

Perris Union High School District

Course of Study

| A. COURSE INFORMATION | | |
|--|---|--|
| Course Title: <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">CTE Construction Technology I</div> <input type="checkbox"/> New <input checked="" type="checkbox"/> Revised | Subject Area: <input type="checkbox"/> Social Science <input type="checkbox"/> English <input type="checkbox"/> Mathematics <input type="checkbox"/> Laboratory Science <input type="checkbox"/> World Languages <input type="checkbox"/> Visual or Performing Arts <input checked="" type="checkbox"/> College Prep Elective <input type="checkbox"/> Other | Grade Level <input type="checkbox"/> MS <input type="checkbox"/> HS <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input checked="" type="checkbox"/> 10 <input checked="" type="checkbox"/> 11 <input checked="" type="checkbox"/> 12 |
| If revised previous course name if changed <div style="border: 1px solid black; padding: 2px; margin-top: 5px;">744 CTE Construction</div> | Is this classified as a Career Technical Education course? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| Transcript Course Code/Number: <div style="border: 1px solid black; padding: 2px; margin-top: 5px;">608611/608612</div> (To be assigned by Educational Services) | Credentials Required to teach this course: <div style="border: 1px solid black; padding: 2px; margin-top: 5px;"> <i>Designated Subjects' Career Technical Education - Building + Constr. Trades</i> <i>Single Subjects Teaching Cred. - Building + Construction Trades</i> <u>To be completed by Human Resources only.</u> </div> | |
| Required for Graduation: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <div style="display: flex; justify-content: space-between;"> <div style="font-family: cursive; color: blue;">Spide Dillon</div> <div style="color: blue;">8-5-2019</div> </div> <div style="display: flex; justify-content: space-between; font-size: small;"> Signature Date </div> </div> | |
| Meets UC/CSU Requirements? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Was this course <u>previously approved by UC for PUHSD?</u> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (Will be verified by Ed Services) | Meets "Honors" Requirements? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | |
| Meets "AP" Requirements? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Unit Value/Length of Course: <input type="checkbox"/> 0.5 (half year or semester equivalent) <input checked="" type="checkbox"/> 1.0 (one year equivalent) <input type="checkbox"/> 2.0 (two year equivalent) <input type="checkbox"/> Other: | |
| Submitted by: Dian Martin Site: Educational Services Date: 8/5/2019 | | |
| Approvals | Name/Signature | Date |
| Director of Curriculum & Instruction | | 8-5-19 |
| Asst. Superintendent of Educational Services | | 8-9-19 |
| Governing Board | | |



RCOE CONSTRUCTION TECHNOLOGY I

DATE:

INDUSTRY SECTOR: Building and Construction Trades Sector

PATHWAY: Residential and Commercial Construction

CALPADS TITLE: Introduction to Residential and Commercial Construction

CALPADS CODE: 7340

HOURS:

| Total | Classroom | Laboratory/CC/CVE |
|-------|-----------|-------------------|
| 180 | 90 | 90 |

| JOB TITLE | O*NET CODE | JOB TITLE | O*NET CODE |
|----------------------------------|------------|--|------------|
| Sheet Metal Workers | 47-2211.00 | Construction Laborers | 47-2061.00 |
| Helpers–Carpenters | 47-3012.00 | First-Line Supervisors of Construction Trades and Extraction Workers | 47-1011.00 |
| Wind Turbine Service Technicians | 49-9081.00 | | |

COURSE DESCRIPTION:

Construction Technology 1 is an overview of the Building Trades Industry that is competency-based designed to provide students with technical instruction and practical experience in basic residential and commercial construction through classroom instruction and applied practice of field skills. Instruction includes an introduction, workplace safety, safe and proper use of hand tools, power tools, trade specific instruction, reviews of resource management, construction trade mathematics, employability skills, and apprenticeship preparation. Students use safe and appropriate practices following construction processes and systems vital to the industry. Additionally, students will work with and maintain equipment used in the industry. Emphasis is placed on the techniques, tools, and materials required for the rough and finish carpentry, estimating, plumbing and electrical work, renewable energy, roofing, and painting. The competencies in this course are aligned with the California Career Technical Education Model Curriculum Standards and have incorporated rigor and writing through the key assignments. Students will have the opportunity to gain critical thinking skills as they manage and design construction projects from small to large and research possible materials and examine real-world building issues. Students will work in teams to develop communication skills, leadership skills, and the ability to gain skills in time management and production demands. The major impact this course can have is to prepare students for post-secondary education in the multitude of careers in engineering, build trades, utility development and management, and will provide the student the opportunity to use research and critical thinking skills as they develop fortitude in completing long-term projects.

