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## San Jacinto Unified School District New Course Proposal

Google Forms <forms-receipts-noreply@google.com>

Thu, Jan 30, 2020 at 11:12 AM

To: sseward@sanjacinto.k12.ca.us

Thanks for filling out San Jacinto Unified School District New Course Proposal

Here's what we got from you:

*Welding I*

EDIT RESPONSE

## San Jacinto Unified School District New Course Proposal

For more information on how to complete this form please contact:

Janet Covacevich

Director, Secondary C & I

(951)929-7700 ext. 4263

jcovacevich@sanjacinto.k12.ca.us

Your email address (sseward@sanjacinto.k12.ca.us) was recorded when you submitted this form.



### Signature Page must be printed and wet signed

Access Signature Page at this link <https://docs.google.com/a/sanjacinto.k12.ca.us/document/d/1TO2G1fXxR6WGNhinPY-oNaxtY130cZHUOjTT3Ntv5Zg/edit?usp=sharing>

School \*

SJHS

**New Course Proposal Submitted By: \***

Zachery Cain

**Course Title \***

Welding I

**Transcript Title (15 characters or less) \***

Please be sure to count each character and spaces used to be no more than 15.

Welding I

**Course Code (assigned by Data Management, extension 4221):**

I0300

**Academic Department \***

CTE-Elective/Interdisciplinary

**Graduation Requirement Met \***

Electives ▼

**Honors (\*note: Honors courses seeking A - G status must offer a non-Honors equivalent course) \***

No ▼

**Grade Level (check all that apply) \***

☐ 6th

☐ 7th

☐ 8th

☒ 9th

☒ 10th

☒ 11th

☒ 12th

**Pre-Requisite (list all that apply) \***

None

**Co-Requisite (list all that apply) \***

None

**Possible credits \***

10 - year long class ▼

**Course Learning Environment \***

☒ Classroom Based

☐ Online/Hybrid

**CALPADS Course Code (assigned by Data Mgt.)**

8230

## Career Technical Education Courses

**Will this course be part of CTE Pathways? \***

Yes ▼

**Is this an Integrated Course (Academics with Career Technical Education) \***

No ▼

**CTE Courses Only: Indicate the Level of the Course:**

Concentrator ▼

**CTE Courses Only: Indicate the Industry Sector**

Manufacturing and Product Development ▼

**CTE Courses Only: Career Pathway & Code Pathway Name**

Welding & Materials Joining

## Submitting Courses That are Program Status, Courses Modeled After Another Institution, or Online, or AP

Course Plans for Program Status, Online, or AP must be attached to this form.

Will this course meet any of the descriptors above? \*

Yes ▼

Program Status Courses (can be auto approved) - Name the Exact Program and Course Title:

### Submitting a Course Modeled After Another Institution:

When modeling after another institution's course, you will also need to enter a course overview specific to San Jacinto Unified School District as well as course content specific to SJUSD.  
Any course modeled after another institution's course will not move forward until it has been written to reflect SJUSD's unique needs.

**Submitting a course modeled after another institution.**

Which school and ATP code? Must state exact course title.

Southwest High School (050816) Welding 1

**Adopt an Online Publisher Course**

**Adopt a Program Status Course**

### Advanced Placement (AP) Courses Only: Please answer the following questions:

This section only applies to AP courses.

**AP Courses Only: Date Submitted to CollegeBoard for AP Audit:**

Month ▼	Day ▼	2020 ▼
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**Exact Course Title****CollegeBoard Authorization Code**

## Course Content

Please note: There are not specific requirements regarding the number of units each course should have. For reference: University of California A-G Guide: <http://www.ucop.edu/agguide/a-g-requirements/index.html> Copy and paste the link into your web browser for course samples.

**Course Overview: Provide a brief summary (3 - 5 sentences) of the course's content. \***

Welding 1 integrates mathematics, science, writing and mechanics. It familiarizes the student with the skills required to perform basic industrial welding. Students focus on safety and are tested on safety practices within the shop.

This course familiarizes the student with the skills required to perform basic industrial welding. The modular format includes theory and practical application in the following main areas; Shielded Metal Arc Welding (SMAW), Oxy-Acetylene Gas Cutting, Gas Tungsten , Gas Tungsten Arch Welding (GTAW/TIG), Flux Cored Arc Welding (FCAW) and Plasma Cutting.

