Pollution Prevention in Architecture
NATIONAL POLLUTION PREVENTION CENTER FOR HIGHER EDUCATION

Sustainable Design Syllabi

Allen, William, Lawrence Technological University
Architecture Theory / Environmental Issues: Fall 1994 syllabus; includes six project descriptions.

Angevine, Eric Neil, Oklahoma State University
Passive Design: Syllabus.

Coates, Gary, Kansas State University
Architecture in the Age of Simulation: Fall 1994 syllabus.

Cook, Jeffrey, Arizona State University
Bioclimate Design Studio: Spring 1995 syllabus

Cook, Jeffrey, Arizona State .
Energy Environment Theory: Fall 1994 syllabus.

Gayer, Diane Elliot, University of Vermont
Architecture and Environmental Design: Fall 1993 syllabus with midterm exam questions.

———, University of Vermont
Architecture and Environmental Design: Spring 1994 syllabus.

———, Norwich University
Environmental Design: Topical Studio: Fall 1994 syllabus.

Haglund, Bruce, University of Idaho
Natural Lighting: Fall 1994 syllabus with six assignment descriptions and a light box diagram.

Haglund, Bruce, University of Idaho
Passive Solar Design & Advanced Thermal Evaluation: Spring 1995 syllabus; includes five project descriptions.

La Grassa, S., University of Detroit Mercy
Sustainable Architecture: 1994 syllabus with project assignments.

Lerner, Sally, University of Waterloo
Introduction to Sustainable Environmental and Resource Systems: Fall 1994 syllabus.

Pena, Rob, University of Oregon
Environmental Resources Design: Spring 1994 syllabus.

Young, Robert A., University of Utah
Preservation Technology and Building Rehabilitation: Winter 1994 syllabus.

Pollution Prevention
in Architecture
NATIONAL POLLUTION PREVENTION CENTER FOR HIGHER EDUCATION

Architecture Theory / Environmental Issues

William Allen
Fall 1994
Lawrence Technological University

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Syllabus: Allen
May 1996

LAWRENCE TECHNOLOGICAL UNIVERSITY
COLLEGE OF ARCHITECTURE and DESIGN
FALL SEMESTER : 1994 : MONDAY

ARCH. THEORY / ENVIRONMENTAL ISSUES
COURSE SYLLABUS

PROFESSOR WILLIAM ALLEN

PURPOSE:
We are all somewhat aware of the *environmental issues* facing us as we move into the next century; the question often ask is how will they affect us? the question might better be how *will* we, as a profession, affect them? The issues are real, although some would contend that more emphasis is given than deserved, and will require that we address them. Society has the ability to learn from observation, to ascertain causality, to predict the probable outcome of its actions. We call it *adaptability*.
Our objective in this course will be two fold: 1. To identify and understand the *issues* as they relate to Architecture. 2. To work within the framework of the environment to explored solutions that will support our needs.

FORMAT:
SEMINAR: 1. a course of study pursued by a group of advanced students doing original research under a professor. 2. CONFERENCE. *This is according to* The Merriam-Webster Dictionary.
Three hour meeting once a week on Monday / two hours Env. Issues, one hour theory, (most of the time)

Field observations / Review of existing developments will be required for a number of issues. These may take the form of group trips and / or individual trips to support a position or presentation.

REQUIRED:
Each student shall be required to prepare a presentation on the Environmental Issues that affect their **THESIS PROJECT.**
Each student shall prepare a written **REPORT** on a *personality* or *organization* of environmental significance.
Each student shall prepare a written **REPORT** on a *PROCESS* or *PRODUCT*, relevant to the practice of architecture.

TEXT:
Earth in The Balance, by Al Gore. There is no one book that will work to cover all the aspects of this course. I believe, after reading it, *twice*, that it serves as a good "liberal" point of view. Considering that the author is now the Vice President of The United States, I feel that it may have a great impact on your future as an architect.

Trashing the Planet, by Dixy Lee Ray,

Green Architecture, by Brenda and Robert Vale

READINGS:

Environmental Overkill, by Dixy Lee Ray, And now for the rest of the story.

A Green History of the World, by Clive Pointing. Great read for those who are interested in *POLITICS* and the environment.

The Way Things Ought To Be, by "Need I Say"

Design With Nature, by Ian Mcharg (He came to L.T.U.)

SUBJECTS:

We will look at ENVIRONMENTAL ISSUES from *SOCIAL, PHYSICAL,* and *PERCEPTUAL* points of view. We will look at those issues from the *micro* to the *macro* environments.

EARTH	**HUMANITY**	**RESULTS**	**SOLUTION**
air	individual	pollution	zoning
land	family	progress	education
water	community	technology	conservation
vegetation	society	consumer	recycle
animals	government		explore
climate	waste		

Environmental Issues as they Effect The Architect

CURRENT EVENTS:

We will start each session with an introduction of current topics from the newspaper or other sources. Each student will be encouraged to either refute or support the article. The texts and the books referenced should be used to support your position.

THESIS REPORT:

A *thumbnail* report of your thesis will be required for this course. Starting with an introduction statement (typed), and moving through program development and into analysis the direction of your thesis will be a part of the discussion portion of this course. Environmental issues will be addressed at this scale. This need not be a *work of art,* but must communicate and document your progress well.

LAWRENCE TECHNOLOGICAL UNIVERSITY
COLLEGE OF ARCHITECTURE and DESIGN
FALL TERM : 1994 : MONDAY
ENVIRONMENTAL ISSUES
THESIS / ENVIRONMENTAL INCORPORATION

PROFESSOR WILLIAM ALLEN

PURPOSE:
The purpose of this project is to illustrate how the topics raised in *Environmental Issues* may influence the development of your Thesis Project. The *Illustration* should encompass a range of issues from the climatic influences that impact on orientation to the selection of materials which have minimum impact on the environment; from processes which facilitate energy conservation to the integration of the natural and built environment. Comparisons which illustrate an advantage or improvement of approach or materials, will be encouraged. Such simple and obvious considerations as orientation, maximizing solar input, alternative energy sources and the like will be encouraged. It is not necessary to incorporate these issues in your design, but it would seem foolish not to take advantage of every opportunity to explore alternatives where they prove to be cost effective.

FORMAT:
The *report* will take the form of the an 8.5 x 11 inch report. It shall be presented as it evolves during the course, addressing environmental issues as they are introduced in discussion. The selection of a *material or process, and personality or organization,* as a required REPORT TOPIC may be in line with or specific to your Thesis Project, adding depth to the whole.
The submissions will afford an opportunity for review and reflection as to the implications of your design on the environment.

DUE:
The Final submission, shall represent a collection and refinement of the assigned elements. an index for organization and reference as well as any bibliography information will help to "sell", reinforce your position, conclusion. The project will be due the final meeting of the course.

LAWRENCE TECHNOLOGICAL UNIVERSITY
COLLEGE OF ARCHITECTURE and DESIGN
FALL SEMESTER : 1994 : MONDAY

ARCH. THEORY / ENVIRONMENTAL ISSUES
ENVIRONMENTALLY SOUND MATERIALS / PROCESSES

PROFESSOR WILLIAM ALLEN

DISCOURSE:
The *specification* of building materials / processes is an important role of the Architect. Through the selection of environmentally sound materials, processes, or systems it is possible to improve the relationship with the natural environment as well as improve the perception of the built environment. It is possible to work with as opposed to "at". Architects have a unique opportunity to take a leadership role in this area.

OBJECTIVE:
The *objective* of this assignment is threefold; 1.) to involve the students in the research of materials, 2.) to afford an opportunity to illustrate a broad range of materials available for professional use, and 3.) to illustrate how they interact with the environment to the benefit of society.

FORMAT:
8.5" * 11" Boards. This will allow for a mounted display in the Gallery.

REQUIRED:
1.) Sample of product.
2.) Explanation of material, its use, and what it is a substitute for. A cost comparison is strongly advised.
3.) Illustrate impact on environment. (Why it is less harmful than another product or process.
4.) Graphics are important / Presentation.
5.) Limit of four boards is encouraged.

NOTE:
Start thinking about product selection now. The research is not difficult, **but the response time for manufactures can be extensive.** A comparison between products is desirable. Product must be approved by instructor. Your selection must be approved by me.

DUE:
As per class calendar.

"In wildness is the preservation of the world. †" Walking [1862]
Henry David Thoreau 1817-1862

LAWRENCE TECHNOLOGICAL UNIVERSITY
COLLEGE OF ARCHITECTURE and DESIGN
FALL SEMESTER : 1994 : MONDAY
ARCH. THEORY / ENVIRONMENTAL ISSUES

ENVIRONMENTALLY SOUND PERSONALITIES

PROFESSOR WILLIAM ALLEN

DISCOURSE:
The SCOPE of *ENVIRONMENTAL ISSUES* is broad. A great deal has been written since Rachel Carson wrote Silent Spring. In the hope that a broader base of understanding about people and issues that face us today, each student will be required to research a person or topic of environmental significance. The person or issue need not be supportive of the current mood of the "Environmentally Correct", but you must be able to either support or refute arguments on or about the topic or person you have selected. Your selection **must be approved.**

OBJECTIVE:
The objective of this assignment is to bring about and awareness of issues through the personalities selected. It should be further noted that due to the encapsulated format and presentation method the report will be shared with the College as well. It is anticipated that during discussion the chosen personalities will emerge as support for your position.

FORMAT:
8.5" * 11" Boards. This will allow for a mounted display in the Gallery.

REQUIRED:
1.) Photo of person or process.
2.) Personal history.
3.) Illustrate impact on environment.
4.) Bibliography.
5.) Limit of four boards is encouraged.

NOTE:
Below is a list of "typicals" that you MIGHT select from. It is just a start to give you an idea of the broad range you have to work from. Your selection must be approved. The list below is *"obvious" ;* I would encourage you to dig a little deeper and find personalities that relate more to architecture.

Ian McKarg, Al Gore, Rachel Carson, Kaplan, James Madison, Washington, Rush Ljimbaugh, Dixy Lee Ray, Henry David Thoreau, Head of Mjichigan Department of Natural Resources, Amory Lovins, Biosphere II, Andres Duany, Primitive Cultures, Sick Building, Greenpeace, Population, Consumption, Tom Lovejoy, Edward O. Wilson, Global Cooling, Global Warming, ETC...
Each personality, issue, should be presented with **both** pro and con comments.

Sign up now ! DUE: As per class calendar.

Pollution Prevention in Architecture
NATIONAL POLLUTION PREVENTION CENTER FOR HIGHER EDUCATION

Passive Design

Eric Neil Angevine
Arch 5133
Oklahoma State University

OKLAHOMA STATE U.

ARCH 5133:

PASSIVE DESIGN

INSTRUCTOR:

Eric Neil Angevine, P.E., Associate Professor
124 Architecture Building 744-6444
(home, until 10:00 pm) 372-3949

Office hours: Monday -- Thursday; 10:30-11:45 am
or by appointment

PREREQUISITES:

ARCH 3117 and ARCH 3134; or equivalent

TEXT MATERIALS:

Executive Summary of *Beyond the Limits*, by Donella H. Meadows *et.al.*, Post Mills, VT: Chelsea Green Publishing Co. (1992).

Energy for Planet Earth, Readings from *Scientific American*, New York: W. H. Freeman and Co. (1991).

Gentle Architecture, by Malcolm Wells, New York: McGraw-Hill Book Co. (1981).

Environmental Control Systems, by Fuller Moore, New York: McGraw-Hill Inc. (1993).

Cool Energy, rev. ed., by Michael Brower, Cambridge MA: The MIT Press (1992).

Climatic Building Design, by Donald Watson and Kenneth Labs, New York: McGraw-Hill Book Co. (1992).

REFERENCES:

The Passive Solar Energy Book, by Edward Mazria, Emmaus, PA: Rodale Press (1979).

Design with Climate, by Victor Olgyay, New York: Van Nostrand Reinhold (1992).

The Passive Solar Construction Handbook, by Steven Winter Associates, Inc., Emmaus PA: Rodale Press (1983).

Sun, Wind, and Light, by G. Z. Brown, New York: John Wiley & Sons (1985).

Graphic Standards of Solar Energy, by Spruille Braden III, Boston: CBI Publishing Co. Inc. (1977)

COURSE PURPOSE

This course is intended to expand the student's knowledge and understanding of contemporary energy issues along with a comprehension of the basic principles of passive design and energy conscious architecture and to provide the student with an opportunity to apply the knowledge gained in the solution of real-world problems.

COURSE OBJECTIVES:

1) To instill in each student the need to incorporate energy-conscious design in every architectural design project.
2) To provide a thorough presentation of the principles and concepts of passive design in architecture available to the practicing architectural designer.
3) To provide each student with an opportunity to critically evaluate the energy-efficiency of existing architectural projects.
4) To provide each student with the opportunity to synthesize an architectural project of his or her own design which utilizes the free and abundant energy available in the natural environment to minimize a dependence upon mechanical heating, cooling and lighting.

