam.
4. Practical midterm and final exam.

Sample test question:
While using the T.I.G. process to weld stainless steel, you notice porosity in the weld.
1. What is the probable cause?
2. What is the solution?

TEXTS AND SUPPLIES

Adopted text: 1. L-Tec Welding and Cutting Systems. Mig Welding Handbook. 1987.
2. Althouse, Turnquist, Bowditch, and Bowditch. Modern Welding. 1987.

Other Materials: 1. Welding gloves.
2. Welding goggles.
3. Safety glasses.
4. Appropriate clothing.

Date BOT Approved: 15-APR-2014
Date Reviewed: Spring 2014
PCA Established: 13-MAR-2014
Date DL Conversion Approved:

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE PLACEMENT:

DEPARTMENT: Industrial Technology

PREFIX & NUMBER: WLDT 309

CATALOG COURSE TITLE: Mini MIG (GMAW)

BANNER COURSE TITLE: Mini MIG (GMAW)

UNITS: 1

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	0.50	8.00-9.00	0.50
Lab:	1.50	24.00-27.00	0.50
Total Contact Hours:	2.00	32.00-36.00	1.00 – 0.00

NUMBER OF TIMES COURSE CAN BE REPEATED:

GRADING OPTION:

GR/P/NP - Letter Grade or Pass/No Pass

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION(S) ON ENROLLMENT: None

ENTRANCE SKILLS:

CATALOG DESCRIPTION:

This course will give students enough MIG welding background to weld in metal sculpture and ornamental iron classes using 110 power MIG welders.

COURSE CONTENT:

1. Review and discuss safety rules and regulations
2. Introduction to MIG welding
3. The use of MIG welding in metals

4. Creating sound welds with small power sources

COURSE OBJECTIVES:
At the end of the course, the student will be able to:

1. identify, understand and use basic welding equipment
2. be able to set-up welding equipment
3. use welding and other equipment safety

METHODS OF INSTRUCTION:

Methods of Instruction
Methods of Instruction Description: 1. Lecture presentation and discussion 2. Video and audio presentations followed by group discussion 3. Welded lab demonstrations with students reciprocating 4. Instructor-guided individual projects produced in welding lab 5. Project presentation, discussion and critique

OUTSIDE ASSIGNMENTS:

Outside Assignments
Sample writing assignment: In your own words, what are the basic safety concerns in handling high pressure shielding gas cylinders.

METHODS OF EVALUATION:

Methods of Evaluation
1. Pre-safety test 2. Students will be graded on individual projects and technique 3. Students will be graded on their ability to work safely in the welding shop environment 4. Writing assignment will be graded on content and accuracy

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS:
Adopted Text:

- None

Other Materials:

- Handouts

STUDENT LEARNING OUTCOMES:

1. WLDT309 SLO1 - Demonstrate ability to set up small GMAW (mini MIG) equipment.
2. WLDT309 SLO2 - Demonstrate ability to operate GMAW (mini MIG) and other welding equipment in a safe manner.
3. WLDT309 SLO3 - Make acceptable welds using small GMAW equipment (Mini MIG).

Date Prepared: Fall 1988
Date Reviewed: Fall 2001
Date Reviewed: Spring 2005
PCA Established:

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DEPARTMENT: **INDUSTRIAL TECHNOLOGY AND PUBLIC SAFETY**

PREFIX & NO.: WLD T 312 ABC

CATALOG TITLE: Pipe Fitting and Welding

SCHEDULE TITLE: Pipe Fitting and Welding

UNITS: 3

WEEKLY LECTURE HOURS: 2

WEEKLY LAB HOURS: 4

TOTAL NUMBER OF WEEKS: (if other than 16)

GRADING OPTION: Credit/No Credit Option

PREREQUISITE: WLD T 107

CATALOG DESCRIPTION
Designed to familiarize the students with the highly specialized pipe fitting and welding industry, and to provide the opportunity for students to develop the skills necessary for entering and advancing in the pipe welding field.

COURSE GOALS To encourage and enable students to:
1. understand the theory of inter-section, development and triangulation as it relates to pipe fitting.
2. understand the making, layout and use of pipe cutting templates.
3. understand and differentiate the concepts and use of chill rings and joint without chill rings.

INSTRUCTIONAL OBJECTIVES At the end of the course, students will demonstrate the ability to:
1. use safe shop procedures.
2. flame cut and fit pipe using standard templates.
3. prepare pipe for welding.
4. develop intersection patterns for pipe.
5. weld pipe in the down hand position and the up hand position.
6. complete the above in accordance with industrial standards.

COURSE OUTLINE

	WEEKS
1. Alignment/preparation/cleaning/beveling, etc.	3
2. Joint design/welding procedures	3
3. Metalurgy	2
4. Measurement/cutting	2
5. Calculations/formulas	2

6. Print reading views (isometric) 1
7. Basic math of pipe fitting 1
8. Pre-fab fitting size, uses, capacity, demonstration 1
9. Pipe welding and fitting terminology 1
10. Welder qualification and testing 1

APPROPRIATE READINGS

1. Frankland, Thomas. Pipe Trades Pocket Manual
2. The Pipe Fitter's and Pipe Welder's Handbook
3. The Pipe Fitter Manual

OUTSIDE ASSIGNMENTS

Each student will be given assignments in

1. hand cutting
2. fitting
3. fabrication projects as determined by instructor
4. measurements and alignments.

EVALUATION

1. Open book test.
2. Manipulative test.
3. Written test (drawing).

Sample Question:
Student will be given a drawing with overall measurements and are asked to calculate all other dimensions.

TEXTS AND SUPPLIES

Adopted Text: Hoobasar, Rampaul L., Pipe Welding Procedures

Other Materials:
1. Films
2. Handouts
3. Safety glasses
4. Gloves
5. Goggles
6. Pliers

Date Prepared:
Date Reviewed: Fall 2001
Date Reviewed: Spring 2005
PCA Established:

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DEPARTMENT: **INDUSTRIAL TECHNOLOGY AND PUBLIC SAFETY**

PREFIX & NO.: WLDT 315 AB

CATALOG TITLE: Metal Fabrication

SCHEDULE TITLE: Metal Fabrication

UNITS: 4

WEEKLY LECTURE HOURS: 2

WEEKLY LAB HOURS: 6

TOTAL NUMBER OF WEEKS: (if other than 16)

GRADING OPTION: Credit/No Credit Option

PREPREQUISITE: WLD T 107

CATALOG DESCRIPTION
Provides the student with the opportunity to combine previously learned skills into a system requiring the use of prints, tolerances, and specifications.

COURSE GOALS To encourage and enable students to:
1. apply fabrication principles, techniques and processes.
2. apply most of the welding techniques learned in the other classes.
3. assemble components into final products by reading and interpreting blue prints and schematics.

INSTRUCTIONAL OBJECTIVES At the end of the course, students will demonstrate the ability to:
1. extract a materials list from shop drawings and blue prints as required.
2. cut, fit, weld, machine, and fabricate parts and sub-assemblies.
3. design and prepare working drawings for a fabricated project.
4. work safely using equipment that would be found in most welding and fabrication shops.

