

Arch-461 Topics in Sustainable Design

Summer 2010

Monday, Wednesday, 6:15 – 9:30 pm

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Topics in Sustainable Design will begin with a discussion of why it is important to transition to a sustainable society. Next an overview of environmental economics and ecology is followed by specific information about the ecology of the Chesapeake Bay region and how landscape design can improve the health of the bay.

After this overview of sustainability, environmental economics and ecology, the class focuses on architectural design. The study of sustainability in architectural design divides itself into three related topics. The first topic is how to design green energy efficient houses where the energy use is dominated by heat flows through the exterior envelope. The second topic is how to design green energy efficient commercial buildings where the energy use is driven by the internal uses of the building as well as through the envelope along the exterior spaces of the buildings. The third topic and possibly the most important is how to design cities and urban areas so that walking and mass transit can significantly reduce development sprawl and automobile use.

The specific topics covered are listed below.

Wednesday, June 2

Overview of the Class

Solar Architectural History

Beyond the Limits

www.myfootprint.org

Global Warming, Architecture 2030

Monday June 7

Environmental Economics

Sim Van der Ryn, Design for Life

The Next Industrial Revolution

Wednesday, June 9

Ecology and Architecture

Turning the Tide

The Natural Garden

The Fractal Geometry of Nature

Monday, June 14

Review of Bio-climatic Design and Solar Shading

Passive Solar Heating

Formal Speculations about Solar Design

Wednesday, June 16

The Sustainable Control Volume
Five Degrees of Freedom
The Superinsulated House
Passive Cooling
Examples of Green Residential Design

Monday, June 21

Review
TEST

Wednesday, June 23

LEED
The Audubon House
The Merrill Building
The Energy Simulation Process
Office Building Energy Analysis with Energy-10

Monday, June 28

Architectural Daylighting Concepts
Sunlighting as Form Giver
Window Systems in High Performance Buildings
High Performance Glass
Daylighting Performance of Buildings
High Performance Lighting

Wednesday, June 30

Green Roof Definitions and Examples
Material Choices
Straw Bale Construction
Indoor air Quality
Alternative Energy Sources, the Sun and the Wind

Monday, July 5

A Field Guide to Sprawl
New Urbanism
The Next American Metropolis
Conservation Design for Subdivisions
Dwees Island, SC
Village Homes, Davis, CA

Wednesday, July 7

Review
TEST

Grading: Grades will be based on exams and projects.

Attendance: Attendance will not be taken, but there will be questions on the exams that cover material that was presented and discussed in lecture that may not be available in the listed books.

Academic Dishonesty: The Student Honor Council at www.studenthonorcouncil.umd.edu, defines the meaning and the consequences of academic dishonesty.

Ownership of Work: Any design project, drawing or model that is submitted for academic credit is recognized by the University of Maryland and the School of Architecture to be the equivalent to a formal examination. Therefore, *upon submission, all projects, drawings and/or models become the property of the School of Architecture.* Generally, University regulations require the professor to retain all final examinations for a period not less than one academic year. However, in practice, projects submitted to the School of Architecture are usually returned to the individual student for inclusion in their academic portfolio. The School of Architecture does reserve the right to retain certain projects for use in publicity, display, or other official uses. In addition, projects may be retained for archival reasons or in cases of grade disputes. In all cases, projects will be made available to the authors for photocopying.

Disabilities: If you have a documented disability and wish to discuss academic accommodations with me, please contact me as soon as possible.

Book List

Arch Folio NA 2542.s6b43 1996
Behling, Sophia and Stefan Behling
Sol Power, the Evolution of Solar Architecture

Arch NA 2760 .B72 1996
Bovill, Carl
Fractal Geometry in Architecture and Design

UMCP Arch Lib Course reserves NA 2542.3.B76 2001
Brown, G. Z.
Sun, Wind, and Light

Arch Stacks HT167 .C3 1993
Calthorpe, Peter
The Next American Metropolis

UMCP EPSL TJ 163.5.03 A93 1994
Croxtton, Randolph
Audubon House

Arch Folio NA2542.S6 L35 1986
Lam, William
Sunlighting as Formgiver for Architecture

Arch Folio NA2542 .35 .m34 1991
Mackenzie, Dorothy
Design for the Environment

UMCP off site shelving HD75.5 .M43 1992
Meadows, Donella, Dennis Meadows, and Jorgen Randers
Beyond The Limits

Arch Folio NA 2542 . M445 2000
Mendler, Sandra
The HOK Guidebook to Sustainable Design

Arch Folio TH 4812 .N53f 1985
Nisson, Ned, and Gautam Dutt
The Superinsulated Home Book

Arch Folio NA 2542 .35 .S68 1992
St. John, Andrew
The Sourcebook for Sustainable Design

Arch NA 2542 .25 .S82 1997
Steele, James
Sustainable Architecture

Arch NA 6230 .Y42 1996
Yang, Ken
The Skyscraper Bioclimatically Considered

Arch Folio NA 2542 .35 .Z45 1996
Zeiher, Laura
The Ecology of Architecture

Edward Mazria
The Passive Solar Energy Book

Jim Leckie, Gil Masters, Harry Whitehouse, Lily Young
Other Homes and Garbage

Fuller Moore
Environmental Control Systems

TA 403.6.G744 2003 Folio
From the Editors of Environmental Building News
GreenSpec Directory

Ralph Knowles
Sun Rhythm Form

Alison Kwok and Walter Grondzik
The Green Studio Handbook

Sim Van Der Ryn
Design for Life

Fuller Moore
Concepts and Practice of Architectural Daylighting

Marc Fontoynt
Daylight Performance of Buildings

Tom Tietenberg
Environmental and Natural Resource Economics

Mathis Wackernagel and William E. Rees
Our Ecological Footprint

Victor Olgyay
Design with Climate

Tom Horton
Turning the Tide Saving the Chesapeake Bay

Alanna Stang and Christopher Hawthorne
The Green House Book

Jerry Yudelson
Marketing Green Building Services
Arch TH 880.Y95 2008

Randall G. Arendt
Conservation Design for Subdivisions

John Carmody, Stephen Selkowitz, Eleanor S. Lee, Dariush Arasteh, and Todd Willmert
Window Systems for High-Performance Buildings

Dolores Hayden
A Field Guide to Sprawl

www.roofmeadow.com

This is a web site with a wealth of green roof details.

www.aiatopten.org

This is a web site with a wealth of information on green buildings.

www.architecture2030.org

This website by Ed Mazria lays out the challenge to cut carbon emissions of buildings.

www.myfootprint.org

This website has a test to inform people of their carbon footprint.