Welding Department Program Review

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Overview

A. Description of Program

The welding department at El Camino College consists of a morning program as well as an afternoon and evening program. In the morning program, welding 1 meets four mornings a week (Monday, Tuesday, Wednesday, and Thursday) for laboratory time and lecture follows on Tuesdays and Thursdays. Welding 2abc also meets four mornings a week (Monday, Tuesday, Wednesday, and Thursday) for laboratory time and lecture follows on Mondays and Wednesdays. Afternoon and evening classes general meet twice a week either on Mondays and Wednesdays or Tuesdays and Thursdays.

B. Status of Previous Recommendations

As previously recommended, a computer was purchased for use in the lecture room for classroom presentations and to incorporate Internet resources into lectures. A computer room for welding students has been requested but has not been funded. This computer facility would have videos and other tutorial materials fro welding students as well as providing a location for welding students to complete welding related research assignments.

Program Statistics

A. Demand

Over the past three fall semesters, the morning welding courses have been full with a waiting list of students wanting to add. During the same period, enrollment in the afternoon and evening classes has declined. This could be a function of increased enrollment fees since many afternoon and evening students work full time and are taking courses to increase welding skills to potentially earn higher pay rates and promotions. With higher fees, money may not have been as ready available for some students.

B. Offerings

It appears that the welding courses offered fit the needs of the student population at El Camino College. Many students enjoy the morning program since they can schedule their work hours during the afternoon and evening. Based on the fill rate of the morning classes, student want morning classes to be offered. Afternoon and evening students often work full time during the day and are not able to take time off from work to attend day classes. Even with the decrease experienced over the last three fall semesters, these courses are still needed by a portion of the welding student population.

C. Scheduling

Based upon the long hours associated with lecture and laboratory courses, classes are scheduled with as much flexibility as possible. A full selection of welding classes are offered in the spring and the fall. Limited courses are offered in the summer due to the rapid pace of the summer schedule. Students seem to be satisfied with the times that classes are scheduled.

D. Retention and Success

1. Retention

Student retention in beginning courses is generally lower than in those in second, third, and fourth semester courses. This is based upon the idea that all students who take a welding course may not decide that it is the correct career path for them to follow. Students who enroll in advanced courses are familiar with the program and are serious about working in the welding related trades. Those students who do withdraw from advanced courses often find employment in the welding industry or have other job or family concerns that limit their available time to take classes.

2. Success Rate

Students who complete the welding program with a Certificate of Completion, Certificate of Competency, or an AS Degree have a high potential to obtain employment in the welding industry. Local unions often accept students into their training programs once they have completed the welding program at El Camino. In addition, Exxon – Mobil, Chevron, and other south bay companies wanted skilled welders.

Cirriculum

A. Course and Content

1.Courses Not Offered

Course offerings are the same in the spring and the fall, so all current courses are offered.
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2.Course Revisions and Additions

There has been discussion of offering a sheet metal fabrication course**.** Presently, the morning welding courses are eight unit courses with the program designed to last over four semesters. Breaking these courses into three or four unit courses could provide more flexibility for students who can not enroll in a class which meets for four mornings a week with two longer lecture days.

B. Articulation

N/A

C. Instruction and Assessment

1.Active Learning

In the laboratory, current equipment is utilized to teach students welding processes. During classroom instruction, lectures, a current textbook, Internet technology, videos, and DVDs stimulate student learning. Homework assignments require research on safety, welding procedures, real world type projects, and critical thinking techniques. In addition, alternative site meeting are conducted to expose students to welding trade shows, local businesses utilizing welding processes, and other welding related events.

2.Assessment

Students are required to complete projects for each required welding process. These projects are critiqued and graded. During the semester, several lectures exams are given. These may include multiple choice, short answer, and essay type formats. The final exam includes both a lab practicum and a lecture exam.

Program Requirements

A. Instructional Support

The major area of instructional support is the use of laboratory demonstrations. The library and learning resource center is also valuable for students conducting research for assignments.

