Escondido Union High School District

Advanced Architectural Design

EUHSD Board Approval Date: 2/13/18
The EUHSD Advanced Architectural Design curriculum document identifies what students should be able to know by grade level in a comprehensive standards-based course of study in the Engineering and Architecture Pathway. This curriculum document may be revised based on student academic achievement data, research and best practices, and input from stakeholders. The EUHSD curriculum document contains the following documents and/or information:

A. Course Description
B. Course Guidelines/Requirements - graduation credit information, transcript information, adopted materials, adopted technology, assessment outline
C. Instructional Materials References
D. Scope and Sequence Map with Essential Standards outlined by Unit
E. References to key essential design and implementation documents

A comprehensive course of study and/or program is designed so that all students have access to the rigorous curriculum necessary to graduate high school demonstrating college and career readiness skills. Student-centered learning provides opportunity for collaboration, communication, and a robust learning environment and provides opportunities for all students to meet the goals of the district’s Instructional Focus at the time of this writing: "All students communicate their thinking, ideas and understanding by effectively using oral, written and/or non-verbal expression.” A key design consideration in the transition to the updated California State Standards is a focus on changes to pedagogy with an emphasis on ensuring students are engaged via relevant learning experiences.

A key design consideration in the transition to the new California State Standards is a focus on changes to pedagogy. The CA Learning Standards describe key instructional shifts, which guide classroom teaching and learning and provide a foundation of curriculum and instructional design based on student inquiry and a focus on rigorous literacy tasks. These instructional shifts can be found by visiting the following URL: https://www.cde.ca.gov/Re/cc/

The curriculum document is aligned to the California Learning Standards and—more specifically—the Model Career Technical Education Standards, the CTE Knowledge and Performance Anchor Standards, and the Pathway Standards specific to this course of study. All CTE standards are located here: https://www.cde.ca.gov/ci/ct/sf/

Advanced Architectural Design Course Description
The Advanced Architectural Design course builds on the concepts and skills of the concentrator course Architectural Design. As the pathway capstone, this course allows students to confront sophisticated design problems, create individually designed projects, and engage in two overarching projects, which incorporate the industry standard concepts, skills, and best practices. The class includes tasks that require students to switch between computer generated and hand drawn architectural design applications. The overall purpose of the course is to allow students to design and create architectural plans that allow them to experience authentic industry-aligned processes from beginning to end. The work of the course requires students to both analyze and evaluate building design drawings, including proper scaling and rudimentary building components in site-specific conditions, but also design and draft a set of their own architectural drawings that build on their previous knowledge and experience. Additional supplemental events and activities related to the course such as engaging with local business and professionals are included and help build on the knowledge and skills of the course and provide practical industry related experiences. The course also includes the communication and leadership skills along with other skills as delineated in the CTE Anchor Pathway Standards.

<table>
<thead>
<tr>
<th>Course Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course Length:</strong></td>
</tr>
<tr>
<td><strong>Grade Level:</strong></td>
</tr>
<tr>
<td><strong>UC/CSU Requirement:</strong></td>
</tr>
<tr>
<td><strong>Graduation Requirement:</strong></td>
</tr>
<tr>
<td><strong>Course Number (Semester A):</strong></td>
</tr>
<tr>
<td><strong>Transcript Abbreviation (Semester A):</strong></td>
</tr>
<tr>
<td><strong>Course Number (Semester B):</strong></td>
</tr>
<tr>
<td><strong>Transcript Abbreviation (Semester B):</strong></td>
</tr>
<tr>
<td><strong>Credits (Semester A):</strong></td>
</tr>
<tr>
<td><strong>Credits (Semester B):</strong></td>
</tr>
<tr>
<td><strong>Required Prerequisite/s:</strong></td>
</tr>
<tr>
<td><strong>Recommended Prerequisite/s:</strong></td>
</tr>
<tr>
<td><strong>Industry Sector:</strong></td>
</tr>
<tr>
<td><strong>Career Pathway:</strong></td>
</tr>
<tr>
<td><strong>Core Instructional Material/s:</strong></td>
</tr>
<tr>
<td><strong>Technology Resource(s):</strong></td>
</tr>
<tr>
<td><strong>Assessment:</strong></td>
</tr>
<tr>
<td><strong>Meeting the Needs of ELs:</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Instructional Resources:</strong></td>
</tr>
<tr>
<td>-----------------------------</td>
</tr>
<tr>
<td>• Drafting textbook</td>
</tr>
<tr>
<td>• Performance Rubrics</td>
</tr>
<tr>
<td>• Product Examples</td>
</tr>
<tr>
<td>• Digital and print images</td>
</tr>
<tr>
<td>• Internet Research</td>
</tr>
<tr>
<td>• CA Colleges Website</td>
</tr>
<tr>
<td>• Variety of architectural and design specific drafting tools including CAD and Architectural design software, drafting machines, scales, templates, etc.</td>
</tr>
</tbody>
</table>
The Scope and Sequence Guide for this course is informed by the California Learning Standards and delineates the concepts and skills students are expected to acquire in order to meet College and Career Readiness expectations set for by the state and local board approved guidelines. Each unit of study is designed to build upon the previous unit and/or prerequisite coursework in support of student mastery of specific standards based skills. This Scope and Sequence document provides guidelines for instructors to ensure they have the necessary information related to content and pedagogy to guarantee students can meet the learning objectives of the course. The document is updated as needed based on input from all stakeholders to ensure it meets the needs of students.