The course emphasizes equipment care and safety and is designed to produce entry-level proficient welders who are ready for certification. Students acquire knowledge and skills within a sequential, standards-based pathway program that integrates hands on, project-based, and work-based instruction.

Specific units include: Using the Ag Welding/Fabrication Shop, Measurement, Project Planning, Plasma and Oxygen/Acetylene Cutting, Shielded Metal Arc Welding, Careers in Agriculture Welding and Fabrication, and a Final Project. Students will focus on understanding theory of the preceding areas, as well as application of these theories. Students will demonstrate core academic knowledge and critical thinking skills as they apply their knowledge to projects and real life scenarios. A variety of resources will be accessed (Internet, professional journals, books, and industry professionals) for the purpose of creating written and oral presentations that demonstrate students' knowledge and ability. Units covered in this course will build upon existing knowledge where applicable. End of unit projects will incorporate, at minimum, the knowledge acquired from at least one other previously covered unit.

**For EACH UNIT of the course, please provide:**

1. A unit title
2. A concise 3 - 5 sentences describing the topics being addressed that demonstrate the critical thinking, depth, and progression of the content covered.
3. A brief 3 - 5 sentences summarizing a key assignment from this unit and covering:
  - a. how a student will complete this assignment
  - b. what a student will produce
  - c. what the student will learn

Most importantly, use the unit(s) and key assignment(s) to demonstrate that the course meets the subject specific course criteria on the A - G Guide.

**Units (outline each unit in the section provided. Indicate new units with a number and title) \***

**Unit A: Work shop safety and Introduction to Welding and Fabrication Shop**

Key assignments will involve safety a safety presentations as well as a safety presentation demonstrating student students knowledge via formal and informal assessment. Students must pass with an 90% or higher.

Students will work in groups of 2-3 to create a poster diagramming and outlining key components of workshop safety. Students present their posters to to two other groups, and groups will then evaluate each others' posters and presentation quality. Students will be assessed regarding safety protocols and expectations; they must pass a safety assessment with a 90% accuracy prior to utilizing equipment and/or working in the shop area. All wrong answered questions will be written out with the correct answers and will contain the reasoning as to why the correct answer is appropriate.

Students will complete a series of measurement tests designed to assess their understand and mastery of basic measurement utilized throughout the course. This may be either a hands on and/or paper demonstration of understanding (fraction, inch, decimal inch, dial caliper, micrometer, etc.)

**Welding and Shop Safety:**

1. Pass the safety test with 100% accuracy.
2. Define the purpose of safety and describe safety measures in the shop lab.
3. Explain the importance of shop cleanliness.
4. Describe importance of work area ventilation.
5. Handle equipment safely during assignments.
6. Remove and properly store equipment

**Interactive Notebooks: Safety First** - Students begin their notebooks with a section on safety in the shop. Specific tool safety is covered for each tool being introduced. Safety is an ongoing practice throughout the course with specific instruction and reinforcement to complement each unit. Students keep notes and directions regarding shop safety throughout the course. Using Interactive Notebooks, students track, annotate, and respond in writing to all materials covered in class. Notebooks facilitate the integration of mathematical and scientific concepts through daily writing, questioning and reflection. Notebooks also provide a platform for regular review of previous concepts and constructions and for written student-teacher interactions.

**Unit B: Measurement**

**Section Overview/Objectives:** The students will learn how to select and use appropriate measurement and layout tools and procedures for metalworking.

This knowledge will be demonstrated by completion of assignments, experiential learning, and a unit test. Concepts and practices learned in Unit 2 will be used throughout this course.

**Unit C: Plasma and Oxygen/Acetylene Cutting**

**Section Overview/Objectives:** Students will learn how electricity and the combination of oxygen and acetylene gas cuts through metals of varying thicknesses. Students will be able to identify the advantages and disadvantages of both cutting techniques as well as which technique to use on different types of metals for the desired outcome. This knowledge will be demonstrated by completion of assignments, experiential learning, and a unit test. Information obtained through Unit 4 will be utilized throughout this course as students learn theory, and then experience project development and construction.

Identify appropriate industrial uses of plasma cutting.

2. Identify advantages of Plasma Cutting
3. Describe proper operation of equipment commonly used for plasma cutting.
4. Describe safety rules and procedures that apply to Plasma cutting.
5. Name materials that can be cut using plasma.

