



## SUSTAINABLE ARCHITECTURE: THE SCIENCE AND POLITICS OF GREEN BUILDING

SPRING 2021 SEMINAR | Arch 4621

Tuesdays 11:20 am – 1:15 pm ONLINE

INSTRUCTOR: JONATHAN OCHSHORN

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.

April 6, 2021

**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 3 <i>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.	20%
Final paper	Political trajectory of a "green" issue: 1600-2000 words, or approximately 5-6 typed pages, 1.5 line spacing.	25%
Attendance and class participation	Participation in all classes is based on discussion of weekly readings. Students not assigned a paper based on the weekly reading must submit a short (1 paragraph) response. Students may choose one week where no written response is required.	25%

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**

The University Faculty Senate requires that the following statement be attached to each course syllabus:

"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." See: <http://cuinfo.cornell.edu/Academic/AIC.html>

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 e mail, an e mail 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.

Pursuant to **Title 17 of the U.S. Copyright Act** and **Cornell University Policy 4.15**, faculty own the copyright to all original course content – their copyright embodies course lectures as well as notes summarizing or capturing the lecture content. Students may take and use lecture notes solely for personal scholarship, and may share lecture notes only with others enrolled in the subject course. Students may ***not** post, copy, republish, distribute or share lecture, course, or class content in any form or medium* with anyone not enrolled in the subject course absent the express written permission of the faculty copyright holder. This prohibition applies to any platform or medium to which course lectures or notes are posted for the purpose of further distribution, whether for-profit or fee-free. Impermissible uses of copyrighted content constitute acts of copyright infringement and may further subject the student to violation(s) of the *Code of Academic Integrity*.

### **VIII. Diversity and Inclusion**

We believe that design is a principal instrument of positive social change, and that progress and innovation are driven by a commitment to inclusion across race, class, ethnicity, gender, age, religion, ability and identity. For this reason, we explicitly confirm our resolute commitment to accelerate Cornell University's actions to be a diverse and inclusive institution. We embrace the responsibilities of ongoing internal critical reflection, dialogue, and action as individuals and as a community. We support the Cornell teaching community—our faculty, staff, and students—in their efforts to act with an ethos of inclusivism and antiracism in creating and sustaining diverse teaching and learning environments.

### **IX. Bias-related Incident Reporting System**

Cornell University is committed to fostering a safe, respectful, and inclusive living, learning, and working environment for our entire community. The bias-related incident reporting system is one step toward promoting that we, as an institution, live out these values. The reporting system allows for you to safely and anonymously report an incident you may have experienced or witnessed, receive support, and explore options for resolution.

To report an incident, individuals can use one of the following methods:

- By submitting an incident report online at <https://www.biasconcerns.cornell.edu/> (non-emergency)
- By contacting the [Cornell University Police Department](#) (CUPD) at (607) 255-1111 or 911 for emergency assistance

### **X. Academic Accommodations**

The Center for Learning and Teaching recommends that the following statements be attached to each course syllabus:

" 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."

### **XI. Religious Holidays**

Cornell University is committed to supporting students who wish to practice their religious beliefs.

Students are advised to discuss religious absences with their instructors well in advance of the religious holiday so that arrangements for making up work can be resolved before the absence.

The New York State Legislature (since July 1, 1992) requires all institutions (public and private) of higher education not to discriminate against students for their religious beliefs. Accordingly, the pertinent parts of Sections 3 and 4 of the law state:

“3. It shall be the responsibility of the faculty and of the administrative officials of each institution of higher education to make available to each student who is absent from school, because of his or her religious beliefs, an equivalent opportunity to . . . make up any examination, study or work requirements which he or she may have missed because of such absence on any particular day or days...”

“4. If . . . classes, examinations, study or work requirements are held on Friday after four o'clock post meridian or on Saturday, similar or makeup classes, examinations, study or work requirements shall be made available on other days, where it is possible and practicable to do so.”

A list of religious holidays can be found here: <https://scl.cornell.edu/identity-resources/office-spirituality-and-meaning-making/services-cornell-united-religious-work/religious-holidays>

## **XII. Course schedule (tentative)**

### **PART I: Introduction and history**

week 1 Feb. 9, 2021

Introduction to sustainability, science, politics, and their interrelationships

week 2 Feb. 16, 2021 [assignment due]

History of sustainability: Vitruvius, Eitel, Diamond, Markham

week 3 Feb. 23, 2021 [assignment due]

History of sustainability: Leopold, Carson, Brundtland, McDonough

week 4 March 2, 2021 [assignment due]

Sustainability in relation to politics and economics (Part I): Shapiro, Held & Hill; Janda et al.

week 5 March 9, 2021 [assignment due] [in-class presentation assignment issued]

Sustainability in relation to politics and economics (Part II): Huber; Wainwright and Mann

### **PART II: LEED and its categories**

week 6 March 16, 2021 [assignment due] [final paper issued]

LEED Intro: USGBC v3.0 and v4 Intro and Preface, Murphy

week 7 March 23, 2021 [assignment due]

LEED in relation to *location-transportation*: DiLorenzo, Jacobs, LEED Reference Guide

week 8 March 30, 2021 [assignment due]

LEED in relation to *site*: Weisman, Wilson, LEED Reference Guide

week 9 April 6, 2021 [assignment due]

LEED in relation to *energy*: Crosby, Weissenbacher, Energy Codes 101, LEED Reference Guide

week 10: April 13, 2021 [assignment due]

LEED in relation to *atmosphere*: “Ruthless criticism of climate change, Green New Deal, geoengineering, LEED Reference Guide

week 11 April 20, 2021 [assignment due]

LEED in relation to *water*: Gross and Dodge; Outwater; LEED Reference Guide

week 12 April 27, 2021 [assignment due]

LEED in relation to *materials*: Misc. articles on mass timber, LEED Reference Guide

week 13 May 4, 2021 [assignment due] [in-class presentation assignment due]

LEED in relation to *indoor environmental quality*: Holladay; Laquatra; LEED Reference Guide. **Course evaluations.**

**PART III: Case studies and conclusions**

week 14 May 11, 2021

Case studies (student presentations of sustainable buildings)

Final paper due during exam days (TBD).