COURSE OUTLINE

	WEEKS
1. Project design	5
A. layout techniques	
B. fabrication principles	
2. Starting and finishing a project	2
A. estimating materials	
B. estimating the cost of materials	
C. writing a bill of materials	
D. cost analysis	
3. Building projects	10
A. how and where to start	

B. choosing fastening techniques
C. reading blue prints

APPROPRIATE READINGS

Steward, John P. Flame Strengthening Technology. 1981.

OUTSIDE ASSIGNMENTS

1. The student will design and build a project.
2. At least one quality project will be built by the student.
3. A cost analysis on each project will be required.

EVALUATION

Each student will be graded on:

1. the quality of the finished project.
2. the design of the project.
3. the accuracy of the analysis of cost and materials.

Sample Test Question: What possible defects might be found in a three-pass built weld? List their remedies.

TEXTS AND SUPPLIES

Adopted text: Not yet determined.

Other Materials:
1. Films provided by instructor.
2. Welding tools.
3. Welding gloves.
4. Cutting goggle.
5. Pliers.

Date Prepared: Fall 2004
Date Reviewed:
Date Reviewed:
PCA Established: Fall 2004

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DEPARTMENT: **INDUSTRIAL TECHNOLOGY AND PUBLIC SAFETY**

PREFIX & NO.: WLD T 316

CATALOG TITLE: Topics in Welding Technology

SCHEDULE TITLE: Metal Yard Sculptures

UNITS: .5

WEEKLY LECTURE HOURS: 1

WEEKLY LAB HOURS: 2

TOTAL NUMBER OF WEEKS: (if other than 16) 8

GRADING OPTION: Letter Grade Only

PREREQUISITE: None

CATALOG DESCRIPTION
Provides an opportunity to explore particular aspects of the discipline which are not covered in detail in the existing program. See the current schedule of classes for topics being offered. Offerings identified as 399 are not offered on a regular cycle (not within a two-year period).

SCHEDULE DESCRIPTION
An introduction to craft and art of creating metal yard sculptures. Emphasis is on creative discovery from fabricated primarily non-ferrous metals, found metal objects, and/or commercially available components.

COURSE GOALS: to encourage and enable students to
1. become familiar with specialized welding concepts.
2. become familiar with specialized welding techniques and materials.
3. become skilled at applying specialized techniques and concepts in the production of welding work or other practices related to the welding profession.

INSTRUCTIONAL OBJECTIVES: at the end of the course, the student will demonstrate the ability to
1. analyze specific welding production methods that will vary from topic to topic.
2. produce finished welding work or complete professional welding processes as appropriate for the topic.

COURSE OUTLINE	**WEEKS**
1. Types of materials and their sources. Sources for designs to inspire students to develop their own unique metal yard sculpture creations.	1
2. Welding shop machines and equipment which can assist in the execution of a design Surface embellishment techniques, texturing, patinas, and colorization.	7

APPROPRIATE READINGS (other than textbook)
1. Various garden art and craft magazines, i.e., Craft, Swart, Better Homes and Gardens, etc.
2. Internet web sites.
3. Dewayne Roy's Metal Project book.

OUTSIDE ASSIGNMENTS

1. Students will keep a notebook containing notes on techniques, experimentation, ideas, and sketches.
2. Students will write a 1-2 page paper.

Sample writing assignment – Write a 1-2 page paper concerning an artist/craftsperson whose work inspires you in the area of garden and/or found metal art.

EVALUATION

1. A written self-evaluation and a group display of at least one of each student's piece of work for discussion.
2. Student notebook.
3. Written paper.

TEXTS AND SUPPLIES

Adopted Text: None

Other Materials: Safety glasses, gloves, found objects

Date Prepared: Feb. 20, 2001
Date Reviewed: Spring 2014
Date Reviewed:
PCA Established:
Date DL Conversion Approved

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Welding

Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: INDUSTRIAL TECHNOLOGY

PREFIX & NUMBER: WLDT 317

CATALOG COURSE TITLE: Ornamental Iron 1

BANNER COURSE TITLE: **ORNAMENTAL IRON 1**

UNITS: 1

TOTAL NUMBER OF CONTACT HOURS: 32-36

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	.5	8 - 9	.5
Lab:	1.5	24 - 27	.5
Total Contact Hours:	2	32 - 36	1

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*
None

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success is highly unlikely. Must be included if the course* has *a prerequisite.)*
Upon entering this course, the student should be able to:
None (no prerequisite for this course)

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*
Upon entering this course, the advisory skills are to:

None (no advisory for this course)

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

Basics of ornamental iron work including fabrication techniques and safety training.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on l6 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
1. Review and discuss safety rules and regulations.	16
2. Introduction to Ornamental Iron.	
3. Introduction to materials.	
4. Measuring and layout.	
5. Cutting.	
6. Bending and forming.	
7. Projects and Project types.	
8. Welding and jointery.	
9. Finishing and corrosion protection.	

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. identify, understand and use basic welding equipment.
2. be able to set-up welding equipment.
3. use welding and other equipment safely.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction
1. Lecture presentation and discussion. 2. Welding lab demonstrations with students reciprocating. 3. Instructor-guided individual projects produced in welding lab. 4. Project presentation, discussion and critique.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Outside Assignments
1. Use internet to research project ideas that pertain to Ornamental Iron. 2. Sample writing assignment: Explain fully in at least one paragraph; What is the safe working pressure of acetylene gas in the lab? Why?

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Students will be graded on individual projects and technique. 2. Students will be graded on their ability to work safely in the welding shop environment. 3. Writing assignment will be graded on content and accuracy.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: None

Supplemental Readings and/or Other Materials:
Handouts

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Identify, understand and use basic welding equipment.
2. Demonstrate the ability to setup welding equipment.
3. Demonstrate the ability to work safely in the welding shop environment.

Date BOT Approved: Fall 1996
Date Reviewed: Spring 2014
Date Reviewed:
PCA Established:
Date DL Conversion Approved

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Welding
Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: INDUSTRIAL TECHNOLOGY

PREFIX & NUMBER: WLDT 318

CATALOG COURSE TITLE: Welding and Metal Sculpture

BANNER COURSE TITLE: **WELDING METAL SCULPTURE**

UNITS: 1

TOTAL NUMBER OF CONTACT HOURS: 32-36

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	.5	8 - 9	.5
Lab:	1.5	24 - 27	.5
Total Contact Hours:	2	32 - 36	1

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*
None

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success is highly unlikely. Must be included if the course* has *a prerequisite.)*
Upon entering this course, the student should be able to:
None (no prerequisite for this course)

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*
Upon entering this course, the advisory skills are to:

None (no advisory for this course)

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

This course will provide an introduction to the art of welding. The student will be able to do light welding and brazing to construct individual projects.

COURSE CONTENT

(Indicate all major topics to be covered and approximate number of weeks for each, based on l6 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)

	WEEKS
1. Review and discuss safety rules and regulations. Tour the shop with an introduction to shop machines and tools to cut, shear, roll, bend, forge, and drill metal.	16
2. Introduction to Welding	
3. Introduction to Cutting Techniques	
4. Hands-on in the Lab	

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. demonstrate basic welding techniques.
2. identify and describe welding procedures.
3. use welding and other equipment safely.