All Career Technical Education coursework in the EUHSD is based on a series of state-adopted CTE standards which include the CTE Knowledge and Performance Anchor Standards, the California Standards for Career Ready Practice, and the CTE Model Curriculum Pathway Specific Standards. Not every standard and its related learning objective is included in the Scope and Sequence Guide since this document provides the essential pathway focus standards and key learning objectives for each unit with the related assignments and assessments. However, all of the CTE model Curriculum Pathway Standards are imbued in the student tasks throughout the course with specific standards emphasized in particular units in order to ensure students build the skills to ensure their success.

The CTE Standards for Career Ready Practice and CTE Model Curriculum Pathway Specific Standards below are integrated throughout the units and describe the fundamental knowledge and skills that a career ready student needs in order to prepare for transition to postsecondary education, career training, or the workforce. These standards are not exclusive to a career pathway, a CTE program of study, a particular discipline, or level of education. Standards for Career Ready Practice are taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a given pathway/program of study.

### CTE Standards for Career Ready Practice

1. **Apply appropriate technical skills and academic knowledge.**
2. **Communicate clearly, effectively, and with reason [both in writing and verbally].**
3. **Develop an education and career plan aligned with personal goals.**
4. **Apply technology to enhance productivity.**
5. **Utilize critical thinking to make sense of problems and persevere in solving them.**
6. **Practice personal health and understand financial literacy.**
7. **Act as a responsible citizen in the workplace and the community.**
8. **Model integrity, ethical leadership, and effective management.**
9. **Work productively in teams while integrating cultural and global competence.**
10. **Demonstrate creativity and innovation.**
11. **Employ valid and reliable research strategies.**
12. **Understand the environmental, social, and economic impacts of decisions.**

### CTE Model Curriculum Pathway Specific Standards

- 1.0 **Academics**: Analyze and apply appropriate academic standards...
- 2.0 **Communications**: Acquire and accurately use general academic and domain specific words...
- 3.0 **Career Planning and Management**: Integrate multiple sources of information...
- 4.0 **Technology**: Use technology, including the Internet, to produce, publish, and update writing...
- 5.0 **Problem Solving and Critical Thinking**: Conduct short as well as more sustained research...
- 6.0 **Health and Safety**: Determine the meaning of symbols, key words [related to health and safety...]
- 7.0 **Responsibility and Flexibility**: Initiate and participate in a range of collaborative discussions...
- 8.0 **Ethics and Legal Responsibilities**: Respond thoughtfully to diverse perspectives...
- 9.0 **Leadership and Teamwork**: Work with peers...[to] set clear goals,...establish individual roles...
- 10.0 **Technical Knowledge and Skills**: Use technology...to produce, publish, and update...products...
- 11.0 **Demonstration and Application**: Demonstrate and apply the knowledge and skills contained in the industry-sector anchor standards, pathway standards, and performance indicators...
**Advanced Architectural Design Scope and Sequence**

**Unit 1 – Review: Historical, Technical, and Practical Elements of Architecture**

**Length: 2-3 Weeks**

**Unit Description:** In Unit 1, students revisit the various career options available to them related to the field of architecture. They also review and demonstrate their understanding of variety of conceptual and practical elements from the first course in the pathway including primary architectural designs, architectural and mechanical lettering, dimensioning and line work, and identifying the principal historical styles of architecture and how they influence today’s designs. As part of their demonstration, students will also learn about building code requirements imposed by various entities including government and homeowners associations.

**Focus Architecture Pathway Standards:**

<table>
<thead>
<tr>
<th>A1.0 Understand how history shaped architecture and know significant events in the history of architectural design.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A1.1</strong> Know significant historical architectural projects and their effects on society.</td>
</tr>
<tr>
<td><strong>A1.2</strong> Understand the development of architectural systems in relation to aesthetics, efficiency, and safety.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A2.0 Compare the theoretical, practical, and contextual issues that influence design.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A2.1</strong> Describe the influence of community context and zoning requirements on architectural design.</td>
</tr>
<tr>
<td><strong>A2.2</strong> Understand the ways in which sociocultural conditions and issues influence architectural design.</td>
</tr>
<tr>
<td><strong>A2.3</strong> Compare the theoretical and practical effects of human and physical factors on the development of architectural designs.</td>
</tr>
<tr>
<td><strong>A2.4</strong> Analyze project design and compile a cost analysis.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A3.0 Understand the sketching processes used in concept development.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A3.1</strong> Apply sketching techniques to a variety of architectural models.</td>
</tr>
<tr>
<td><strong>A3.2</strong> Produce proportional two- and three-dimensional sketches and designs.</td>
</tr>
<tr>
<td><strong>A3.3</strong> Present conceptual ideas, analysis, and design concepts using freehand graphic communication techniques.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A8.0 Systematically complete an architectural project.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A8.3</strong> Read and interpret architectural and construction plans, drawings, diagrams, and specifications.</td>
</tr>
<tr>
<td><strong>A8.6</strong> Plan a project using site and building restrictions imposed by various entities (e.g., Planning, Zoning, Building, and HOAs).</td>
</tr>
</tbody>
</table>