A-G APPROVAL: G

ARTICULATION: None

DUAL ENROLLMENT: None

PREREQUISITES:

| Prerequisite |
|--------------|
| None |

METHODS OF INSTRUCTION

- Direct instruction
- Group and individual applied projects
- Multimedia
- Demonstration
- Field trips
- Guest speakers

STUDENT EVALUATION:

- Student projects
- Written work
- Exams
- Observation record of student performance
- Completion of assignment

INDUSTRY CERTIFICATION:

- None

RECOMMENDED TEXTS:

- Modern Carpentry Willis H. Wagner and Howard Bud Smith The Goodheart-Willcox Company, Inc. 2016
- Building Skills Paxton Patterson Inc. Paxton Patterson Inc.
- OX Safety for Small Businesses OX Safety OSHA

PROGRAM OF STUDY

| Grade | Fall | Spring | Year | Course Type | Course Name |
|------------|------|--------|--------------------------|--------------|---------------------------------|
| 10, 11, 12 | | | <input type="checkbox"/> | Introductory | RCOE Construction Technology I |
| 11, 12 | | | <input type="checkbox"/> | Capstone | RCOE Construction Technology II |

| I. | SAFETY | CR | Lab/ CC | Standards |
|-----|--|----|------------|---|
| | <p>This unit introduces the mandates of basic safety in construction job sites, building on prior knowledge of general understand of math, science and life experiences. Students will identify and be able to recognize safe practices for avoiding injury while practicing skills of general and unique tool usage, handling of materials and indulgent exposure to the multiple ways workers become injured. Students will study trends and changes to the construction industry over time to improve worker safety; while gaining information about the loss of life, limb and financial losses that occur when workers are injured. Students will apprehend the necessity for a “safety first” mindset, the characteristics of a professional craftsman. Students will understand and demonstrate safe handling of a variety of construction tools, electrical and non-electrical; hand and power tools – both stationary and portable and includes proper maintenance and care procedures. Students are required to demonstrate safety and maintenance procedures for all tools necessary for job specifications as well as to demonstrate proper use, including steps for turning on and off electric power tools, and safe storage.</p> <p>Unit Assignment(s):</p> <p>In this unit, students will demonstrate through oral and written quiz Personal Protective Equipment Demonstrate through oral and written quiz shop procedures. Demonstrate through oral and written quiz signs and symbols for Notice, Safety Caution, and Danger Demonstrate through oral and written quiz Material Safety Data Sheets. Demonstrate through written quiz and demonstration proper use of industry standard tools that are specific to this course (E.g. hammer, hand saw, cordless drill, cordless impact). This safety assessment is related to the school classroom shop.</p> <p>Using the following web resources: https://www.xosafety.com/pages/free-construction-safety</p> <p>Instructions will include the use of these PowerPoint that can assist students in identifying large construction worked related injuries that are real-world based will include:</p> <p>Aerial lifts, Bloodborne Pathogens, Confined Spaces, Construction, Cranes and Rigging, Electrical Safety, Excavations and Trenching, Forklift operations, Hazards Communications, Hydrogen Sulfide, Ladder safety, Lockout Tagout, Respirator use, Scaffolding and Fall Protection</p> <p>These PowerPoints allow for instructors to return to the subject matter as needed as they work through the course curriculum.</p> <p>To culminate this unit, students will have the option to create a video tutorial for a variety of tools in the shop, or a safety poster, including proper safety procedures, how to use the tool, and maintenance and care procedures. The videos will be shared and will be used as a resource for students to refresh themselves on the tools, for new students joining the class, and to share with other classes and schools around the district.</p> <p>Students will document (photograph) their work and write reflections on their progress and process. They will keep documentation and reflections organized electronically (Google Folder) or in a binder if computer access is limited.</p> | 10 | 10 | <p>Academic: LS: 11-12.6</p> <p>CTE Anchor: Career Planning and Management: 3.1</p> <p>CTE Pathway: D11.13</p> |
| II. | BLUEPRINT READING AND PLANS | CR | Lab/ CC | Standards |
| | <p>Students will be introduced to Blue Print reading, building codes, and specifications. Students will be able to identify the commonly used elements in a full set of house plans including building codes, Architectural drawing scale, and building specifications. Students will create a blueprint of the classroom/shop from which they do mathematical calculations for linear foot/trim, square footage for the concrete foundation, give dimensions of</p> | 10 | 10 | <p>Academic: LS: 11-12.6</p> <p>CTE Anchor: Communications: 2.1</p> <p>CTE Pathway:</p> |

