



El Camino College  
COURSE OUTLINE OF RECORD – Official

<b>Course Acronym:</b>	ARCH
<b>Course Number:</b>	258
<b>Descriptive Title:</b>	Structures Analysis-Timber
<b>Division:</b>	Industry and Technology
<b>Department:</b>	Architecture
<b>Course Disciplines:</b>	Architecture
<b>Catalog Description:</b>	In this course, students are introduced to the analysis of structural components in residential buildings. Topics covered include vertical and horizontal loadings, shear and moment diagrams, beams, wood and steel columns, foundation and lateral bracing systems.
<b>Prerequisite:</b>	
<b>Co-requisite:</b>	
<b>Recommended Preparation:</b>	Eligibility for English 1A and Proficiency in pre-algebra skills
<b>Enrollment Limitation:</b>	
<b>Hours Lecture (per week):</b>	3
<b>Hours Laboratory (per week):</b>	0
<b>Outside Study Hours:</b>	6
<b>Total Course Hours:</b>	54
<b>Course Units:</b>	3
<b>Grading Method:</b>	Letter Grade only
<b>Credit Status:</b>	Credit, degree applicable
<b>Transfer CSU:</b>	Yes
<b>Effective Date:</b>	Prior to July 1992
<b>Transfer UC:</b>	
<b>Effective Date:</b>	
<b>General Education:</b> ECC	
<b>Term:</b>	
<b>Other:</b>	
<b>CSU GE:</b>	
<b>Term:</b>	
<b>Other:</b>	

<b>IGETC:</b>	
<b>Term:</b>	
<b>Other:</b>	
<b>Student Learning Outcomes:</b>	<p><b>SLO #1 Beams and Lateral Bracing</b></p> <p>Given lecture information, handouts and in-class discussion, students will be able to demonstrate the knowledge of the function of structural components in residential buildings. Students will be able to calculate the size of beams, columns and lateral bracing systems of light framed wood structures.</p> <p><b>SLO #2 Graphic Techniques</b></p> <p>Successful students, completing the Architecture Program, following instructions, supervised classroom practice using CADD system; will use proper graphic techniques to complete instructions.</p> <p><b>SLO #3 Spatial Organization</b></p> <p>Successful students tracking for graduation transfer, and or employment in the architecture field, will create design drawings and design models to show spatial organization.</p>
<b>Course Objectives:</b>	<ol style="list-style-type: none"> <li>1. Describe basic structural principals for residential construction.</li> <li>2. Calculate reactions on simple beams.</li> <li>3. Construct shear and moment diagrams for simple beams.</li> <li>4. Calculate sizes of beams, columns and footings for Type V light wood frame buildings.</li> <li>5. Analyze the lateral seismic forces on a wood building and calculate the required bracing systems to resist the force.</li> <li>6. Apply The International Building Code formulas that are used in calculating structural systems in buildings.</li> </ol>
<b>Major Topics:</b>	<p><b>I. OVERVIEW OF STRUCTURES ANALYSIS-TIMBER (9 hours, lecture)</b></p> <ol style="list-style-type: none"> <li>A. Basic principles</li> <li>B. Stresses</li> <li>C. Shear</li> <li>D. Tension</li> <li>E. Compression</li> <li>F. Safety factors</li> <li>G. Formulas</li> <li>H. Moment and shear diagrams</li> </ol> <p><b>II. VERTICAL AND HORIZONTAL LOADINGS (12 hours, lecture)</b></p> <ol style="list-style-type: none"> <li>A. Tributary widths</li> <li>B. Dead and live loads</li> <li>C. Formulas</li> <li>D. Reactions</li> <li>E. Applications</li> </ol>

	<p><b>III. WOOD BEAMS (9 hours, lecture)</b></p> <ul style="list-style-type: none"> <li>A. Analysis</li> <li>B. Formulas</li> <li>C. Loading</li> <li>D. Applications</li> </ul> <p><b>IV. WOOD COLUMNS (6 hours, lecture)</b></p> <ul style="list-style-type: none"> <li>A. Analysis</li> <li>B. Formulas</li> <li>C. Loading</li> <li>D. Applications</li> </ul> <p><b>V. FOUNDATIONS (8 hours, lecture)</b></p> <ul style="list-style-type: none"> <li>A. Analysis</li> <li>B. Formulas</li> <li>C. Loading</li> <li>D. Applications</li> </ul> <p><b>VI. LATERAL BRACING (10 hours, lecture)</b></p> <ul style="list-style-type: none"> <li>A. Analysis</li> <li>B. Seismic</li> <li>C. Wind</li> <li>D. Loading</li> <li>E. Formulas</li> <li>F. Applications</li> </ul>
<b>Total Lecture Hours:</b>	54
<b>Total Laboratory Hours:</b>	0
<b>Total Hours:</b>	54
<b>Primary Method of Evaluation:</b>	2) Problem solving demonstrations (computational or non-computational)
<b>Typical Assignment Using Primary Method of Evaluation:</b>	Draw shear and moment diagrams of a given floor beam. Calculate beam size and column sizes that support the beam. Write calculations on a one-page report and submit to the instructor.
<b>Critical Thinking Assignment 1:</b>	Calculate the size of a beam spanning 20 feet that is supporting 500 square feet of a clay tile roof that has a dead load of 25 pounds per square foot and a live load of 15 pounds per square foot. Write calculations on a one- to two-page report and submit to the instructor.
<b>Critical Thinking Assignment 2:</b>	Using calculations, calculate seismic loads and design shearwalls for a one-story house. Write calculations on a one-page report and submit report to the instructor.
<b>Other Evaluation Methods:</b>	Other Exams Quizzes

	Homework Problems Multiple Choice
<b>Instructional Methods:</b>	Demonstration Lecture Multimedia presentations
<b>If other:</b>	
<b>Work Outside of Class:</b>	Study  Skill practice  Required reading  Problem solving activities
<b>If Other:</b>	
<b>Up-To-Date Representative Textbooks:</b>	International Code Council. <u>INTERNATIONAL RESIDENTIAL CODE</u> . International Code Council, 2021
<b>Alternative Textbooks:</b>	
<b>Required Supplementary Readings:</b>	
<b>Other Required Materials:</b>	
<b>Requisite:</b>	
<b>Category:</b>	
<b>Requisite course(s): List both prerequisites and corequisites in this box.</b>	
<b>Requisite and Matching skill(s):Bold the requisite skill. List the corresponding course objective under each skill(s).</b>	
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<b>Requisite Skill:</b>	Eligibility for English 1A  Proficiency in pre-algebra skills
<b>Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). If applicable</b>	<b>Students need well-developed reading skills in order to understand and interpret information in their textbooks and writing skills to develop essays and projects.</b>  Summarize, analyze, evaluate, and synthesize college-level texts.  <b>Ability to perform algebraic calculations.</b>  Formulate mathematical representations of real-world applications including the recognition of proportional relationships.  Solve linear equations.  Find perimeters, areas, and volumes of various geometrical shapes and use in applications.
<b>Enrollment Limitations and Category:</b>	
<b>Enrollment Limitations Impact:</b>	
<b>Course Created by:</b>	Michael Stallings
<b>Date:</b>	12/03/2015
<b>Original Board Approval Date:</b>	06/18/2018
<b>Last Reviewed and/or Revised by:</b>	Guillermo Villavicencio
<b>Date:</b>	05/12/2022
<b>Last Board Approval Date:</b>	11/21/2022