METHODS OF INSTRUCTION

(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)

Methods of Instruction
1. Lecture presentation and discussion. 2. Welding lab demonstrations with students reciprocating. 3. Instructor-guided individual projects produced in welding lab. 4. Project presentation, discussion and critique.

OUTSIDE ASSIGNMENTS

(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required

texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)

Outside Assignments
Sample writing assignment: In your own words, what are the basic safety concerns in handling gas welding equipment.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Students will be graded on individual projects and technique. 2. Students will be graded on their ability to work safely in the welding shop environment. 3. Writing assignment will be graded on content and accuracy.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: None

Supplemental Readings and/or Other Materials:
Handouts

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Identify, understand, and use basic gas welding equipment.
2. Demonstrate the ability to set-up welding equipment.
3. Demonstrate the ability to work safely in the welding shop environment.

Date BOT Approved: Spring 2004
Date Reviewed: Spring 2014
Date Reviewed:
PCA Established:
Date DL Conversion Approved

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Welding

Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: INDUSTRIAL TECHNOLOGY

PREFIX & NUMBER: WLDT 319

CATALOG COURSE TITLE: Blacksmithing Projects

BANNER COURSE TITLE: **BLACKSMITHING PROJECTS**

UNITS: 1

TOTAL NUMBER OF CONTACT HOURS: 32-36

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	.5	8 - 9	.5
Lab:	1.5	24 - 27	.5
Total Contact Hours:	2	32 - 36	1

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*
None

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success is highly unlikely. Must be included if the course* has *a prerequisite.)*
Upon entering this course, the student should be able to:
None (no prerequisite for this course)

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*
Upon entering this course, the advisory skills are to:

None (no advisory for this course)

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

An opportunity to use blacksmithing in the fabrication of projects developed and assigned by the instructor.

COURSE CONTENT

(Indicate all major topics to be covered and approximate number of weeks for each, based on l6 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)

	WEEKS
1. Review and discuss safety rules and regulations.	16
2. Measure and Layout	
3. Materials	
4. Cutting	
5. Bending and Forming	
6. Machining	
7. Welding	
8. Cleaning	
9. Finishing and Corrosion Protection	

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. understand and use basic blacksmithing equipment
2. set up blacksmithing equipment.
3. work safely in the welding shop environment.

METHODS OF INSTRUCTION

(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)

Methods of Instruction
1. Lecture presentation and discussion.
2. Video and audio presentations followed by group discussion.
3. Welding lab demonstrations with students reciprocating.
4. Blacksmithing project presentation, discussion and critique.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Outside Assignments
1. Use internet to research project ideas that pertain to blacksmithing. 2. Sample writing assignment: Explain fully in at least one paragraph; What is the proper way to light a gas burning forge? Why?

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Students will be graded on individual projects and technique. 2. Students will be graded on their ability to work safely in the welding shop environment. 3. Writing assignment will be graded on content and accuracy.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: None

Supplemental Readings and/or Other Materials:
Andres, Jack: New Edge Of The Anvil

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Identify, understand and use basic welding equipment.
2. Demonstrate the ability to set-up welding equipment.
3. Demonstrate the ability to work safely in the welding shop environment.

Date Prepared: Fall 1986
Date Reviewed: Fall 2001
Date Reviewed: Spring 2005
PCA Established:_____

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DEPARTMENT: **INDUSTRIAL TECHNOLOGY AND PUBLIC SAFETY**

PREFIX & NO.: WLD T 330

CATALOG TITLE: Welding Certification

SCHEDULE TITLE: Welding Certification

UNITS: 3

WEEKLY LECTURE HOURS: 2

WEEKLY LAB HOURS: 4

TOTAL NUMBER OF WEEKS: (if other than 16)

GRADING OPTION: Credit/No Credit Option

PREREQUISITE: WLD T 107, 307, or 308

CATALOG DESCRIPTION
Introduces advanced students to the requirements for welding certification. It will include theory and practical applications of welding procedures and techniques in preparation for taking a certification examination in one of the following areas: 1) Gas metal arc welding (GMAW), 2) Shielded metal arc welding (SMAW), or 3) Gas tungsten arc welding (GTAW). These meet the codes as provided by the American Welding Society, American Petroleum Institute, American Society of Mechanical Engineers Standards.

COURSE GOALS To encourage and enable students to:
1. prepare for and take certification test in GMAW or GTAW
2. prepare weld specimens for testing
3. perform effectively under test conditions
4. acquire sufficient knowledge in the theory and practical applications to satisfy the entry level requirement for employment.

INSTRUCTIONAL OBJECTIVES At the end of the course, students will demonstrate the ability to:
1. work to specific dimensions and dimensional tolerances
2. interpret a set of blue prints
3. weld in all positions to specific certification standards
4. cut, fit and grind as needed to complete test specimens
5. test at or above 80% proficiency
6. function in a welding facility in a safe manner.

COURSE OUTLINE

WEEKS

1. Certification Processes 3
A. gas metal arc welding
B. gas tungsten arc welding
C. shielded metal arc welding
2. Metal Characteristics 1
A. mild steel plate unlimited thickness
B. mild steel pipe
C. non-ferrous plate and pipe
3. Testing Requirements 3
A. American Welding Society
B. American Petroleum Institute
C. Federal Aviation Agency
D. American Society of Mechanical Engineers
4. Preparations for Certification Testing 10
A. safety - review all safety procedures
B. electrode selection
C. welding symbols
D. fit and "weld up" from a set of isometric drawings
E. tools of trade - use and identification
F. nomenclature and welding terminology
G. identification and application of materials
H. layouts

APPROPRIATE READINGS

To be assigned: i.e. American Welding Society, Welding Journal

OUTSIDE ASSIGNMENTS

1. Students will be responsible to do homework assignments which may include:
   A. outside reading
   B. films or computer work in the L.R.C.
2. Weldment's as listed on individual progress charts.
3. Welding assignments outside of class time.

Example of outside assignments:

1. Read Chapter 12.
2. Answer 26 questions at the end of the chapter.
3. Study G.T.A.W. Troubleshooting guide.
4. View film #906 on T.I.HG. Welding and be prepared to answer questions on it.

EVALUATION

1. The students will perform a series of weldments for instructor.
2. The students will do test plates to be tested by the instructor and/or the local testing laboratory.
3. The student will take written examinations concerning certifications and certification test.

TEXTS AND SUPPLIES

Adopted Text:

Other Materials:

Date Prepared: Fall 1986
Date Reviewed: Fall 2001
Date Reviewed: Spring 2005
PCA Established:

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DEPARTMENT: **INDUSTRIAL TECHNOLOGY AND PUBLIC SAFETY**

PREFIX & NO.: WLD T 331 ABC

CATALOG TITLE: Advanced Welding Certification

SCHEDULE TITLE: Advanced Welding Certification

UNITS: 2

WEEKLY LECTURE HOURS: 1

WEEKLY LAB HOURS: 3

TOTAL NUMBER OF WEEKS: (if other than 16)

GRADING OPTION: Credit/No Credit Option

PREREQUISITE: WLD T 330

CATALOG DESCRIPTION

Provides advanced students and practicing welders the current regulations and changes in environmental and safety requirements, and prepares them to pass additional welding certification tests in: 1) Gas metal arc welding (GMAW), 2) Shielded metal arc welding (SMAW), or 3) Gas tungsten arc welding (GTAW). These meet the codes as provided by the American Welding Society, American Petroleum Institute, American Society of Mechanical Engineers Standards. This course is designed to enhance employability of students by expanding their skills and knowledge as well as the types of processes they are certified to perform.