B. Facilities and Equipment

Having current equipment is critical to the student learning environment. Students need to know how to use equipment that they will most likely use on the job. Faculty and staff attempt to provide state of the art expose to students learning the welding trade.

C. Staffing

Presently, there are two full time welding instructors, a welding laboratory assistant, two adjunct faculty, a welding laboratory technician, and a tool room attendant. This has remained constant over the past three years.

Faculty are encouraged to attend workshops and conferences to stay current in the field. Each spring an alternative site meeting is planned during the WESTEC trade show at the Los Angeles Convention Center.

D. Planning

If either full time welding instructor retires, a replace new faculty member would need to be hired. It would be difficult to fill the gap with adjunct faculty.

Conclusion

A. Prioritize recommendations

A ceiling mounted video projector for use in the welding classroom, room S102 should be purchased. This projector would be connected to the computer that is currently in the classroom so that current technologies such as welding related web sites can be used to supplement lecture materials.

Outdated equipment should continue to be replaced with newer models.

B. Identify major needs

Equipment needs should be identified so that funding may be requested through VTEA, block grants, Foundation Mini Grants, and other grant funds.

C. Discuss strategies to implement recommendations and needs

Once purchased, new equipment is utilized in both the laboratory and lecture setting.

Welding Department Vision Statement

The Welding Department at El Camino College seeks to maximize the ability of its students to compete in the job market by offering up to date and diverse courses in welding technology. To achieve this goal, the department emphasizes current technology trends in both the welding shop and the classroom environment and offers classes both day and evening classes. In addition, courses are adapted to meet diverse student needs and respond to changes in the welding industry.

Welding 1 is an introductory course providing basic skills for welding and the related industries, covering: oxy-acetylene welding and cutting, gas tungsten arc welding, shielded metal arc welding, gas metal arc welding, and flux cored arc welding, and emphasizing shop projects and lecture-based instruction of welding equipment and procedures.

Welding 2 abc is an intermediate welding course with emphasis on the weldability of mild steel, low alloy steel, stainless steel, cast iron, and aluminum, utilizing the following processes: oxy - acetylene cutting, shielded metal arc welding; gas metal arc welding; gas tunsten arc welding; flux cored arc welding. This is a manipulative and theoretical study of welding equipment, procedures, processes, occupational safety, and nomenclature. This course will also include welding safety, nomenclature, weld symbols, and Los Angeles City Structural Certification specifications.

El Camino College
COURSE OUTLINE OF RECORD

I. COURSE DESCRIPTION:

Course Title and Number: WELDING 1

Descriptive Title: Introduction to Welding Process

Discipline: Welding Division: Industry and Technology

Hours Lecture: 5 hour Hours Laboratory: 10 hours Course Units : 8

Weeks: 18 X 9 ___ 6 ___ 4 ___ Other: _____

Grading Method: Letter X CR/NCR ____ Both ___ No Grade ___

Associate Degree Credit: X Non-Degree Credit: ____ Non-Credit: _____

Transfer CSU: No Yes X Effective Date: _____

Transfer UC: No ____ Yes X UC Approval Date: _____
Pending ___

Prerequisite, Corequisite, Recommended Preparation, Enrollment Limitation (Specify):

None

Catalog Description:
This is an introductory welding course that will provide entry level welding skills to welders and those in related skill trades. The course will cover the following processes: oxy – acetylene cutting, oxy – acetylene welding and brazing, shielded metal arc welding, gas metal arc welding, gas tungsten arc welding, and flux cored arc welding. This is a manipulative and theoretical study of welding equipment, procedures, processes, occupational safety, and welding nomenclature. This course will also include a study in weld symbols, blue print reading, metal fabrication, joint design, and welding specifications.

