

Fall 2012 URBN 6644 SUSTAINABLE DESIGN – Theory and Methods
Seminar Instructor: Richard Epstein
rick@re-architecture.com

INTRODUCTION

This seminar will provide students with an introductory understanding of **SUSTAINABILITY** as an integrated approach to design and not a simplistic technological fix. Sustainable design is a proxy for **QUALITY** – for a holistic and integrated approach to place-making that takes into account the web of human and natural **SYSTEMS** that exist. This creates the potential to impart meaning to a place by firstly understanding these systems and then more broadly considering their significance and application. There are global and local imperatives that make this particularly pressing: climate change, water scarcity, air pollution, and material and energy shortages. Social and economic dimensions also have particular urgency given the ongoing economic challenges we are facing as well as the social inequalities of our time.

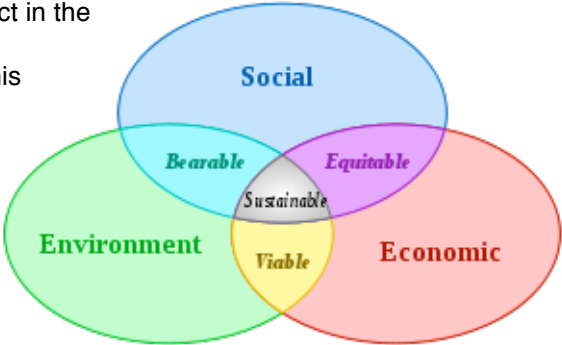


A critical issue in the consideration of sustainability is that of **SCALE**. It is through an understanding and consideration of the opportunities at each scale and their inter-relationship that an integrated approach to the built environment can be realized. While buildings are the primary users of energy, the form of the city itself has a profound impact on the way we experience a building. Similarly, the regional scale affects large-scale systems including water and energy production. With more than 50% of the world’s population now living in cities, the urban environment has both a significant impact on how we live and is at a scale where we can make a difference. Indeed, with growing urbanization, it is imperative that cities are optimized for sustainability and create a high quality of life and more density. This seminar will explore the opportunities available at each scale to address these complex challenges. It will especially explore how sustainable approaches can offer insight into achieving a higher quality of life in the urban habitat.

APPROACH

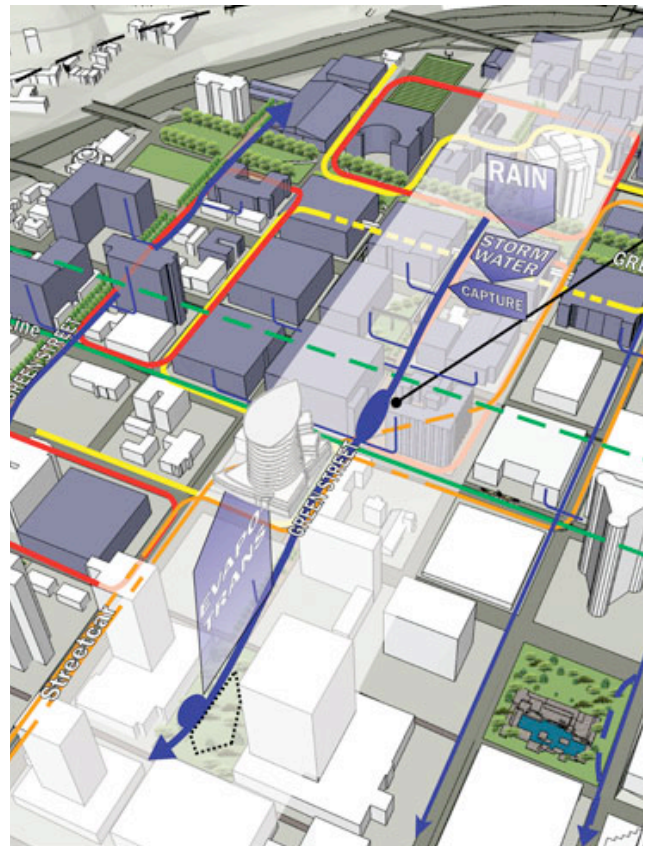
We will begin by looking at definitions of sustainability as well as defining the problem on both a global and local basis. The issue of scale will be a foremost consideration of the class: what are the problems and the potential that are revealed at each scale, from the site, to the building, the neighborhood, the city, and the region. Weekly readings and exercises will provide an introduction to the issues. Students will begin working in groups of 2-4 and pick a key area of sustainability to research including definitions, metrics, and important precedents and then present their findings to class. Lectures, films, and presentations by other faculty, local experts and the instructor will supplement these student presentations.

The class will divide into groups to study a site, neighborhood or district in the city. The students will baseline environmental, social, and economic parameters. This includes a baseline carbon footprint for the area. This material will be used to define the problems and opportunities and presented at the mid-term. Each group will then create an integrated vision for the neighborhood to show specific approaches to decrease the carbon footprint and increase the quality of life. Issues of urban form, density, transportation, externalities and infrastructure will all be considered. The carbon footprints – before and after - will be compared against an “ideal”: Manhattan, the city with the lowest carbon footprint in America. Comprehensive measures for each area will also be sought that take into account social issues, economic sustainability, happiness and other factors to create a holistic “eco-district”.