INTENDED OUTCOMES:

As a result of a planned series of readings, lectures, discussions and student exercises, the student is expected to be able to:

analyze a given climate and determine appropriate passive design strategies for buildings constructed in that climate.

determine the intensity of solar heat gain on a building for a given date and time, given the geographic location of the building.

analyze an actual building and critically evaluate its capability for accepting or rejecting heat from the environment.

design a simple building employing both quality aesthetics and the principles of passive design.

COURSE FORMAT:

The course is planned to provide a relatively unstructured seminar format for the exchange of information between the instructor and the students as well as between students. Included will be:

1) Assigned readings from a variety of references.
2) A field trip to a major electric generating facility.
3) Field trips to local residential projects to examine and evaluate the application of passive design concepts.
4) Student assignments employing library research, application of scientific principles and the critical evaluation of passive design.
5) A term project in which the student applies the knowledge and skills learned to a project of his or her own design.

Regular class attendance is expected. Students will receive credit for attendance and participation in class discussion. All assignments are due at the beginning of class on the due date. Students should bring appropriate texts to class daily.

FIELD TRIPS:

There will be a two-hour field trip to the OG&E Sooner Power Plant on Wednesday, January 26. This trip is a required component of the course and will be of minimum expense to the student. Students with a scheduled class at 10:30 am should notify the instructor of that class of this field trip at the earliest opportunity.

Additional field trips to local residences will occur during class time. These field trips are an essential part of the learning experience and will be the basis for case study assignments.

TEACHING PHILOSOPHY: Passive design is an art, based upon the use of precise scientific principles. The application of passive design principles to architecture is a matter of priority and choice made by the designer. Amory Lovins, one of the foremost authorities on energy conservation today, has forecast that architects and engineers who continue to design energy-wasting buildings will soon be unable to find work. For this reason the course begins with an overview of energy issues. Students are expected to have completed the reading assignment for each day and to be prepared to discuss salient points. A student will be preselected to lead the discussion each day. I prefer to limit my own input to resolving differences and correcting inaccuracies. However, if discussion does not develop between students I will attempt to facilitate discussion with probing questions.

Following this introduction the course will revert to a series of lectures outlining the scientific background for passive design supplemented by assigned reading from the text books. Although the lecture format is primarily a means of one-way communication, these lectures should not provide the student with the sole source of information or knowledge of the subject matter.

As the course progresses students are expected to become more involved in discussion. As the content centers around application of basic principles, class sessions might be more accurately described as seminars or discussion sessions. During these classes students are expected to participate in the discussion of applications and case studies.

Students are responsible for four primary activities: class participation, homework assignments, a short research paper and a design term project. Class sessions will not be an effective learning experience unless students are prepared. The lectures on fundamental principles are designed to supplement the assigned reading rather than to duplicate it. It is important therefore that the student do the assigned reading **prior** to each class.

My experience has shown that students who do not regularly attend class receive the lowest grades. Although I do not wish to penalize such students by further lowering their course grades, I do believe that credit for attendance and participation is a viable incentive for students to attend both physically and mentally. While occasional absences are inevitable it is unlikely that a student's occasional absence would result in a significant change in the student's grade for the course. Students with legitimate excuses (illness, court obligations, field trips, etc) should provide documentation of their excuse in advance or within 48 hours of such an absence.

Homework assignments are designed to provide the students with an opportunity to apply the knowledge, principles and skills learned from the reading and lectures. Assignments will normally be due two class periods after they are assigned. This delay is designed to provide the student with an opportunity to attempt solutions and return with questions **prior** to the due date.

The term project is created to be both a learning experience and an opportunity to utilize the skills learned by synthesizing the principles of passive design into a realistic project. A program for this project will be provided, however students may stray from the program with the approval of the instructor.

GRADING POLICY:

Class Participation	20%
Class Assignments	20%
Research Report	20%
Term Project	40%

Assignments are due at the beginning of class on the due date. Assignments turned in after class or on subsequent days will be graded at 10% off per day. No late assignments will be accepted after April 22, 1994.

Final course grades will be based on the total numerical grade received by each student. Total points may be scaled upward prior to the assignment of letter grades to reflect substantial improvement over the duration of the course or other special circumstances. Letter grades will be awarded on the basis of the following scale:

A: >90% B: 80%-90% C: 70%-80% D: 60%-70%

DROP POLICY:

Students who wish to drop the course after the end of the sixth week of the semester should contact the instructor to discuss their concerns and reason for not continuing. Students may not drop the course after the beginning of the eleventh week. See University Drop Policy in the catalog.

ACADEMIC DISHONESTY:

Academic dishonesty or misconduct is not condoned or tolerated at Oklahoma State University. Academic dishonesty is behavior in which a deliberately fraudulent misrepresentation is employed in an attempt to gain undeserved intellectual credit, either for oneself or for another. Academic misconduct is behavior that results in intellectual advantage obtained by violating specific directions rules or accepted academic standards, but without deliberate intent for use of fraudulent means.

Copying or imitating the language, ideas, and thoughts of another author... and presenting them as one's own creation without proper attribution is plagiarism and will not be tolerated in this class or within the School of Architecture. Each student is expected to do his or her own work. It is anticipated that groups of students may work together in solving numerical problems. However copying of another student's work will be considered grounds for the issuance of a "zero" for the assignment. The copying of material from any published or unpublished source without credit will result in a grade of "F" for the course and the possibility of additional disciplinary action. In the event of an unprovable allegation of cheating, the student(s) in question may be required to submit alternate evidence of their understanding of the material.

SPECIAL NEEDS:

Any student who has a disabling condition that requires special arrangements in order to meet course requirements should consult with the instructor during the first week of class. Documentation of the disabling condition may be required.

SCHEDULE:

Week #1

1/10 Introduction; Energy Issues
read: *Gentle Architecture*; Ch 1 (pp 1-3)

1/12 Energy for Planet Earth
read: *Beyond the Limits* (exec summary);
Energy for Planet Earth; 1 (pp 1-10)

1/14 Conventional Energy Sources
read: *Cool Energy*; Ch 1 (pp 5-16)
EPE; 8 (pp 83-94)

Week #2

1/17 Renewable Energy Sources
read: *Cool Energy*; Ch 2 (pp 21-38)

1/19 Alternate Energy Sources I
read: *Cool Energy*; Ch 4,5 (pp 71-110)

1/21 Alternate Energy Sources II
read: *Cool Energy*; Ch 6,7 (pp 111-154)

Week #3

1/24 Electrical Energy Efficiency
read: *EPE*; 2 (pp 11-24)

1/26 **Field Trip** - Sooner Power Plant

1/28 The Nuclear Alternative
read: *EPE*; 9 (pp 95-105);
Cool Energy; Ch 1 (pp 16-19)

Week #4

1/31 Energy for Buildings
read: *EPE*; 3 (pp 25-34)
Environ. Cont. Sys.; Ch 1 (pp 1-6)
ref: *Climatic Bldg. Design*; Intro. (pp 3-8)

2/2 Gentle Architecture
read: *GA*; ch 1,2 (pp 5-40)

2/4 Designing with Nature
read: *GA*; ch 3,4 (pp 41-66)

Week #5

2/7 Human Thermal Comfort
read: *ECS*; Ch 2 (pp 29-36)
ref: *CBD*; Ch 1-2 (pp 21-32)

2/9 Climatology
read: *ECS*; Ch 3 (pp 39-55)
ref: *CBD*; Ch 3 (pp 33-37)

2/11 Microclimate Resources
read: *ECS*; Ch 4 (pp 55-66)

Week #6

2/14 Solar Energy [Climate assignment due]
read: *Cool Energy*; Ch 3 (pp 39-69)
ref: Mazria II (pp 5-27)

2/16 Solar Geometry and Shading
read: *ECS*; Ch 5 (pp 75-88)
ref: *CBD*; Ch 4,7 (pp 38-42; 50-52)

2/18 Passive Solar Heating
read: *ECS*; Ch 7,8 (pp 107-123)
ref: Mazria; III (pp 28-43)
Mazria; IV.8-110 (pp 119-143)

Week #7

2/21 Indirect Gain Systems [Shading assignment due]
read: *ECS*; Ch 9,10 (pp 125-145)
ref: Mazria; III (pp 43-58)

2/23 Isolated Gain Systems
read: *ECS*; Ch 11 (pp 147-156)
ref: Mazria; III (pp 59-65)

2/25 Passive Cooling; Ventilation
read: *ECS*; Ch 14,15 (pp 175-194)
ref: *CBD*; Ch 8 (pp 53-60)

Week #8

2/28 Radiation and evaporation [Research Paper due]
read: *ECS*; Ch 16,17 (pp 195-207)
ref: *CBD*; Ch 9,10 (pp 61-70)

3/2 **Field Trip** - Passive Residence

3/4 Mass Effect and Earth Shelter
read: *ECS*; Ch 18 (pp 209-217)
ref: *CBD*; Ch 11 (pp 71-75)

Week #9

3/7

3/9 **No class - Spring Break**

3/11

Week #10

3/14 Site Planning
read: *GA;* Ch 5 (pp 67-107);
ECS; Ch 4 (pp 66-74)
ref: *CBD*; strat 1-7 (pp 83-97);
Mazria; IV.1 (pp 66-77)

3/16 Building Massing [Case Study due]
ref: *CBD*; strat 8-14 (pp 98-113);
Mazria; IV.2,3 (pp 79-89)

3/18 **No Class** - ARCH 3433 Field Trip

Week #11

3/21 Building Layout [Site Planning due]
read: *GA*; Ch 6 (pp 109-136)
ref: *CBD*; strat 15-27 (pp 114-143)

3/23 **Field Trip** - Passive Residence

3/25 Envelope Details
read: *GA*; Ch 7 (pp 137-150);
ECS; Ch 20 (pp 245-251)
ref: *CBD*; strat 28-37 (pp 144-170)

Week #12

3/28 Fenestration Details [Building Massing due]
read: *ECS*; Ch 20 (pp 251-260)
ref: *CBD*; strat 38-50 (pp 171-202)

3/30 Thermal Storage Details
read: *ECS*; Ch 20 (pp 266-275)
ref: Mazria; IV.11-14 (pp 134-171)

4/1 **Field Trip** - Passive Residence

Week #13

4/4 Greenhouse Details [Building Layout due]
ref: Mazria; IV.15-16 (pp 173-185)

4/6 Roof Ponds
ref: Mazria; IV.17-18 (pp 187-199)

4/8 Load Control
ref: Mazria; IV.23-26 (pp 231-261)

Week #14

4/11	Performance and evaluation [Concept Design Due] read: *GA*; Ch 8-9 (pp 151-165)
4/13	**Guest Lecture** - Home Power
4/15	**No Class** - Term Project Critiques

Week #15

4/18	Project Presentations
4/20	Project Presentations
4/22	Project Presentations

Week #16

4/25	Project Presentations
4/27	Project Presentations
4/29	**No Class** - Documentation Due

Pollution Prevention
in Architecture
NATIONAL POLLUTION PREVENTION CENTER FOR HIGHER EDUCATION

Architecture in the Age of Simulation

Gary Coates
Arch 715 B, Fall 1994
Kansas State University

National Pollution Prevention Center for Higher Education • University of Michigan
Dana Building, 430 East University, Ann Arbor MI 48109-1115
Phone: 313.764.1412 • Fax: 313.936.2195 • E-mail: nppc@umich.edu

Syllabus: Coates
May 1996

Kansas State University College of Architecture and Design
Department of Architecture

ARCH 715B: Architecture in the Age of Simulation
Fall 1994 ref #: 03620
Tuesday evening 7:00-9:30 pm Seaton 168

Instructor: Gary Coates
Office: Seaton 111
Phone: 532-5953

Architecture in the Age of Simulation

This course explores the major crises and transformative movements of our age in order to better understand current trends and emerging possibilities of architecture and community design. The primary context for this consideration is a comprehensive examination of the "ecology of scarcities" produced by the routine operation of urban-industrial society and the growing need to create a sustainable society worth sustaining. The psychological, social, historical and spiritual roots of the ecological crisis and the modern and postmodern condition are reviewed.

Within this framework we study in some detail three major and interrelated revolutions which are now occurring in: 1) science and technology (the development of genetic engineering, biotechnology, computerized multi-sensory simulation technology and artificial intelligence machines); 2) societal structure and the organization of human settlements (the shift from a monolithic, centralized urban-industrial society to a decentralizing post-industrial society comprised of depopulated rural landscapes and automobile-addicted anti-cities made up of shopping malls, office parks, life-style specific residential enclaves and theme park entertainment centers); 3) architectural theory and practice (deconstructionism, postmodernism and the development of a movement toward an ecological architecture and sustainable patterns of human settlement).

