Construction Advanced

I. Course Description

A. Rational for Course: The course is based on California Career Technical Education Standards for the Building Trades and Construction Industry Sector and the California Common Core State Standards for Literacy in History/Social Studies, Science, and Technical subjects as outlined below.

B. Grade Level: 10-12
C. Credits: 10
D. Prerequisites: Construction 1-2
E. Course Description:

Construction Technology 3-4 is a one year course designed to increase the student's knowledge of constructing residential and light commercial structures. The topics covered build on the foundation material introduced in Construction 1-2. The emphasis of the course is on advanced construction techniques, finished carpentry, project management, and sustainable building (green building).

II. Course Purpose: Goals and Student Outcomes

<table>
<thead>
<tr>
<th>Student Outcomes</th>
<th>California State CTE Standards</th>
<th>California Common Core Standards</th>
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<tbody>
<tr>
<td>A. Introduction and Orientation: The student will understand classroom and lab procedures. The student will be able to:</td>
<td>Foundation Standards</td>
<td>Pathway Standards</td>
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<tr>
<td>1. Describe classroom procedures.</td>
<td>9.1,9.3,9.5</td>
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<td>2. Identify team members; and</td>
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<td>3. Describe construction technology</td>
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<td>B. Stairs: Stair Basics, Stair Construction, The student will be able to:</td>
<td>Foundation Standards</td>
<td>Pathway Standards</td>
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<tr>
<td>1. Identify the method of construction used on any stairway.</td>
<td>4.1,4.2,8.1,10.6,10.7,(2.1),(2.3),(2.6)</td>
<td>D1.1,1.2,1.3</td>
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<td>2. Identify the different parts of a stairway and the purpose of each part.</td>
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<td>D4.1,4.2,4.3,4.4</td>
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<td>3. Understand the building code requirements that apply to stairs.</td>
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<td>4. Summarize the steps of stair construction.</td>
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<td>5. Explain how to layout and cut a stringer stairway.</td>
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<td>6. Explain how to layout a cleat-stringer stairway</td>
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<td>C. Molding &amp; Trim: Molding &amp; Trim Basics, Interior Door &amp; Window Details, Baseboard, Ceiling, &amp; Other Molding. The student will be able to:</td>
<td>Foundation Standards</td>
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<tr>
<td>1. Identify uses for molding and trim other than decoration.</td>
<td>(1.2),(1.3),(2.1),(2.3),(2.8),(3.1),(3.2)</td>
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</tbody>
</table>
2. Explain which joints are used for molding and trim and why.
3. Identify different molding and trim.
4. Demonstrate how to scribe molding and trim to an uneven surface.
5. Demonstrate how to trim to an uneven surface.
6. Explain how to cut a cope joint.

<table>
<thead>
<tr>
<th>Pathway Standards</th>
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<tbody>
<tr>
<td>D6.3, 6.4</td>
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D. Basic Plumbing - Supply, Waste and Irrigation: The student will have a basic understanding of plumbing requirements. The students will be able to:
1. Describe supply plumbing products. (Both hot and cold supplies should be discussed as well as conservation techniques.
2. Describe waste plumbing and its theory of operation;
3. Discuss irrigation systems as used in single family residential construction.
4. Describe sprinkler system of fire abatement.

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<tr>
<td>Pathway Standards</td>
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<tr>
<td>D1.1, 1.2, 1.3</td>
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<tr>
<td>D4.1, 4.2, 4.3, 4.4</td>
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E. Basic Electrical - service, Circuit and Wiring concepts: The student will understand basic power requirements for home use. The student will be able to:
1. Describe power requirements and service panels;
2. Understand electrical symbols on working drawings;
3. Wire a plug, light and switch combination;
4. Describe basic electrical theory.

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<td>D5.1</td>
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F. Steel Framing: The student will be able to identify and describe structural framing components used in residential construction. The student will be able to:
1. Describe the three types of steel frame construction.
2. Identify tools used in steel framing.
3. Tell the difference between welding and clinching.
4. Describe how to lay out steel floor joists.
5. Explain why steel framed structures use in-line framing.
6. Explain how to set steel ceiling joints.