| A9.2 Prepare an effective oral presentation of the portfolio content. |

**Key Learning Objectives & Tasks:**

**Students will...**
- Convey what they learned in the first course through a variety of collaborative discussions and tasks.
- Recall and practice their distinctive style of lettering and repeat consistently and continue to build on a particular lettering and numerical style to use in their work.
- Demonstrate their ability to use their lettering rapidly, legibly and consistently.
- Demonstrate their understanding of architectural styles by matching buildings to their architectural periods.
- Sketch residential elevations giving them the characteristics of the various traditional domestic styles.
- Acquire up-to-date knowledge regarding architecture-related careers.
- Read about careers related to architecture and discuss in class the possibilities.
- Hear a member of the architectural community speak on the opportunities available.
- Given specifications for a fireplace, students will be able to find the size possibilities for the flue liner.

**Key Assignments & Assessments:**

- Research, record, and describe the various careers and jobs related to architecture and engineering.
- Review previous research and work/products from their student portfolio from the *Architectural Design* course.
- Select a particular feature of alphabet letter (i.e., the horizontal line) and modify it from the norm.
- Experiment with the modification through all the letters and numbers until a pleasing, legible, and consistent alphabet is created and repeatedly used.
- Given a rectangular shaped plan, sketch the exterior roof and siding details to represent a given domestic style.
- Research and describe building codes and their importance in the architecture field.

**Sample Performance Task:** Students will create a “review presentation” which includes the elements listed above; they will produce verbal, written, and visual expressions of their learning and store it in their portfolio for future reference and presentation of knowledge and skills. They explore industry related elements in order to couch their review in practical industry application.
## Advanced Architectural Design Scope and Sequence

### Unit 2 – Developing Architecture Designs Using Computer-aided Drafting (CAD)

**Length:** 2 Weeks

### Unit Description:
In Unit 2, students build on their knowledge of CAD by engaging in a variety of introductory practice tasks in order to become more knowledgeable and proficient in the use of CAD to create their own architectural designs. They begin the construction of their advanced coursework career portfolio, which they construct, edit, and present collaboratively. They also compare their work products/artifacts to current industry examples of the same or similar products.

### Focus Architecture Pathway Standards:

| A4.0 Understand the use of computer-aided drafting (CAD) in developing architectural designs. |
| A4.1 Develop a preliminary architectural proposal using CAD software. |
| A4.2 Analyze viability of a project as the design is developed using Building Information Modeling (BIM). |
| A9.2 Prepare an effective oral presentation of the portfolio content. |

### Key Learning Objectives & Tasks:

**Students will...**

- Participate in a series of collaborative discussions and research-based tasks to learn more about computer-aided drafting (CAD) in general.
- Engage in simple guided lessons using CAD software.
- Launch and configure CAD software for use in creating architectural designs.
- Create a variety of foundational drawing files used in typical architectural drawings (e.g. symbols).
- Demonstrate their understanding of operating the computer by designing and printing a one-room structure.
- Given exact specifications, students will put together four walls/openings and complete a floor plan/all dimensions.
- Understand the purpose of Building Information Modeling (BIM) and how it is applied in the Autodesk Revit software.

### Key Unit Assignments & Assessments:

**Sample Performance Tasks:** Students create a series of simple architectural digital drawings/products based on specific criteria using CAD software. The products include but are not limited to:

- Architectural documents such as a symbol library using the AutoCAD software.
- A digital architectural design template they will use and build upon in later assignments.
- A sheet layout with border and title strip.
- A series of full-size plot drawings at a scale to fit a specific paper size.

**Sample Performance Task:** Students launch and configure Revit software to create architectural designs. Using the BIM (Building Information Modeling) component of the Revit software, students research and present their findings—verbally and in writing—of cost analysis, square and cubic feet of space for heating and cooling, electrical load requirements, etc. Students make presentations of their design work and BIM data to peers/instructor. They include these products in their ongoing coursework portfolio, share, and edit them collaboratively.
**Advanced Architectural Design Scope and Sequence**  
**Unit 3 – Design Process**  
**Length: 1 Week**

**Unit Description:** In Unit 3, students demonstrate their understanding of the elements and principles of the design process and build on this knowledge by creating floor plans and whole-space planning thus allowing students to scale up their designs. As part of this unit, students describe the influence of design and the design process on socio-cultural conditions. They include their products and analysis in their coursework portfolios including an argumentative text in which they argue why design matters for humans in practical ways.

