



University of California, Santa Cruz, Rachel Carson College IDEASS Practicum Sustainable Building Design

Tiny House Design Lab

CRSN 152-04 (44145) in collaboration with
Stanford University, Center for Integrated Facilities Engineering
EcoLogic Architects & Carmel Maker Space

- Lead Instructor: **Thomas Rettenwender**, M.A., Mag.Arch., Architect
- Starts Thursday Sept 23, 2021 11:40 - 1:15 pm runs 10 Weeks
- Guest Lecture Series with reknowned industry professionals
- Hands-On & On-Site Skills-based Training Program
- Virtual Design & Construction (VDC) Tutorials
- Hybrid Online/On-Site Design Training

When : Thursday, Sep 23 , 2021 - Thurs Dec 2, 2021
Where : Porter Academic 246

Field Trips (subject to change)

- 01 UCSC Micropod, Uvasosos, Santa Clara
- 02 Barrios Unidos, Santa Cruz
- 03 SJCC Mikra House, San Jose Homeless Tiny House Village
- 04 Pocket House, Hartnell College, Salinas &
- 05 Rancho Cielo Construction Academy
- 06 FLEX Lab, Lawrence Berkeley Lab, Berkeley
- 07 Stanford Univ. CIFE & PBL Lab, Palo Alto

Digital Design Tools

1. CAD (Auto CAD and Draftsight)
2. Concept Design (Indesign, Word press)
3. Schematic Design (Sketch-up, Tinker CAD)
4. 3d Computer Aided Modeling (Rhino, Revit)
5. Physincal Modeling (scale modeling)
6. 3d Printing, Laser Cut, CNC Milling
7. Zero-Net & Smart Systems (Arduino, Rasp- berry-Pi)

Guided Design Phases

1. Program Requirements
2. Concept Design
3. Site Assessment
4. Schematic Design
5. Master Plan
6. Design Development
7. Construction
8. Monitoring

Principles of Ecological Design

1. Virtual Design and Construction
2. Building Rating Systems, Ecometrics & VDC
3. Site Specific Design & Passive Design
4. Biophelia
5. Biomimicry
6. Formal and Informal Strucural Design
7. Integrating and Optimizing Ecosystem Ser- vices
8. Integrated Renewable Energy & Microgirds
9. Water Systems Design

Guest Lectures by Industry Professionals

- Jeni Levini
Author & Real Estate Lawyer
- Jordan Daniels
Climate Resiliency Specialist
- Paul Hanson
Engineer and Inventor
- Forest Pederson
Stanford University VDC mentor
- Joseph Heady
Founder SJCC Robotics Club
- Nane Alejandrez
Director Barrios Unidos

Ecometric Design Challenge

Title to be announced Nov 1, 2021

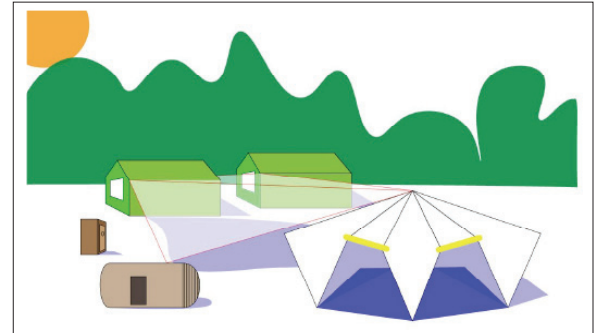
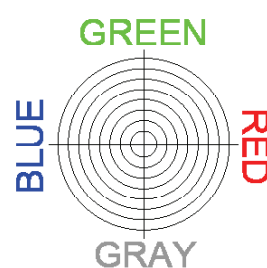
Design Challenge Launch
Design Submittal Due

Nov 1, 2021
Dec 12, 2020

Submittal Requirements

- 2 x Tabloid or A3 Pages with
- 2D Design
- 3D Design
- VDC & Eco-metric Analysis

Ecometrics



Tiny House Case Studies - In-depth architectural and ecometric analysis of tiny house designs. Will serve as drafting, physical modeling and virtual modeling exercises.