**Unit D: Shielded Metal Arc Welding and Resistance Spot Welding**

After receiving comprehensive instruction on the various machines, students select and use the appropriate welding and cutting tools, processes, and machinery to produce practice weldments and fabrication projects. The focus of the unit is the production of a completed fabrication, assembly or repair using appropriate joining and mechanical fastening techniques and processes.

**Section Overview/Objectives:** Section Overview/Objectives: Students will learn to select electric gas metal arc welders, equipment, and other materials needed for welding. Students will use gas metal arc welding equipment and procedures in welding. This knowledge will be demonstrated by completion of assignments,



experiential learning, and a unit test. Major areas of instruction include; Selecting and Using Arc Welding Equipment and Arc Welding Mild Steel. Gas Tungsten Arc Welding (GTAW)

1. Describe applications of GTAW.
2. Describe functions of machines used in GTAW.
3. Discuss appropriate safety procedures.
4. Describe shielded gases, accessories and electrodes used in GTAW.
5. Demonstrate understanding of power source, shielding gases, torch nozzle and tungsten electrode.
6. Demonstrate preparation of welds.
7. Select electrodes, shielding gases and flow rate for GTAW.
8. Demonstrate welds in all positions.
9. Demonstrate shop and equipment safety at all times.

Resistance Spot Welding (RSW)

1. Identify purposes of spot welding.
2. Describe materials that can be spot welded
3. Describe workplace uses of RSW
4. Identify equipment commonly used for RSW
5. Describe the procedures for RSW
6. Describe safety rules and procedures that apply to RSW
7. Safely operate RSW equipment

Unit E. Careers In Welding

In this unit students will focus on employability skills and careers with in the industry. Students will be introduced to industry professionals who will inform the students about available careers in the welding and engineering industry. These presenters will also be able to inform students about post high school educational opportunities for students wishing to pursue welding as a career. In this unit we will cover:

1. Describe the relationship between effective life skills and good work habits.
  2. Describe the relationship between good work habits and effective time management skills.
  3. Define work ethic and explain the importance of ethical standards and social responsibility in the workplace environment.
  4. Discuss the following traits of a successful customer service representative and describe representative behavior.
    - a. positive attitude/maintains a healthy self-concept
    - b. self-confidence/considers risks
    - c. honesty/integrity
    - d. perseverance
    - e. self-management/work ethic
    - f. pride in product/work
    - g. dependability/punctuality
  5. Define personal hygiene and identify acceptable workplace attire.
  6. Differentiate between personal time pressures and problems and work-related responsibilities.
  7. Explain the balance between work and family and identify personal strategies for achieving and maintaining a balance.
  8. Identify personal stressors and formulate strategies (time management, goal setting, establishing priorities) to alleviate and control stress.
  9. Establish goals for personal development, family life, leisure time, volunteerism, and further education/training
- Understand elements of effective personal skills in the workplace environment, including group dynamics, conflict resolution, and negotiation:
10. Recognize effective communication patterns and develop skills that enhance professional relationships:
    - a. Compare and contrast assertive, aggressive, and passive communication styles.
    - b. Identify barriers to effective communication in the workplace.
    - c. List ways to improve basic skills of listening and communicating.
    - d. Identify non-verbal communication clues and state their meanings.
    - e. Present a positive image through verbal and nonverbal communication and understand the power of body language in communication.
    - f. Recognize and describe some cultural differences in communication styles.
    - g. Describe communication patterns which demonstrate respect.

- h. Demonstrate ability to communicate effectively with persons of diverse backgrounds.
- 11. Identify and discuss behaviors of an effective team.
- 12. Explain the importance of mutual respect in workplace relations.
- 13. Discuss and demonstrate strategies for conflict resolution and negotiation, and explain their importance within the business environment.
- 14. Analyze situations that may create conflict and develop methods for productively dealing with conflict.
- 15. Separate personalities from problems.
- 16. Invent options that are acceptable for both sides.
- 17. Base agreements on what is fair.
- 18. Discuss laws that apply to sexual harassment in the workplace and identify tactics for handling harassment situations.
- 19. Work cooperatively, share responsibilities, accept supervision, and assume leadership roles.
- 20. Demonstrate cooperative working relationships and proper etiquette across gender and cultural groups

## Course Materials

Provide the COURSE MATERIALS that students use and analyze throughout the course. When appropriate, please incorporate these materials into the course's unit descriptions in the COURSE CONTENT section. Some subject areas and disciplines require courses to include specific course materials. Please refer to the subject course criteria in the link above and/or the California Department of Education (<http://www.cde.ca.gov/ci/cr/cf/imagen.asp>) for more information.