Basic to the course is an examination of the nature and meaning of the shift from typography to television as the primary media environment within which public discourse occurs. We look at the effects of television on architecture, consciousness and culture. Television is analyzed as merely the first step in the emergence of the coming "age of simulation," in which human experience will be increasingly the engineered outcome of artificial environments and electronically simulated realities.

Within the framework of the crisis of sustainability, the disappearance of public space and shared values and the shift to a society based on mediated realities we look at the nature of architecture and the potential role of the architect in helping to form a human future. We conclude by examining specific proposals for addressing the social, ecological and spiritual crises of our time by creating humanly scaled and ecologically sustainable buildings, towns and cities.

Grading Policy

This is a seminar/discussion class aimed at maximum student participation. Grades are based on three book reports, a term project/paper and the quality of participation in class discussions.

Required Texts

Mander, Jerry, In the Absence of the Sacred

Postman, Neil, Amusing Ourselves To Death

Benedikt, Michael (ed.), "Buildings and Reality: Architecture in the Age of Information," Center: A Journal of Architecture in America

Sorkin, Michael (ed.), Variations on a Theme Park: The New American City and the End of Public Space

Calthorpe, Peter, The Next American Metropolis: Ecology, Community and the American Dream

Supplemental readings at Claflin Books

Pollution Prevention in Architecture
NATIONAL POLLUTION PREVENTION CENTER FOR HIGHER EDUCATION

Bioclimate Design Studio

Jeffrey Cook
ADE 661, Spring, 1995
Arizona State University

SCHOOL OF ARCHITECTURE ARIZONA STATE UNIVERSITY TEMPE, ARIZONA
ADE 661 Professor Jeffrey Cook
BIOCLIMATE DESIGN STUDIO (5 credits) Spring 1995
studio AED 385 M - 1:40 - 5:30 pm, W, F - 3:40 - 5:30 pm

CATALOG DESCRIPTION:

ADE 661 BIOCLIMATIC DESIGN STUDIO (5) Sustainable architectural and site synthesis at a variety of scales emphasizing bioclimatic criteria and the use of passive and low energy systems. Prerequisite: professional degree or instructor approval.

CO-REQUISITE, PREREQUISITE: ATE 558, Bioclimatic Parameters. Waived Spring 1995.

COURSE OBJECTIVES:

To expand creative methods of architectural synthesis by the integration of bioclimatic and ecologic criteria.

To demonstrate the design opportunity of ecological responsibility within the built environment.

To create memorable architecture with measurable performance.

GENERAL DESCRIPTION:

For architectural designers the purpose of advanced and specialized studies should be to enrich one's responsibility and prowess in synthesis. This course involves creative exercises based on the use of analytic materials presented in the studio, developed in other courses as well as broader global resources. Thus in addition to the conventions of current formal and aesthetic ordering systems are the bioclimatic and ecologic ordering systems of the natural world.

The ethic of global responsibility proposed is not one of benign neutrality, nor of minimum impact; but of biological enhancement, of contributory participation with natural systems. The assumption is that humans as the most advanced and intelligent of the earth's living genotypes have that capacity, opportunity and duty. This requires a reconceptualization of architecture - both as a creative method, and as operational result.

A series of design syntheses explores the creative opportunities within the architectural ordering of natural energies and local resources. Climatic factors such as sun, wind, temperature and precipitation, in juxtaposition with concepts of human comfort will be generators in exploring aesthetic alternatives that engage both built and natural environments.

METHODOLOGY:

The semester will be based on a series of shorter projects and many incremental assignments as a deliberate design methodology. For some this may be an appropriate approach in responding to increasing technical or social responsibility and the basis of a lifetime of effective practice. It will also offer the opportunity of developing a varied portfolio within one semester.

All of the traditional methods of design studio will be used. In addition, new tools such as the heliodon and the artificial sky will be introduced. This studio is the complement to the course Bioclimatic and Energy Parameters. The analytic techniques developed in that course will be prime inputs to the design studio.

Aside from site analysis of both rural and urban sites, the course will emphasize solar determinates at all scales. Facility with architectural design for sun angles will use a variety of

graphic, model and computer methods. Potential exercises include both a solar monument, and a window to a solar specification. Environmental sensitivity of materials will be explored.

REQUIRED TEXTS

Olgyay and Olgyay. Solar Control and Shading Devices, Princeton University Press, 1957.

Olgyay, Victor. Design with Climate, Princeton University Press, Princeton 1963

LOF, Sun Angle Calculator.

Attached essay, "Making Sense of Architecture" by David Pearson from AR, October 91, p. 68-70.

RECOMMENDED TEXTS:

*Watson, Donald, and Ken Labs. CLIMATIC BUILDING DESIGN.1983 New York. McGraw Hill. Revised paper back 1993 ISBN 0-07-068488-X. Students facile on IBM compatible computers may benefit from the software packages described on page 277

- Essay "Global Indigenous Architecture", by Jeffrey Cook, from PROCESS ARCHITECTURE # 98, Tokyo, p 5-18.

SAMPLE EXERCISES AND PROJECTS:

1. Solar Monument
2. Aperature Architecture
3. Four Seasons Living Cell
4. A Zoo Habitat
5. Urban Housing.
6. Campsite for a Field Station

One of these exercises will be returned to towards the end of the semester to develop in greater detail, to be a portfolio project, or a submission in a major competetion.

The first project is intended to be a competition project with graduate students from the University of California at Los Angeles that will generate a subset of exercise designs. It will also be a reference through the semester, and be revisited at the end of the semester. The conclusion is expected to be a student organized construction workshop in May, after the semester.

GRADING CRITERIA:

Product	60%
Process	40%

The final grade for the semester will be determined as follows:

A=Excellent
B=Very Good
C=Average
D=Deficient
E=Failure

At least one developed exercise or project, plus two partial or sketch schemes to be submitted in 8 1/2" x 11" design portfolio format on Wednesday, April 26th, at 5:30 pm. (Materials may include quantitative or qualitative site or program analysis, aspects of performance or related criteria,, as well as synthesis.) Final review and individual conference on Wednesday, 3rd May will constitute the final examination.

Pollution Prevention
in Architecture
NATIONAL POLLUTION PREVENTION CENTER FOR HIGHER EDUCATION

Energy Environment Theory

Jeffrey Cook
APH 494/511, Fall 1994
Arizona State University

SCHOOL OF ARCHITECTURE — ARIZONA STATE UNIVERSITY — TEMPE, ARIZONA

Energy Environment Theory — Regents' Professor Jeffrey Cook
APH 494/511 (formerly ATE 494/511 — Fall 1994
Tues, Thurs - 3:15 - 4:30pm — AED 75 — 3 credit hours

Catalog Description: Architectural, urban, and regional implications of strategies using renewable resources. Solar and other energy sources in designed and natural environments.

Prerequisite(s): Graduate standing at the Master's level, or permission of instructor for senior undergraduates.

Instructional Objectives: A graduate course in theoretical aspects and practical realities of energy applications illustrated in the built environment from prehistoric, historic, and particularly contemporary times; especially case studies of the values represented in solar and other renewable resource systems in the designed environment of architecture, landscape, urban, and regional design. It is intended primarily as a complement to the Master's of Science experimental lab and the design studio experiences in the climate responsive and energy conscious design, as well as energy performance in buildings. It is also intended for the energy option stream in the M.Arch. program.

The focus is on energy ethics in the natural and built environment and their material and aesthetic consequences; especially on concepts of maximizing the usefulness of present and projected solar energy and other renewable resources through building design. **The current concern with "sustainability" is repeatedly addressed.** Land planning, investment policy, urban design, and landscaping are also included. Illustrations, primarily from the twentieth century and especially recent applications, are presented as demonstrations of present and future potentials.

The questions then are not ***what***, or ***how***; but ***WHY***, or ***SO WHAT!***

Students should appreciate opportunities of bioclimatic design standards at every scale including the ramifications of particular energy mixes based on local conditions. Students, regardless of major, should be able to articulate the environmental consequences of solar and other renewable decisions. An identical course is offered under a different number for senior undergraduate credit.

Instructional Methodology: Two regular weekly meetings will include lectures, research, presentations, guests, films, field trips, discussions, quizzes, and examinations, plus one Saturday field trip.

Attendance Policy: One hundred percent attendance is expected. The instructor will administratively withdraw students for absence, tardiness, or activities detrimental to the opportunities of others.

Required Text: Brown. Sun, Wind and Light, 1985. Heschong, Thermal Delight in Architecture, 1985.

Recommended References:

Anderson, Solar Building Architecture
Brown, State of the World, 1994,
Butti, A Golden Thread
Cook, Award Winning Passive Solar Buildings

Olgyay, Design with Climate
Scientific American, September 1990
Mazria, The Passive Solar Home Book
Wright, Natural Solar Architecture
Other references to be posted.

Grading: Grading for the semester will be based on:

A. Electricity (1)	10%
(2)	10%
B. Quiz on texts	10%
C. Book Review (1 or 2)	20%
D. Term Project	40%
E. Class Presentation	10%
F. Final Exam	20%
	120 %

Cook, ASU

ASSIGNMENTS

A. Living Without Electricity. 10%. What are the lessons of 25 hours without electricity? Your refrigerator might be allowed but no air conditioning, fans, electric lights, or any electrical devices. Content: 1. Accountability = facts of what was in and what out, on and off. 2. Experience - what did it feel like? 3. Conclusions. Presentation must be within one week of the experience (which must be before Labor Day). Include at least one artifact that will document or illustrate some aspect of the experience. Format choices = 1. Written report; 2. 10 minute oral report to class (either or both).

B. QUIZ on assigned texts - Tuesday, 11 October, 1994. Blue Book Required. 10%

C.1. BOOK REVIEW: 10% (optional) Goal: to encourage a critical examination of some of the literature in the field. One review due before 18 October. Submit the title for approval -- 1,000 to 1,500 words.

1. Summarize the entire book.
2. Critically examine one chapter, concept ,or idea in detail. Illustrate that concept with a drawing (it must be traced or freehand drawn -- no Xerox) found in some other book (give source).
3. Analyze the value of the book in its appropriateness both to your personal goals (such as an environmental designer) and to its intended audience. No duplicate title within the class.

OR:

C.2. APPLIED BOOK REVIEW: Environmental Delight in Tempe. 10% (optional) Read the book, Thermal Delight in Architecture. Explore the campus and the nearby community to find an example of luminous or thermal delight. Preferable locations would be within walking distance. Three to four pages typewritten to describe either two locations and use one reference to the book, or find one location and use at least two references. One hand-drawn illustration. Solo, or teams of two. Due on or before 18 October. The purpose of this exercise is to provide:

1. A critical reading of an easy book.
2. A critical examination of your immediate built environment.
3. Experience in identifying and communicating environmental qualities that are outside the usual.
4. Learning through team or buddy system.

D.1. TERM PROJECT: 40% (mandatory) Proposal due up to Thursday, September 22. Submit brief, written definition of title for approval on Term Project Data Sheet. Final project is due any time before Thanksgiving, Tuesday, 22 November at the very latest. Prepare a comprehensive study based on the following outline. The study should include hard data, five hand-drawn illustrations, and conclusions. Select annotated bibliography and a minimum of three references are required. Presentation to be 2,000 to 5,000 words. Teams of two allowed.

Environmental Design: Heating, cooling, lighting, ventilation and comfort in recent buildings.

1. To understand the energy content and comfort standards of recent buildings.
2. To demonstrate concepts and methods of energy use and respect for resources.
3. To identify changing standards of heating/cooling systems.
4. To appreciate the impact of technical parameters of building decisions.
5. To explore how energy attitudes influence the form of buildings, cities, and landscapes.
6. To learn by teamwork or collaborative.

Choose a recent significant, well-published building. It could be a high or low energy building, conventional type (office, school, etc.). Proof of its significance is that it has had at least three different publications.

Report Content:

1. Introduction: Describe the subject.
2. Why did you choose the subject?
3. Location: Define the chief climatic concerns of the geographic location of the subject.
4. Analyze the site for microclimatic influences on the form and composition of the subject.