- Jade House**
- 200 sf studio dwelling
 - Designed for pre-fabrication
 - Integrated solar blinds
 - In collaboration with Foothill College Science & Learning Institute 2016



- Multi-Use MicroPod**
- Built at UCSC 2014 - 2016
 - Based on 4' x 8' trailer frame
 - Solar power system & solar awning
 - Outdoor kitchen
 - Integrated green house
 - Currently serves as a utility core for sustainable water farm

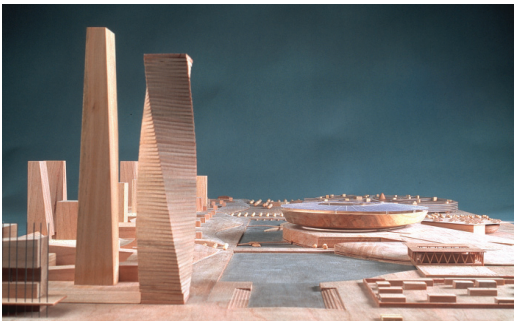


- Pocket House**
- Built at Hartnell College, Salinas in 2015 in collaboration with UCSC
 - 175 sf interior sf
 - 10' x 10' footprint with loft
 - Solar PV system
 - custom designed structure and connections for portability
 - solar thermal wall



- Mikra House**
- Built at San Jose City College in 2016
 - built on 8' x 16' trailer
 - 200 sf interior expands to 380 sf with folding wall panels
 - Voice controlled smart home system
 - Bathroom Kitchen and sleeping loft.

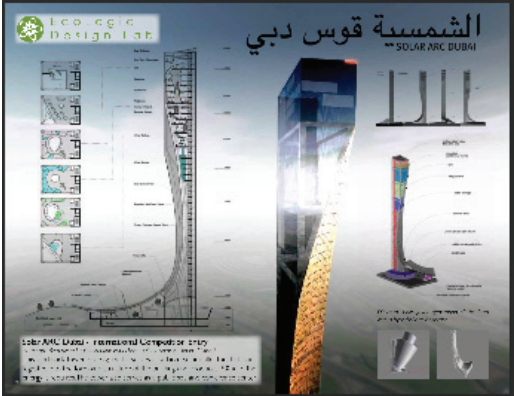
Sustainable Urban Masterplanning Case Studies - From extra small to extra large the same tools apply. In-depth case studies of masterplanning projects incorporating EcoLogic Design principles.



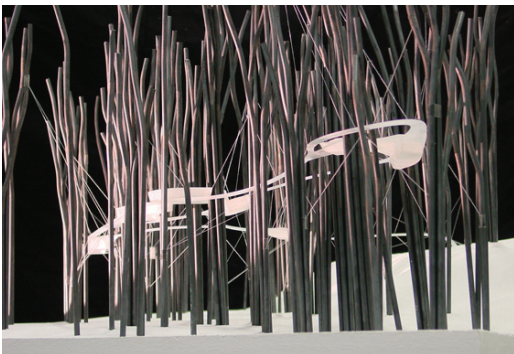
- 2008 Beijing Olympics World Park**
- First Prize, International Design Competition, in collaboration with PAS Jordan & Mueller
 - Olympic masterplan with sports, housing, hotel, business district and exhibition area integrated in a ecological design & landscape concept



- Monterey Bay Shores Ecoresort**
- Located in Sand City
 - Designed in 2007 and currently under construction
 - 350 unit hotel, condo and spa
 - Extensive living roofs
 - Based on dune topography