## Course Material

Please access the hyperlinked Google Slide deck for a sample of the required information for any course materials that will be used in the course.

## Google Slide Deck Link w/samples

<https://docs.google.com/a/sanjacinto.k12.ca.us/presentation/d/1LaBuMtWAqL9bMaPKGQ8ooRZ6AZOLtS2PV0HGPudpYqo/edit?usp=sharing>

Select Course Material (select all that apply) \*

- ☒ Textbook
- ☐ Literary Text
- ☒ Manual
- ☐ Periodical
- ☐ Scholarly Article
- ☒ Website
- ☐ Primary Document
- ☒ Multimedia



☐ Other

**Course Material: Primary \***

Welding Fundamentals (Goodheart Wilcox)  
Welding Fundamental Lab Workbook (Goodheart Wilcox)

**Course Materials: Additional (if applicable)**

## A-G Courses

For courses seeking A - G status please answer the questions below

**Is this course being submitted for A-G status? \***

Yes ▾

**Subject for A - G status**

- ☐ "A" History/Social Science
- ☐ "B" English
- ☐ "C" Mathematics
- ☐ "D" Lab Science
- ☐ "E" Language Other Than English
- ☐ "F" Visual and Performing Arts
- ☒ "G" Elective

**Name the Discipline (i.e. US History, LOTE, Theater, etc.)**

CTE Elective-Interdisciplinary

**Is this an Integrated Course (Academics with Career Technical Education)**

- ☐ Yes
- ☒ No

**Does this course need to be retro-activated to a previous year?**

No ▾

**If yes, which year(s)?**

- ☐ 2017-2018
- ☐ 2016-2017
- ☐ 2015-2016
- ☐ 2014-2015

## **Final Review**

Please review your course prior to submission to ensure it meets all requirements, courses will not be moved forward until they have provided all the required information.

## **End of Course Submission**

Before you submit, please verify that you have completed all required components for submission.

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[Quoted text hidden]

# Welding 1

Southwest High School (050816)

## Basic Course Information

Title:	Welding 1
Transcript abbreviations:	Welding 1 / 2755
Length of course:	Full Year
Subject area:	College-Preparatory Elective (G) / Interdisciplinary
UC honors designation?	No
Prerequisites:	None
Co-requisites:	None
Integrated (Academics / CTE)?	Yes
Grade levels:	9th, 10th, 11th
Course learning environment:	Classroom Based

## Course Description

### Course overview:

Welding 1 at Southwest High School integrates mathematics, science, writing and mechanics. It familiarizes the student with the skills required to perform basic industrial welding. Students focus on safety and are tested on safety practices within the shop.

This course familiarizes the student with the skills required to perform basic industrial welding. The modular format includes theory and practical application in the following main areas; Shielded Metal Arc Welding (SMAW), Oxy-Acetylene Gas Cutting, Gas Tungsten , Gas Tungsten Arch Welding (GTAW/TIG), Flux Cored Arc Welding (FCAW) and Plasma Cutting.



The course emphasizes equipment care and safety and is designed to produce entry-level proficient welders who are ready for certification. Students acquire knowledge and skills within a sequential, standards-based pathway program that integrates hands on, project-based, and work-based instruction.

Specific units include: Using the Ag Welding/Fabrication Shop, Measurement, Project Planning, Plasma and Oxygen/Acetylene Cutting, Shielded Metal Arc Welding, Careers in Agriculture Welding and Fabrication, and a Final Project. Students will focus on understanding theory of the preceding areas, as well as application of these theories. Students will demonstrate core academic knowledge and critical thinking skills as they apply their knowledge to projects and real life scenarios. A variety of resources will be accessed (Internet, professional journals, books, and industry professionals) for the purpose of creating written and oral presentations that demonstrate students' knowledge and ability. Units covered in this course will build upon existing knowledge where applicable. End of unit projects will incorporate, at minimum, the knowledge acquired from at least one other previously covered unit.

