

# ARCH 4621 Sustainable Architecture

## The Science and Politics of Green Building



Spring 2019

Room TBD

Tuesdays 2:30 pm – 4:25 pm

**Instructor:** Jonathan Ochshorn, 221 W. Sibley Hall, jo24@cornell.edu, 607-255-1194

**Office hours:** Fridays, 9-10 am (see <http://www.ochshorndesign.com/cornell/officeHours/officeHours.html>)

**Grading:** Letter grade, 3 credit hours

**Prerequisites:** none

**Description:** Students will examine the six basic components of sustainable building design (site, location, water, energy, materials, and IEQ) from both a historical perspective and as implemented through the LEED/USGBC rating system, in each case comparing the issues raised by building and environmental science with the political context within which those issues are considered. While not its primary purpose, this course will provide an excellent introduction for students planning to take the LEED Green Associate or Accredited Professional (AP) exam.

**I. Rationale:** This purpose of this course is to place the topic of sustainable architecture in a broad context that includes politics as well as building science.

**II. Course Aims and Objectives:**

*Aims*

Students will examine the six basic components of sustainable building design (site, location, water, energy, materials, and IEQ) both from a historical perspective and as implemented through the LEED/USGBC rating system, in each case placing the issues raised by building and environmental science in the political/economic context within which they are considered.

*Specific Learning Objectives (NAAB criteria):*

<b>A.3</b>	<b>Investigative Skills</b>	<i>Ability to gather, assess, record, and comparatively evaluate relevant information and performance in order to support conclusions related to a specific project or assignment.</i>
<b>B.6</b>	<b>Environmental Systems</b>	<i>Ability to demonstrate the principles of environmental systems' design, how design criteria can vary by geographic region, and the tools used for performance assessment. This demonstration must include active and passive heating and cooling, solar geometry, daylighting, natural ventilation, indoor air quality, solar systems, lighting systems, and acoustics. (Well, maybe not acoustics.)</i>

*Other Learning Objectives:*

Excellent initial preparation for the LEED Green Associate or Accredited Professional (AP) exam

**III. Format and Procedures:**

Primarily seminar format with individual student presentations.

**IV. My assumptions:**

I am primarily interested here in questions of public policy and sustainable design. What are the issues raised by building science/environmental science, and how do private owners and governmental bodies respond to those issues? My views on such things have been shaped by the writings of Karl Held and Audrey Hill (see *The Democratic State* at <http://www.gegenstandpunkt.com/english/state/toc.html>).

## V. Course Requirements:

1. Class attendance and participation policy: Individuals with flu-like illnesses need to stay out of circulation. For those well enough to attend class, attendance and participation in discussions is required.

2. Course readings:

a) Required text: USGBC, *LEED Reference Guide for Green Building Design and Construction*, latest edition; or alternative readings.

b) Other required readings (online or course reserve) listed in week-by-week course schedule.

3. Papers, presentation, and participation:

Item	Description	% Course grade
Short discussion papers	Sign up in class for <i>3 papers</i> based on the weekly reading assignments: 1000-1300 words each, or approximately 3-4 typed pages, 1.5 line spacing.	3 @ 10% = 30%
In-class presentation	<i>Group project</i> : critique of a sustainable building.	25%
Final paper	Political trajectory of a "green" issue: 1600-2000 words, or approximately 5-6 typed pages, 1.5 line spacing.	30%
Attendance and class participation	Participation in all classes is based on discussion of weekly readings.	15%

4. How many credits? 3

5. Additional requirements: n/a

**VI. Grading Procedures:** Grades will be based on one in-class presentation, submission of short papers based on weekly readings, participation in class discussions, and a final paper.

**VII. Academic Integrity:** Each student in this course is expected to abide by the Cornell University Code of Academic Integrity. Any work submitted by a student in this course for academic credit will be the student's own work, except in the cases of projects that are specifically structured as group endeavors.

You are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students. You can give "consulting" help to or receive "consulting" help from such students. However, this permissible cooperation should never

involve one student having possession of a copy of all or part of work done by someone else, in the form of an email, an email attachment file, a diskette, or a hard copy.

Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Code can also be extended to include failure of the course and University disciplinary action.

During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action.

### **VIII. Accommodations for students with disabilities**

In compliance with the Cornell University policy and equal access laws, I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances, so arrangements can be made. Students are encouraged to register with Student Disability Services to verify their eligibility for appropriate accommodations.

## IX. Course Schedule (tentative)

Week and date	Topic	Readings
<b>PART I: Introduction and history</b>		
1. Jan. 22, 2019	Introduction: sustainability, science, and politics	
2. Jan. 29, 2019	History of sustainability Part I	Vitruvius, Eitel, Diamond, Markham
3. Feb. 5, 2019	History of sustainability Part II	Leopold, Carson, Brundtland, McDonough
4. Feb. 12, 2019	Sustainability in relation to politics and economics (Part I)	Shapiro, Held & Hill; Janda et al.
5. Feb. 19, 2019	Sustainability in relation to politics and economics (Part II)	Shapiro, Held & Hill; Janda et al.
<b>PART II: LEED and its categories</b>		
6. Feb. 26, 2019	February Break — No Class	
7. March 5, 2019	LEED Introduction	USGBC v3.0 and v4 Intro and Preface, Murphy
8. March 12, 2019	LEED in relation to <i>site</i> and <i>location</i>	DiLorenzo, Jacobs, LEED Reference Guide
9. March 19, 2019	LEED in relation to <i>energy</i>	Crosby, Weissenbacher, Energy Codes 101, LEED Reference Guide
10. March 26, 2019	LEED in relation to <i>atmosphere</i>	Royal Society & National Academy of Sciences, Gegenstandpunkt (on climate change), LEED Reference Guide
11. April 2, 2019	Spring break — No Class	
12. April 9, 2019	LEED in relation to <i>water</i>	Gross and Dodge; Outwater; LEED Reference Guide
13. April 16, 2019	LEED in relation to <i>materials</i>	Roberts, LEED and vinyl; Moore, pro vinyl; Walsh, against vinyl, LEED Reference Guide
14. April 23, 2019	LEED in relation to <i>indoor environmental quality</i>	Holladay; Laquatra; LEED Reference Guide
<b>PART III: Case studies and conclusions</b>		
15. April 30, 2019	Case studies (student presentations of sustainable buildings)	
16. May 7, 2019	Cases studies; the future of sustainability: what sustainability sustains; current issues	

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