<table>
<thead>
<tr>
<th>Focus Architecture Pathway Standards:</th>
<th>Key Learning Objectives &amp; Tasks:</th>
<th>Key Unit Assignments &amp; Assessments:</th>
</tr>
</thead>
</table>
| **A2.0** Compare the theoretical, practical, and contextual issues that influence design.  
A2.1 Describe the influence of community context and zoning requirements on Architectural Design.  
A2.2 Understand the ways in which sociocultural conditions and issues influence Architectural Design.  
A2.3 Compare the theoretical and practical effects of human and physical factors on the development of Architectural Designs.  
A2.4 Analyze project design and compile a cost analysis.  | Students will…  
• Solve various design problems using sunrise-sunset charts.  
• Compute solutions for traffic flow studies of specific building areas.  
• Design individual rooms using differing specification criteria in relating inside features to one another and inside to outside.  
• Solve roof plans for single and multiple level structures.  
• Using local zoning maps and building codes, design various structures for zone specific uses, e.g. commercial, residential, institutional, agricultural.  | **Performance Task 1:** Design a living room for a Single Family Residence using multiple case scenarios of family activities and necessities. Present designs using digital format with verbal explanations.  
**Performance Task 2:** Design and orient a structure for varying climate and geographical zones (beach house, mountain cabin, high desert hacienda, city townhouse, etc.). Present solutions in graphic and written format.  
**Performance Task 3:** Draft property parcels including property lines with compass bearing and lengths, topographical elevations, zoning setback lines, and key orientation factors including prevailing breeze, noise considerations, view, and solar gain/mitigation. Explain how those factors influence site use and building design.  
**Performance Task 4:** Students write an informative/argumentative text in which they describe their design and how it—and the architectural design in general—impacts human development and well-being. They present their findings to an audience and include the work products from this unit in their course portfolio. |
**Advanced Architectural Design Scope and Sequence**  
**Unit 4 – Reference Materials**  
**Length: 2 Days**

**Unit Description:** In Unit 4, students demonstrate the need and use of reference materials such as common construction material sizes, ergonomic design, fixture and device specifications, etc., used in completing architectural drawings and how these factors influence design.

**Focus Architecture Pathway Standards:**

<table>
<thead>
<tr>
<th>A7.0 Understand the properties of structural materials.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A7.1 Understand the integration of architectural factors, such as soil mechanics, foundation design, engineering materials, and structure design.</td>
</tr>
<tr>
<td>A7.2 Develop a stress analysis chart of typical structural components.</td>
</tr>
<tr>
<td>A7.3 Evaluate available building materials (e.g., steel, concrete, and wood) by considering their properties and their effect on building form.</td>
</tr>
<tr>
<td>A7.4 Develop a preliminary building plan using the appropriate materials.</td>
</tr>
<tr>
<td>A8.3 Read and interpret architectural and construction plans, drawings, diagrams, and specifications.</td>
</tr>
</tbody>
</table>

**Key Learning Objectives & Tasks:**

<table>
<thead>
<tr>
<th>Students will…</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Use various forms of reference sources, such as Sweets Catalogs, Architectural Graphic Standards, on-line search engines, etc., to answer questions of size, availability, building, procedures, etc., that influence architectural design.</td>
</tr>
<tr>
<td>• Demonstrate the process of researching special product information and specifications used in the decision-making process of the design phase of architectural drawings.</td>
</tr>
<tr>
<td>• Given a specific question about framing, students will demonstrate their ability to find the answer in the correct reference material.</td>
</tr>
</tbody>
</table>

**Key Unit Assignments & Assessments:**

**Sample Performance Task:** Given a particular make and model of oven, find the manufacturer's specifications for installation. Upon concluding that the oven will not fit the chosen cabinet design, research available models to find one that meets the client's specifications and will fit the design.

**Sample Performance Task:** Demonstrate the process of using architectural references in the design phase of a kitchen, including cabinetry, plumbing and electrical fixtures, appliances, flooring, countertops and back-splashes. Present the information via an informative brochure including graphically in the completion of a kitchen design drawing, and present the data in table format indicating all materials, fixtures, appliances, etc., with sizes and cost analysis.
Advanced Architectural Design Scope and Sequence
Unit 5 – Floor Plans and Schedules
Length: 5 Weeks

**Unit Description:** In Unit 5, students will use knowledge of area design and planning to formulate multiple floor plans and schedules, and demonstrate the procedures and sequence for putting the plan on paper using appropriate technique, line weight, drafting symbols, dimensioning and architectural conventions.

**Focus Architecture Pathway Standards:**

A6.0 Understand methods used to analyze simple structures.
A6.1 Understand load transfer mechanisms.
A6.2 Understand stress-strain relationships of building structures.
A6.3 Interpret structural design considerations, including load-bearing relationships of shear walls, columns, and beams.
A6.4 Design a simple structure by using structural analysis principles.
A7.2 Develop a stress analysis chart of typical structural components.
A7.3 Evaluate available building materials (e.g., steel, concrete, and wood) by considering their properties and their effect on building form.
A7.4 Develop a preliminary building plan using the appropriate materials.