COURSE GOALS To encourage and enable students to:

1. prepare for and take certification tests in GMAW, SMAW and GTAW
2. prepare weld specimens for testing
3. perform effectively under test conditions
4. re-certify as needed to maintain currency in the field and expand the areas they are certified to perform.

INSTRUCTIONAL OBJECTIVES At the end of the course, students will demonstrate the ability to:

1. work to specific dimensions and dimensional tolerances.
2. interpret a set of blue prints.
3. weld in all positions to certification standards.
4. cut, fit and grind as needed to complete test specimens.
5. test in all areas at or above 80% proficiency.
6. function in a welding facility in a safe manner

COURSE OUTLINE

	WEEKS
1. Processes	3
A. gas metal arc welding	
B. gas tungsten arc welding	
C. shielded metal arc welding	
2. Welding Metalurgy	3
A. mild steel plate unlimited thickness	
B. mild steel pipe	
C. non-ferrous plate and pipe	
3. Testing Approved Codes	3
A. American Welding Society	
B. American Petroleum Institute	
C. Federal Aviation Agency	
D. American Society of Mechanical Engineers	
4. Changes in OSHA, APCD, and other regulatory agency regulations	4
5. Advanced technological developments	4

APPROPRIATE READINGS

To be assigned: i.e. American Welding Society, Welding Journal

OUTSIDES ASSIGNMENTS

1. Weldment's as listed on individual progress charts.
2. Welding assignments outside of class time.

Example of outside assignments:
Study section Two (Permissible stresses of sheet metal) A.W.S.
specification for welding sheet steel in structures.

EVALUATION

1. The students will perform a series of weldments for instructor.
2. The students will do test plates to be tested by the instructor and/or the local testing laboratory.

Sample question: Explain the function and discuss the necessity of the A.W.S. as it relates to the welding industry.

TEXTS AND SUPPLIES

Adopted Text: Althouse, Turnquist, Bowditch and Bowditch. Modern Welding

Other Materials: 1. Welding parameter sheets.
2. Handouts.

Date BOT Approved: Fall 1996
Date Reviewed: Spring 2014
Date Reviewed:
PCA Established:
Date DL Conversion Approved

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Welding

Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: INDUSTRIAL TECHNOLOGY

PREFIX & NUMBER: WLDT 333

CATALOG COURSE TITLE: Welding Certification-SMAW

BANNER COURSE TITLE: **WELDING CERTIFICATION-SMAW**

UNITS: 1

TOTAL NUMBER OF CONTACT HOURS: 32-36

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	.5	8 - 9	.5
Lab:	1.5	24 - 27	.5
Total Contact Hours:	2	32 - 36	1

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*
None

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success is highly unlikely. Must be included if the course* has *a prerequisite.)*
Upon entering this course, the student should be able to:
None (no prerequisite for this course)

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*
Upon entering this course, the advisory skills are to:

None (no advisory for this course)

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

This course is to encourage individuals who are near or at completion of preparation for taking their SMAW Certification test either for employment or the completion of their school program.

COURSE CONTENT

(Indicate all major topics to be covered and approximate number of weeks for each, based on l6 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)

	WEEKS
1. Introduction to Welding Certifications.	16
2. Introduction to Preparation for Testing.	
3. Introduction to Materials, Shapes, Specifications, and Standards for Testing.	
4. Hands-on Practice and Testing.	

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. prepare a test plate and complete testing procedures.
2. become certified welder.
3. demonstrate knowledge about certification rules, qualifications and uses as they pertain to the welder.

METHODS OF INSTRUCTION

(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)

Methods of Instruction
1. Lecture presentation and discussion.
2. Video and audio presentations followed by group discussion.
3. Welding lab demonstrations with students reciprocating.
4. Test specimen presentation, discussion and critique.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Outside Assignments
1.Use internet to research local businesses that require SMAW certification. 2. Use internet to research potential employment opportunities and earning potential. Sample writing assignment: Write an essay outlining the requirements for certification in SMAW according to AWS D1.1 Structural welding code.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Satisfactory completion of the test. 2. Level of performance on test. 2. Internet research assignments are graded for content and accuracy.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: None

Supplemental Readings and/or Other Materials:
Handouts

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Prepare a test plate and complete testing procedures.
2. Demonstrate knowledge about certification rules, qualifications and uses as they pertain to the welder.
3. Become a certified welder.

Date BOT Approved: Fall 1996
Date Reviewed: Spring 2014
Date Reviewed:
PCA Established:
Date DL Conversion Approved

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Welding

Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: INDUSTRIAL TECHNOLOGY

PREFIX & NUMBER: WLDT 334

CATALOG COURSE TITLE: Welding Certification-GMAW

BANNER COURSE TITLE: **WELDING CERTIFICATION - GMAW**

UNITS: 1

TOTAL NUMBER OF CONTACT HOURS: 32-36

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	.5	8 - 9	.5
Lab:	1.5	24 - 27	.5
Total Contact Hours:	2	32 - 36	1

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*
None

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success is highly unlikely. Must be included if the course* has *a prerequisite.)*
Upon entering this course, the student should be able to:

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*

Upon entering this course, the advisory skills are to:

None (no advisory for this course)

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

This course is to encourage individuals who are near or at completion of preparation for taking their GMAW certification test either for employment or the completion of their school program.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on l6 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

	WEEKS
1. Introduction to Welding Certifications	16
2. Introduction to Preparation for Testing	
3. Introduction to Materials, Shapes, Specifications, and Standards for Testing	
4. Hands-on Practice and Testing	

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. prepare a test plate and complete testing procedures.
2. become certified welder.
3. demonstrate knowledge about certification rules, qualifications and uses as they pertain to the welder.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction
1. Lecture presentation and discussion. 2. Video and audio presentations followed by group discussion. 3. Welding lab demonstrations with students reciprocating. 4. Test specimen presentation, discussion and critique.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Outside Assignments
1. Use internet to research local businesses that require GMAW certification. 2. Use internet to research potential employment opportunities and earning potential. Sample writing assignment: Write an essay outlining the requirements for certification in GMAW according to AWS D1.1 Structural welding code.

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Satisfactory completion of the test. 2. Level of performance on test. 2. Internet research assignments are graded for content and accuracy.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: None

Supplemental Readings and/or Other Materials:
Handouts

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Prepare a test plate and complete testing procedures.
2. Demonstrate knowledge about certification rules, qualifications and uses as they pertain to the welder.
3. Become a certified welder.

Date BOT Approved: Spring 2007
Date Reviewed: Spring 2014
Date Reviewed:
PCA Established:
Date DL Conversion Approved

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE: Welding

Please refer to the disciplines list located in the Minimum Qualifications Handbook developed by the Academic Senate of California Community Colleges.