FRAMEWORK

1. Sustainability: Why and What
 - a. Global Issues: Climate Change, Resource Scarcity, Inequality
 - b. Local Issues: Energy, Water, Trash, Air & Water Quality, Habitat
 - c. The Three Legs: Environmental, Social, Economic
 - d. Setting priorities
2. Scale
 - a. Building/Block/Neighborhood/City/Region/Hinterland
 - b. Relation of scale to sustainability approaches
 - c. Scale and Control: Who are the players
3. Carbon Footprint
 - a. The Carbon Pie: What makes it up (Country, City, Neighborhood)
 - b. How do you measure it: Definitions, Measurement, Calculation
 - c. Base Case vs. Proposals
4. Urban Form
 - a. Density: What are the benefits, risks,
 - b. Climate and Urban Form
 - c. Walkability: Destinations, Mixed Use
 - d. Transportation Modes
5. Rating Systems
 - a. LEED ND – Elements and Approach
 - b. Other Systems
6. Urban Infrastructure
 - a. Energy: The Grid, local distribution
 - b. Water: Sources and Uses
 - c. Waste: Types, Where does it go, Zero Waste
7. Health and the City
 - a. “Lifestyle” Diseases: Obesity, Diabetes,
 - b. Environmental Health: Air and Water Quality
 - c. Urban Agriculture: Localism
 - d. Walkability and Health
8. Sustainability and Happiness
 - a. Public Space and Community
 - b. Biophilia
 - c. “Quality of Life” and Happiness Metric
9. The Human Dimension
 - a. Economics - Financing
 - b. Social Equity
 - c. Governance - Implementation



KEY TEXTS

Ecological Urbanism, edited by Mohsen Mostafavi

Sustainable Urbanism by Doug Farr

Green Metropolis by David Owen

Toward the Livable City, by Emilie Buchwald

Toward Sustainable Communities, by Mark Roseland

Sustainability and Cities, by Peter Newman and Jeffrey Kenworthy

The Ecology of Place, by Timothy Beatley and Kristy Manning

Design with Nature, by Ian McHarg

Design with Climate, by Victor Olgay

Thermal Delight in Architecture, Lisa Heschong

Biophilic Cities: Integrating Nature into Urban Design and Planning by Timothy Beatley

Green Urbanism, Learning from European Cities, by Timothy Beatley

Eco-Design, A Manual of Ecological Design, by Ken Yeang

Designing High-Density Cities: For Social and Environmental Sustainability, Edited by Edward Ng
LEED and ND Manuals



COURSE POLICIES:

- Students are expected to come to the seminar on time and stay for the entire class time.
- If a student needs to miss class for a special reason such as sickness, I need to be notified by email. Class attendance and participation is essential for success. It is your responsibility to clarify missed assignments with me prior to the next class.
- UCD Blackboard will be used for assignments, readings, etc. It is your responsibility to check this and let me know if there are any problems.
- In addition to announcements made and written handouts distributed in class, I may need to contact you between classes, which I will do through individual and group email messages. One of the requirements for this course is that you maintain an email address, check it regularly for messages, be sure it is working, and let me know if you change your email address. You are responsible for any messages, including assignments and schedule changes, I send you via email. You also may contact me via email, in addition to seeing me during office hours.
- Turn off cell phones during class.
- My commitment is to create a climate for learning characterized by respect for each other and the contributions each person makes to class. I ask that you make a similar commitment
- Requests for exceptions to these policies must be discussed with me in advance. If a student has any issues regarding the seminar, I request that we discuss this. Good communication is essential to success.

GRADES

Grades will be based on both individual and group work. Grades will be absolute (not curved)
Students will be assessed according to the following criteria:

- Critical thinking
- Class Participation/Attendance
- Ability to work with others
- Graphic Presentation Skills
- Verbal Presentation
- Individual Initiative
- Engagement with the topics in the class

- Completeness/thoroughness of work.

Grades will be based on the following breakdown:

- 20% Papers and Sketch Problems
- 20% Group Topic Presentations
- 15% Mid Term Review – neighborhood baseline
- 35% Final Sustainability Problem
- 10% Attendance/Class Participation



LEARNING OUTCOMES: It is expected that students achieve the following learning outcomes from this seminar:

Design: Understand the applications of sustainability to design. Be able to weigh the different approaches, emphasize the appropriate one for a given site, and apply sustainable thinking in a holistic way to a design problem.

Communication Skills: Students will be able to work individually and in groups to effectively and efficiently convey ideas using verbal, visual and graphic communication techniques appropriate for a wide variety of professional, academic and layperson audiences.

Specifically, students will be able to:

- A. Prepare and present organized, professional, engaging confident and compelling verbal presentations that explain complex ideas and concepts to a wide variety of audiences.
- B. Construct a well-organized, legible, coherent and convincingly laid out visual presentation that explains complex ideas and concepts in an efficient and effective manner.
- C. Constructively critique the work of others while actively listening to, seeking out, and responding to constructive criticism from peers, instructor and other experts.
- D. Act as a respectful member of groups or teams, considering multiple viewpoints and strategies.

Professional Expertise: Students will be able to advocate the role of the designer in the built environment to solve complex environmental problems. Students will learn how to collaborate with other professions and disciplines and provide a holistic perspective on sustainability.

Specifically, students will be able to:

- A. Assess personal and professional predispositions to reflectively participate in a discourse on the motivations, intents and effects of urban design interventions especially in the context of sustainability.
- B. Begin to analyze different sustainability paradigms and critically develop and apply ethical frameworks and to appropriately respond to culturally, socially and economically diverse conditions.

Substantive knowledge: Students should develop an understanding of the diverse components that underlie sustainable approaches in architecture and urban design. This includes being able to find and process information and interpret it in a design context. Specifically this includes:

- A. An understanding of the definitions of sustainability
- B. The role of urban form, compact development and walkability
- C. The contribution and inter-relationships of different urban systems to the issue of sustainability including: transportation, energy, water, solid waste, etc
- D. The measurement and approaches of carbon footprints
- E. Sustainability metrics and rating systems
- F. The social and economic issues of sustainability
- G. The application of sustainable approaches to design problems.