EL DORADO UNION HIGH SCHOOL DISTRICT
Educational Services

Course of Study Information Page

Course Title: Metals (#530)	
Rationale: This is an introduction into the world of metals; the student will learn the basics of machining, welding, and manufacturing.	
Course Description: This program is designed to provide the student with vocational experiences associated with general metals area of sheet metal, bench metal and welding, foundry, forging and machine tools. The student will explore the modern concepts and trends affecting the metalworking industry. It also looks into the social, economic and ecological impact technology has had on our society. This program also provides the student an opportunity to develop competencies in metal fabrication and machine tool operation.	
Length of Course:	1 Year
Grade Level:	10 - 12
Credit: Number of units: 5 units per semester ❒ Meets graduation requirements ❒ Request for UC "a-f" requirements ❒ College Prep ☒ Elective ☒ Vocational	
Prerequisites:	Shop Fundamentals or teacher permission
Department(s):	Trades and Industries
District Sites:	El Dorado High School
Board of Trustees Adoption Date:	5-9-00
Textbook(s)/Instructional Materials:	Modern Metalworking; John R. Walker; 6th Edition, 2000
Date Adopted by the Board of Trustees:	5-23-00 (in lieu of funds)

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Educational Services

Metals

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Course: Metals

"Big Idea" (Theme)

Students will develop an awareness and understanding of the importance of personal safety and how to practice it.

State/National Standards

Chapter 4
162: Safety

Give examples of student work that demonstrates mastery of this standard

1. Safety test results
2. Observation of student practices in the shop.

Safety reinforcement notebook.

Identify best practices used to teach standard

Modeling by teacher

Lecture

Hands-on testing

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Course: Metals

"Big Idea" (Theme)

The student will understand the mechanical and physical properties of common metals and be able to describe how they are extracted from the earth, refined, and formed into usable shapes.

State/National Standards

Chapter 6

06: Materials

Give examples of student work that demonstrates mastery of this standard

1. Test results.
2. Observation of student practices in the shop.
3. Notebook

Identify best practices used to teach standard

Lecture

Test results

Visual aids

EL DORADO UNION HIGH SCHOOL DISTRICT
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Course: Metals

"Big Idea" (Theme)

The student will demonstrate a working knowledge of bench metal cutting tools.

State/National Standards

Chapter 11
16: Industrial forming for welding fabrication

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Observation of student practices in the shop
3. Completed student projects

Identify best practices used to teach standard

Modeling by teacher

Lecture

Hands on testing

EL DORADO UNION HIGH SCHOOL DISTRICT
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"Big Idea" (Theme)

The student will demonstrate a working knowledge of bench metal hand tools.

State/National Standards

Chapter 11
16: Industrial forming for welding fabrication

Give examples of student work that demonstrates mastery of this standard

1. Test results.
2. Observation of student practices in the shop.
3. Completed student projects.

Identify best practices used to teach standard

Modeling by the teacher

Lecture

Hands on testing

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"Big Idea" (Theme)

The student will demonstrate a working knowledge of bending, shaping, and mechanically fastening bench metals.

State/National Standards

Chapter 11
16: Industrial forming for welding fabrication

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Observation of student practices in the shop
3. Completed student projects

Identify best practices used to teach standard

Modeling by the teachers

Lecture

Hands on testing

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Course: Metals

"Big Idea" (Theme)

The student will demonstrate a working knowledge of the different metals from which sheet metal is formed and how it is produced.

State/National Standards

Chapter 11
33: Sheet metal

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Observation of student practices in the shop
3. Calculating cost of material
4. Computing waste
5. Optimum cutting plan
6. Completed student projects

Identify best practices used to teach standard

Modeling by the teacher

Lecture

Hands on testing

EL DORADO UNION HIGH SCHOOL DISTRICT
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Department: Trades and Industry Grade Level:10 - 12

Course: Metals

"Big Idea" (Theme)

The student will demonstrate a working knowledge of sheet metal pattern, development, and cutting.

State/National Standards

Chapter 11
33: Sheet metal

Give examples of student work that demonstrates mastery of this standard

1. Measuring of material
2. Calculating cost of material
3. Computing waste
4. Optimum cutting plan
5. Completed student projects

Identify best practices used to teach standard

Lecture

Teacher-generated examples (hand-outs)

Student worksheets

Completed student patterns

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"Big Idea" (Theme)

The students will demonstrate a working knowledge of sheet metal forming and fastening practices.

