

# Solar Home Design

## ENVS 132 / Fall 2013

### 1. Course Information

**Instructor:** Benoit Delaveau  
Department: Environmental Studies WSQ 115  
College of Social Science, San Jose State University.  
Fall Semester, 2013

Course Title:	Solar Home Design
Course Code:	48321 (ES)
Section:	01
Class Hours & Location:	1:30-4:15pm, Friday - Clark Hall 243
Office Hours:	11-12:15pm Friday, & by appointment
Office Location:	WSQ 115A (Washington Square Hall)
Phone (leave message):	(650) 288-6653
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Preferred Contact:	Email

### 2. Course Description

#### a. Overview

Americans use an inordinate amount of energy to realize the standard of living to which we all have come to enjoy. Not only do we enjoy this standard of living, we expect it. Yet, to live as we do requires a tremendous amount of energy and resources.

The residential sector uses between one-fifth and one-fourth of all energy consumed in the United States. There are many ways to reduce this energy consumption and resource consumption without diminishing our comfort levels or "doing without". This class will explore ways to live with environmental responsibility and integrity when it comes to our homes.

#### b. Goals and Learning Objectives

**1. PASSIVE HEATING AND COOLING DESIGN FOR HOUSES:** The basics of integral solar home design for heating and cooling, sunspace additions to homes, and direct gain for new construction and remodel.

2. **HOME ENERGY EFFICIENCY:** How to make a home more energy efficient than conventional homes improving heating/cooling systems, the building envelope, lighting, and appliances and working on occupant behaviors. How to decrease our impact on the environment through the way we live in our homes.

3. **GREEN LIVING:** Using 'green' and recycled building materials for construction and interior living spaces.

4. **HEALTHY HOMES:** Often, indoor air is more polluted than outside air. We will explore ways to prevent this.

**c. Required textbook (for class discussion and participation, homework and exams)**

*The Solar House: Passive Heating and Cooling.* By Daniel D. Chiras, published by Chelsea Green Publishing Company, 2002. Available on Amazon.com (instant download available on Kindle/Kindle apps).

*Consumer Guide to Home Energy Savings.* 10<sup>th</sup> edition by Jennifer Thorne Amann, Alex Wilson, and Katie Ackerly, published by New Society Publishers, 2012. Available on Amazon.com (instant download available on Kindle/Kindle apps, hardcopy book strongly recommended)

**d. Other readings (lectures material - no need to purchase):**

*Residential Energy: cost savings and comfort for existing buildings.* 4<sup>th</sup> edition by John Krigger and Chris Dorsi. Published by Saturn Resource Management, Inc., 2004.

*The Home Energy Diet: how to save money by making your house energy smart.* By Paul Scheckel, published by New Society Publishers, 2005.

*The Homeowner's Guide to Energy Independence: Alternative Power Sources for the Average American.* By Christine Woodside, published by The Lyons Press, 2006.

*Good Green Homes: Creating Better Homes for a Healthier Planet.* By Jennifer Roberts, published by Gibbs Smith, 2003

**e. Other Reading materials**

Class handouts and articles.

**3. Course requirements**

**a. Projects (30 points):** One field trip (10 points) and two speaker write-ups (10 points each).

Keep notes on all field trips and speakers. Take pictures when applicable.

Write down the date, what you saw, what features were involved, function of the features, significance of the feature, what you learned. Polish and type your notes, turn the final document to your instructor for grading.

**b. Exams (30 points):** One mid-term (15 points) and one Final (15 points) -

**c. Homework (30 points):**

- 1 - Your home energy use – (5 points)
- 2 - Floor plan Assignment – (5 points)
- 3 - Direct Gain Assignment – (5 points)
- 4 - Your home Energy Use Index and Energy Cost Index - (5 points)
- 5 - Your home Energy Audit - (5 points)
- 6 - Your home Energy Conservation Plan - (5 points)
- 7 - Extra credit options may be available during the semester

**d. Class Participation (5 points):** Worth 5% of your final grade. To get these 5 points, I expect each student to actively participate during each lecture at least two times, bringing to the discussion additional info, or just asking for clarification. If you miss a lecture (as any undocumented absence), you'll miss these participation points, and the opportunity to get an A+. I believe in debates, and new ideas. I am hoping that this informal atmosphere will foster trust, respect, and open communication. In a constructive manner, I expect you to challenge the material presented in this class and I look forward to your input.

NOTE that University policy F69-24, “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”

**e. Quizzes (5 points):** Worth 5% of your final grade. Each 10 min. quiz will be testing the readings. There will be 5 of them, 1 pt each.