**A8.0 Systematically complete an architectural project.**
A8.1 Describe the various components of structures, including lighting; heating, ventilating, and air-conditioning (HVAC); mechanical; electrical; plumbing; communication; security; and vertical transportation systems.
A8.2 Develop a preliminary proposal for presentation of an Architectural Design.
A8.3 Read and interpret architectural and construction plans, drawings, diagrams, and specifications.
A8.4 Develop a complete set of architectural plans and drawings.
A8.5 Estimate the materials needed for a project by reading an architectural drawing.
A8.7 Plan the sequence of events leading to an architectural project.

**Key Learning Objectives & Tasks:**

Students will…
- Demonstrate understanding of floor plans by drawing one from specific information.
- Given complete specifications for each room of a residence, students will draw the floor plan with all doors and windows and permanent features.
- Apply complete dimension and notes on a completed floor plan using appropriate architectural dimensioning and lettering techniques.
- Participate in guided "draw-alongs" to illustrate correct procedure and technique used in the creation of floor plans.
- Practice the application of architectural symbols such as windows, doors, fixtures, etc. to sample plans.

**Key Unit Assignments & Assessments:**

*Sample Performance Task:* Draw the floor plan of house described in specifications at scale of ¼" = 1’ – 0”, showing all features shown in demonstration plan.

*Sample Performance Task:* Provide architectural specifications in a user-friendly way so that a customer/client could present them to the end user who could then make suggestions. Use both written/typed language as well as images/graphics to convey this information. Research current best practices to support this task. Present final products to at least two other students before final submission for credit. Include in course portfolio.
**Advanced Architectural Design Scope and Sequence**  
**Unit 6 – Electrical Plan and Schedules**  
**Length: 2 Weeks**

<table>
<thead>
<tr>
<th>Unit Description:</th>
<th>Key Learning Objectives &amp; Tasks:</th>
<th>Key Unit Assignments &amp; Assessments:</th>
</tr>
</thead>
</table>
| In Unit 6, students research and discuss the requirements for placing electric lights and outlets and the design criteria for circuits in order to understand the current industry best practices related to this work and to prepare to implement these practices in their course work projects. They create an informative multimedia text to demonstrate their learning. | Students will…  
- Demonstrate their understanding of residential electrical design by placing all required (by code) and all additional (for convenience) lights and outlets on their floor plan.  
- Given the floor plan drawn in Unit 5, Students will place all electric light outlets and convenience outlets on the plan according to anticipated furniture and appliance placement.  
- Check to see that electric design meets building code requirements and make adjustments and/or additions accordingly. | **Sample Performance Task:** Collaboratively research the various components of structures with a focus on HVAC related elements.  
**Sample Performance Task:** Trace floor plan walls, openings, permanent built-ins and major appliances in light line weight, and locate all electric outlets with controls (switches, dimmers, relays, etc.). Create a digital informational text/video to showcase/illustrate your research and the elements of the HVAC and present it to an audience of your peers; revise as necessary based on feedback Add this product to your Coursework Portfolio. |

**Focus Architecture Pathway Standard:**
A4.0 Understand the use of computer-aided drafting (CAD) in developing architectural designs.  
A8.1 Describe the various components of structures, including lighting; heating, ventilating, and air-conditioning (HVAC); mechanical; electrical; plumbing; communication; security; and vertical transportation systems.
## Advanced Architectural Design Scope and Sequence
### Unit 7 – Foundation Plan and Details
### Length: 1 Week

**Unit Description:** In Unit 7, students will engage in a variety of projects and tasks designed to help them understand the different floor and building support systems so they can describe and detail the structure of each system component both graphically and in written form. They work collaboratively to provide feedback and write a reflection regarding how they would approach the same design task differently with a new design project.

**Focus Architecture Pathway Standards:**
- **A6.0** Understand methods used to analyze simple structures.
  - **A6.1** Understand load transfer mechanisms.
  - **A6.2** Understand stress-strain relationships of building structures.
  - **A6.3** Interpret structural design considerations, including load-bearing relationships of shear walls, columns, and beams.
  - **A6.4** Design a simple structure by using structural analysis principles.
- **A7.0** Understand the properties of structural materials.
  - **A7.1** Understand the integration of architectural factors, such as soil mechanics, foundation design, engineering materials, and structure design.
  - **A7.2** Develop a stress analysis chart of typical structural components.
  - **A7.3** Evaluate available building materials (e.g., steel, concrete, and wood) by considering their properties and their effect on building form.

**Key Learning Objectives & Tasks:**
- Students will...
  - Demonstrate their understanding of under floor structure by being able to draw details of various parts of foundations involving both concrete slabs and wood floors. They will be able to use the code to select support member sizes and spacing.
  - Given a completed floor plan, students will draw a foundation plan showing the position of all parts of the building that touch the ground.
  - Identify by drawings and notes the size and spacing of all wood members under the floor, according to code restrictions.