Originator: SAMUEL DANTZLER Submittal Date: Spring 1999

BOARD APPROVAL DATE:

Review and/or Revised by:

_____ Date _____

_____ Date _____

_____ Date _____

II. COURSE OBJECTIVES AND METHODS OF EVALUATION

A. Course objectives (List the major objectives as stated as student outcomes in behaviorally measurable terms.)

Each student, after receiving lectures, demonstrations, homework assignments, and laboratory assignments will be able to:

1. Follow safety procedures for safe operations of tools, machines and welding equipment found in a welding facility.
2. Apply proper welding procedures for oxy - acetylene welding and brazing.
3. Demonstrate proper oxy – acetylene manual and machine cutting processes.
4. Identify, define, and draw weld symbols in accordance with American Welding Society A 2.0.
5. Apply proper welding procedures for Gas Tungsten Arc Welding of aluminum and steel.
6. Identify mild steel, low alloy, and stainless steel electrodes in accordance with American Welding Society Numerical Classification A 5.0. steel
7. Apply proper welding procedures and techniques for Shielded Metal Arc Welding, Gas Metal Arc Welding, and Flux Cored Arc Welding.

B. Methods of Evaluation – Associate Degree Credit Course
Students in this course will be graded, at minimum, in at least one of the four categories. Please check the appropriate responses. The course must have a minimum of one response in category 1, 2, or 3.

1. Substantial writing assignment, including:

_____	essay exam (s)	_____	reading report (s)
_____	written homework	_____	laboratory report (s)
_____	term or other paper (s)	_____	other (specify)

Substantial writing assignments are inappropriate for this degree application course because:

_____ The course is primarily computational in nature

____x The course primarily involves skill demonstrations or problem solving

2. Computational or non-computational problem-solving demonstrations, including:

___x___	exam	_____	homework problems
_____	laboratory reports	_____	field work
___x___	quizzes	_____	other (specify)

3. Skill demonstrations, including:

___x___	class performance (s)	_____	field work
___x___	performance exam (s)	_____	other (specify)

4. Objective examinations, including:

___x__	multiple choice	**____x___**	true / false
___x__	completion	**____x___**	other (specify)
_____	matching	**short answer/explanation**	

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C. Methods of Evaluation – Non-Degree Credit Course
Students will be graded, at minimum, in at least one of the following four categories. Please check the appropriate responses. The course must have a minimum of one response in category 1, 2, or 3.

1. Substantial writing assignment, including:

_____	essay exam (s)	_____	reading report (s)
_____	written homework	_____	laboratory report (s)
_____	term or other paper (s)	_____	other (specify)

Substantial writing assignments are inappropriate demonstrations or problem solving for this degree application course because:

_____ The course is primarily computational in nature

____x The course primarily involves skill

2. Computational or non-computational problem-solving demonstrations, including:

___**x**___	exam	_____	homework problems
_____	laboratory reports	_____	field work
___**x**___	quizzes	_____	other (specify)

3. Skill demonstrations, including:

___**x**___	class performance (s)	_____	field work
___**x**___	performance exam (s)	_____	other (specify)

4. Objective examinations, including:

___**x**__	multiple choice	____**x**___	true / false
___**x**__	completion	____**x**___	other (specify)
_____	matching	**short answer/explanation**	

D. Methods of Evaluation – Non-Credit Course
Indicate methods used for determining whether stated objectives have been met.

Student's performance on quizzes and exams
Student's performance on laboratory work

Welding 1

III. OUTLINE OF SUBJECT MATTER

The outline of topics should be detailed enough to enable an instructor to determine the major areas of knowledge and activities that should be covered so that the course may have consistency from instructor to instructor and semester to semester.

