

**RIALTO UNIFIED SCHOOL DISTRICT
HIGH SCHOOL CURRICULUM PROPOSAL**

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|------------------------|-----------------------------------|------------------------|-------|
| Name of Course: | Advanced Residential Construction | Grade Level(s): | 10-12 |
|------------------------|-----------------------------------|------------------------|-------|

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| Brief Course Description: |
| Advanced Residential Construction is the capstone course of the construction trades, green construction, and careers, with integrated Geometry content. Students master measurement systems, safe use of hand and power tools, calculation and characteristics of materials, carpentry, framing, basic electrical wiring, and site preparation. Coursework is project-based, developing teamwork and project management skills. |

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|---------------------|----------------|----------------|--------------------|--------------|--------------|
| Proposed By: | George McGuire | School: | Carter High School | Date: | Nov 30, 2020 |
|---------------------|----------------|----------------|--------------------|--------------|--------------|

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|--|--------------------------------------|--|--|
| The Following is Proposed for this Course: | | | |
| <input checked="" type="checkbox"/> Addition | <input type="checkbox"/> Revision | <input checked="" type="checkbox"/> A – G | <input type="checkbox"/> Deletion |
| <input type="checkbox"/> Required Course | <input type="checkbox"/> Content | <input type="checkbox"/> Honors | <input type="checkbox"/> Name of Course |
| <input checked="" type="checkbox"/> Elective (CTE) | <input type="checkbox"/> Name Change | <input checked="" type="checkbox"/> Career Tech. Ed. | <input checked="" type="checkbox"/> Pathway: Sector: Building & Construction Trades |

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| The Following Maximum Credits are Proposed for this Course: | |
| Units of Credit in (Subject Area): | 10 elective or in: |

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|--|--|--------------------------------------|--|--------------------------|
| The Following Schools will Offer this Course: | | | | |
| <input checked="" type="checkbox"/> Carter High | <input type="checkbox"/> Eisenhower High | <input type="checkbox"/> Rialto High | <input type="checkbox"/> Milor/Zupanic | <input type="checkbox"/> |


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| The Proposed Course will have the Following Budget Implication: | |
| Individual School Site: | Carter High School |
| District Level: | |
| Total Estimated Cost: | \$5000 CTEIG funds/ Smaller Workforce Grant Funds |

| Approval Signatures for the Proposed Course: | | | |
|--|---|--------------|---|
| Signature | Yes/No | Date | Comments |
| Submitting School Department Chair Bunny Cervantes, CTE Chair | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Nov 30, 2020 |   |
| Carter High School Principal Greg Anderson | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Nov 30, 2020 |  |
| Eisenhower High School Principal | <input type="checkbox"/> Yes <input type="checkbox"/> No | | |
| Rialto High School Principal | <input type="checkbox"/> Yes <input type="checkbox"/> No | | |
| Milor/Zupanic High School Principal | <input type="checkbox"/> Yes <input type="checkbox"/> No | | |

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|--|---|--------------|-------------------|
| District Curriculum Committee Chair Rochelle Hitchcock | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Nov 30, 2020 | <i>RHitchcock</i> |
| Curriculum Council Chair | <input type="checkbox"/> Yes <input type="checkbox"/> No | | |
| Approved by the Rialto Unified School Board of Education on (date): | | | |

Advanced Residential Construction

 Brand new course

Fields marked with an asterisk (*) are required.

Toggle over the "?" symbol for more information about each form field.

Course Overview *

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

Advanced Residential Construction is an overview of the construction trades, green construction, and careers, with integrated Geometry content. Students master measurement systems, safe use of hand and power tools, calculation and characteristics of materials, carpentry, framing, basic electrical wiring, and site preparation. Coursework is project-based, developing teamwork and project management skills.

In this course, students will apply geometric content including measurement of angles and segments, polygon properties, area and surface area, congruence, proportion, and similarity. Apply these skills, students use safe and appropriate practices following construction processes and systems vital to the industry.

Work-based learning experiences will include field trips, job shadowing, preliminary certifications and summer internships offered. These partnerships play a key role in highlighting the importance of labor unions' impact on workers' rights, protections, and fair wages.