**Key Unit Assignments & Assessments:**

**Sample Performance Task:** Trace floor plan (exterior wall edge), complete foundation walls and footings. Use code to select wood support member’s size and spacing, and place pier supports accordingly.

**Sample Performance Task:** Building on the formative task, students draw all steps, concrete patio, garage aprons and deck supports and present their final product to an audience of their peers. They revise their work based on feedback. They also write a constructed response detailing what they would do differently in the process when engaging in the same process on a different design.
**Advanced Architectural Design Scope and Sequence**  
**Unit 8 – Framing Sections**  
**Length: 2 Weeks**

<table>
<thead>
<tr>
<th><strong>Unit Description:</strong></th>
<th>In Unit 8, students will understand the framing structure of an average residence including wall, window, door, ceiling and roof framing and how it all relates to the foundation through bearing walls.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focus Architecture Pathway Standards:</strong></td>
<td></td>
</tr>
<tr>
<td>A6.0 Understand methods used to analyze simple structures.</td>
<td></td>
</tr>
<tr>
<td>A6.1 Understand load transfer mechanisms.</td>
<td></td>
</tr>
<tr>
<td>A6.2 Understand stress-strain relationships of building structures.</td>
<td></td>
</tr>
<tr>
<td>A6.3 Interpret structural design considerations, including load-bearing relationships of shear walls, columns, and beams.</td>
<td></td>
</tr>
<tr>
<td>A6.4 Design a simple structure by using structural analysis principles.</td>
<td></td>
</tr>
<tr>
<td>A7.0 Understand the properties of structural materials.</td>
<td></td>
</tr>
<tr>
<td>A7.1 Understand the integration of architectural factors, such as soil mechanics, foundation design, engineering materials, and structure design.</td>
<td></td>
</tr>
<tr>
<td>A7.2 Develop a stress analysis chart of typical structural components.</td>
<td></td>
</tr>
<tr>
<td>A7.3 Evaluate available building materials (e.g., steel, concrete, and wood) by considering their properties and their effect on building form.</td>
<td></td>
</tr>
</tbody>
</table>
| **Key Learning Objectives & Tasks:** | Students will…  
• Demonstrate their understanding of framing by being able to draw sectional details through the sill, the wall, the cornice and the roof support system. They will be able to use the code to select ceiling joists and roof rafters for the spans encountered.  
• Given a completed floor plan, students will select a location for a typical section and will draw that framing section from the bottom of the footings to the ridge beam.  
• By notes, identify all members by name, size and spacing. |
| **Key Unit Assignments & Assessments:** | Sample Performance Task: Use floor plans to select section position and use foundation plan and details to aid in drawings section to floor platform.  
Sample Performance Task: Collaboratively create a design product, which includes technical drawings of bearing and non-bearing partitions and uses code to select ceiling joist and rafter sizes for the existing spans. In addition, draw section details of special areas, baseboard, roof finish, exterior finish, and interior finish.  
• Write and present a reflection regarding the design process and the way you worked with your design team. |
Advanced Architectural Design Scope and Sequence
Unit 9 – Exterior Elevations
Length: 3 Weeks

**Unit Description:** In Unit 9, students engage in a performance task designed to help them understand the relationships of (1) floor plan to exterior views (elevations) and (2) the given wall of a building to the various types of roofing, (3) chimney to roof, and (4) floor level to ground. Students engage in a reflective practice with a partner after their work is completed to describe the processes they chose and to determine from one another’s approaches what changes they would make in the future when engaging the same or a similar project/task.

**Focus Architecture Pathway Standards:**

<table>
<thead>
<tr>
<th>A5.0 Compare the relationship between architecture and the external environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A5.1 Understand the significance of sustainable building design practices that incorporate beneficial energy and environmental design policies.</td>
</tr>
<tr>
<td>A5.2 Develop a site analysis that considers passive energy techniques, sustainability issues, and landscaping.</td>
</tr>
<tr>
<td>A5.3 Create a building design that incorporates passive and/or active energy-efficient technologies.</td>
</tr>
<tr>
<td>A6.0 Understand methods used to analyze simple structures.</td>
</tr>
<tr>
<td>A6.1 Understand load transfer mechanisms.</td>
</tr>
<tr>
<td>A6.2 Understand stress-strain relationships of building structures.</td>
</tr>
<tr>
<td>A6.3 Interpret structural design considerations, including load-bearing relationships of shear walls, columns, and beams.</td>
</tr>
<tr>
<td>A6.4 Design a simple structure by using structural analysis principles.</td>
</tr>
</tbody>
</table>

**Key Learning Objectives & Tasks:**

<table>
<thead>
<tr>
<th>Students will…</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Research and discuss current best practices related to floor plans, roofing design, etc.</td>
</tr>
<tr>
<td>• Demonstrate their understanding of the elevation “relationships” by being able to draw elevations from the four or more sides of a residence using various roof styles, and to artistically represent the finish textures of all parts.</td>
</tr>
<tr>
<td>• Given a completed floor plan, students will design a hip roof to fit.</td>
</tr>
<tr>
<td>• Given floor plan with the hip roof, including its overhand, students will complete the four elevations.</td>
</tr>
</tbody>
</table>