| | | | | |
|-------------|--|-----------|---------------|---|
| | <p>door/window openings, identify the diverse types of door/window openings. They will also identify the appropriate architectural symbols for electrical, plumbing, and mechanical aspects of the plan.</p> <p>Unit Assignment(s):</p> <p>Through project planning and the interpreting and use of blueprint dimensions and transfer scale drawings to full-scale build outs students will work through 9 areas of plan components which include: 1) Vocabulary and tool identifications of engineering and planning tools, 2) plot planning and exterior elevations, 3) designing foundations and slab foundations, 4) section drawings, 5) electrical and heating systems, 6) wall framing, 7) roof framing, 8) kitchen and bathroom design, and 9) specifications for environmental considerations. Through written plans summarize the concept of modular construction. Create blueprints using standard mechanical techniques. Create a reference tool for unfamiliar symbols, notes, and abbreviations for quick reference. This unit will cover several weeks of the course and have students using and developing the skill set throughout the progress of the program as students will continue to develop and interpret blueprint readings for projects used for other instructional activities. Students will use and develop research skills and the use of technology in the survey of software that supports blueprint design, such as Sketchup.</p> | | | D11.13 |
| III. | FLOOR FRAMING SYSTEMS | CR | Lab/CC | Standards |
| | <p>Students will use their knowledge from the previous unit to create a foundation plan. In the plans students will layout footings, stem walls, anchor bolts, etc. Students will be able to differentiate between applications for wood and concrete foundations, identify the steps and terms for concrete foundations. The unit will cover the following: Vocabulary, concrete slab forming a rebar, slab calculations, curb finishing, best practices and career opportunities.</p> <p>Unit Assignment(s):</p> <p>Required reading pgs 75-78 from Modern Carpentry. Students will use the Pythagorean Theorem to square the concrete forms they create. Students will use measurement to center their forms in the space provided. Students will continue to gain a greater understanding of building to scale, fractions, geometric shapes, adding and subtraction through calculating concrete yardage, board footage for form material, measuring to within 1/16-inch accuracy. Students will calculate the needed materials for concrete, rebar, curbing and other needed materials for floor framing. Using oral and written methods students will identify the steps and technical terms for concrete and wood foundations. Students will write a short summary of the skills they examined and developed in this unit and provide reasoning for why the floor framing is imperative to the buildings support systems.</p> | 10 | 10 | <p>Academic: LS: 11-12.6</p> <p>CTE Anchor: Career Planning and Management: 3.2</p> <p>CTE Pathway: D11.13</p> |
| IV. | WALL AND CEILING FRAMING | CR | Lab/CC | Standards |
| | <p>Students will be able to identify the main parts of a wall. Students will be able to explain the different methods used for framing both outside corners and partition intersections in wall framing. Students will learn and demonstrate rough openings and plate and stud layout. Students will learn how to construct and erect a wall, including materials needed and sheathing. Using the foundation built in the prior unit students will be able to estimate the materials required for framing walls, ceiling, and sheathing and construct a four-wall system. The students will use the blueprint design skills to draw the wall and ceiling components, supports, joints, and electrical, plumbing and ventilation access. This unit will expose students to materials for walls, driving nails, window and door sets, plate layouts and how utilities would come through and be supported by the walls.</p> <p>Unit Assignment(s):</p> <p>Using lecture and demonstration notes, which will include the reading of the textbook pages 56 & 57 from Modern Carpentry, students will identify the main</p> | 10 | 10 | <p>Academic: LS: 11-12.6</p> <p>CTE Anchor: Ethics and Legal Responsibilities: 8.3</p> <p>CTE Pathway: D10.3</p> |