**f. Penalty for late or missed work:** 10% deduction for work (project, exams, homework) handed within a week of when it is due. After that I will not accept late assignments. This is for two reasons. One, it is not fair to the students that work hard to turn their assignments in on time. Two, late papers create extra work for your instructor. Exceptions *might* be made if I am told ahead of time what the problem is. Exceptions fall under the category of hospitalization, death in the family, care-taking duties, and documented illness. If you are home with a cold or the flu (I'll have to be informed by email the day of the lecture, or the assignment due date), you can still email assignments as attachments.

**g. Consent for Recording of Class and Public Sharing of Instructor Material** University Policy S12-7, <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor's permission to record the course.

“Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor’s permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”

“Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

**4. Tentative course calendar including assignment due dates, exam dates, date of final exam:**

(Please note that the course calendar is “subject to change with fair notice”)

TENTATIVE CLASS SCHEDULE – Fall 2013

Class date	Class Topic	Readings	Assignments due
Aug. 23 #1	Introduction – Energy, the big picture, units	Handouts (article on negawatts)	
Aug. 30 #2	Passive Solar Home	Read chapters 1-3 in Chiras	#1 Your home energy use due.
Sept. 6 #3	Passive Solar Home	Read chapters 4-7 in Chiras	#2 Floorplan assignment due.
Sept. 13 #4	Conservation and Return on Investment	Read chapter 1 in A,W,&A	
Sept. 20 #4	Home Performance/building envelope	Read chapter 2-3 in A,W,&A	#3 Direct gain assignment due.
Sept. 27 #5	Analyzing Utility Data	Handouts (baseload, EUI/ECI)	
Oct. 4 #6	Space Heating/cooling	Read chapter 4/5 in A,W,&A	#4 Your home EUI/ECI due.
Oct. 11 #7	Lighting	Read chapter 11 in A,W,&A	<b>Mid-term due</b>

Oct. 18 #8	Renewable Energy	Read chapter 8 in Chiras	
Oct. 25 #9	Home Energy Audit - Guest Speaker		
Nov. 1 #10	Appliances and Smart controls	Read chapter 7 to 10 in A,W,&A	#5 Your home energy audit due.
Nov. 8 #11	Healthy Homes	Handouts	
Nov. 15 #12	Water use and energy	Read chapter 6 in A,W,&A	
Nov. 22 #13	Field Trip - Passive Solar Home		
Nov. 29	Campus closed	No class	#6 Your home ECP due.
Dec. 6 #14	Study session - Last day of class!	Wrap-up.	Write-up of field trip due.
Dec. 13 #15	Final <b>Note the day and time!</b>	You are done. J	Have a great winter break!

## 5. Grades:

Projects	30% - 30 points
Homework	30% - 30 points
Midterm and Final Exams	30% - 30 points
Class Participation	5% - 5 points
Quizzes	5% - 5 points
<b>Total</b>	<b>100%</b>

### a. Grading information:

Grading Percentage Breakdown

97% and above	A+
93% - 96%	A
92% - 90%	A-
89% - 87%	B+
86% - 83%	B
82% - 80%	B-
79% - 77%	C+
76% - 73%	C
72% - 70%	C-
69% - 67%	D+
66% - 63%	D
62% - 60%	D-
59-0%	F

## 6. University, College, or Department Policy Information:

### a) Academic integrity statement (from Office of Judicial Affairs):

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. [The University Academic Integrity Policy S07-2 at http://www.sjsu.edu/senate/docs/S07-2.pdf](http://www.sjsu.edu/senate/docs/S07-2.pdf) requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Integrity Policy S07-2 requires approval of instructors.

### b) Campus policy in compliance with the Americans with Disabilities Act:

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential](#)

[Directive 97-03](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at [http://www.sjsu.edu/president/docs/directives/PD\\_1997-03.pdf](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) requires that students with disabilities requesting accommodations must register with the [Accessible Education Center](http://www.sjsu.edu/aec) (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.

In 2013, the Disability Resource Center changed its name to be known as the Accessible Education Center, to incorporate a philosophy of accessible education for students with disabilities. The new name change reflects the broad scope of attention and support to SJSU students with disabilities and the University's continued advocacy and commitment to increasing accessibility and inclusivity on campus.

## **7. APPENDIX:**

- “You are responsible for understanding the policies and procedures about add/drops, academic renewal, withdrawal, etc. found at <http://slisweb.sjsu.edu/enrollment/lateadd.htm>  
Sept. 3 – last day to drop courses without an entry on student permanent record.  
Sept. 10 – last day to add courses