Pollution Prevention in Architecture
NATIONAL POLLUTION PREVENTION CENTER FOR HIGHER EDUCATION

Architecture and Environmental Design

Diane Elliot Gayer
VOTC 195, Fall 1993
University of Vermont

VOTC 195 ARCHITECTURE AND ENVIRONMENTAL DESIGN:
Explorations in the Built-Environment

University of Vermont, Fall 1993
A-162 Living Learning Complex
Design Studio Rm 121
T, Th 4:00 - 5:30PM

Prof. Diane Elliott Gayer
Tel: 482-3047

8/31: What is Architecture, what is sustainability?	9/2: Design Problem #1
9/7 : High Tech Design Solutions	9/9: Design Problem #2
9/14: Low Tech Design Solutions	9/16: #2
9/21: #2	9/23: Design presentations
9/28: CWP design charrette with John Anderson	9/30: CWP design charrette
10/5: Tour of Hydro-One	10/7: Tour of Burlington Wastewater treatment plant
10/12: Steve Badanes of Jersey Devils, guest speaker	10/14:Design Problem #3, field trip to visit site
10/19: Schools or Wetlands?	10/21: Design problem #3, guest speaker
10/26: Who is in charge?	10/28: #3
11/2: Mid term exam/paper	11/4: #3
11/9:John Anderson, guest speaker on "Entropy vs. Architecture"	11/11: #3
11/16:Dr. Harry S. Blanchard, guest speaker on "Technology and Spirit"	11/18: #3
11/23:video	11/25: Thanksgiving
11/30:Dr. Joni Seager, guest speaker on "Gender & the Environment"	12/2: #3
12/7: Visit to CCA, Montreal and the Biodome	12/9: #3
12/12: Final Presentations	12/14: Final Presentations

VOTC 195 ARCHITECTURE AND ENVIRONMENTAL DESIGN:
Explorations in the Built-Environment

Required texts:

Clive Pointing. Green History of the World, the Environment and the Collapse of Great Civilizations.

Chapters 1-3	by 9/14
Chap. 4,5,6,7 opt.	
Chap. 8	by 11/16
Chap. 9,10,11,12,opt.	
Chap. 13 pp.277-294	by 10/5
Chap. 14,15	by 10/5
Chap. 16,17	by 12/7

Brenda and Robert Vale. Green Architecture.

Chapters 1-2	by Nov. 2
Chapters 3-4, Spring Semester	

Additional texts:

Reprinted articles as distributed in class.

"Blueprint for a Green Future"	by 9/7
Transportation	by 9/9
"The Hannover Principles"	by 9/28
"State of Sustainability"	by 9/21
Articles on Water, Forestry...	by 10/5
"Toward a Symbiotic Architecture"	by 10/11
"The Commons"	by 10/19
"Ecology of Commerce"	by 10/26
"The Law of Entropy and the Economic Problem"	by 11/19
"The Architects of the Mechanical World View"	by 11/16
"The Gender and Environment Debate: Lessons fromIndia"	by 11/30
"The Futility of Global Thinking"	by 12/7

Other sources:

Seymour Jarmul. Energy Conservation.
Ian McHarg. Design with Nature.
Bernard Rudovsky. Architecture without Architects.
Malcolm Wells. Gentle Architecture.
Leslie Weisman. Discrimination by Design.
Forest Wilson. Architecture: Fundamental Issues.
Alex Wilson. The Culture of Nature.

ARCHITECTURE AND ENVIRONMENTAL DESIGN

VOTC 195 DIANE GAYER
FALL 1993 482-3047

MID-TERM QUESTIONS.

Please answer 3 out the 4 questions. Answers should be approximatly 300 words long, based on your readings and your own thoughts and experience. Grading will be based on completeness of thought, clarity of language and comprehension of material. Mid-term answers are due at 4pm Tuesday, November 9.

1. Discuss the interrelationships between a) climate and construction materials, b) materials and technology, c) technology and the end-product.

2. Page 86 of GREEN ARCHITECTURE shows sketches of australian aboriginal shelters which were used as the basis for the Tourist Information Center shown on page 87. Discuss how this borrowing from simple indigenous forms is (or is not) appropriate for contemporary architecture.

3. The photographs on pp 108,109 of GREEN ARCHITECTURE are examples of adaptive use: what was originally designed as a train station, later became a car park and now a modern art museum. Discuss the pro's and con's of recycling old buildings.

4. You are an architect in the year 2025. Discuss your concept of architecture, design and construction.

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Architecture and Environmental Design

Diane Elliot Gayer
VOTC 196, Spring 1994
University of Vermont

VOTC 196 **ARCHITECTURE AND ENVIRONMENTAL DESIGN: Explorations in the Built-Environment.**

University of Vermont, Spring 1994 — Prof. Diane Gayer
A-162 Living/Learning Center — Tel: 482-3047
Class: T, Th 4:00 - 5:30pm
Design Studio Rm. 121 — Ofc. Hrs. Th 3-4pm or by apt.

	1/20 "Elements" of Architecture (Earth, Air, Water, Fire)
1/25 "Design an Entry" (#1)	1/27 What is Design? Form, Function & Geometry
2/1 Sketch problem	2/3 John Quinney on "Designing w/ Nature"
2/8 What is Sustainable? (Biosphre, Arcosanti,...)	2/17 Planning & Land-Use (South Africa, Nepal, VT)
2/22 Project #2	2/24 Project #2
3/1 Town Mtg. Day	3/3 Futurism: Le Corbu, Fuller, F.L.Wright, Soleri, Levit
3/8 Project #3	3/10 Project #3
3/15 Presentations	3/17
3/22 Spring Break	3/24 Spring Break
3/29 Life cycle, waste & recycling	3/31 Derek Drummond on "Livable Cities"
4/5 Field trip: Wastewater Treatment Facility	4/7 Intro to Project #4
4/12 Group project (#4)	4/14 site model (#4)
4/19 Ted Montgomery on "Tenstones"	4/21 Individual projects (#4)
4/26 Project #4	4/28 Indiv. Review (Project #4)
5/3 Project #4	
5/10 Final Review	

VOTC 196 **ARCHITECTURE AND ENVIRONMENTAL DESIGN: Explorations in the Built-Environment.**

Reading:

Articles to be handed out in class. Cost $8.00. No additional texts need to be purchased.

Other Reading:

Green Architecture by Brenda and Robert Vale will be available on reserve in the library or in the Studio, if you did not purchase the book last semester.

Please read Chapter 3, 4 and the Postscript by March 29. Those of you who did not take VOTC 195 might want to read the first part of the book as well.

Additional Reading:

Design with Nature, Ian McHarg
Architecture without Architects, Bernard Rudovsky
Gentle Architecture, Malcolm Wells
The Culture of Nature, Alex Wilson
Discrimination by Design, Leslie Weisman
Beyond Culture, Edward Hall
Redesigning the American Dream, Dolores Hayden
Mind and Nature, Gregory Bateson
Feng Shui: The Chinese Art of Placement, Sarah Rossbach
The Natural House Book, David Pearson
Sustainable Communities, Van der Ryn & Calthorpe
The Sphinx in the City, Elizabeth Wilson

Pollution Prevention
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Environmental Design: Topical Studio

Diane Gayer
Fall 1994
Norwich University

NORWICH UNIVERSITY
TOPICAL STUDIO: ENVIRONMENTAL DESIGN

FALL 1994

PROFESSOR GAYER
Tel. 482-3047

Philosophy:

My philosophy is that environmental design is not something we apply to architecture, but must be inherent in it. It also must be inherent in us, it must slowly take over our way of seeing, breathing, acting and designing.

If it is part of us and not applied like a new coat of paint, then and only then will it be integral with the design process, will it be part of the spirit of our design. We look for clarity of vision in design, for strength of heart and uniformity of concept; environmental consciousness comes from where one stands and is made visible by what we produce...This does not preclude a variety of solutions from simple to complex, but we must understand the complexity and that everything we create has ramifications. Drinking a coffee here impacts the oceans, the forests, the growers in South America or Africa; the price we pay affects their lifestyle as well as ours, the chemicals used affect their land quality and our health. Building a single family house on ten acres in Vermont affects our production of agriculture, our connection to the workplace, our relationship with neighbors, our sense of community, and quality of air, water and land, etc. We do not design in isolation.

I am teaching because I care about our environment here and now, because I care that the United States is using the majority of the earth's resources for a tenth of the population and because I think that we as architects have the special combination of skill and vision to do something about it. That we can be leaders in our communities directly by shaping and influencing the construction and design of the built-environment we live in.

None of this is at the expense of aesthetics. We need beauty to support our spirit, beautiful things in harmony with nature are universal. To quote Le Corbusier in 1927: "You employ stone, wood, and concrete, and with these materials you build houses and palaces; that is construction. Ingenuity is at work. But suddenly you touch my heart, you do me good, I am happy and I say: 'This is beautiful'. That is architecture. Art enters in."

If our buildings are to last, are to be built to withstand time, then we need to start thinking about them differently. Buildings must be designed with climate and location in mind, with appropriate materials and technology, and conscious planning of land-use. We need to think about who is constructing what for whom--are we designing a high-rise twin tower on spec because a

developer sees a potential market and in doing so the project razes multiple 2-3 story housing tenements or are we working for a non-profit agency who is rebuilding low-income housing through sweat-equity? These may reflect opposite sides of the issue, but they co-exist, in fact the latter because of the former.

We are in the arduous process of redefining architecture and trying to make it sustainable. There will be a small avenue for those who stay in traditional practice, but as fast as things are changing, the practice of private architecture as we have known it will become obsolete. Looking for a technological fix to create a better mouse box is not what is needed, over the last twenty years we have come to ask the question of what really is a mouse box and are now in the exciting place of actually trying out various solutions to the question.

There is much need for our creativity and ability to understand and solve problems, as the mayor of Curatiba, Brasil, an architect discovered. There was a long-overdue trash problem in the overcrowded favelas and a need to provide affordable public transportation. To solve this he instituted an all-around bus system for the city and created a barter system of trash for bus tokens. This solved an infrastructure problem of trash removal in certain areas of the city, improved the sanitation and allowed people a more reliable means of getting to work. Perhaps this is not a typical architectural problem, but that is what I am talking about, architecture is taking on all the aspects of redesigning our built-environment. We must broaden our definition of design and learn to use our talents and insight more completly.

Course Description:

The Environmental Design Studio is a Fourth Year Topical Studio scheduled to run MWF 1 to 5pm with a lecture hour Fridays @ 12:00. The intent of this design studio is 1) to cover building specific issues such as use of local materials, embodied energy and toxicity in various materials, daylighting and ventilation in the creation of healthy environments; 2) to explore the impact of land-use, transportation, zoning, of natural resource use on our environment and make the connection to architecture; and 3) to develop the sense of place and empowerment that can occur through holistic design.

There will be three design projects assigned during the course of the semester for which juried reviews will be scheduled. In addition there may be other miscellaneous assignments as deemed appropriate.

Evaluation:

Grades will be based on participation, attendance, journal, portfolio and design projects. You will receive letter grades on your design projects. Generally, letter grades may be interpreted as follows:

A= represents outstanding accomplishments that go beyond the stated objectives and issues; exemplary work that contributes insight or perspectives on those issues.

B= represents very good accomplishments within the stated objectives and issues; above average with solid concepts, development, and communication.

C= represents expected levels of accomplishments within the stated goals and issues; what was asked for and what is expected for this design level.

D= represents work below expected levels of accomplishment for the stated objectives and issues; insufficient mastery of what is expected at this level of design.

F= represents failure to meet the expected level of accomplishment for the stated objectives and issues. An F is assigned for any project that is not submitted.

Incomplete projects that are submitted will be judged by the faculty based on what is presented, or exists, on the due date. A grade penalty will be assigned based on the degree of incompleteness.

Your journal is to contain free-hand sketches, thoughts, ideas, notes from class or readings, explorations, poems, essays, etc. You may work on this during studio when you are not working on your design project.

Your portfolio should contain design work from your assigned projects from bum wad sketches through final drawings. I want to see the development and thought process from each project. These will be turned in after the final review for each design project.

Attendance & participation is expected by all. You should come to studio ready to work, think and have fun. You should be prepared as in having done your reading, research or other necessary prep work for desk crits or class discussions. Plan on having a desk crit each Monday.

Presentations and final reviews. We will be inviting outside guests for these reviews and so the dates will be relatively fixed. You should have your projects done by the date assigned. Petitions for extensions will not be granted on an individual basis, if you are having trouble of any sort, please come see me before it is too late.

Readings

The textbook for this class is Green Architecture by Brenda and Robert Vale. Please read:

Introduction and Chapter One by Sept.16
Chapter 2 by Oct.7
Chapter 3 by Oct.28
Chapter 4 and Postcript by Nov.18

Other articles handed out in class are to be considered as text material and you are expected to read and apply these to the course.

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Natural Lighting

Bruce Haglund
Arch 499.12/502, Fall 1994
University of Idaho

UNIVERSITY OF IDAHO
COLLEGE OF ART & ARCHITECTURE
ARCH 499.12/502 - Natural Lighting
Haglund/Fall 1994

NATURAL LIGHTING SEMINAR
COURSE DESCRIPTION

1. Course: Arch 499.12 Natural Lighting meets Tuesday at 3:30-5:20 p.m. in UCC 332.

2. Texts: *Concepts and Practice of Architectural Daylighting*, Moore
Graphic Daylight Design Method, Millet
Simulating Daylight with Architectural Models, Schiler, ed.
SERI Manual
SERI Transparencies
Natural Light Reader

On Reserve:
Perception and Lighting as Formgivers in Architecture, Lam
Sunlighting as a Formgiver for Architecture, Lam
The Theme is Light, L. Kahn
Graphic Daylight Design Method, Millet

3. Course Concept: The course is structured as a seminar/workshop in order to maximize hands-on experience with the various prediction techniques. The heart of the workshop project will be a redesign problem of a real space on-campus, which will be measured, modeled, redesigned, predicted, redesigned, etc. Each student will be a member of a small group working on the redesign project. Each group will be responsible for a 15-minute presentation of each phase of their redesign project - see schedule. Presentations will be similar to design studio presentations with class members and the instructor acting as critics. In addition to presentation, each group will compile a reproducible folio explaining their process.