| | | | | |
|------------|---|-----------|--------------------|---|
| | parts of a wall through oral and written methods using blueprints and scaled classroom models. Through presentation, the students will explain methods of framing outside corners and partition intersections of wall frames. Students will analyze where door and window openings should be and the needed support of such openings. Students will formulate a four-sided room wall setup and use oral and written methods students will show uses of rough openings, through blueprint markups. Students will then work in the lab area and demonstrate procedures for assembly and installation of an exterior wall, which will include; demonstrating how to cut and install joists on a wood frame building, door and window openings and where utilities of plumbing and electrical can be installed. Then the students' will estimate in written form materials requirements of frame walls and ceiling to the scope of a construction project. Students will use research to calculate the current cost of lumber and the suppliers market prices for the project. | | | |
| V. | ROOF FRAMING | CR | Lab/ CC | Standards |
| | <p>Students will identify roof types, pitch, water mitigation and become familiar with several practical roof finishes. Students will evaluate slope and pitch and angels and compound angles using the proper construction tools. Students will be able to identify and cost out the materials needed to construct a gable roof including sheathing. Using the frame constructed in the previous unit students will construct, sheath and install the roofing materials for a gable roof including trusses.</p> <p>Unit Assignment(s):</p> <p>Through live and video presentation acquire how to frame a gable roof with vent openings Through live and video presentation demonstrates how to frame a roof opening will be presented; including the use of a framing square, a speed square, and rafter tables. Students will research lumber costs and create a written estimate of materials used in framing and sheathing a roof.</p> <p>Students will read multiple sections from Modern Carpentry that covering the roofing unit, pages to read and make notes from are 283-362. In this unit students will build a small gabled roof structure, calculating slope, rafter length, miter cuts, birds mouth cuts, ridge beam or board height and length measurements. Students then will discuss in class what was difficult in the building of a roof and what they gained in understanding through discussion, review of notes and examine what safety issues exist for roofers. The final part of the assignments will include students' researching roofing companies for career opportunities, wages, and required skill sets. The students will present to their classmates through a google or PowerPoint presentation.</p> | 10 | 10 | <p>Academic: LS: 11-12.6</p> <p>CTE Anchor: Leadership and Teamwork: 9.7</p> <p>CTE Pathway: D11.13</p> |
| VI. | PLUMBING | CR | Lab/ CC | Standards |
| | <p>Students will learn the difference between rough plumbing and finish plumbing, and the timing for each type of plumbing project. Students will determine the different plumbing lines: waste and supply. The student will identify what materials are needed for each line, explain the timing to rough plumb and finish plumb each line and determine what materials needed to plumb both lines for an average size home bathroom.</p> <p>Unit Assignment(s):</p> <p>In this unit students will read pages 442-- 445 from the Home Repair text</p> <p>The skill sets gained in this unit will be using previous skills gained in associated units. Through oral and written demonstrations students will acquire the skills to describe rough plumbing Using reference material from online sources and Home Repair textbook (pg 442- Plumbing) and applicable hands-on materials in the lab students will determine the difference between waste and supply plumbing Through written and oral quiz methods students will be able to identify the varied materials used for both supply and waste plumbing. Through presentation show the timing of rough and finish plumbing.</p> | 10 | 10 | <p>Academic: LS: 11-12.6</p> <p>CTE Anchor: Career Planning and Management: 3.2</p> <p>CTE Pathway: D11.13</p> |