## Course content:

### Work shop safety and Introduction to Welding and Fabrication Shop

*Section Overview/Objectives:* In this unit the students will learn to recognize major work areas and use safe procedures when working in a welding and fabrication shop. Students will participate in hands-on activities designed to build their foundational understanding of participation in a workshop classroom environment. Students will also learn to interpret safety colors and codes, protect the body against injury, and work safely in agricultural welding/fabrication settings. Students will become aware of and recognize and reduce hazards in agricultural welding/fabrication settings, and to react effectively in case of fire or other emergencies. This knowledge will be demonstrated by completion of assignments, experiential learning, and a unit test. Information learned in Unit 1 will be utilized throughout the course. All of the skills and procedures acquired in unit 1 will be used in subsequent units of study.

#### Welding Career Overview:

1. Discuss job opportunities in the welding field
2. Discuss techniques and uses of various cutting and welding operations including Oxy-Acetylene Gas Cutting Equipment, Shielded Metal Arc Welding and Equipment (SMAW), Gas Tungsten Tungsten Arc Welding and Equipment (GTAW/TIG), Flux Cored Arc Welding (FCAW), and Plasma Cutting and Equipment
3. Describe the general components of different welding and cutting equipment.
4. Relate the purpose of the different equipment versus different material and their advantage.
5. Explain the importance of so many types of equipment in relation to the industry.

#### Welding Tools:

1. Identify the necessity for thorough knowledge of welding and cutting equipment prior to operation.
2. Describe the flame cutting station
3. Explain the components and application of a cutting station.
4. Describe a gas and arc welding station
5. Explain the purpose and proper procedures to use and maintain the power shear.
6. Describe use of the power shear
7. Demonstrate safe operation of the power guillotine shear
8. Demonstrate operation of metal band saw
9. Explain the use of the guide bend tester and its importance in welder certification.
10. Describe operation of a guide bend tester.
11. Describe operation of a tensile testing machine

12. Define why it is necessary to identify the dangers of a pedestal grinder
13. Demonstrate understanding of pedestal grinder uses
14. Identify and discuss use and methods of heat oven for low hydrogen electrodes

#### Hand Tools, Clothing and Accessories

1. Explain the proper use and maintenance of hammers.
2. Describe the use of pliers in welding.
3. Explain Box Wrench use and maintenance.
4. Explain Open End Wrenches use and maintenance.
5. Explain Spark Lighter use and operation.
6. Explain the proper use of the rule and its components:  $\frac{1}{2}$   $\frac{1}{4}$   $\frac{3}{4}$  etc.
7. Describe proper use and advantages of calipers for welding accuracy.
8. Describe purpose of the steel brush.
9. Describe the use of files in welding practice.
10. Discuss and demonstrate proper use of the electric grinder.
11. Discuss proper helmet usage.
12. Describe the importance of mask and goggles during cutting and welding.
13. Explain the general maintenance and use of the welding jacket and gloves.
14. Describe situations in which leggings, apron or cap are used.
15. Describe the safety aspects of TIG gloves.
16. Explain the importance of steel toe protective boots for a metal worker

#### Unit Assignment(s):

This assignment will involve safety a safety presentation as well as a safety presentation demonstrating student students knowledge via formal and informal assessment. Students must pass with an 90% or higher.

Students will work in groups of 2-3 to create a poster diagramming and outlining key components of workshop safety. Students present their posters to to two other groups, and groups will then evaluate each others' posters and presentation quality. Students will be assessed regarding safety protocols and expectations; they must pass a safety assessment with a 90% accuracy prior to utilizing equipment and/or working in the shop area. All wrong answered questions will be written out with the correct answers and will contain the reasoning as to why the correct answer is appropriate.

Students will complete a series of measurement tests designed to assess their understand and mastery of basic measurement utilized throughout the course. This may be either a hands on and/or paper demonstration of understanding (fraction, inch, decimal inch, dial caliper, micrometer, etc.)

#### Welding and Shop Safety:

1. Pass the safety test with 100% accuracy.
2. Define the purpose of safety and describe safety measures in the shop lab.
3. Explain the importance of shop cleanliness.
4. Describe importance of work area ventilation.
5. Handle equipment safely during assignments.
6. Remove and properly store equipment

Interactive Notebooks: Safety First - Students begin their notebooks with a section on safety in the shop. Specific tool safety is covered for each tool being introduced. Safety is an ongoing practice throughout the course with specific instruction and reinforcement to complement each unit. Students keep notes and directions regarding shop safety throughout the course. Using Interactive Notebooks,



students track, annotate, and respond in writing to all materials covered in class. Notebooks facilitate the integration of mathematical and scientific concepts through daily writing, questioning and reflection. Notebooks also provide a platform for regular review of previous concepts and constructions and for written student-teacher interactions

## Measurement

*Section Overview/Objectives:* The students will learn how to select and use appropriate measurement and layout tools and procedures for metalworking. This knowledge will be demonstrated by completion of assignments, experiential learning, and a unit test. Concepts and practices learned in Unit 2 will be used throughout this course.

### Unit Assignment(s):

Examples of student assessment include:

**Use and Identification** - Students will identify measurement and layout tools of the industry as well as their correct usage. Information obtained will be included in their interactive notebooks. Pictures of the tools along with a scenario detailing proper use will also be present.

**A Fraction of an Inch** - Students learn by teaching. For this assignment, students must make a story book that teaches a K-2 student how to read a ruler. The students' storybooks must show measurement to 1/16". Students must also demonstrate understanding of reducing of fractions. Story books will be graded based on a rubric format.

**What is Scale?** - In this activity students will understand that the term "SCALE" has a dual meaning in project design and drawings. Scale refers to the ratio of the linear size of the model to the size of the real object being modeled. A problem based worksheet is also provided to help students understand scale factors and define ratio of a model size relative to the actual object that the model represents. The Teacher will tap into prior knowledge in understanding that models and toys have different scales in relation to the real object being modeled. Students will understand that key parts to every scale drawing are the scale factor and the degree to which scale models has been reduced in size, compared to the original. Students will demonstrate their understanding of scale by completing a table showing real life sizes of various objects (10 items to be provided by teacher, 10 items to be selected by student) and then their scaled size in inches. Students must complete both 1/2" and 1/4" scale.

**Supersize Me!** - After studying scale factor, students choose an everyday object and enlarge it using a feasible scale factor of their choice and appropriate layout tools in the shop. Students use balsa wood to design all or most components of the object but may supplement the object with other materials. Students apply their knowledge of ratio and proportion to create the enlarged object. After designing the object, students analyze how increasing dimension affects surface area and volume. The outcome of this project is a new, smaller larger. Students understand scaling-up and scaling-down in theory and in practice.

## Plasma and Oxygen/Acetylene Cutting

*Section Overview/Objectives:* Students will learn how electricity and the combination of oxygen and acetylene gas cuts through metals of varying thicknesses. Students will be able to identify the advantages and disadvantages of both cutting techniques as well as which technique to use on different types of metals for the desired outcome. This knowledge will be demonstrated by completion of assignments, experiential learning, and a unit test. Information obtained through Unit 4 will be utilized throughout this course as students learn theory, and then experience project development and construction.



- Identify appropriate industrial uses of plasma cutting.
2. Identify advantages of Plasma Cutting
  3. Describe proper operation of equipment commonly used for plasma cutting.
  4. Describe safety rules and procedures that apply to Plasma cutting.
  5. Name materials that can be cut using plasma.

### Unit Assignment(s):

Students will, through written, verbal and demonstration methods, demonstrate/list procedures to correctly set up and operate the Oxygen Acetylene Cutting Torch. Utilizing this cutting process, students will perform skill-building practice cuts on 1/4" thick mild steel plates. As a performance task, students will then cut out a 5"x5" dimensioned test plate with various features.

**Critical Thinking: Cutting Scenarios-** Students will be given a variety of scenarios as if they are working in a fabrication shop and have just taken a customer order. They must utilize the information learned in Unit 3 to complete project plans and a bill of materials. They must then determine which cutting technique to use based on the customer's desired outcomes.

**Demonstration: Torch Set Up-** Students must demonstrate how to properly and safely light an oxygen/acetylene torch and adjust the flame to obtain a neutral flame and then a feathered flame.

Students are then also assessed on the following areas as well:

- Evaluation of cut edges by the instructor
- Evaluation of the cut quality and dimensions.

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## Shielded Metal Arc Welding and Resistance Spot Welding

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After receiving comprehensive instruction on the various machines, students select and use the appropriate welding and cutting tools, processes, and machinery to produce practice weldments and fabrication projects. The focus of the unit is the production of a completed fabrication, assembly or repair using appropriate joining and mechanical fastening techniques and processes.

*Section Overview/Objectives:* Students will learn to select electric gas metal arc welders, equipment, and other materials needed for welding. Students will use gas metal arc welding equipment and procedures in welding. This knowledge will be demonstrated by completion of assignments, experiential learning, and a unit test. Major areas of instruction include; Selecting and Using Arc Welding Equipment and Arc Welding Mild Steel.

### Gas Tungsten Arc Welding (GTAW)

1. Describe applications of GTAW.
2. Describe functions of machines used in GTAW.
3. Discuss appropriate safety procedures.
4. Describe shielded gases, accessories and electrodes used in GTAW.
5. Demonstrate understanding of power source, shielding gases, torch nozzle and tungsten electrode.
6. Demonstrate preparation of welds.
7. Select electrodes, shielding gases and flow rate for GTAW.
8. Demonstrate welds in all positions.
9. Demonstrate shop and equipment safety at all times.

## Resistance Spot Welding (RSW)

1. Identify purposes of spot welding.
2. Describe materials that can be spot welded
3. Describe workplace uses of RSW
4. Identify equipment commonly used for RSW
5. Describe the procedures for RSW
6. Describe safety rules and procedures that apply to RSW
7. Safely operate RSW equipment

### ≡ Unit Assignment(s):

1. Students will, through written, verbal and demonstration methods, demonstrate/list procedures for completing a weldment, which includes outside corner, butt, lap, and tee joints in the flat position on carbon steel using the GMAW, SMAW and OFW methods.
2. Students will be assessed in the following areas:
  - Inspected and acceptable welds in each process
  - Passing result of a break test on the standard weldments

Students will , through written, verbal and demonstration methods, demonstrate/list procedures for...

- Preparing weld plates
- Fitting together and taking weld plates.
- completing groove weld stringer passes and a cover pass.
- Measuring out test strip specimens

Final project-based assessment to determine the overall competency of the various preparations and knowledge of welding machines, hand tools, power tools and fabricating machines via student demonstration and presentation. Students are encouraged to present their work at local and state events where they gather, organize, and present the skills, concepts and products that they learned/created throughout the Welding 1 course here at Southwest High School.

## Careers In Welding

In this unit students will focus on employability skills and careers with in the industry. Students will be introduced to industry professionals who will inform the students about available careers in the welding and engineering industry. These presenters will also be able to inform students about post high school educational opportunities for students wishing to pursue welding as a career.

In this unit we will cover:

1. Describe the relationship between effective life skills and good work habits.
2. Describe the relationship between good work habits and effective time management skills.
3. Define work ethic and explain the importance of ethical standards and social responsibility in the workplace environment.
4. Discuss the following traits of a successful customer service representative and describe representative behavior.
  - a. positive attitude/maintains a healthy self-concept

b. self-confidence/considers risks

c. honesty/integrity

d. perseverance

e. self-management/work ethic

f. pride in product/work

g. dependability/punctuality

5. Define personal hygiene and identify acceptable workplace attire.

6. Differentiate between personal time pressures and problems and work-related responsibilities.

7. Explain the balance between work and family and identify personal strategies for achieving and maintaining a balance.

8. Identify personal stressors and formulate strategies (time management, goal setting, establishing priorities) to alleviate and control stress.

9. Establish goals for personal development, family life, leisure time, volunteerism, and further education/training

Understand elements of effective personal skills in the workplace environment, including group dynamics, conflict resolution, and negotiation:

10. Recognize effective communication patterns and develop skills that enhance professional relationships:

a. Compare and contrast assertive, aggressive, and passive communication styles.

b. Identify barriers to effective communication in the workplace.

c. List ways to improve basic skills of listening and communicating.

d. Identify non-verbal communication clues and state their meanings.

e. Present a positive image through verbal and nonverbal communication and understand the power of body language in communication.

f. Recognize and describe some cultural differences in communication styles.

g. Describe communication patterns which demonstrate respect.

h. Demonstrate ability to communicate effectively with persons of diverse backgrounds.