In addition, these work-based learning opportunities provide applicable knowledge of the California construction industry and economy. The value of the integration lies in the project-based process, which will include communication, collaboration, critical thinking, problem-solving, and analysis of mathematical problems following the progression of core geometrical concepts from inception to contextual completion. Students understand the attributes of good design and how it applies to the design, construction and servicing of structures. In small heterogeneous work groups, students mirror construction sites by demonstrating effective leadership styles, key concepts of group dynamics and

... Please provide an example in the course submission; additional units may be added by selecting the "add another unit" button.

Use the unit(s) and key assignment(s) to demonstrate that the course meets the subject-specific course criteria on the A-G Policy Resource Guide (</guide/>). Be sure to show how the unit(s) and key assignment(s) support students to:

- Read and write within the context of the course in meaningful ways.
- Solve problems (including laboratory work, as appropriate) specific to the discipline(s).
- Develop analytical thinking and research skills.
- Develop oral communication and listening skills.

▼ Unit 1: Leadership, Teamwork, Construction Tools, Techniques, and safety ()

Unit Summary ()

In this unit, students are introduced to the safe usage of construction tools, how to annotate and analyze technical readings, how to participate in structured cooperative roles, working on inquiry-based projects, and daily formative assessment through hands-on practice and written reflection. Throughout the course of the unit, students will be able to define leadership and identify responsibilities, competencies, and behaviors of successful leaders as well as participate in interactive teamwork to solve real Building and Construction Trades sector issues and problems.

Unit Assignment(s) ()

In an assignment central to this unit, students observe teacher demonstrations on the appropriate use of construction tools and safety equipment. Afterward, they practice in pairs the use of tools in an appropriate manner with the teacher and staff supervision, students take notes in their construction notebook and are tested at the end of the assignment in use and written forms. In another key assignment of this unit, students learn how to read and annotate technical text after pre-reading their textbook in class and articles online provided by their teacher. Students read the text and summarize it in pairs switching roles until the text is read and explained to their partner. Students note key concepts in their construction lab notebook. The teacher also reviews how to annotate text as demonstrated in a presentation.

(https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIoiqnG-0TZVUO63cjOrWvvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

▼ Unit 2: Health and Safety OSHA Certification ()



Unit Summary ()

In this unit, students will learn the history of OSHA and its origin, identifying proper health measures. Special emphasis is placed on Cal/OSHA standards for the construction industry, personal responsibility in the workplace, and career exploration within the construction industry as well as examining issues that address gender/equity issues. Students will also examine the impact of EPA legislation on industry practices as well as the proper disposal of hazardous materials.

(https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIoiqnG-0TZVUO63cjOrWvvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

Unit Assignment(s) ()

Students will take a safety exam to show their understanding of industry safety procedures. Students have to pass safety exams with no less than a score of 100% and will not be able to continue on without demonstrating a strong understanding of safety procedures in handling tools and conducting themselves within the shop.

Unit 3: Math-Construction Calculations, Measurement Systems, and Blueprints



Unit Summary

In this unit, students learn about Measurement Systems and gain a deeper understanding of the use of Hand and Power Tools. Safe procedures are reviewed. In this unit, students will learn to apply formula barriers to determine area, volume, lineal, board and square feet. Additionally, students will practice estimating the materials needed to complete a specific task as well as apply the Pythagorean Theorem to calculate pipe offsets, roof slope, and check for squares. (https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIoiqnG-0TZVUO63cjOrWvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

Unit Assignment(s)

After viewing a teacher demonstration of measuring techniques, students measure accurately to the sixteenth of an inch using tape, ruler, framing square and calculate areas and volumes using algebra, geometry, and arithmetic. In another key assignment of this unit, students demonstrate their ability to identify and use basic hand tools safely and properly such as hammers, pliers, wire cutters, saws, wood chisels, and wrenches, after viewing a teacher demonstration lesson with each of the tools. Projects that students work on both in and outside of the class involve the use of the common hand tools. Students are assessed on safe and proper use before beginning projects by their teacher. (https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIoiqnG-0TZVUO63cjOrWvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