The folio will be in 11" x 17" (maximum) format with illustration. Each redesign phase will be written up in the following format:

1. Introduction - describe what is being done and how your team is doing it. (1 page)

2. Data/measurements/illustrations/calculations - present the technical aspect of the redesign phase as clearly as possible. Annotate data and illustrations.

3. Conclusion - describe what you discovered about your study building and what you found out about the prediction method. (1 page)

Each section of the folio should be handed in after the presentation for feedback from the instructor. At the end of the term the whole notebook is due. The final submission should include a project introduction and a project conclusion. (A suggested remedy to the study building's lighting problems and remarks about the course material in general). The folio will be copied for each team member at the term's end.

4. Grading: This is an advanced course and will be graded accordingly. Final grade is based on participation in the process and on the final folio.

5. Course Outline:

A. The Quality of Light

Aug. 30 "Light Chords" Rendering exercise.
Assignment #1 "The Quality of Light"
Read: *Natural Light Reader*: "In Praise of Seattle Light" and "Enlightenment"
(suggested: *The Theme is Light*, L. Kahn)

B. Exploring Daylighting Design

Sept. 6 "The Case Study Method - U of I Law Library as Exemplar"
Read: Moore, Chap. 2,3,4, & Yellow Handout
Natural Light Reader: "Manipulating Daylight"

Sept. 13 "Building Daylight Models"
Assignment #1 due, preliminary presentations of light box
Assignment #2 "Daylight Model"

Sept. 20 "The Virtues of Toplighting-Aalto, Isozaki"
Read: Moore, Chap. 5,8,9,10,11,14
Natural Light Reader: "Museum Daylighting", "Guarding Against Deterioration", and "Technics: Natural Light in Museums"

Sept. 27 "Careful Sidelighting - CSOBs, Liberty Elementary, United Gulf Bank Bahrain"

Oct. 4 Assignment #2 due, Daylight Model Presentation

C. Quantities of Light

Oct. 11 "The Graphic Daylight Design Method (GDDM)"
Assignment #3 "GDDM"
Read: Moore, Chap. 15 and Millet

Oct. 18 "SERI Protractors"
Assignment #3 due, Assignment #4 "SERI Protractors" Read: SERI protractors manual

Oct. 25 NO CLASS

Nov. 8 "Computer Methods"
Assignment #4 due, Assignment #5 "Computer Methods"
Read: Moore, Chap. 12 and 18

D. Daylighting Technology

Nov. 15 "Daylighting History - Toplighting in Moscow"
Assignment #5 due, Assignment #6 "Model Remodel"
Read: Moore, Chap. 1

Nov. 22 NO CLASS

Nov. 29 "History of Daylighting Technology", and "High Technology - Beam Daylighting Techniques"
Read: Lam, *Sunlighting as...*, Chap. 7 and Case Studies Group G

Dec. 4 "The Importance of the Lighting Code-Emerald PUD, Mt. Airy"
Read: *Natural Light Reader*, "Watts the Matter", "Lighting to Perfection", "Mt. Airy", "Codes"

E. Model Refinement Workshops

Dec. 11 Final Redesign Presentation

NO FINAL EXAMINATION - PRESENTATION OF LIGHT BOX AND FOLIO OF WORK

3:30 - 5:30 pm Saturday, December 17

UNIVERSITY OF IDAHO
COLLEGE OF ART & ARCHITECTURE
Dept. of Architecture
Arch. 499.12/Natural Lighting
Haglund/Fall 1994

LIGHTING PORTFOLIO

ASSIGNMENT #1: THE QUALITY OF LIGHT

The purpose of this exercise is to experience first-hand the quality of the natural light resource in the Palouse.

Natural light is a dynamic resource that varies diurnally, annually, and directionally. In order to confirm this and to become more sensitive to this you will perform a semester-long experiment to record the fluctuation in light from late winter to early summer.

The experiment. Construct a light box according to the plan attached. It is important that the material is not translucent and that all corners are light-tight so that light enters the box only through the apertures you have intended. The box must have the ability to be both top-lighted and side-lighted, top-lighted only or side-lighted only. Consequently, the covers for the top-light and side-light must also be light-tight. Observation of light conditions can be done either by hand-rendering or photography. If photography is chosen, a 35mm SLR camera with a wide angle or normal lens using fast daylight balanced slide film (like Ektachrome ASA 200) is suggested.

To make your observations choose a constant setting in a fairly open space with good access to the sky (rooftops, lawns, parking lots, wheat fields, etc.). Align the box with its long axis running east to west with the observation port on the west end. Use a calendar on the back inside wall to record the time of day and year and sky condition of your observation. Make observations early and late in the day as well as during midday. Take advantage of varying sky and ground conditions.

Presentation. A preliminary presentation of your model and your initial observations will be made to the class on **September 13**. Suggestions for refining your model and your techniques will be made. The final presentation will be made during finals week. Your in-class presentation should include slides of the model and its setting. For the portfolio you may make color photo copies of selected slides. You may seek additional advice and consultation throughout the semester.

UNIVERSITY OF IDAHO
COLLEGE OF ART & ARCHITECTURE
Dept. of Architecture
Arch. 499.12/Natural Lighting
Fall 1994/Haglund

Assignment #2: Daylight Model

Reference: Concepts & Practice of Architectural Daylighting, Chapter 14.

In order to explore the potential for natural lighting you will study a small office space with potential for improved daylighting.

For this study you will build a carefully constructed 1/2"=1'0" or 1"=1'0" scale model of your assigned space, representing its current condition. Later this model will be remodeled to embody enhancements to its daylighting scheme. Keep this need for flexibility in mind while building the model.

Concurrently, you will investigate the building that you are modeling, discovering the lighting problems and measuring the daylight factors of the actual building (electric lights off!). Compare actual and model measurements.

You will present your model and your findings on October 4. The final remodel will be presented December 11.

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Assignment #3: GDDM

References: *GDDM*, Millett (at Bookstore)
Moore, Chapter 15
Insideout, E2.2–E2.4

Perform two lighting analyses using the GDDM:

1. Your study building as you have modeled it—this serves as a base case to which other prediction techniques and proposed design changes can be compared.

2. A design proposal for remodeling your study building—this can be analyzed to assess the effectiveness of your redesign in solving lighting problems in the spaces.

Document your efforts by writing

1. an introduction explaining the problem, the method, and the redesign proposal.
2. an experiment description with annotated data (the GDDM drawings and calculations).
3. a conclusion which explains what you learned about the space, it remodel, and the analysis method.

Assignment due: October 18.

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COLLEGE OF ART & ARCHITECTURE
Dept. of Architecture
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Fall 1994/Haglund

Assignment #4: SERI Protractors

Reference: *SERI Manual* and transparencies (at Bookstore).

Use your study building remodel proposal as the subject of this daylighting prediction tool.

The protractors are ideal for spot checking critical surfaces in your design proposal. Have each member of your group select one critical horizontal and one critical vertical surface to analyze. You will need to add the IRC as calculated in assignment #3, GDDM, to the SC and ERC calculated with the SERI protractors.

Document your efforts by writing:

1. an introduction explaining the problem, the method, and the importance of the surfaces selected.

2. a description of the procedure and the calculations with an annotated drawing showing the GDDM results and the SERI points/results.

3. a conclusion which explains what you learned about the remodeled space and the analysis method.

Assignment due: November 8

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Assignment #5: Computer Methods

Software Available:

Controlite (Quicklite)	IBM, DOS
Microlite	IBM-PC, XT w/color monitor only
Superlite-PC	IBM, DOS 386 or better
Lumen Micro	IBM, DOS 386 or better

Use one of the software tools above to model your study building.

Perform an analysis of both your original model and a remodel proposal (which could differ from the GDDM/SERI remodel). Represent your computer output in spatial graphic format (plot the data on a floor plan, for instance).

Document your efforts by writing

1. an introduction that explains the problem and the reason for selecting the specific computer tool.

2. a description of the procedure including annotated data and graphics.

3. a conclusion which explains what you learned about the remodel and the analysis tool.

Assignment due: November 15

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Assignment #6: Model Remodel

Now that you've investigated possible reconfigurations of your study building synthesize your findings in a remodeled model of the space.

Test your original building and its remodel with light meters and photographs.

Document your efforts by writing:

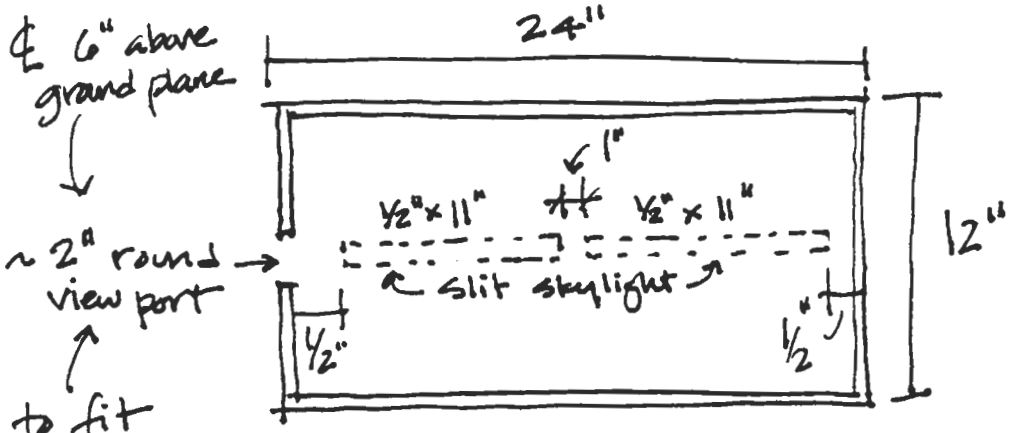
1. an introduction to the problem, the rationale for the remodel, and the methods used.

2. a description of the procedures and annotated graphic information.

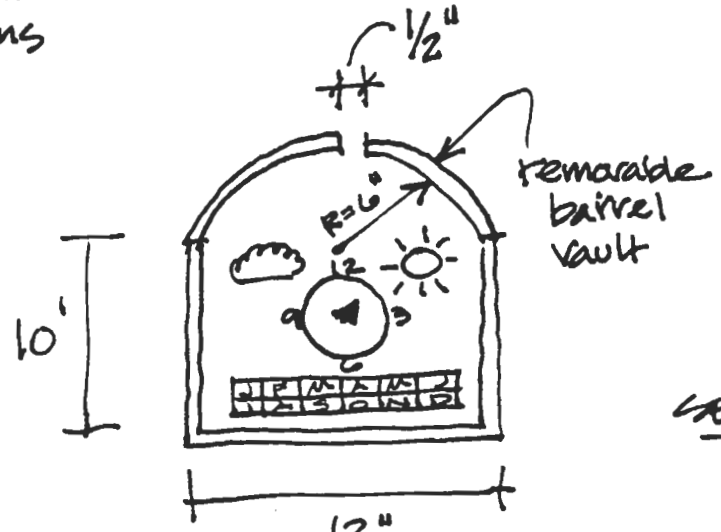
3. a conclusion that compares the original building to the remodel and describes what you learned about the building and the methods used.

Assignment due: December 11

LIGHT BOX DESIGN
(fall '94)



PLAN



SECTION
+ END ELEVATION

Pollution Prevention in Architecture
NATIONAL POLLUTION PREVENTION CENTER FOR HIGHER EDUCATION

Passive Solar Design and Advanced Thermal Evaluation

Bruce Haglund
Arch 499/502.04, Spring 1995
University of Idaho

UNIVERSITY OF IDAHO
COLLEGE OF ART & ARCHITECTURE
Department of Architecture
Arch. 499/502.04 Passive Solar Design and Advanced Thermal Evaluation (PSDATE)
Spring 1995/Haglund

COURSE DESCRIPTION:

The intention of this course is to advance the student's understanding of passive solar design and the underlying thermal principles necessary to describe thermal performance. It recognizes the intrinsic interdependencies of natural systems, mechanical systems, building occupants, and building/energy codes. The discussion and exercises will be centered on three current and distinct models for analysis of thermal performance.