| | | | | |
|--------------|--|-----------|----------------|---|
| | Through written and research methods determine the materials needed to fully plumb a sink and toilet for both supply and waste lines. Students will research the cost of plumbing for bathrooms, choose appliances and design a basic bathroom with a blueprint with drawings, have photos of chosen fixtures and take photos/ videos of the practice of plumbing the wall for supply and wastewater in the lab. students will then present to the rest of the class their bathroom research, video/photo of how to do the plumbing and justify why they chose the design and process of their bathroom design justifying costs and layout. The class will listen and provide critique and feedback to the presenters. | | | |
| VII. | ELECTRICAL | CR | Lab/ CC | Standards |
| | <p>This unit will be an introduction to electrical for residential, examining the coding requirements, safety requirements and the basics of voltage and electric circuits related to the electrical panel. Students will learn the relationship of timing between rough and finish electrical. Students will learn the different applications for two wire plug and switch. Students will be able to determine the materials, tools, and timing for a rough wire of a house. Students will determine the materials, tools, and timing to wire a light switch and demonstrate this knowledge by wiring a light switch. Students will examine 110, 220 and calculation for load and loss in meeting the energy demands of the home electronics.</p> <p>Unit Assignment(s):</p> <p>In this unit, students will read pages 105-116 from Modern Carpentry to gain information on electrical trade skills and the needed information for an introduction to residential electrical requirements.</p> <p>Describe in oral methods rough electrical and the tools used. Identify in written lists and diagrams of how two wire applications should be set up. Explain through the presentation the timing of rough and finish electrical. Determine and list out the materials needed to wire a light and light switch. Through presentation demonstrate how to wire a switched light. Students will examine how the electrical panel divides the load of incoming utility and how certain appliances in a residential will have individual demands of voltage. Students will research general appliances found in a home and identify the electrical demands of such appliances. The students will design a wiring blueprint, demonstrated where the lines and lines types will run to handle the load demands and to meet all fire and safety coding. Students will be discovering AC/DC, voltage, circuitry, and how to calculate the demands of loads.</p> | 10 | 10 | <p>Academic: LS: 11-12.6</p> <p>CTE Anchor: Demonstration and Application: 11.5</p> <p>CTE Pathway: D11.13</p> |
| VIII. | INTERIOR/EXTERIOR WALL COVERING FINISHING | CR | Lab/ CC | Standards |
| | <p>Students will understand the differences between interior and exterior wall finish work. Students will understand when the work can begin on the interior and exterior wall covering in relation to the other work being done on the build. Students will understand what materials and the differences in materials for interior and exterior wall covering finishing and the different techniques that can be used. Students will understand the timing of the interior wall covering in relation to the other work that must happen before covering up the wall frame. Students will learn the different materials and textures used for interior and exterior wall coverings and the most commonly used types. Students will learn the difference and be able to identify oil-based versus waterborne products, wood sidings, stucco types and stone exterior applications. Students will be using their knowledge to apply exterior products to specific projects given.</p> <p>Unit Assignment(s):</p> <p>In this unit, students will read from the Modern Carpentry the following pages: 314, 204,182-183, 253-280,336-337, 442</p> <p>Show through written and presentation, demonstrate the industry standard methods of covering up the wall frame Identify through written and oral</p> | 10 | 10 | <p>Academic: LS: 11-12.6</p> <p>CTE Anchor: Demonstration and Application: 11.5</p> <p>CTE Pathway: D11.13</p> |

| | | | | |
|------------|--|-----------|--------------------|---|
| | methods materials commonly used to cover up interior walls and ceiling. Identify through written and oral methods commonly used wall textures, paints, primers, and sealers. Review and compare the written method the differences between oil-based and waterborne products Through visual aid and presentation, methods identify wood sidings, stucco and stone exterior applications Apply interior and exterior finishes on specific projects. described in textbook pages 440-448. | | | |
| IX. | FINISH FLOORING | CR | Lab/ CC | Standards |
| | <p>Students will explore modern trends in residential flooring, identifying sustainable flooring products and demonstrate safe installation techniques for a variety of types of materials. Students will work with and show their understanding of the industry standard for diverse types of flooring using both strip flooring and tile.</p> <p>Unit Assignment(s):</p> <p>In this unit students will first read pages 160-201 from Creative Homeowner Text for gaining information on flooring:</p> <p>In written form describe strip, plank and unit block wood flooring by developing a short essay describing similar and different needs for each type of flooring. Layout and install in real time strip flooring. In oral form describe the procedure for applying hardboard particleboard, wafer board, and plywood underlayment In written form outline the basics for installing resilient flooring by listing steps in correct order with a description for each type of flooring. In written form identify flooring types in wood, ceramic/porcelain, natural stone and vinyl, where a demonstration of cost, design need and appearance are described and demonstrate. Students will build in real time a 2' x 2' floor project. The floors students will develop will be wood, concrete, tile, and vinyl in small sections to gain skills in different modalities of flooring.</p> | 10 | 10 | <p>Academic: LS: 11-12.6</p> <p>CTE Anchor: Communications: 2.1</p> <p>CTE Pathway: D11.13</p> |

Entered by:

District: Riverside County Office of Education
Contact: John Bruestle, CTE Instructional Specialist
Phone: 951-826-6313
Email: jbruestle@rcoe.us