



El Camino College
COURSE OUTLINE OF RECORD – Official

Course Acronym:	SUST
Course Number:	249
Descriptive Title:	Studio 3 - Sustainable Design and Ecology
Division:	Industry and Technology
Department:	Environmental Technology
Course Disciplines:	Environmental Technology
Catalog Description:	As the third course in a four architectural design studio series, this course explores sustainable and ecological practices for site planning and building performance. Whereas the emphasis of earlier design studios is on artistic expression of building design, this studio will focus on the technological side of architecture. It will cover the adaptation with natural systems, synthesis of regulatory frameworks, ecological enhancements and regional design. Topics such as passive energy design, natural daylighting, solar and wind capture, stormwater retention systems as well as other ecologically supportive methodologies.
Prerequisite:	Architecture 199 with a minimum grade of C
Co-requisite:	
Recommended Preparation:	
Enrollment Limitation:	
Hours Lecture (per week):	2
Hours Laboratory (per week):	4
Outside Study Hours:	4
Total Course Hours:	108
Course Units:	3
Grading Method:	Letter Grade only
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	
Transfer UC:	No
Effective Date:	
General Education: ECC	
Term:	
Other:	
CSU GE:	

	Term:
	Other:
	IGETC:
	Term:
	Other:
Student Learning Outcomes:	<p>SLO #1 Small Scale Residential/Commercial Site</p> <p>Given instruction in green building technology and design development principles that are specific to site and landscape development, the student will design and develop a small scale residential and a commercial site using specific criteria taught in class.</p> <p>SLO #2 Regional Area or Commercial Site Design</p> <p>Given instruction in green building technology and design development principles that are specific to site and landscape development, the student will design and develop a large regional area and or a large commercial site using specific criteria and strategies taught in class.</p> <p>SLO #3 Sustainable Site & Landscape Design</p> <p>After receiving instruction in the principles of sustainable landscape and site development, successful students will gain the knowledge base of what is required to develop and design a sustainable site and landscape, and that information can then be used to obtain the necessary approvals from various agencies or municipalities to obtain permits.</p>
Course Objectives:	<ol style="list-style-type: none"> 1. Describe and discuss principles and strategies of sustainable and regenerative practices in site and landscape development. 2. Examine construction strategies for hillside development. 3. Examine, prepare and evaluate solutions to grading and drainage systems. 4. Examine governmental code sections to interpret requirements for irrigation and lighting systems.
Major Topics:	<p>I. The Science of Building Performance (2 hours, lecture)</p> <ol style="list-style-type: none"> A. The factors of functionality and performance B. Buildings as expression vs. performance C. Sustainability influencing the design process <p>II. Sustainable Buildings & Sites (2 hours, lecture)</p> <ol style="list-style-type: none"> A. Sustainability during ancient times B. Ancient sustainable strategies C. Sustainable measures in the modern world <p>III. Introduction to Sustainability Measures (1 hour, lecture)</p>

- A. Principles & strategies
- B. UN's 17 sustainable development goals
- C. Think globally, act locally

IV. The Land You Stand On (3 hours, lecture)

- A. Planning Principles
- B. Land-use Regulations
- C. Zoning and sustainability

V. Energy/ Resource Conservation (2 hours, lecture)

- A. Design of collection systems, bio-retention systems
- B. Groundwater recharging concepts
- C. Regulation and code application

VI. Passive Energy Design (2 hours, lecture)

- A. PassiveHaus and the 5 principles of design
- B. Solar, wind and thermal strategies
- C. Passive energy vs. active energy

VII. Hydrology & Water Resource Management (1 hour, lecture)

- A. State mandates for water conservation
- B. Design of collection systems, bio-retention systems
- C. Strategies for controlling runoff

VIII. Carbon Footprint & Net Zero Design (3 hours, lecture)

- A. Embodied and operational carbon
- B. Energy consumption and generation
- C. Analyzing building assemblies