This year's class is supported by a grant from the Vital Signs project. Our Vital Signs assignment is to study the effect of thermal mass on the performance of existing energy-conserving, active/passive solar buildings and to initiate "work-ups" of these buildings. The grant monies have supported preliminary work in scouting of and information gathering for the candidate buildings for class study. Study team field trips and some supplies will also be supported. The Vital Signs project will also lend us sophisticated equipment for making on-site, "guerrilla" monitoring forays during the field trips.

The format for the class is a combination of seminar and workshop, featuring considerable hands-on experience with monitoring and evaluation techniques. Students will evaluate existing buildings, focusing on analysis rather than design. However, design implications will be at the heart of the discussion. Each of the three models for analysis is associated with a state-of-the-art, computer-based thermal analysis tool. These tools will be fully integrated into the coursework.

GRADING:

5 exercises @ 10 points each
1 point off for late work

TEXTS:

PSDATE Reader—available at UI Bookstore

SOFTWARE:

UISUN	public domain	UI
Solar-5	public domain	UCLA
WATTSUN	public, licensed	WSEO
CALPAS-3	private, licensed	BSG

BUILDINGS:

Farm Credit Bank	Spokane, WA
North Central High	Spokane, WA
Central Pre-Mix	Spokane, WA
Liberty Elementary	Boise, ID
Blue Ridge Elementary	Walla Walla, WA
Pendleton Junior High	Pendleton, OR

COURSE SCHEDULE:

Jan	17	Introduction—Context—Assign Buildings
	24	Solar Buildings—SLR Method Lecture
	31	Direct/Indirect Gain Seminar—**Present Assignment #1**
Feb	7	ASHRAE Calculation Method Lecture
	14	Solar-5/Wattsun Workshop
	21	Energy Code/Model Conservation Standards
	28	Thermal Mass Strategies Seminar—**Present Assignment #2**
Mar	7	Site Visit Preparation Seminar
	14	Thermal Network Method Lecture
	21	***Spring Break—No Class***
	28	CALPAS-3 Workshop
Apr	4	Guerrilla Monitoring Seminar—**Present Assignment #3**
	11	Solar Building Survey Lecture
	18	Advanced Solar Building Lecture
	25	Thermal Performance Seminar—**Present Assignment #4**
May	2	***Undergraduate Thesis Week—No Class***
	9	Final Project Write-Up Due—Final Seminar—**Present Assignment #5**

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ASSIGNMENT #1

Computer-aided Schematic Design

Select one room in your assigned building that uses a passive solar heating strategy.

1. Sketch it in plan, N-S section, and South elevation. Measure its floor, south aperture, and thermal mass areas. Note its wall, ceiling, and floor insulation levels.

2. Use UISUN to evaluate the building's solar heating performance as it exists. (WATTSUN ver. 1 can be used to help determine the BLC.)

3. Run a series of parametrics to determine the roles of mass, aperture, and insulation in the performance of the room. As a minimum vary independently, each of the following:

   a) system type (explain the difference in mass configuration and amount in each)

   b) aperture size (reduce and expand aperture)

   c) building skin insulation level and use of night insulation on the aperture

4. Analyze the results of your parametrics. Compare the relative effects of mass, glass, and fiberglas. Discuss the interdependencies among these factors.

5. Check the portability of your room. Compare the "as is" configuration with diverse climatic settings—Charleston, Dodge City, Madison, and Phoenix, as a minimum.

6. Write an analytic conclusion for your findings. Critique the design of the room you've analyzed and its role in the entire building design.

Assemble your work in an 8½" x 11" or 11" x 17" format portfolio. The presentation should be clear and rational.

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ASSIGNMENT #2

Thermal Mass Strategies

Thermal mass is useful for providing thermal stability in both passive and mechanically tempered buildings. The most effective mass is directly exposed to thermal stimuli within the conditioned space. These stimuli include direct solar radiation, lights and equipment, and people.

For this exercise examine the architectural drawings of your assigned building to form an understanding of its thermal mass strategies.

1. From the drawings, pick a space in the building that appears to use thermal mass effectively and one that does not. Sketch/diagram each space showing the relationships between the mass and thermal stimuli during both the heating and cooling seasons.

2. For each space sketch/diagram its thermal enclosure. Analyze the completeness and switchability (seasonally and diurnally) of the insulating skin.

3. Focusing on the two selected spaces, describe, analyze, and critique the overall thermal mass strategy of the building.

Assemble your work in an 8½" x 11" or 11" x 17" format portfolio. The presentation should be clear and rational.

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ASSIGNMENT #3

On-Site Thermal Mass Survey

For this exercise you will prepare for, conduct, and report on a field trip to your assigned building.

Preparation:
One seminar session will be devoted to discussing and developing issues and techniques for the field trip. Additionally, assignments #2 & #3 act as orientation to the building and its performance. Among the activities that you must prepare for are:

- interviews with users and operators
- observations and photographs
- on-site monitoring

Field trip:
The field trip is intended to attain Vital Signs Level 1 Protocol goals—"Brief visit, limited instrumentation appropriate to a single day visit. Will involve observations, interviews, and survey techniques." On the field trip you will be expected to:

- confirm location and configuration of the thermal mass and insulation
- record surface conditions of mass, including obstructions
- monitor surface and air temperatures
- record glazing and shading features
- survey building operators and occupants
- photograph the building and selected details

Report:
Write-up your field trip by describing the preparations and the visit procedures. Analyze the findings from your visit. Present you finding to the seminar.

Assemble your work in an 8½" x 11" or 11" x 17" format portfolio. The presentation should be clear and rational.

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ASSIGNMENT #4

Thermal Mass Performance Model

This exercise is intended to examinethe role of mass in the thermal comfort of buildings. You will analyze the building as a whole, using both actual performance data and performance predictions. Information gathered and insights gained from the preceding exercises help inform your analysis for this exercise.

1. Use the utility bills and information gathered during the site visit (monitoring and building operator interview) to determine actual performance of the building.

2. Use either Solar-5 or Calpas-3 to predict the energy use/thermal performance of the building. To help confirm your monitored performance data, you should be able to get weather data for the day of your site visit for Solar-5. Model the building with and without thermal mass to help form an understanding of the importance of mass in the building's performance.

3. Compare the actual and predicted performance of the building. Critique its design and operation.

Assemble your work in an 8½" x 11" or 11" x 17" format portfolio. The presentation should be clear and rational.

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ASSIGNMENT #5

Thermal Performance Critique

This is the capstone exercise for the course. The Presentation will be in both written and oral form. You will critically examine the building and present problems and suggested solutions. The breadth of your work should include at least:
thermal performance hypothesis

- comments on appropriateness of thermal strategies
- critique of effectiveness
- problems found
- suggested solutions
- items for further study/investigation
- lessons learned from the building and the course

Assemble your work in an 8½" x 11" or 11" x 17" format portfolio. The presentation should be clear and rational.

Pollution Prevention
in Architecture
NATIONAL POLLUTION PREVENTION CENTER FOR HIGHER EDUCATION

Sustainable Architecture

S. La Grassa

Ar 324, Term III 94
University of Detroit Mercy

University of Detroit Mercy
Term III 94
Ar 324: Sustainable Architecture
Prof. S. La Grassa

COURSE DESCRIPTION:

This course will explore, investigate and analyze the concepts associated with the issue of "sustainability" as it relates to Architecture and Urbanization.

It will be taught through a variety of modalities: primarily seminar and lecture with also field trips and guest lecturers as available. We will also examine what is presently being designed within the concept of sustainable "Green" buildings as well as what is forecast for the future.

The emphasis will be on student exploration, involvement and participation.

REQUIRED TEXTS:

Guiding Principles of Sustainable Design, U.S. Department of the Interior.

Audubon House, John Wiley and Sons, 1994.

CLASS POLICIES:

1. Attendance is MANDATORY. **One unexcused absence** will be acceptable.

2. Standard University policies will be adhered to for "I" and "W" (withdrawal) grades. Consult the Bulletin, Request Form, and Schedule of classes for conditions and dates. "Serious reasons..." for an "I" grade or an excused absence are such things as a Death in the family, sickness or other extenuating circumstances that are not the fault of the student. Such determinations are solely at my discretion. Documentation will be required as part of your Request.

3. Plagiarism will result in an automatic "F" grade for the course.

4. Late work will receive a penalty of 5% per day until it is submitted.

5. **Incomplete Assignments** will be graded in accordance with the information presented. At the discretion of the instructor, you may be required to complete the work

University of Detroit Mercy
Ar 324 Sustainable Architecture
Term III 94
Prof. S. La Grassa

PAPER: ---------- **30% of Final Grade** ----------

We have been discussing issues that affect Sustainability over the last class periods. These issues will be the focus of your major Paper for this Term. Select one Issue that you are interested in exploring and researching. Keep the topic focused - not too narrow, not too broad.

Your paper shall be concerned with the relationship between the issue identified and its relationship to sustainable architecture and the architect's role as designer.

REQUIREMENTS: ----------

Between **7 to 10, double spaced, Typewritten pages** exclusive of illustrations. Provide Endnotes, and Bibliography according to the formats given. Illustrations are encouraged.

SCHEDULE: ----------

JUNE 3, 1994 @ 9:30 a.m.
TOPIC with brief one page abstract of the concepts, ideas to be explored. Typewritten.

JUNE 10, 1994 @ 9:30 a.m.
OUTLINE see example for degree of detail required.

JULY 1, 1994, @ 9:30 a.m.
FINAL PAPER !!

University of Detroit Mercy
Ar 324 Sustainable Architecture
Term III 94
Prof. S. La Grassa

Term Project:

Your Term Project will be analytical and graphic in nature. You will be given a project that has been published as an example of Sustainable Design. It will be your responsibility to research this project, determine its role and its components that make it a good example of sustainable design and then present it clearly on a series of 11"x17" illustration (matt) boards.

The purpose of this presentation is that it will be didactic. Any viewer should be clearly lead to a thorough comprehension by the manner in which you have presented the design. It should not be just an assemblage of diagrams and photographs taken from magazines and organized on boards. It should be thorough yet succinct.

It must be legible and clear graphically when viewed from a distance of at least 8'.

It shall include a Bibliography of all sources that you have found on the subject design/building.

Projects:

1. Village Homes and the Greening of Harlem
2. Way Station, Frederick, Maryland by Greg Franta
3. Rocky Mountain Institute by Steve Conger for Amory Lovins
4. National Resources Defense Council, New York City, Croxton Collaborative.
5. Audobon House, NYC, Croxton Collaborative
6. NMB Bank, Netherlands.
7. Spring Lake Park Visitors Center, Santa Rosa, Ca. by Bowman
8. Boyce Thompson Southwest Arboretum Visitor Center, Superior, Arizona.
9. Center for Maximum Potential Building Systems, Laredo, Texas. "Blueprint Farm". Pliny Fisk III.
10. Biosphere III, Oracle, Arizona

DUE: Thursday, August 4, 1994 by 3:00 P.M. in the Architecture Office. Group review Friday, August 5 @ 9:30 a.m.

Pollution Prevention in Architecture
NATIONAL POLLUTION PREVENTION CENTER FOR HIGHER EDUCATION

Introduction to Sustainable Environmental and Resource Systems

Sally Lerner
ERS 218, Fall 1994
University of Waterloo

National Pollution Prevention Center for Higher Education • University of Michigan
Dana Building, 430 East University, Ann Arbor MI 48109-1115
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Syllabus: Lerner
May 1996

University of Waterloo
Department of Environment and Resource Studies

ERS 218 Fall 1994

INTRODUCTION TO SUSTAINABLE ENVIRONMENTAL AND RESOURCE SYSTEMS

Instructor: Sally Lerner

Teaching Assistants: Carmen Everest, Sheldon Smith

Prerequisite: 2nd year standing. Priority will be given to those for whom it is required

Lecture: Thursday, 2:30-4:30 pm, EL 103

Tutorials: All students attend their first tutorials the week of Sept. 19-23. Thereafter, follow the alternate-week A/B pattern below, as noted in the Course Schedule.

Sect.01	1:30	T ES1-353	A
02	1:30	T ES1-353	B
03	12:30	T ES1-353	A
04	12:30	T ES1-353	B
05	11:30	M AL 208	A
06	1:30	M AL 208	B
07	9:30	F AL 208	A
08	2:30	W ES1-225	B
09	9:30	R ES1-353	A
10	9:30	R ES1-353	B
11	10:30	R HH 123	A
12	10:30	R HH 123	B

Background and Objectives of the Course

The concept of "sustainable development" has served as both a catalyst and framework for public and political discussion of environmental issues. The original phrase was "environmentally sustainable development", but the first word is, unfortunately, routinely omitted. For some people, "sustainable development" is seen a rallying point from which to make progress toward a more environmentally sustainable society. Others suspect it is sometimes used as window dressing to disguise "business as usual." In all cases the concept engenders controversy, as perhaps it was intended to do. Always stimulating is the ongoing debate about how developed, as well as developing, countries should seek to become more environmentally sustainable.