Unit 4: Drawing and Sketching: Building Construction Design



Unit Summary

In this unit, students complete monthly presentations of inquiry-based construction projects that require a thorough knowledge and hands-on application of concepts from their concurrent Geometry course. Through this unit, students will learn how to interpret and apply information from technical drawings, schedules, and specifications used in the construction trades. Students will demonstrate techniques for proper site preparation. Students will be asked to demonstrate a foundational understanding of layout techniques to include setting forms, reinforcements, and placing concrete according to construction drawings, specifications, and building codes. (https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIoiqnG-0TZVUO63cjOrWvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

Unit Assignment(s)

In teams, students will participate in a blueprint project where they will integrate important geometric concepts, concepts from our reading, and ideas from notes taken in class. Students will modify a blueprint using the discussed mathematical concepts: vocabulary concerning the building blocks of Geometry to

calculate framing materials needed from plans and prepare outlines of budgets for projects.
(https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIoiqnG-0TZVUO63cjOrWvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

▼ Unit 5: Introduction to Green Construction ()



Unit Summary ()

Over the course of several units, students construct a Green Shed. Students research commercial design and green building strategies are explored in greater depth in-relation to environmental regulations. Conservation and environmental impacts are also covered. Students participate in a project where they answer an essential question that resolves a "Green Construction" related problem in their local community by learning how to construct through the Green Shed project. In this unit, students will not only apply formulas to determine area, volume, and square feet, but will also be able to practice identifying elements used in technical drawings, like elevation, plan, section, and detail reviews. Students will use leveling devices and will be able to demonstrate wall and plate layout. They will work to measure, cut, and assemble wall components with the appropriate tools and fasteners. Students will get the chance to demonstrate the ability to square wall systems and install wall bracing and shear panels according to code. (https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIoiqnG-0TZVUO63cjOrWvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

Unit Assignment(s) ()

Teams of students will construct a garden shed with "green roof," demonstrating mastery of concepts taught previously in the course. Students construct a Green garden shed, applying the concepts of triangle congruence and the properties of isosceles trapezoids; the playhouse will incorporate rainwater recovery, solar energy panel installation to minimize labor and materials, utilization of 30-40% reclaimed lumber, and composting of all organic waste materials. This project will require students to apply the Pythagorean theorem, and proportion and similarity and to undertake a detailed analysis of Green and traditional materials and techniques utilized in the construction industry.
(https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIoiqnG-0TZVUO63cjOrWvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

▼ Unit 6: Concrete and Masonry ()



Unit Summary ()

In this unit students learn the foundation of layout techniques to include setting forms, placing reinforcements, and placing concrete according to construction drawings, specifications, and building codes. Students are also introduced to foundation layout tools and will practice sequencing procedures for placing large and small slabs, demonstrate how to establish elevations for concrete structures, and construct, place, and brace forms for concrete as detailed in construction drawings for footings, slab, and

raised floors. Additionally, students will demonstrate the proper removal and care of concrete forms. (https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIoiqnG-0TZVUO63cjOrWvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

Unit Assignment(s) ()

As an introductory lesson to this unit, students read about specifications and building codes relevant to the pouring of a foundation. Students are assessed on their knowledge through in-class discussion with the teacher checking for understanding after students complete written exercises on the topic provided by their teacher. Central to this unit, students learn to use leveling devices (plumb and Level, the Laser Level, the Spirit Level to check for elevation, level, while installing batter boards under the direct supervision of their teacher after initial discussion and demonstration of use. Students take notes in their construction notebook. Students check the site layout for square using the diagonal method. In a related assignment, students learn to pour concrete into the forms that were prepared in prior lesson assignments. They learn about Mixing Concrete, Test Beam, Big Pours, Building Concrete Forms, and Bracing Concrete Forms, after reading about it in their text and watching a teacher demonstration. Students learn how to establish grades using survey instruments in this same lesson. (https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIoiqnG-0TZVUO63cjOrWvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

▼ Unit 7: Framing ()



Unit Summary ()

In this unit, the topic of Framing is covered in depth. Students continue to learn how to apply mathematical concepts such as the Pythagorean Theorem, Distance Formula, and Trigonometric functions when analyzing blueprint. In this unit, students learn framing terminology and techniques while building a small shed. There is an emphasis in this unit of the practical applications of the geometric and trigonometric formulas. This unit will have students demonstrating an understanding of different roofing materials and methods of application. They will also practice how to properly place a moisture barrier and pest control guard on a foundation, and to layout, cut, and install joist supports, rim joists, and floor joists as specified on construction plans. (https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIoiqnG-0TZVUO63cjOrWvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