DEPARTMENT: INDUSTRIAL TECHNOLOGY

PREFIX & NUMBER: WLDT 335

CATALOG COURSE TITLE: Flux Core Arc Welding

BANNER COURSE TITLE: **FLUX CORE ARC WELDING**

UNITS: 1

TOTAL NUMBER OF CONTACT HOURS: 32-36

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	.5	8 - 9	.5
Lab:	1.5	24 - 27	.5
Total Contact Hours:	2	32 - 36	1

GRADING OPTION: Letter Grade or Pass/No Pass Option

PREREQUISITE(S): WLDT 307

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION ON ENROLLMENT: (*Some common limitations on enrollment are: a requirement to pass a tryout prior to being enrolled in an athletic course or team, or physical requirement where the student's safety would be compromised by an inability* to *meet specific physical capabilities.)*
None

PREREQUISITE SKILLS (*The course outline must document entry skills without which student success is highly unlikely. Must be included if the course* has *a prerequisite.)*
Upon entering this course, the student should be able to:
None (no prerequisite for this course)

ADVISORY SKILLS *(For advisories, the course outline must document entry skills which are either necessary but are likely to be obtained by other means or, while not necessary, would broaden or enhance student learning but are not fundamental to student success.)*
Upon entering this course, the advisory skills are to:

None (no advisory for this course)

CATALOG DESCRIPTION

The catalog description could begin with a short paragraph (course description) that provides a well-developed overview of topics covered. Some suggested language is:

- *Identification of the target audience depending on whether the course is required for the major, degree or certificate, transfer, etc., that will assist students in their educational planning.*
- *Prerequisites, corequisites, advisories and/or limitations on enrollment.*
- *Designation of course repeatability.*
- *Lecture/lab/activity/studio hours and units.*
- *Field trip potential or other requirements that may impose a logistical or fiscal burden upon the students should be included along with an option for alternatives.*

Introduces students to craft flux core welding. Topics include types, uses, safety considerations and fabrication techniques.

COURSE CONTENT *(Indicate all major topics to be covered and approximate number of weeks for each, based on l6 weeks. If the course works on hours, rather than weeks, include the number of hours to cover each of the topics for the course.)*

WEEKS
16

1. Introduction to Flux Core Arc Welding
2. Introduction to power sources
3. Understanding how FCAW equipment works
4. Understanding welding procedures

COURSE OBJECTIVES:

At the end of the course, the student will be able to:

1. identify, understand and use basic welding equipment.
2. be able to set-up welding equipment.
3. use welding and other equipment safely.

METHODS OF INSTRUCTION *(Types and/or methods or instruction are required. The course outline may show one or more teaching patterns. However, instructors have the freedom to choose how they will achieve course objectives.)*

Methods of Instruction
1. Lecture presentation and discussion.
2. Welding lab demonstrations with students reciprocating.
3. Instructor-guided individual projects produced in welding lab.
4. Project presentation, discussion and critique.

OUTSIDE ASSIGNMENTS *(Assignment examples, if provided, should reflect coverage of all objectives and course content. Assignments can include supplemental reading materials beyond the required texts. The initiator should give the basis for grading, and relate assignments to skills and abilities listed in the objectives.)*

Outside Assignments
1.Pre-safety test 2.Post-safety test 3.Sample take home test question: What is the safe working pressure of acetylene gas in the lab? Why?

METHODS OF EVALUATION *(List or describe the types and/or methods of evaluation. The course outline should describe the basis for grading or other evaluations, and relate the methods of evaluation to skills and abilities in the course objectives.).*

Methods of Evaluation
1. Pre- and post-safety tests. 2. Students will be graded on individual projects and technique. 3. Students will be graded on their ability to work safely in the welding shop environment. 4. Writing assignment will be graded on content and accuracy.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS

- *This field includes the text (and when possible, with date of publication) and other instructional materials.*
- *Text and other learning materials may have external requirements due to articulation requirements or certification requirements found in many programs.*
- *This section only contains that which is required for the student to be able to effectively participate in and successfully pass the course.*
- *Assignments specific to required reading and instructional materials should be given in the form of examples, where possible.*

Adopted Text: None

Supplemental Readings and/or Other Materials:
Handouts

STUDENT LEARNING OUTCOMES

In this section, the initiator is to list the current course Student Learning Outcomes (SLOs). The outcomes may be revised as part of the program review annual update process, but is not done using this form. For new courses, the SLOs must be defined and need to be mapped to the program and institutional learning outcomes. Please contact Institutional Research and Planning (IRP) for assistance with new or modified SLOs.

1. Weld in all positions using the Flux Core Arc Welding Process.
2. Identify, fit and weld the five basic weld joints used in the welding industry.
3. Set up the F.C.A.W. process equipment.
4. Function in a welding facility in an efficient and safe manner.

Date BOT Approved: 18-MAR-2014
Date Reviewed: Spring 2014
PCA Established:
Date DL Conversion Approved:

ALLAN HANCOCK COLLEGE
COURSE OUTLINE

DISCIPLINE PLACEMENT: Auto Body Technology or Automotive Technology or Machine Tool Technology or Welding

DEPARTMENT: Industrial Technology

PREFIX & NUMBER: WLDT 350

CATALOG COURSE TITLE: Skills U.S.A. Competition Prep

BANNER COURSE TITLE: Skills USA Competition Prep

UNITS: 3

	Hours per week (based on 16 weeks)	Total Hours per Term (range based on 16-18 weeks)	Units
Lecture:	2.50	40.00-45.00	2.50
Lab:	1.50	24.00-27.00	0.50
Total Contact Hours:	4.00	64.00-72.00	3.00 – 0.00

NUMBER OF TIMES COURSE CAN BE REPEATED:

GRADING OPTION:

GR/P/NP - Letter Grade or Pass/No Pass

PREREQUISITE(S): None

COREQUISITE(S): None

ADVISORY(IES): None

LIMITATION(S) ON ENROLLMENT: None

ENTRANCE SKILLS:

CATALOG DESCRIPTION:

Skills USA is a partnership of students, teachers and industry working together to ensure America has a skilled workforce. This Skills USA Competition Prep course helps students prepare for regional, statewide and national intercollegiate competition in a variety of Career and Technical disciplines. Students will learn to plan projects, work in teams, solicit community support and develop a wide range of job skills. Contest simulations and lab preparation will focus on Welding Technology. This course is not open to students who are enrolled in or have received credit for AB 350 or ARCH 350 or AT 350 or EL 350 or ET 350 or MT 350.

COURSE CONTENT:

1. Introduction to Skills U.S.A.
2. Contestant elgibility and registration
3. Review Skills U.S.A. discipline options
4. Competition preparation, timelines and procedures
5. Community outreach and sponsorship development
6. Simulated intercollegiate competition

COURSE OBJECTIVES:
At the end of the course, the student will be able to:

1. gather data, research, evaluate, and use appropriate information to plan and complete a multi-faceted project.
2. enlist community support for educational projects.
3. assume responsibility for meeting deadlines, maintaining budgets and completing projects.
4. evaluate projects for completeness, clarity, and presentation.

METHODS OF INSTRUCTION:

Methods of Instruction
Lab Lecture Methods of Instruction Description: Lecture presentations and classroom discussions, video and audio presentations followed by group discussion, instructor-guided individual and group projects produced in various labs, presentations of individual and group projects followed by in-class discussion and evaluation.