**Key Unit Assignments & Assessments:**

| Sample Performance Task: Draw specified overhang outside of exterior walls on floor plan according to the best practices detailed in the research and by the instructor. |
| Sample Performance Task: Using techniques demonstrated in class and practiced on floor plan blanks; create/draw in all hip rafters and valley rafters and ridges until all roof surfaces are represented. Analyze your own work and write a brief description of the process and share your reflection with a partner; engage in a dialog in which you ask and answer questions regarding the process used and how you might make changes in the future based on what your partner shared. Share findings as a whole group using illustrations and other visuals to support your presentation. |
**Advanced Architectural Design Scope and Sequence**  
**Unit 10 – Interior Elevations**  
**Length: 2 Weeks**

**Unit Description:** In Unit 10, students research and explore the mechanics of drawing interior elevations and are able to distinguish between required and unnecessary elevations as relates to the bid and cost analysis process.

<table>
<thead>
<tr>
<th>Focus Architecture Pathway Standards:</th>
<th>Key Learning Objectives &amp; Tasks:</th>
<th>Key Unit Assignments &amp; Assessments:</th>
</tr>
</thead>
</table>
| A2.4 Analyze project design and compile a cost analysis.  
A3.0 Understand the sketching processes used in concept development.  
A3.1 Apply sketching techniques to a variety of architectural models.  
A3.2 Produce proportional two- and three-dimensional sketches and designs.  
A3.3 Present conceptual ideas, analysis, and design concepts using freehand graphic communication techniques.  
A8.0 Systematically complete an architectural project.  
A8.1 Describe the various components of structures, including lighting; heating, ventilating, and air-conditioning (HVAC); mechanical; electrical; plumbing; communication; security; and vertical transportation systems. | Students will…  
- Demonstrate their understanding of basic cabinetry construction by being able to draw and design cabinet systems that are functional, pleasing, and consistent with the style of the residence.  
- Given an empty room, students will design and draw kitchen cabinets with cupboards, drawers, counters, and appliances that allow a logical and efficient workflow to progress within the kitchen itself and within the context of the related rooms.  
- Given an empty room, students will design and draw bathroom cabinets with counters, drawers, doors and fixtures that will allow a logical use of the space available and meet the needs of the occupants. | - Locate vertically and horizontally on each wall the positions of all major units, appliances and fixtures in a room, specifically a kitchen space.  
- Divide the spaces left into cupboards and drawers to give balance and function to the design. |

**Sample Performance Task:** Students produce proportional two- and three-dimensional sketches and designs to illustrate their understanding and ability to describe and design interior elevations. Students write a brief informative text in which they describe why elevation descriptions are a vital part of the design process including technical examples. Present to peers and the instructor and revise according to feedback. Include products in Course Portfolio.
Advanced Architectural Design Scope and Sequence  
Unit 11 – Site Plans  
Length: 2 Weeks  

**Unit Description:** In Unit 11, students will research and explore the various specific requirements for a comprehensive site plan with particular attention to developing a site analysis that takes into account sustainability, environmental sensitivity, and passive and active energy efficient technologies.

**Focus Architecture Pathway Standards:**

A2.1 Describe the influence of community context and zoning requirements on Architectural Design.  
A5.0 Compare the relationship between architecture and the external environment.  
A5.1 Understand the significance of sustainable building design practices that incorporate beneficial energy and environmental design policies.  
A5.2 Develop a site analysis that considers passive energy techniques, sustainability issues, and landscaping.  
A5.3 Create a building design that incorporates passive and/or active energy-efficient technologies.  
A8.2 Develop a preliminary proposal for presentation of an Architectural Design.  
A8.3 Read and interpret architectural and construction plans, drawings, diagrams, and specifications.  
A8.4 Develop a complete set of architectural plans and drawings.  
A8.5 Estimate the materials needed for a project by reading an architectural drawing.  
A8.6 Plan a project using site and building restrictions imposed by various entities (e.g., Planning, Zoning, Building, and Home Owners Association [HOA]).  
A8.7 Plan the sequence of events leading to an architectural project.

**Key Learning Objectives & Tasks:**

Students will…
- Demonstrate their knowledge of site plan composition by being able to complete a site plan.  
- Given a plot of land, students will locate house and all permanent items to be placed around house having to do with access, recreation, and landscaping following setback requirement for the area.  
- Given plot with house located, students will locate all services in street, position all meters, and draw lines from street to meters and to location on house where service is accepted.

**Key Unit Assignments & Assessments:**

- Collaboratively research and explore current industry best practices regarding site plan design and analysis.  
- Analyze multiple site plans, which may contain errors and oversights from different periods. Identify key challenges the plans may or may not address.