State/National Standards

Chapter 11
33: Sheet metal

Give examples of student work that demonstrates mastery of this standard

1. Observation of student practices in the shop
2. Laboratory forming and fastening practices on sheet metal
3. Completed student projects

Identify best practices used to teach standard

Lecture

Modeling by the teacher

Student worksheets

EL DORADO UNION HIGH SCHOOL DISTRICT
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Course: Metals

"Big Idea" (Theme)

The student will demonstrate a working knowledge of common foundry tools and patterns

State/National Standards

Chapter 11
32: Foundry and casting

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Observations of student practices in the shop

Identify best practices used to teach standard

Lecture

Teacher-generated examples (hand-outs)

Student worksheets

Foundry tool identification

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Department: Trades and Industry Grade Level:10 - 12

Course: Metals

"Big Idea" (Theme)

The students will demonstrate a working knowledge of gating, sand, and cores as they apply to foundry practice.

State/National Standards

Chapter 11
32: Foundry and casting

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Observations of student practices in the shop

Identify best practices used to teach standard

Lecture

Teacher-generated examples (hand-outs)

Student worksheets

Foundry tool identification

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Department: Trades and Industry Grade Level:10 - 12

Course: Metals

"Big Idea" (Theme)

The student will demonstrate an understanding of industrial casting processes.

State/National Standards

Chapter 11
32: Foundry and casting

Give examples of student work that demonstrates mastery of this standard

1. Observation of student practices in the shop
2. Student created patterns
3. Student created sand cast molds
4. Student performed foundry pour

Identify best practices used to teach standard

Modeling by the teacher

Foundry tool identification

Lecture

Foundry pour

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"Big Idea" (Theme)

The student will demonstrate a working knowledge of oxy-acetylene welding and custting practices

State/National Standards

Chapter 11
17: Oxyfuel gas processes

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Observe the student setting up the system
3. Observe the student using the process

Identify best practices used to teach standard

Lecture

Modeling by the teacher

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"Big Idea" (Theme) The student will demonstrate a working knowledge of arc welding practices
State/National Standards Chapter 11 18: Shielded metal arc welding (SMAW)
Give examples of student work that demonstrates mastery of this standard 1. Test results 2. Practical application in the laboratory 3. Observation of student performance
Identify best practices used to teach standard Lecture Modeling by the teacher

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"Big Idea" (Theme)

The student will demonstrate an understanding of industrial weld practices

State/National Standards

Chapter 11
22: Special processes

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Observe the student using different processes
3. Test welds for strength

Identify best practices used to teach standard

Lecture

Modeling by the teacher

Student handouts

EL DORADO UNION HIGH SCHOOL DISTRICT
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Department: Trades and Industry Grade Level:10 - 12

Course: Metals

"Big Idea" (Theme)

The student will demonstrate a working knowledge of basic layout and measurement practices in metalworking.

State/National Standards

Chapter 11
14: Product development and documentation

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Observe the students use of micrometers
3. Observe the students use of vernier calipers

Identify best practices used to teach standard

Lecture

Teacher-generated examples (overhead transparencies, VCR)

Worksheets

EL DORADO UNION HIGH SCHOOL DISTRICT
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"Big Idea" (Theme)

The student will demonstrate a working knowledge of drills and drilling machines

State/National Standards

Chapter 11
16: Industrial forming for welding fabrication

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Observe the students use of drilling machines
3. Observe the students use of drill bits
4. Completed student projects

Identify best practices used to teach standard

Lecture

Modeling by the teacher

Drill bit sharpening demonstration

worksheet handouts

EL DORADO UNION HIGH SCHOOL DISTRICT
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Course: Metals

"Big Idea" (Theme)

The student will demonstrate a working knowledge of the engine lathe

State/National Standards

Chapter 11
27: Conventional lathe

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Observe the student using the lathe
3. Completed student projects

Identify best practices used to teach standard

Lecture

Modeling by the teacher

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"Big Idea" (Theme)

The student will demonstrate a working knowledge of the milling machine, shapers, and planers

State/National Standards

Chapter 11
28: Conventional milling machine

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Observe the student using the milling machine
3. Completed student projects

Identify best practices used to teach standard

Lecture

Modeling by the teacher

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Course: Metals

"Big Idea" (Theme)

The student will demonstrate a working knowledge of abrasives and abrasive machines

State/National Standards

Chapter 11
29: Grinders and grinding wheels

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Observation students using the machines
3. Teacher's observation of the student's work

Identify best practices used to teach standard

Lecture

Modeling by the teacher

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"Big Idea" (Theme)

The student will demonstrate an understanding of industrial machines and manufacturing processes

State/National Standards

Chapter 11
34: Organization of a manufacturing enterprise

Give examples of student work that demonstrates mastery of this standard

1. Test results
2. Practical application of machining and manufacturing practices
3. Completed student projects

Identify best practices used to teach standard

Lecture

Modeling by the teacher

Handouts