OUTSIDE ASSIGNMENTS:

Outside Assignments
1. Contact businesses to promote Skills USA competition and gain sponsorships. 2. Use the Internet to research Skills USA. 3. Complete and submit regular worksheets. 4. Use the Internet to research particular disciplines. Sample Writing Assignment: In at least one paragraph, relate the Skills USA competition to Career and Technical Education (CTE).

METHODS OF EVALUATION:

Methods of Evaluation
1. Written report on contact with local businesses. 2. Internet research assignments are graded for content and accuracy. 3. Various lab projects are graded for accuracy and appearance. 4. Comprehensive final exam. Exam graded for accuracy and applied techniques. Sample Essay Question: Describe the fundamental requirements for success in inter-collegiate competition.

REQUIRED TEXTS AND OTHER INSTRUCTIONAL MATERIALS:
Adopted Text:

- None

Other Materials:

- Reference material will vary depending on the content of project.

STUDENT LEARNING OUTCOMES:

1. WLDT350 SLO1: Gather data, research, evaluate, and use appropriate information to plan and complete a multi-faceted project.
2. WLDT350 SLO2 - Enlist community support for educational projects.
3. WLDT350 SLO3 - Assume responsibility for meeting deadlines, maintaining budgets and completing projects.
4. WLDT350 SLO4 - Evaluate projects for completeness, clarity, and presentation.

DEGREE AND CERTIFICATE REQUIREMENTS

Associate of Science/Certificate of Achievement
Welding Technology

MT 109	Survey of Machining	4
WLDT 106	Beginning Welding	3
WLDT 107	Advanced Welding	3
WLDT 306	Layout and Fabrication Interpretation	3
WLDT 300	Shop Math and Measurement	3

Plus a minimum of 15 units selected from the following:

MT 110	Machine Tool Practices	4
WLDT 307	G.M.A.W. Welding	3
WLDT 308	T.I.G. Welding	3
WLDT 312	Pipe Fitting and Welding	3
WLDT 315	Metal Fabrication	4
WLDT 330	Welding Certification	3
WLDT 331	Welding Certification Lab	2

Certificate of Achievement
Welding Technology: Metal Fabrication

MT 109	Survey of Machining	4
WLDT 106	Beginning Welding	3
WLDT 107	Advanced Welding	3
WLDT 306	Layout and Fabrication Interpretation	3
WLDT 315	Metal Fabrication	4
WLDT 300	Shop Math and Measurement	3

Certificate of Achievement
Welding Technology: Pipe Welding

MT 109	Survey of Machining	4
WLDT 106	Beginning Welding	3
WLDT 107	Advanced Welding	3
WLDT 306	Layout and Fabrication Interpretation	3
WLDT 312	Pipe Fitting and Welding	3
WLDT 300	Shop Math and Measurement	3

Welding Technology

The welding technology program at Allan Hancock College is a great way to start your career in the challenging, dynamic and adaptive field of welding and metalworking. In the industry, welding professionals continuously apply new knowledge and scientific principles to a form of fabrication that is sometimes described more as an art than as a craft. There are a vast number of opportunities available to job seekers in mainstream welding and various auxiliary fields.

Allan Hancock College is committed to providing low-cost, high-tech training in basic and advanced welding, metal fabrication and pipe welding. The curriculum is designed to prepare individuals to learn the basics of layout, fitting, cutting operation, oxyacetylene, shielded metal arc, and gas metal arc (G.M.A.W. and T.I.G.) welding processes.

For more information

Welding technology is one of the career technical education programs at Allan Hancock College within the department of Industrial Technology. It resides in the Manufacturing and Product Development industry sector.

Department of Industrial Technology
Marna Lombardi, Department Secretary
Phone: 805.922.6966 ext. 3335
mlombardi@hancockcollege.edu

Or visit our website at
www.hancockcollege.edu/cte

ALLAN HANCOCK COLLEGE
800 South College Drive
Santa Maria, CA 93454-6399
(805) 922-6966
www.hancockcollege.edu

Allan Hancock College is a California public community college in northern Santa Barbara County serving more than 11,000 credit students each semester. The college offers degrees and certificates in more than 100 fields of study from accounting to welding. The college has a campus in Santa Maria and centers in Lompoc, Solvang, and at Vandenberg AFB.

Funded in part by the Chancellor's Office, California Community Colleges CTEA 1C grant.

Career Technical Education (CTE)

Welding Technology

Associate in Science Degree option

- Welding Technology

Certificate of Achievement options

- Welding Technology
- Metal Fabrication
- Pipe Welding Technology

ALLAN HANCOCK COLLEGE
Start here. Go anywhere.

rev.4/13 | rep.4/13

Welding Technology

The welding technology program at Allan Hancock College progresses from basic to advanced welding courses. The first course in the program covers safety protocols and the basic skills involved in welding and metalworking. In the advanced classes students apply the basic skills to more advanced welding techniques such as hand cutting and semiautomatic cutting. As you progress through the program you will also have the opportunity to learn metalworking as it is used in the arts i.e. sculpture, ornamental iron, blacksmithing and garden art. Our program provides training in essential manipulative skills and technical knowledge required to perform in the areas of oxyacetylene, shielded metal arc, gas metal arc (G.M.A.W. and T.I.G.) welding processes.

The associate degree and certificate curriculum in welding technology is designed to provide comprehensive occupational training in all common types of welding methods as related to today's welding fabrication industries. Upon degree/certificate completion you will have mastered the techniques used in modern welding and metalwork. Certification tests may be taken as part of your certificate/degree completion.

Employment Opportunities

Upon graduation you will be prepared for entry-level employment in a variety of fields and job positions such as:

- Welder
- Fabricator
- Maintenance welder
- Pipe welder/fitter
- Ornamental Iron
- Blacksmithing
- Contract welder
- Certified Welder
- Welding Engineer
- Equipment Repair
- Equipment Sales
- Quality Control
- Education
- Manufacturing

According to the Bureau of Labor Statistics (bls.gov) welders, cutters, solderers, and brazers can expect to make an annual wage of $40,140 on average in the state of California based on May 2011 statistics. Pay increases with experience.

Equipment and Facilities:

Outdoor blacksmithing lab: Students will learn how to forge metal using gas forges, anvils and power hammers.

Inside welding lab: Students will learn traditional welding techniques with up-to-date equipment. Welding techniques include:

- GMAW (MIG Welding)
- GTAW (TIG Welding)
- SMAW (Stick welding)
- Flux Core Arc Welding
- Gas Welding and Brazing
- Flame Cutting
- Plasma Arc Cutting

Welding Technology *(A.S. & Certificate of Achievement)*

The graduate of the certificate program in metal fabrication will pass at least one welder qualification test (3G-verticle or 4G-overhead) using at least one basic process and pass the GMAW and SMAW processes to the American Welding Societies D1.1 Structural Welding Code.

A major of 31 units is required for the associate in science degree and certificate.