APPROXIMATE TIME (ALLOTTED IN WEEKS)	M A J O R T O P I C S
1	Orientation and welding safety
3	Oxy – Acetylene Welding and Brazing
1	Properties of materials Nature of the arc Electrode classification and fluxes Selection of welding process Shielding Gases Steel specification and classification
1	Mechanical properties of metals
3	Gas Tungsten Arc Welding - Aluminum - Steel
3	Shielded Metal Arc Welding
2	Gas Metal Arc Welding
1	Flux cored Arc Welding
2	Weld symbols and types of joints
1	Problem solving and repair welding

IV. READING AND WRITING ASSIGNMENTS OR, IF MORE APPROPRIATE, ASSIGNMENTS REQUIRING COMPUTATION, PROBLEM SOLVING, OR SKILL DEMONSTRATION
Three hours of work per week, including class time, are required for each unit of credit.

A. Provide a representative example of an assignment.
Laboratory projects:
A typical project would include cutting designated thickness of specified material, layout and design of project, and performing welding assignments as specified.

B. Two hours work outside of class are required for each hour of lecture or equivalent.
Each student in this course will be required to perform the following outside of regular class time.

___**x**___	Study
_____	Answer questions
___**x**___	Required reading
_____	Problem solving activity or exercise
_____	Written work (essays/compositions/report/analysis/research)
_____	Journal (reaction and evaluation of class, done on a continuing basis throughout the semester)
___**x**___	Observation of or participation in an activity related to the course content (e.g. play, museum, concert, debate, meeting) – **welding conferences**
_____	Course is lab only – minimum required hours satisfied by scheduled lab time
___**x**___	Other (specify) field trips to welding shops/facilities

V. COLLEGE - LEVEL CRITICAL THINKING ASSIGNMENTS
Cite a minimum of two specific assignments that demonstrate college – level critical thinking. (Required for degree applicable courses only.)

Essay and short answer questions on exams
Class discussions
Following assigned laboratory directions for lab projects

VI. PLANNED INSTRUCTIONAL ACTIVITIES: (e.g. lecture, media, field trips)

Lectures
Class discussion
Videos
Guest speakers
Field Trips

VII. APPROPRIATE TEXTS AND MATERIALS

For degree applicable courses the adopted texts and/or educational materials have been certified to be primarily college level:

Yes **X** No

A. Required Text(s):
*Welding Principles and Applications,*4 th Edition, Jeffus and Johnson, Delmar Publications, 1998.

B. Required Supplementary Readings(s):
None

C. Other Required Materials(s):
Safety glasses, gloves, welding goggles, chipping hammer, welding brush.

* A complete list of required and recommended materials is maintained in the Division Office.

VIII. PREREQUISTIES, COREQUISTIES, AND ENROLLMENT LIMITATIONS

A. _____ Prerequisitie _____ Corequisite

1. Indicate Type:

_____ Standard _____ Sequential _____ Health and Safety

_____ Computational/Communication Skills

2. Standard Requisite:
Identify three UC/CSU campuses that offer the equivalent pre/corequisite course with the equivalent target course and list the number and title of each.

University Name: _____ Catalog Year _____

Equivalent Target Course: _____

Equivalent Requisite Course: _____

University Name: _____ Catalog Year _____

Equivalent Target Course: _____

Equivalent Requisite Course: _____

University Name: _____ Catalog Year _____

Equivalent Target Course: _____

Equivalent Requisite Course: _____

3. Entrance Skills/Knowledge:
List the **required** skills and/or knowledge without which a student would be **highly unlikely to receive a grade of A, B, or C, or Credit** (or for Health and Safety, would endanger self or others) in the Target Course.

a. Ability to follow directions .

b. Attention to detail.

(Add additional Skills/Knowledge as needed.)

Welding 1

B. ENROLLMENt LIMITATIONS

1. Indicate the category which describes the Enrollment Limitations for this course.

_____ Band/Orchestra

_____ Theater

_____ Speech

_____ Chorus

_____ Journalism

_____ Dance

_____ Intercollegiate Athletics

_____ Honors Course

_____ Blocks of Course

_____ Other (Specify)

2. List Degree and /or Certification requirements that are met by this course:

This course fulfills partial requirements for:
Associate in Science Degree
Certificate of Completion in Welding

3. List all El Camino courses that also satisfy requirements listed in B.2.: