

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT

**Course Outline
Metal 3 & 4**

Date: May 2002

Proposed Grade Level(S): 11 & 12

Grading: A-F

Prerequisites: Metal 2 with a Grade of 'C' or Better

Subject Area: Technology

Course Length: 1 Year

Number Of Credits: 5/Semester

COURSE DESCRIPTION:

The extensive knowledge and skills students have acquired in the use of metal fabrication tools and equipment will be enhanced in preparation for a pre-apprenticeship program and work experience education. Students will develop occupational skills in the areas of sheet metal, gas, arc, MIG, and TIG welding, machining, and ornamental ironwork. Age-appropriate activities are designed for students to construct a number of useful articles with personal aesthetic values using a variety of materials, equipment, and constructive processes. Design, planning, and manipulative activities will be an integral part of the course. Safety is emphasized throughout the course in the use of hand tools and power equipment. All students will benefit from this course regardless of their respective learning styles, learning rates, or gender.

GENERAL GOALS/PURPOSE:

- Students will understand the chemical, physical, and mechanical properties of welding materials and how welding processes affect those properties.
- Students will understand common types of weld tests, how to identify a flaw, and what constitutes a defect. They will perform visual inspections of their welds; prepare and perform selective destructive and nondestructive tests to determine dimensional accuracy; and identify undercut, overlap, porosity, tensile strength, hardness, and shear strength.
- Students will understand workplace functions in all aspects of a manufacturing organization. They will perform the organizational functions of a manufacturing enterprise, including site management, finance operations, marketing, community relations, and labor relations.
- Students will work safely and be able to recognize potential hazards.
- Students will develop interpersonal skills, work habits, and acquire information that will lead to employment.

STUDENT READING COMPONENT:

Students will locate, understand, and interpret written information in documents such as manuals, graphs, and textbooks.

STUDENT WRITING COMPONENT:

Students will communicate thoughts, ideas, information, and messages in writing through letters, directions, reports, graphs, and flowcharts.

STUDENT ORAL COMPONENT:

Students will communicate orally in giving directions to a project and short presentations.

STUDENT MATH COMPONENT:

Students will perform basic and advanced computations and approaches to practical problems by choosing appropriately from a variety of mathematical techniques.

DETAILED UNITS OF INSTRUCTION:

1. Orientation
2. Safety
3. Destructive and Nondestructive testing
4. Welding Inspection Process and Procedures
5. Functions of a Manufacturing Organization
6. Labor Relations
7. Owning your own Business
8. Handling Hazardous Materials
9. Welding Certification Process

THIS COURSE WILL PREPARE STUDENTS FOR THE HSEE AND/OR FCUSD EXIT EXAMS IN:

Math, Reading, Writing

LAB FEE, IF REQUIRED: \$20 per year for consumable and take home material

SUBJECT AREA CONTENT STANDARDS TO BE ADDRESSED:

Industrial and Technology Education Content and Performance Standards 1996:

Standard 14 Product Development and Documentation
Standard 15 Variables in Welding Fabrication
Standard 16 Industrial Forming for Welding Fabrication
Standard 24 Inspection, Testing, and Certification
Standard 34 Organization of a Manufacturing Enterprise

DISTRICT ESLR'S TO BE ADDRESSED:

When students complete an Industrial and Technology Education course, they will be:

1. **Self-directed Learners** who will be able to solve engineering problems;
2. **Effective Communicators** who can express technology concepts to others effectively;
3. **Quality Producers** who can solve technology problems in a neat and organized manner;
4. **Constructive Thinkers** who are able to approach complex technology problems in a organized, logical, and systematic fashion;
5. **Collaborative Workers** who can work in teams to accomplish a task; and
6. **Responsible Citizens** who accept responsibility for their actions.