This course has three main objectives:

1. To examine critically the concept of environmentally sustainable development, from historical and theoretical perspectives;

2. To identify ways in which community-level systems such as water, energy, waste management, shelter and transportation, which serve basic human needs, can be made more sustainable; and

3. To engage students in the design of sustainable communities.

Organization of the Course

In the first weeks of the course, the concept of environmentally sustainable development will be introduced. A look at the history of the idea will be followed by an overview of critiques of the concept. Design criteria for sustainability will also be explored.

The balance of the course will examine what environmental sustainability looks like in action. While national and international examples will be presented, the emphasis will be on designing for sustainability at the community/regional level in North America. What we can learn from

others' experiences, including those in developing countries, will be of particular interest.

The formal tutorial sessions, which will be attended in alternate weeks by each student, will allow for student-led discussion of the lecture ideas and issues in greater depth. In the weeks when students are not scheduled for formal tutorials, the tutorial groups are expected to meet independently to pursue their work on the major assignment, "Designing an Environmentally Sustainable Community".

Texts and Other Material

There are three texts for the course:

(1) A book by journalist Michael Keating, *The Earth Summit's Agenda for Change: A Plain Language Version of Agenda 21 and the Other Rio Agreements* (Geneva: Centre for Our Common Future, 1993. Available from the UW Bookstore ($12.85+GST);

(2) *Regeneration: The Report of the Royal Commission on the Future of the Toronto Waterfront (1992).* This project adopted an ecosystem approach to sustainability for the Greater Toronto Region, and represents an important application of the concepts in ERS 218 at the regional level. Available in ES1-212 ($2.00) Assigned reading for November 3/94 as well as for use as a resource document.

(3) *ERS 218 Course Notes*, which provides background information related to the lectures and the assignments. Tutorial discussions and assignments will also draw on these readings. Available from the UW Bookstore ($28.04)

A number of books have been placed on Reading Room Reserve (ERS 218) in the Arts Library. These materials will serve as additional resources for both the individual written assignment and the the major community design assignment. A list of the weekly required readings and of Reserve material is attached to this course outline.

ERS 218 Course Schedule

Date	Topic
Sept. 15	Introduction to the Course; The Concept of Sustainability Video: "Conversation for a Sustainable Society"
Sept. 19-23	Tutorials: Organization of student tutorial contributions ALL STUDENTS ATTEND TUTORIALS THIS WEEK
Sept. 22	Background: George Francis - Historical Perspectives on Sustainable Development Comment: Sally Lerner - Sustainable Development: Critiques and Prospects
Sept. 26-30	[A] Tutorials: Discussion of historical perspectives/ critiques/prospects
Sept. 29	Lecture: George Francis - Design Criteria for Sustainability Video: "Environmental Design
Oct. 3-7	[B] Tutorials: Discussion of historical perspectives/ critiques/perspectives
Oct. 6	Case Reports: Designing Sustainable Communities • Guelph 2000 •K-W Green Community Project
Oct. 10-14	[A] Tutorials: Developing indicators for ecological and social sustainability
Oct. 13	**Lecture: Sehdev Kumar - Learning From the "Third World" Video: "Learning from Ladakh"**
Oct 17-21	[B] Tutorials: Developing indicators for ecological and social sustainability
OCT. 20	**ASSIGNMENT 1 DUE**
Oct. 20	Lectures: Susan Sauve - Managing Waste in the City of Waterloo; Jim Robinson - Managing Water in the Region of Waterloo
Oct. 24-28	[A] Tutorials: Issues related to local waste and water management systems

Oct. 27	Lecture: Ann Dale - National Initiatives for Sustainability: The National Round Table on the Environment and the Economy
Oct. 31- Nov. 4	[B] Tutorials: Issues related to local waste and water management systems
Nov. 3	Lecture: Tia Luste (Waterfront Regeneration Trust) - Regional Initiatives for Sustainability: The Royal Commission on the Future of the Toronto Waterfront
	Video: "Introduction to Ecological Economics"
Nov. 7-11	[A] Tutorials: Relating the Royal Commission recommendations to national and local sustainability efforts
Nov. 10	**Overview: Patti Cook - Sustainable Systems on Campus**
Nov. 14-18	[B] Tutorials: Relating the Royal Commission recommendations to national and local sustainability efforts
Nov. 17	**Lecture: Tom Beechey (Ontario Ministry of Natural Resources) Natural Areas Management for Sustainability**
Nov. 21-25	NO FORMAL TUTORIALS
Nov. 24	**ASSIGNMENT 2 PRESENTATIONS**: 2:30-4:30 pm, EL 103
Nov. 29- Dec. 1	**ASSIGNMENT 2 PRESENTATIONS:** scheduled in Tutorial hours
Dec. 1	Course Wrap-up and Feedback Session
DEC. 5	**WRITTEN ASSIGNMENT 2 DUE**

September 15:
Introduction to Sustainable Development

1. World Commission on Environment and Development, *Our Common Future*, Oxford University Press, 1987, pp. 1-23.

2. Robinson, John, et al, "Defining a Sustainable Society: Values, Principles and Definitions", *Alternatives*, 17:2, July/August 1990, pp. 36-46.

3. Keating, Michael, *The Earth Summit's Agenda for Change: A Plain Language Version of Agenda 21 and the other Rio Agreements*, Geneva: Center for Our Common Future, 1993, pp. v-1 TEXTBOOK - NOT IN COURSE READER

For September 22:
Historical Perspectives on Sustainable Development

1. MacNeill, Jim, "Strategies for Sustainable Economic Development", *Scientific American*, 261(3), September, 1989, pp. 155-165.

2. Orfald, David and Robert Gibson, "The Conserver Society Idea: A History with Questions", *Alternatives* 12(3/4), Spring/Summer, 1985, pp. 37-44).

3. Francis, George, Introduction to Sustainable Environment and Resources Systems. Copies of overhead transparencies for the lecture "Historical Perspectives on Sustainable Development".

Sustainable Development: Critiques and Prospects

1. Nikiforuk, Andrew, "Sustainable Rhetoric", *Harrowsmith*, Sept.-Oct. 1990, pp.14-16.

2. Gibson, Bob, "Should Environmentalists Pursue Sustainable Development?", *Probe Post*, Winter, 1991, pp. 22-25.

3. Korten, David, "Sustainable Development: Conventional versus Alternative Wisdom", *Human Economy*, Vol. 14/2, Summer 1994, pp. 1,8,14

4. Goodland, Robert, Herman Daly, Salah El Serafy and Bernd von Droste, "Introduction", in Robert Goodland et al, *Environmentally Sustainable Economic Development*, Paris: UNESCO, 1991, pp.9-13

5. Brown, Lester R., Sandra Postel, and Christopher Flavin, "From Growth to Sustainable Development" in Robert Goodland et al, *Environmentally Sustainable Development*, Paris: UNESCO, 1991, pp. 93-98

For September 29:
Design Criteria for Sustainability

1. Slocombe, D. Scott, and Caroline Van Bers, "Ecological Design Criteria for a Sustainable Canadian Society".*The Environmentalist,* Vol. 12/4, 1992, pp. 243-254.

2. Lerner, Sally, "Socio-Political Design Criteria for a Sustainable Canadian Society". Working Paper No. 3, Sustainable Society Project, Department of Environment and Resource Studies, University of Waterloo, July 22, 1991, pp. 1-15.

3. Wackernagel, Mathis et al, *How Big is Our Ecological Footprint?*, Vancouver:Univ. of British Columbia, n.d.

For October 6:
Designing Sustainable Communities

1. Environmental Education Dossiers, *Cities* , Barcelona, Spain: Centre UNESCO de Catalunya, 1994, pp.1-8

2. Roseland, Mark, "Toward Sustainable Communities" in Mark Roseland, *Toward Sustainable Communities: A Resource Book for Municipal and Local Governments* , Ottawa: National Round Table on the Environment and the Economy (NRTEE), 1992, pp. 21-54

3. Baum, Frances E., "Healthy Cities and Change: Social Movement or Bureaucratic Tool?" *Health Promotion International*, Vol. 8/1, 1993, pp. 31-40.

For October 13:
Learning from the "Third World"

No assigned readings. Time to review, browse other sources

For October 20:
Basic Community Systems - Waste and Water

1. Roseland, Mark, "Energy Conservation and Efficiency "(Ch.6), "Solid and Hazardous Waste Reduction and Recycling" (Ch.7), "Water and Sewage" (Ch.8) in Mark Roseland, *Toward Sustainable Communities*, Ottawa: NRTEE, 1992, pp. 153-199.

2. Robinson, J.E., et.al., "Integrating Demand Management of Water/Wastewater Systems: Where Do We Go From Here?", *Canadian Water Resources Journal*, 9 (4), 1984, pp. 29-36.

For October 27:
National Initiatives for Sustainability

1. Doering, Ron, *Canadian Round Tables on the Environment and the Economy: Their History, Form and Function*, Working Paper, for discussion, September 1993

2. National Round Table on Environment and Economy, *Annual Review*, Ottawa, 1992-93.

3. Government of Canada, *Canada's Green Plan in Brief - A Summary of Canada's Green Plan for A Healthy Environment*, Ottawa, 1990

4. Doern, G. Bruce, "Shades of Green: Gauging Canada's Green Plan", C.D. *Howe Institute Commentary*, No. 29, April 1991, pp. 1-11.

November 3:
Regional Initiatives for Sustainability

1. Royal Commission on the Future of the Toronto Waterfront, *Regeneration - Toronto's Waterfront and the Sustainable City*: Final Report, Ottawa: Supply and Services Canada, 1992, pp. vii-61. Note also specific examples of regions and cities. TEXTBOOK-NOT IN READER

November 10:
Sustainable Systems on Campus

No assigned readings

November 17:
Natural Areas Strategies for Sustainability

1. Riley, John L. and Pat Mohr, *The Natural Heritage of Southern Ontario's Settled Landscapes: A Review of Conservation and Restoration Ecology for Land-Use and Landscape Planning*, Aurora, Ontario: Ontario Ministry of Natural Resources, Southern Region, 1994, Abstract, Contents and pp.1-5, 32-33, 53-55

2. Gowdy, John M., "Progress and Environmental Sustainability", *Environmental Ethics*, Vol.16/1, Spring 1994, pp. 41-55.

SALLY LERNER
ASSIGNMENTS FOR ERS218

Assignments and Evaluation

Students will complete (1) an individual written assignment and (2) a major "Environmentally Sustainable Community Design" assignment working with other members of the tutorial group (written report and final presentation). In addition, each student will (3) assist in leading one tutorial discussion. Active participation in the tutorial discussions is, of course, expected.

Assignment 1. (25%) Individual written assignment
Due Oct. 20/94 by 12 NOON in ES1-212.

Select one of the following:

1. *Can a consumer society become environmentally sustainable?*
State your answer and write a two-page rationale for that answer (word-processed, double-spaced), providing references from the readings assigned through Oct. 13/94 and additional sources you have consulted.

OR

2. Locate information on a specific existing community-level sustainability initiative (not a whole community-wide program) in any community you choose. Write a two-page paper (word-processed, double-spaced) describing the initiative in one-half page and devoting the remainder to evaluating its objectives and effectiveness in terms of the readings assigned through Oct. 13/94 and additional sources you have consulted.

Assignment 2. (50%)
Designing an Environmentally Sustainable Community

The members of each tutorial group will work together to develop: (1) a **design** for a sustainable community similar in size to Kitchener-Waterloo and (2) a **plan** for making implementation of the design possible (Hint: think actor systems, legislation, incentives and disincentives.)

The two Assignment 2 products will be:

• (**30%**) A word-processed document covering (1) and (2) above, 20 double-spaced pages maximum, excluding illustrations and appendices. This

document must be referenced appropriately and prepared to a standard of quality that would allow it to be displayed in a public place such as a library. **DUE DEC. 5/94 BY 4PM IN ES1-212**

• **(20%)** A formal presentation of the Sustainable Community Design material (15 minutes) such as might be made to a city council. Visuals and handouts are expected. **SCHEDULED NOV. 24-DEC.1/94**

Excellence and orginality of content and presentation will be important criteria in marking these two products. Allocation of the mark to reflect different levels of individual effort will be an option.

Assignment 3. Leading a tutorial presentation (25%)

Students, working in pairs, will prepare discussion questions for the tutorial sessions. Each team will organize and lead one tutorial discussion. The team will prepare, as a handout, a one-page summary (it can be in point form) of the ideas they want to develop in the discussion. The tutorial themes are listed in the course schedule below. Students will consult with their tutorial leader on the scope and focus of their tutorial. Tutorial dates will be assigned at the first tutorial session.

Active tutorial participation

Students should demonstrate through their comments and questions a good understanding of the ideas and issues under consideration.