**Sample Performance Task:** Students create a site plan overview/outline that demonstrates their ability to take into account a variety of natural and artificial elements and that acknowledges sustainability, environmental sensitivity, and the use or potential use of passive and active energy efficient technologies. Students illustrate their plan digitally and showcase it online and via printed/physical methods. They take into account feedback and revise as necessary. They include this plan as a key element of their student Coursework Portfolio.
**Advanced Architectural Design Scope and Sequence**  
**Unit 12 – Student Designed Set of House Plans**  
**Length: 14 Weeks**

**Unit Description:** In Unit 12, students bring together their understanding of architecture and design by planning and drawing a complete set of house plans that include all of the key elements of the sketching and drafting process and take into account the environment, current industry standards and common customer expectations, etc. The house plans include a complete floor plan, elevations, site plan, roof plan, and foundation plan with the necessary details per current industry practice. Students also create the related documents including informative texts, presentation materials, etc. and share their results with their peers, instructors, and publish their work online and submit it formally (e.g. a trade fair, etc.) as the culmination of their work in the pathway.

**Focus Architecture Pathway Standards:**

- **A2.1** Describe the influence of community context and zoning requirements on Architectural Design.
- **A2.2** Understand the ways in which sociocultural conditions and issues influence Architectural Design.
- **A2.4** Analyze project design and compile a cost analysis.
- **A3.0** Understand the sketching processes used in concept development.
- **A3.1** Apply sketching techniques to a variety of architectural models.
- **A3.2** Produce proportional two- and three-dimensional sketches and designs.
- **A3.3** Present conceptual ideas, analysis, and design concepts using freehand graphic communication techniques.
- **A4.0** Understand the use of computer-aided drafting (CAD) in developing Architectural Designs.
  - **A4.1** Develop a preliminary architectural proposal using CAD software.
  - **A4.2** Analyze viability of a project as the design is developed using Building Information Modeling (BIM).
- **A5.0** Compare the relationship between architecture and the external environment.
  - **A5.1** Understand the significance of sustainable building design practices that incorporate beneficial energy and environmental design policies.
  - **A5.2** Develop a site analysis that considers passive energy techniques, sustainability issues, and landscaping.
  - **A5.3** Create a building design that incorporates passive and/or active energy-efficient technologies.
- **A6.0** Understand methods used to analyze simple structures.
  - **A6.1** Understand load transfer mechanisms.
  - **A6.2** Understand stress-strain relationships of building structures.
  - **A6.3** Interpret structural design considerations, including load-bearing relationships of shear walls, columns, and beams.
  - **A6.4** Design a simple structure by using structural analysis principles.
- **A7.0** Understand the properties of structural materials.
  - **A7.1** Understand the integration of architectural factors, such as soil mechanics, foundation design, engineering materials, and structure design.

**Key Learning Objectives & Tasks:**

Students will…
- Research and discuss what a complete set of house plans includes according to current standards.
- Demonstrate their understanding of residential Architectural Design by drafting, designing, and drawing a set of house plans suitable for being put out to bid.
- Given limiting specifications, students will, with the help of their families, design a vacation home for a specific location.
- Select design combinations most suitable to the family and its needs at the location, and will proceed to draw the basic and technical plans.

**Key Unit Assignments & Assessments:**

- Without scale, sketch general house layout, relating the three design areas to the exterior environment. (3 or 4 possibilities)
- Within each design area, sketch general room layout with furniture requirements to scale, relating the rooms to one another and the exterior environment. (3 or 4 possibilities).

**Sample Performance Task:** Create a comprehensive set of house plans according to the current industry standards and practices. Include all of the key features and elements including floor, elevations, site, roof, and foundation plans. Work collaboratively with peers and the instructor to receive ongoing feedback, adjust, and revise plans/work accordingly. Submit for final assessment and revise once more as necessary. Outside experts in the field will also take part in the assessment as opportunities permit.

*The completed set of architectural plans becomes the summative element of students’ portfolio of work. Students are encouraged to enter their project in the San Diego County Fair at Del Mar. They will also be encouraged to publish their work online.*
| A7.2 Develop a stress analysis chart of typical structural components. |
| A7.3 Evaluate available building materials (e.g., steel, concrete, and wood) by considering their properties and their effect on building form. |
| A7.4 Develop a preliminary building plan using the appropriate materials. |

**A8.0 Systematically complete an architectural project.**

| A8.1 Describe the various components of structures, including lighting; heating, ventilating, and air-conditioning (HVAC); mechanical; electrical; plumbing; communication; security; and vertical transportation systems. |
| A8.2 Develop a preliminary proposal for presentation of an Architectural Design. |
| A8.3 Read and interpret architectural and construction plans, drawings, diagrams, and specifications. |
| A8.4 Develop a complete set of architectural plans and drawings. |
| A8.5 Estimate the materials needed for a project by reading an architectural drawing. |
| A8.6 Plan a project using site and building restrictions imposed by various entities (e.g., Planning, Zoning, Building, and Home Owners Association [HOA]). |
| A8.7 Plan the sequence of events leading to an architectural project. |