Required core courses *(16 units)*:

MT 109	Survey of Machining	4 units
WLDT 106	Beginning Welding	3 units
WLDT 107	Advanced Welding	3 units
WLDT 306	Layout and Fabrication Interpretation	3 units
WLDT 381	Industrial Math	3 units

Plus a minimum of 15 units selected from the following:

MT 110	CNC Principles and Practices	4 units
WLDT 307	G.M.A.W. Welding	3 units
WLDT 308	T.I.G. Welding	3 units
WLDT 312	Pipe Fitting and Welding	3 units
WLDT 315	Metal Fabrication	4 units
WLDT 330	Welding Certification	3 units
WLDT 331	Welding Certification Lab	2 units

Recommended elective:

WLDT 199	Topics in Welding Technology	.5-3 units

Welding Technology: Metal Fabrication *(Certificate of Achievement)*

The graduate of the certificate program in metal fabrication will pass at least one welder qualification test (3G-verticle or 4G-overhead) using at least one basic process.

Twenty units constitute the certificate.

MT 109	Survey of Machining	4 units
WLDT 106	Beginning Welding	3 units
WLDT 107	Advanced Welding	3 units
WLDT 306	Layout and Fabrication Interpretation	3 units
WLDT 315	Metal Fabrication	4 units
WLDT 381	Industrial Math	3 units

Welding Technology: Pipe Welding Technology *(Certificate of Achievement)*

The graduate of the certificate program in metal fabrication will pass at least one welder qualification test (3G-verticle or 4G-overhead) using at least one basic process.

Nineteen units constitute the certificate.

MT 109	Survey of Machining	4 units
WLDT 106	Beginning Welding	3 units
WLDT 107	Advanced Welding	3 units
WLDT 306	Layout and Fabrication Interpretation	3 units
WLDT 312	Pipe Fitting and Welding	3 units
WLDT 381	Industrial Math	3 units

ADVISORY COMMITTEE

Welding

Gabriel Marquez, Full time faculty
Allan Hancock College

Steve Baily, Shop Foreman
Valley Welding & Machine

Cliff Dugger
Teixeira Farms

Hans Duus, Owner
Hans Duus Blacksmithing, Inc.

Jim English, Welding Instructor
Righetti High School

Mike Fontes, Welding Professional

Don Lahr, Owner
Lahr Industrial Welding

Stan Luis Jr.
Praxair

Andrew Mehlschau
Lahr Industrial Welding

Luke Mehlschau
Lahr Industrial Welding

Nancy Miller, Director, Career Technical Education
Lucia Mar School District

Richard Melsheimer, Owner
Melfred Borrzall, Inc

Rayvell Snowden, Part Time Faculty
Allan Hancock College

VALIDATION

PROGRAM REVIEW -- VALIDATION TEAM MEMBERS

TO: Academic Dean Date: Spring 2014

From: Gabriel Marquez

We recommend the following persons for consideration for the validation team:

DEPARTMENT **Industrial Technology** PROGRAM **Welding**

Board Policy requires that the validation team be comprised of the dean of the area, one faculty member from a related discipline/program, and two faculty members from unrelated disciplines.

(Name)	(Related Discipline/Program)
Eric Mason	**Industrial Technology (Auto Body Collision)**
Richard Melsheimer	**Melfred Borzall**
D.K. Philbin	**Life & Physical Science (Chemistry)**
(Name)	(Related Discipline/Program)

At the option of the self-study team, the validation team may also include one or more of the following: a. someone from a four-year institution in the same discipline; someone from another community college in the same discipline; a high school instructor in the same discipline; a member of an advisory committee for the program. Please complete the following as relevant to your program review.

Eric Mason, Department Chair, Industrial Technology & Instructor, Auto Body Technology
(Name) (Title)

Affiliation: Allan Hancock College Telephone Contact Number: 805.922.6966 x 3335

Address 800 S. College, Santa Maria, CA 93454 emason@hancockcollege.edu
(Mailing) City/State/Zip email address

Richard Melsheimer , President,
(Name) (Title)

Affiliation: Melfred Borzall Telephone Contact Number: 805.614.4344 x 22

Address 2712 Airpark, Santa Maria, CA 93455 dmelsheimer@melfredborzall.com
(Mailing) City/State/Zip email address

D.K. Philbin, Chemistry Instructor, Life & Physical Sciences
(Name) (Title)

Affiliation: Allan Hancock College Telephone Contact Number: 805.922.6966 x 3490

Address 800 S. College Santa Maria, CA 93454 dkphilbin@hancockcollege.edu
(Mailing) City/State/Zip email address

APPROVED: 05/08/15

EXECUTIVE SUMMARY
(Validation Team Report)

WELDING

1. MAJOR FINDINGS

Strengths of the program

- The dedicated full-time faculty member is giving direction to the program and setting a high standard. He is working to improve the program for the benefit of the students and is aware of the needs that the financial gaps have created and dealing with them openly. Because he has come from AHC's own program and has been employed in the industry, he is a model to students and exemplifies the goals of the program.

- The part-time faculty are to be commended for their involvement through volunteering for outreach activities and participating in the departmental demands such as SLO assessment. Their care and concern is exemplary.

- The department staff has been very supportive of the program by assisting with financial reviews, making connections to the Apprenticeship programs, offering office support of Advisory meetings, and supporting program review. The lab staff has contributed significantly with organization, safety concerns, and tracking purchasing. There has been a marked increase in discipline/department communication.

- The new space in O-200 will give some vitality to the lab area and open opportunity to students who have been wait-listed due to lack of number of course sections.

- The Advisory Committee is involved and supportive on many levels such as assisting with the outreach activities, doing fund raisers, and reviewing industry needs and changes.

- Outreach to young students at high schools and middle schools through the Welding Competition, the school visits, and the career days is outstanding. The program has been reaching non-traditional students in unprecedented numbers.

- Students are getting state certified and getting jobs!

Concerns of the Program

- There is insufficient funding to support the instructional supplies needs of students in the courses. There has been no adjustment for inflation over the last 5 years or financial planning for the repair and replacement of aging equipment. The discipline has had to rely on the work of the Advisory Group fund raising to make it to end of the fiscal year.

- There have been unanticipated needs in the new building that will have costs associated with them, and there has not been financial planning in preparation for the innovation that is being discussed for industry changes and needs.

- Students are not completing the program in two years because some courses that were cut during the down-turn of the economy have not been restored. Students also report in the student survey that college advising is weak.

- The change in repeatability rules has impacted students that have previously taken course to practice for the building of skill levels.

- Storage space for materials in the new space is very limited.

- The permanent placement of the grinders is not workable in the new building as it was planned.

- Planning for new welding technology has not been addressed with a plan yet.

2. RECOMMENDATIONS

- The Validation Team recommends that the supplies and materials for the courses are left in their current location until an adequate storage space is identified and exists closer to the new lab location. Funding for such projects could possibly come from categorical type CTEA sources. During this work, the Validation Team finds it advisable to develop future storage possibilities as program expansion is being implemented.

- The Validation Team recommends the review of Materials Fees to assist with some of the financial strain. Also, the chronic shortfall should be addressed on the institutional level by developing a more reasonable expectation of increased costs and a contingency funding plan.
- The Validation Team supports the use of the old lab space for programs, such as Electronics, that need both the high use of power and adequate space to have the lab and classroom in close proximity.

- The lab assistant should be increased to full-time due to the demands of the new lab space and the increase in students. It would be advantageous to restore student workers and to increase the department secretarial hours. A second full-time faculty member should be sought through the faculty prioritization process.