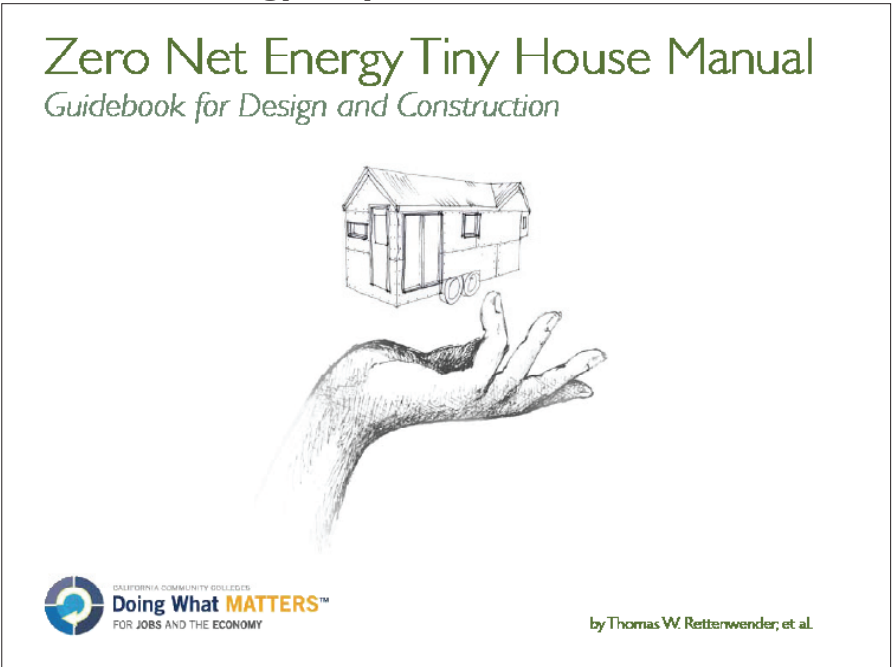
- Solar ARC Dubai**
- International design competition submission
 - Landmark tower and conference center
 - Integrated solar concentrator for power and solar thermal heating/cooling
 - Vertical hamam



- Redwood Gateway Interpretive Center**
- Masters thesis project with Prof Greg Lynn and Prof Zaha Hadid
 - Suspended tree structures in a Humboldt County old growth redwood grove
 - Light weight composite structural system
 - Program includes hostel, cafe and canopy research lab.

Partial Reading List

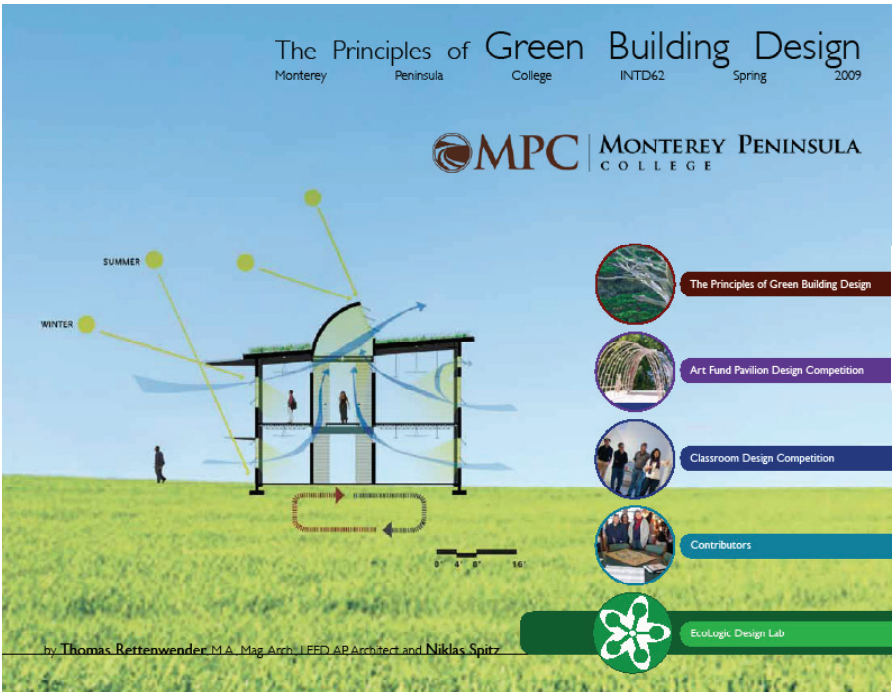
Zero Net Energy Tiny House Manual



Living Architecture Pre-Design Analysis for Google



Principles of Green Building De-



Miani Gray Water Primer