11. Identify and discuss behaviors of an effective team.

12. Explain the importance of mutual respect in workplace relations.

13. Discuss and demonstrate strategies for conflict resolution and negotiation, and explain their importance within the business environment.

14. Analyze situations that may create conflict and develop methods for productively dealing with conflict.

15. Separate personalities from problems.

16. Invent options that are acceptable for both sides.

17. Base agreements on what is fair.

18. Discuss laws that apply to sexual harassment in the workplace and identify tactics for handling harassment situations.

19. Work cooperatively, share responsibilities, accept supervision, and assume leadership roles.

20. Demonstrate cooperative working relationships and proper etiquette across gender and cultural groups

## ≡ Unit Assignment(s):

The Imperial Valley Regional Occupational Program will come into the classroom on various days to work with the students on building their professional portfolio as well as working on resumes, job applications and communication skills. The students will receive a grade based on their portfolio progress as well as the resume and job application that they turn in at the end of the unit.

Students will create a cover letter and resume detailing the competencies and skills attained while enrolled in the welding 1 course. Students will assume to be preparing this information for potential employment at a local fabrication, electrical, plumbing, concrete or power systems company.



Students will complete a 2-3-page paper on a career interest within the industry. The papers are meant to be a way of further developing the student's knowledge of welding and engineering career opportunities.

Students will create a Prezi, Google Slides or PPT to discuss their career interest and information they have learned relevant to the career they have selected.

## course Materials

### Textbooks

Title	Author	Publisher	Edition	Website	Primary
Welding Fundamentals	Bowditch	Goodheart-Wilcox Publisher	2017/5th edition	www.g-w.com	Yes
Welding Fundamentals Lab Workbook	Bowditch	Goodheart-Wilcox	5th/2017	www.g-w.com	No

### Websites

Title	Author(s)/Editor(s)/Compiler(s)	Affiliated Institution or Organization	URL
CTE Online Ag Mechanics Model	[ empty ]	California Department of Education	http://www.cteonline.org/portal/default/Curriculum/Viewer/Curriculumaction=2&view=viewer&cmobjid=132916
Welding Connects our World	[ empty ]	Lincoln Electric	http://www.lincolnelectric.com/en-us/education-center/training-materials/Pages/training-materials.aspx
Miller	[ empty ]	Miller	https://www.millerwelds.com/



## New Course Signature/Approval Page

- I. Suggested Course Title: Welding I
- II. Department(s): CTE Elective
- III. School: San Jacinto High School

IV. School Committee Members:

- |                                 |                               |
|---------------------------------|-------------------------------|
| a. Name: <u>Zach Cain</u>       | Signature: <u>[Signature]</u> |
| b. Name: <u>Courtney Hall</u>   | Signature: <u>[Signature]</u> |
| c. Name: <u>[Signature]</u>     | Signature: <u>[Signature]</u> |
| d. Name: <u>Stefanie Seward</u> | Signature: <u>[Signature]</u> |
| e. Name: _____                  | Signature: _____              |

V. Committee Meeting Date(s): \_\_\_\_\_

VI. Department Chair Signature:

- |                           |                               |                      |
|---------------------------|-------------------------------|----------------------|
| a. Name: <u>RCostello</u> | Signature: <u>[Signature]</u> | Date: <u>1/30/20</u> |
| b. Name: _____            | Signature: _____              | Date: _____          |

VII. Principal Signature:

- |                               |                               |                        |
|-------------------------------|-------------------------------|------------------------|
| a. Name: <u>Courtney Hall</u> | Signature: <u>[Signature]</u> | Date: <u>1/30/2020</u> |
|-------------------------------|-------------------------------|------------------------|

VIII. Course Proposal Reviewed by Educational Services:

- |  |                       |
|--|-----------------------|
| a. Director, Educational Services: <u>Janet Covacevich</u> |                       |
| Signature: <u>[Signature]</u>                              | Date: <u>1-30-20</u>  |
| b. Assistant Superintendent of Educational Services: _____ |                       |
| Signature: <u>[Signature]</u>                              | Date: <u>2/2/2020</u> |

IX. Course Proposal Approved by the Board of Trustees:

- |   |             |
|---|-------------|
| a. SJUSD Board of Trustees President: _____ |             |
| Signature: _____                            | Date: _____ |