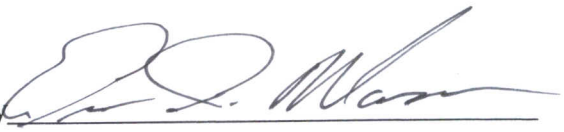
- The Validation Team recommends that the Advisory Group develop a plan for innovation as seen in the emerging industry. This includes more machines that reflect the industry use so that students are both knowledgeable and prepared.

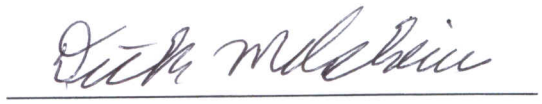
- Curriculum should be developed to offset the new repeatability rules by establishing continued levels of skill building courses. This is first apparent in pipe welding where there could be intermediate and advanced levels, but it could be applicable to other areas as well.

- The full program offering of courses should be available for students to finish in two years. This would mean the restoration of needed courses and a program plan identifying how a student could arrange a two-year course of study.

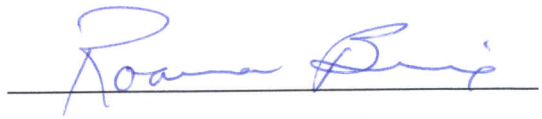
- Informing the Counseling department on program and course availability would assist with students being better informed. The tracking of students that take more than one course would assist with the advising and completion of certificates.

VALIDATION TEAM SIGNATURE PAGE

Eric Mason, Department Chair, Industrial Technology 

Dick Melsheimer, President, Melfred Borzall 

D.K.Philbin, Instructor, Life & Physical Sciences, 

Roanna Bennie, Dean, Academic Affairs, 

PLAN OF ACTION – POST-VALIDATION
(Sixth-Year Evaluation)

DEPARTMENT **Industrial Technology** PROGRAM **Welding**

In preparing this document, refer to the Plan of Action developed by the discipline/program during the self-study, and the recommendations of the Validation Team. Note that while the team should strongly consider the recommendations of the validation team, these are recommendations only. However, the team should provide a rationale when choosing to disregard or modify a validation team recommendation.

Identify the actions the discipline/program plans to take during the next six years. Be as specific as possible and indicate target dates. Additionally, indicate by the number each institutional goal and objective which is addressed by each action plan. (See Institutional Goals and Objectives) The completed final plan should be reviewed by the department as a whole.

Please be sure the signature page is attached.

RECOMMENDATIONS TO IMPROVE DESIRED **STUDENT OUTCOMES** AND IMPROVE STUDENT PERFORMANCE	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Restoration or addition of courses to offer full program offering to ensure that students can finish program in two years whether they are night or day time students. Will continue to invite and work with counselor to improve student success and completion.	Full program offering recommendation and continue dialog with counseling recommendation. **Goal SLS2**	Fall 2018

RECOMMENDATIONS TO ACCOMMODATE CHANGES IN **STUDENT CHARACTERISTICS**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Enrollment Changes Careful consideration will be taken to determine if material fees should be increased.	Lab fee recommendation **Goal IR4**	Fall 2018
Demographic Changes Continue to participate in outreach functions to encourage and entice nontraditional and disadvantaged students in to the program.	Self study recommendation **Goal E1**	Fall 2018 and on-going

RECOMMENDATIONS TO IMPROVE THE **EDUCATIONAL ENVIRONMENT**	**Theme/Objective/ Strategy Number AHC from Strategic Plan**	**TARGET DATE**
Curricular Changes Curriculum will be developed to improve skill building and to ensure student success. More classes will be developed to teach more advanced skill in classes were skill level is difficult achieve in one semester for certification like in TIG welding and pipe welding were a higher degree of skill is necessary.	Curriculum development recommendation **Goal SLS1, SLS2, SLS4**	Fall 2018
Co-Curricular Changes No co-curricular changes at this time.		
Neighboring College and University Plans Will continue to work with instructors from Cuesta College who participated in High School welding competition and one of which is in the Welding Advisory Committee.	Self study recommendation **Goal IR3**	Fall 2018
Related Community Plans Invite community partners and industry leaders for them to see and get involved with the exiting technical education opportunities at Allan Hancock College.	Self study recommendation **Goal E1**	Fall 2018

RECOMMENDATIONS THAT REQUIRE ADDITIONAL RESOURCES	Theme/Objective/ Strategy Number AHC from Strategic Plan	TARGET DATE
Facilities Take advantage of the new facilities to better serve our students and the college by adding the much needed classes, and continue to improve the facilities to keep up with technology and industry to better serve students and the community by making every booth in the lab be able to be used for all the welding processes taught at Allan Hancock College. It would give the welding department the ability to offer the classes students need in the evening as well as in the day to finish their educational goals in the two years. Storage in old building metal containers will continue until more suitable storage is devised so new building is not cluttered. The purchase of six storage lockers approximately $600 each for instructors to keep instructional tools and materials for the different classes should alleviate some of the storage issue. Old lab space should be used for educational space requiring heavy electrical usage since it is already equipped.	Recommendation to add classes to finish educational goals in a more timely fashion **Goal SLS3** **SLS4** Storage recommendation **Goal IR4** Old lab space recommendation **Goal IR3**	Fall 2019
Equipment Have a plan with advisory board recommendations to continually replace, upgrade or add two new pieces of equipment per year approximately $15,000 each, to better serve our students needs by teaching with the latest equipment and methods to keep up with industry. Purchase two welding simulators approximately $12,000 plus an additional $4,000 for licensees to give students that need extra time to acquire welding skill an opportunity to practice without supervision by having it in a common area such as the library and for outreach. Purchase hydraulic press approximately $15,000 to test weld specimens. Purchase two AutoCAD licensees approximately $5,000 to incorporate technology in to the program by installing the software in to the programs two computers designated for student use. Items that would incorporate innovation being taught at the college would be items such as the incorporation of a welding robot to teach the latest technology used in industry. Small items also like welding chambers $ 4,000 and positioners $ 4,000 would teach students more advanced welding skills.	Enovation recommendation **Goal IR3** **IR4**	Fall 2019
Staffing Find and hire a second full time welding instructor or several part time instructors to teach the additional classes to help students reach their educational goals in a timelier manner. Lab assistant and department secretary full time positions should be sought. A continuation of the use of student workers to assist in the operation of the lab should continue because it is vital to the program.	Staffing recommendation **Goal IR1** **E2**	Fall 2019

VALIDATION TEAM RECOMMENDTIONS Disregarded or modified (if appropriate)	REASON	ACTION/CHANGEEGE
Recommendation		
Recommendation		
Recommendation		

PLAN OF ACTION – Post-Validation

Review and Approval

Plan Prepared By

Gabriel Marquez _____ Date: 5/19/2015

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

Reviewed:

Eric, Mason, Department Chair, Industrial Technology

_____ Date: 5/19/2015

*Signature of Department Chair indicates approval by department of Plan of Action.

Reviewed:

Larissa Nazarenko, Interim Dean of Academic Affairs

_____ Date: 05/19/15

Jane Harmon, Interim Vice President, Academic Affairs

_____ Date: 5/20/15