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<td>Pathway Standards</td>
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<td>D1.1, 1.2, 1.4, 1.5</td>
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| (12.0), (15.0), (16.0), (19.0) |

G. Mechanical Systems: The student will be able to:
1. Describe or sketch a simple plumbing system.
2. List the common materials used by a plumber.
3. Recognize the various types of piping used for water supply and DWV systems.
4. Describe the basic elements of an electrical system.
5. Identify the three basic kinds of circuits.
6. Explain how split system air conditioners work and identify the basic parts.

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<td>D1.1, 4.1, 4.2, 4.3, 4.6, 2</td>
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H. Thermal & Acoustical Insulation: The students will be able to:

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4. Identify several types and forms of insulation.
5. Describe how an insulator’s R-value determines its effectiveness as insulation.
6. Define the main function of insulation.
7. Identify the best uses for common types of insulating materials.
8. Explain the importance of vapor retarders and ventilation.
9. Describe several types of wall construction that reduce noise transmission.

Pathway Standards
D1.1,1.2,1.3
D4.1,4.2,4.3,4.4

I. Wall & Ceiling Surfaces: The student will be able to:
1. Name and describe the various types of drywall.
2. Identify the different types of fire-code drywall.
3. Describe a nail pop and the methods used to prevent it.
4. Explain potential safety and health problems related to installing drywall and explain preventative measures.
5. Identify the basic materials used in three-coat plaster work.
6. Construct a suspended ceiling.

Foundation Standards
Pathway Standards
D5.1

J. Site Drainage:
1. Interpret information from the grading plan.
2. Describe the basics of site drainage.
3. Describe the principles of site drainage.
4. Explain the environmental cost of site drainage.
5. List several grade-change devices.
6. Describe different drainage systems.

Foundation Standards
Pathway Standards
D1.1,4.1,4.2,4.3,6.2

K. Finished Flooring: The student will be able to:
1. List the three most common form of wood flooring.
2. Describe the major kinds of wood used in flooring and how they are graded.
3. Explain how to install wood strip and parquet flooring.
4. Estimate the quantity of resilient flooring needed for a room.
5. Perform the basic methods of installing ceramic tile and carpeting.

Foundation Standards
3.1,3.2,3.3,3.4,3.5,3.6,3.7,3.8,4.1,4.2,4.3,6.1,7.1,7.5
(1.4),(2.5),(1.6)
(10.3.5),(12.4.2),(12.4.3)
Pathway Standards

III. Course Outline

Safety
- Machine Safety
- Shop Safety
- Job Site Safety

Stairs
- Stair Basics
- Stair Construction

Molding and Trim
San Mateo Union High School District
Course of Study

Molding & Trim Basics
Interior Door & Window Details
Baseboard, Ceiling, & Other Moldings

Plumbing Basics
Plumbing System Basics
Basic Plumbing Materials

Electrical Basics
Electrical System Basics
Electrical Materials & Systems

Steel Framing
Steel as a Building Material
Steel Framing Tools
Steel Framing Methods
Metal Wall Stud Assembly

Mechanicals
The Plumbing System
The Electrical System
HVAC Systems

Thermal & Acoustical Insulation
Thermal Insulation
Acoustical Insulation

Wall & Ceiling Surfaces
Drywall
Plaster
Suspending & Acoustical Ceilings

Site Drainage
Grading & Drainage Basics
Grading & Drainage Principles
Drainage Systems

Finish Flooring
Wood Flooring Basics
Installing Hardwood Flooring
Vinyl, Tile, & Carpet Flooring

IV. Key Assignments

Alignment of Key Assignments to California Common Core State Standards for Literacy in History/Social Studies, Science, and Technical Subjects

Safety Test
Research Paper
Resume Writing

Projects:

V. Instructional Methods and/or Strategies

Classroom lecture
Instructional Videos & Websites
Classroom with reading & chapter review worksheets
Chapter review
Demonstrations
Guest speakers
Job shadowing
Field Trips

VI. Assessment Methods and/or Tools

The course will rely primarily on Authentic Assessment in which students will be asked to perform real-world tasks (such as build a project) that demonstrate meaningful application of essential knowledge and skills.

The assessment may include a skill that students demonstrate and a rubric by which their performance or project will be evaluated.

Quizzes and Exams

VII. Textbook(s) and Supplemental Instructional Materials

Title: Carpentry and Building Construction
Publisher: Glencoe 2010
Authors: Mark D. Feirer and John L. Feirer
ISBN: 9780078797842
$68.00

Fine Homebuilding Magazine (supplemental reading)