Unit Assignment(s) ()

In a key assignment of this unit, students review trigonometric and geometric functions and formulas relevant to framing and pitching a roof, by reviewing math formulas in their text, discussions with their teacher and taking notes in their construction notebook. In a follow-up series of lessons, students frame walls and a pitched roof, using the Pythagorean Theorem to determine distance and find missing lengths of sides of right triangles, and also using trigonometric functions to solve for an unknown length of a right triangle, given an angle and a length. Students identify the relationship between the angles formed when a transversal intersects parallel lines, then use these relationships to find the measures of angles. Students sketch their design plans indicating their formulas and measurements used in the construction notebooks. (https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIoiqnG-0TZVUO63cjOrWvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

Unit: Exterior Finishes



Unit Summary

In this unit, exterior finish materials and protective finishes in building construction are covered in detail. Students learn about calculating irregular external surfaces, painting exteriors, sheathing, hanging doors, and sealants. They also learn about the installation process of exterior surfaces such as installing vinyl, wood and other materials used in constructing exteriors to a framed building. Students will also practice caulking and sealing joints to prevent air and moisture infiltration and increase energy efficiency.

(https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIOiqnG-0TZVUO63cjOrWvvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

Unit Assignment(s)

In this lesson, students apply their knowledge of exterior finish materials and protective finishes by practicing in class on surfaces they have sketched, framed, poured, and finished themselves. Students will be able to refer to notes and their textbook as well as learning supplemental videos assigned to reinforce each step of technique. Along with grading the overall finish of the project, students will also provide an accompanying sketch /draft of their energy efficient selection of materials for a small shed or home with a window. Students are assessed on the practical and energy efficiency of the designs they include in their sketch.

(https://docs.google.com/document/d/e/2PACX-1vTwMe6nOLnF1y0lqIOiqnG-0TZVUO63cjOrWvvB1ioJ3G_eW2TO2YOh1bOv2ZZcqftdq_ckod1g3fAK/pub)

Unit 9: Interior Finishes



Unit Summary

In this unit, students continue to build upon what they have learned in exterior finishing, by an in-depth study of interior finishing. Students learn to apply and demonstrate proper installation techniques of interior finish materials and protective finishes as well as energy efficiency designs for interior surfaces. In this unit, students will learn to Identify types and uses of wall finishing materials; cut, fit, and install gypsum wallboard onto a framed wall using appropriate fasteners; properly prepare walls to receive protective finishes; and apply finishes according to specifications and industry standards. (<https://hs-articulation.ucop.edu/>In this unit, students continue to build upon what they have learned in exterior finishing, by an in-depth study of interior finishing. Students learn to apply and demonstrate proper installation techniques of interior finish materials and protective finishes as well as energy efficiency designs for interior surfaces. In this unit, students will learn to Identify types and uses of wall finishing materials; cut, fit, and install gypsum wallboard onto a framed wall using appropriate fasteners; properly prepare walls to receive protective finishes; and apply finishes according to specifications and industry standards.)

Unit Assignment(s)

In a key assignment of this lesson, students learn to calculate interior surface space for the application of interior sheetrock hanging, taping and paint finishing. After reading their text and discussing with their teacher about types of interior wall finishing materials, they develop sketches and plans for the small shed they build in prior lessons. Building upon prior lessons of this unit and former units, students install a pre-hung interior door and install a small window in the shed they have worked on according to teacher demonstration and industry standards. (<https://hs-articulation.ucop.edu/>In a key assignment of this lesson, students learn to calculate interior surface space for the application of interior sheetrock hanging, taping and paint finishing. After reading their text and discussing with their teacher about types of interior wall finishing materials, they develop sketches and plans for the small shed they build in prior lessons. Building upon prior lessons of this unit and former units, students install a pre- hung interior door and install a small window in the shed they have worked on according to teacher demonstration and industry standards.)

+ Add another unit ()