IX. The Ground & Its Natural Features (4 hours, lecture)

- A. Working with existing conditions
- B. Landscape, structures and soil

	<p>C. Using Plants to support a design strategy</p> <p>X. Vernacular Architecture as a Sustainable Strategy (6 hours, lecture)</p> <p>A. Demonstrating that <i>All Design is Local</i></p> <p>B. Building envelope that responds to local climate</p> <p>C. Hyper-local methods and materials</p> <p>XI. Big Idea: Organizing Around Sustainability (8 hours, lecture)</p> <p>A. Sustainable materials & green codes</p> <p>B. Low Impact Design (LID) requirements</p> <p>C. Title 24 Compliance</p> <p>D. The Heat Island effect</p> <p>E. Decarbonization practices</p> <p>XII. Beyond Sustainability (2 hours, lecture)</p> <p>A. Ten Shades of Green</p> <p>B. Regenerative and biophilic strategies</p> <p>C. Designing for resiliency</p> <p>XIII. The ‘Learning by Doing’ activity emphasizing instructor-to-student and peer-to-peer interactions including desk critiques and pin-ups. (72 hours, lab)</p> <p>A. Exercise engagement based of lecture content</p> <p>B. Developing/ testing of design principles</p> <p>C. Drawing/ sketching to explore ideas</p> <p>D. Participation in group tasks and projects</p> <p>E. Individual project development and evaluation</p>
Total Lecture Hours:	36
Total Laboratory Hours:	72
Total Hours:	108
Primary Method of Evaluation:	3) Skills demonstration

Typical Assignment Using Primary Method of Evaluation:	After analyzing the existing conditions of a one-acre site, develop sustainable design solutions that address building performance, connection to natural systems and sustainability via diagramming, case studies, design sketches, building and site schematic drawings, and models and renderings. Submit design development and drawings to the instructor.
Critical Thinking Assignment 1:	Prepare a presentation that compares and contrasts concepts and strategies that focus on sustainable building landscape construction technologies. Submit drawings to the instructor.
Critical Thinking Assignment 2:	Prepare a five- to seven-page/slide project presentation, with diagrams, photos, case studies, concepts and related drawings, examining and demonstrating strategies for sustainable design and how these principles are applied in developing the built environment. Submit project presentation to the instructor.
Other Evaluation Methods:	<p>Essay Exams</p> <p>Performance Exams</p> <p>Objective Exams</p> <p>Oral Exams</p> <p>Reading Reports</p> <p>Written Homework</p> <p>Field Work</p> <p>Class Performance</p> <p>Term or Other Papers</p> <p>Other (specify): Drawing Preparation Presentation Journal (kept regularly throughout the course) Clinical Evaluations</p>
Instructional Methods:	<p>Demonstration</p> <p>Discussion</p> <p>Field Trips</p> <p>Guest Speakers</p> <p>Laboratory</p> <p>Lecture</p> <p>Multimedia Presentations</p>
If other:	Internet Presentation/Resources
Work Outside of Class:	<p>Study</p> <p>Answer questions</p> <p>Skill practice</p> <p>Required reading</p> <p>Journal</p>
If Other:	Prepare drawings for evaluation
Up-To-Date Representative Texts:	Francis Ching, <u>Architecture: Form, Space, and Order</u> , 4 th Ed, John Wiley, 2021 Meg Calkins. <u>The Sustainable Sties Handbook</u> . John Wiley and Sons, 2012. (Discipline Standard)
Alternative Texts:	

Required Supplementary Readings:	
Other Required Materials:	
Requisite:	Prerequisite
Category:	Sequential
Requisite course(s): List both prerequisites and corequisites in this box.	Architecture 199
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	<p>Ability to analyze existing conditions.</p> <p>ARCH 199 - Formulate design concepts or ideas through research, inspiration and sketches.</p> <p>ARCH 199 - Ability to synthesize an abstract idea to create architecture.</p> <p>ARCH 199 - Understand the relationship between site, program, analysis, concept, process and product.</p> <p>Ability to graphically communicate and present the design intent.</p> <p>ARCH 199 - Visually and orally present and convey design projects to others.</p>
Requisite Skill:	
Requisite Skill and Matching Skill(s): Bold the requisite skill(s). If applicable	
Requisite course:	
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Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	Greg George

Date:	10/17/2011
Original Board Approval Date:	02/19/2013
Last Reviewed and/or Revised by:	MARC YEBER
Date:	11/17/2023
Last Board Approval Date:	03/21/2024
Effective Term:	FALL 2024