Pollution Prevention
in Architecture
NATIONAL POLLUTION PREVENTION CENTER FOR HIGHER EDUCATION

Environmental Resources Design

Rob Pena
Arch 407/507, Spring, 1994
University of Oregon

National Pollution Prevention Center for Higher Education • University of Michigan
Dana Building, 430 East University, Ann Arbor MI 48109-1115
Phone: 313.764.1412 • Fax: 313.936.2195 • E-mail: nppc@umich.edu

Syllabus: Pena
May 1996

ENVIRONMENTAL RESOURCES DESIGN

Values, Practice and Policies of Sustainability and Architecture

DEPARTMENT OF ARCHITECTURE
School of Architecture and Allied Arts
University of Oregon

COURSE: ARCH 407/507 - Spring, 1994 ❦ CRN 31227, 3 Credits

INSTRUCTOR: Rob Peña - 202A Pacific, ext. 6-3663

PLACE: Tuesdays and Thursdays 2:00 – 3:20 PM, 279 LA

REQUIRED TEXTS: Course Reader (Campus Copy Center: Class Packet #199, $18.00)
REDI Guide (University Book Store: $13.20)

OVERVIEW

The human footprint on the global environment is most directly represented by our buildings. They are responsible for over a third of national energy use and may be the largest single repository of resources worldwide. The next generation of designers is poised to play, one way or the other, a pivotal role in the world's environmental future. This course will examine the evolving role of architecture in the design and creation of a more sustainable future. Our objective is to become better equipped to make use of both the methods and materials that will minimize the impact buildings and communities have on the biosphere. As both citizens and professionals our study will address the policies, regulations and other legal mechanisms used to guide the construction of buildings and the creation of communities.

COURSE OUTLINE

This broad-based inquiry will rest on a foundation of ethics and values underpinning our work as designers, and tested against the policies which govern our current use of the commons. We will develop our inquiry as follows:

I. A VIEW FORM THE EARTH
The Health of the Planet
- Carrying capacity
- Exponential growth in a finite environment
- Architecture: buildings and their environmental impact

II. A HOME ON EARTH
History, Ethics, Values, and Economic Philosophies
- The final settling of the West: the end of the frontier
- The rights of nature
- The ethics of sustainability

III. DESIGNING WITH NATURE
Architecture and Environmental Resources
- Architectural design and the conservation of resources
- Alternative methods and means of construction
- Making sustainable communities

outline of sustainability

Syllabus
ARCH 407/507

IV. PROTECTING THE COMMONS
Policy, Law, and the Global Community
- The role of law
- Regulations and codes
- Design guidelines

OBJECTIVES

- To gain an increased understanding of the scale, complexity, and interconnected nature of the global environmental situation.
- To examine contemporary western perspectives on the environment in light of other perspectives across time and place, and informed by an understanding of the history of development in the western United States.
- In response to these exploration, to provide a medium for the continued development of personal ethics as well as the values and responsibilities that guide our approach to professional practice, ethics that are compatible with the goals of a sustainable society.
- To contribute to the ongoing efforts of our school and the profession to practice architecture with greater environmental and social responsibility.

RESPONSIBILITIES

Active participation is expected of all seminar members. This includes both participation and facilitation of discussions, completion of assigned investigations/exercises, and thoughtful analysis of readings and presentations.

A term project based on one or more of the course topics outlined above will be completed by the end of finals week. This may take the form of a research paper or it could involve research that results in a new article for the REDI Guide. A project which is an extension of design work from a current or recent studio project is encouraged. A third area will be research in the area of codes and design guidelines promoting environmentally responsive, landscape-sensitive community designs. These options will be discussed during the second week of the term, and research/project proposals will be submitted during the third week.

RECOMMENDED BOOKS

The following books, available at the book store, are recommended additions to the required readings for this course:

Brown, Lester R. Saving the Planet *How to shape an environmentally sustainable global economy*. New York: W.W. Norton and Company, The Worldwatch Institute, 1991.

Brown, Lester R., et.al. State of the World 1994. New York, W.W. Norton & Company, 1994.

Calthorpe, Peter. The Next American Metropolis: Ecology, Community, and the American Dream. New York: Princeton Architectural Press, 1993.

Also available at the University of Oregon bookstore:

Dobson, Andrew, ed. The Green Reader: Essays Toward a Sustainable Society. San Francisco: Mercury House, 1991.

Vale, Brenda and Robert. Green Architecture: Design for an Energy-conscious Future. Boston: Little, Brown and Company, 1991.

Pearson, David. The Natural House Book: *Creating a healthy, harmonious, and ecologically-sound home environment.* New York: Simon & Schuster Inc., 1989.

FOR FURTHER READING

Bateson, Gregory. Mind and Nature: A Necessary Unity. New York: E.P.Dutton, 1979.

Berry, Wendell. What are People For? San Francisco: North Point Press, 1990.

Black Elk. Black Elk Speaks: Being the Life Story of a Holy Man of the Ogalala Sioux as told to John G. Neihardt (Flaming Rainbow). New York: W. Morrow and Company, 1932.

Brown, Lester R. Building a Sustainable Society. New York: W.W. Norton and Company, The Worldwatch Institute, 1992.

Carson, Rachel. Silent Spring. New York: Fawcett Crest, 1962.

Hayes, Denis. Rays of Hope: The Transition to a Post-Petroleum World. New York: W.W. Norton and Company, The Worldwatch Institute, 1984.

Leopold, Aldo. A Sand County Almanac. Oxford University Press, Inc., 1966.

Lyle, John Tillman. Design for Human Ecosystems: Landscape, Land Use, and Natural Resources. New York: Van Norstrand Reinhold, 1985.

McHarg, Ian L. Design with Nature. New York: Doubleday & Co., Inc., 1971.

Nash, Roderick Frazier. The Rights of Nature: A History of Environmental Ethics. Madison: University of Wisconsin Press, 1989.

Sessions, Bill, and Devall, George. Deep Ecology: Living as if Nature Mattered. Layton, Utah: Gibbs Smith, 1985.

Shabecoff, Philip. A Fierce Green Fire: The American Environmental Movement. New York: Hill and Wang, 1993.

Snyder, Gary. The Practice of the Wild. San Francisco: North Point Press, 1990.

Van der Ryn, Sim, and Calthorpe, Peter. Sustainable Communities: A New Design Synthesis for Cities, Suburbs and Towns. San Francisco: Sierra Club Books, 1986.

COURSE READER

PART I A VIEW FROM THE EARTH
The Health of the Planet

1 - 20 Postel, Sandra. "Carrying Capacity: Earth's Bottom Line," State of the World 1994. New York, W.W. Norton & Company, 1994, Worldwatch Institute, pp. 3 - 21 (19 pages of 253).

21 - 34 World Commission on Environment and Development, Our Common Future. New York: Oxford Universtiy Press, 1987, pp. 1 - 23. (23 of 383 pages)

35 - 42 Harden, Garret, and Baden, John. "The Tragedy of the Commons," Managing the Commons. San Francisco: W.H.Freeman and Company, 1977, pp. 16 - 30 (15 pages of 293).

PART II A HOME ON EARTH
History, Ethics, Values, and Economic Philosophies

43 - 46 Stegner, Wallace. Where the Bluebird Sings to the Lemonade Springs. New York: Penguin Books USA Inc., 1992."A Letter to Wendell Berry," pp. 207 - 213.

47 - 54 Berry, Wendell. "Getting Along with Nature," Home Economics. San Francisco: North Point Press, 1987, pp. 6 - 20. (15 of 192 pages).

55 - 64 Attfield, Robin, The Ethics of Environmental Concern, "Ecological Problems." Athens, GA: University of Georgia Press, 1991, pp. 1 - 19 (20 pages of 249 including index).

65 - 72 Berry, Wendell. "Does Community Have Value?" Home Economics: San Francisco: North Point Press, 1987, pp. 179 - 192. (14 of 192 pages).

73 - 76 Berry, Wendell. "Conservation is Good Work." The Amicus Journal, a publication of the National Resourses Defense Council: New York, 40 West 20th St., 10011, Winter 1992, Volume 14, No. 1.

PART III DESIGNING WITH NATURE
Architecture and Environmental Resources

77 - 79 Van der Ryn, Sim. "From Patron Saints to Ecological Design." Annals of Earth, Volume VII, Number 1, 1989, pp. 12 - 13. (2 of estimated 60 pages.)

80 - 88 Koh, Jusuck. "Ecological Design: A Post-Modern Design Paradigm of Holistic Philosophy and Evolutionary Ethic." Landscape Journal, vol. 1, no. 2, 1982. The Board of Regents of the University of Wisconsin System.

89 - 94 Rees, William. Defining Sustainable Development research bulletin. Vancouver, British Columbia: Univ. of British Columbia Center for Human Settlements, May 1989. (7 of 7 pages.)

95 - 106 Sturges, Willam Gould. "Toward a Definition of Sustainable Construction Technologies: A framework of Performance Criteria Applied to Three Wooden Light-Frame Floor and Roof Framing Systems in the Cascadia Bioregion." Master's Thesis, University of Oregon, 1991, pp. 9 - 30.

107 - 108 Maser, Chris. "Ends and Means: Restoration and the Future of Land Management." Trumpeter Vol. 6, No. 3 / Summer 1989: 97-98 (2 of 120 pages)

109 - 110 Franklin, Jerry. "A Kinder, Gentler Forestry in Our Future: the Rise of Alternative Forestry." Trumpeter Vol. 6, No. 3, Summer 1989: 99-100. (2 of 120 pages)

111 Vieira, Robin. "Checklist for Sustainable Development." Solar Today, Sept./Oct. 1990: 12, American Solar Energy Society, in Boulder, Colorado. (1 of estimated 30 pages)

112 - 113 Wilson, Alex, ed. "Checklist for Environmentally Sustainable Design and Construction." Environmental Building News, 1:2 Sept./Oct. 1992: 8 - 9. (2 of 16 pages.)

114 - 116 Cole, Raymond and David Rousseau. "Environmental Aspects of Common Building Materials." Canadian Architect, March 1991, 22-23. (2 of estimated 70 pages.)

117 - 120 Wilson, Alex, ed. "Rigid Foam Insulation and the Environment," Environmental Building News, 1:21 July/August 1992, 1, 11-13.

PART IV PROTECTING THE COMMONS
Policy, Law, and the Global Community

121 - 134 Boyer, Barry B. "Building Legal and Institutional Frameworks for Sustainability," Buffalo Enviornmental Law Journal 63, 1993.

135 - 142 Ruckleshaus, "Toward a Sustainable World," Scientific American, September 1989, p. 166.

142 - 150 Hawken, Paul. "A Declaration of Sustainability." Utne Reader, Minneapolis, LENS Publishing Co., Inc., September/October 1993, pp. 54 - 61.

ENVIRONMENTAL RESOURCES DESIGN
Values, Practice and Policies of Sustainability and Architecture

DEPARTMENT OF ARCHITECTURE
School of Architecture and Allied Arts
University of Oregon

PRELIMINARY COURSE SCHEDULE
Spring 1994

WEEK/DATE	SEMINAR TOPICS	ASSIGNMENT *(due at the beginning of class)*
1. Tu., Mar. 29	PART I: A VIEW FROM THE EARTH • Course Introductions • Eco-test • Environmental Impact of Buildings	
Th., Mar. 31	• Exponential Growth • Discussion: *The Health of the Planet*	***Readings:*** Postel: "Carrying Capacity..." World Commission: "Our Common Future"
2. Tu., Apr. 5	• Discussion: *The Commons*	***Readings:*** Hardin: "Tragedy of the Commons" Stegner: "A Capsule History of Conservation" (to be handed out)
Th., Apr. 7	PART II: A HOME ON EARTH • Discussion: *Environmentalism* • Guest: Andy Johnson - the REDI Guide	
3. Tu., Apr. 12	• Discussion: *Ethics and Values*	***Readings:*** Berry: "Getting Along with Nature," and "Does Community Have Value?" Attfield: "Ecological Problems"
Th., Apr. 14	**Optional Field Trip**: Forum on wood use, Portland, 8:30 AM to noon. *Seminar will meet at regular time* • Architecture and environmental values • Visit GIS laboratory	
4. Tu., Apr. 19	**Guests**: Polly Welch and Ginger Cartwright • Professional Values • Identification of how sustainability can be addressed in architecture.	***Reading:*** Berry: " Conservation is Good Work"
Th., Apr. 21	**Guest**: Richard Britz • Practicing sustainable design • Critique of the Idaho Project	

5.	Tu., Apr. 26	PART III: DESIGNING WITH NATURE • Discussion: *Environmental Resources* • Criteria for environmental design	***Readings:*** Van der Ryn: "From Patron Saints..." Koh: "Ecological Design..." Rees: "Defining Sustainable Design..."
	Th., Apr. 28	**Field Trip:** Cerro Gordo Sustainable Community and Engineered Wood Products Facility, Saginaw.	
6.	Tu., May 3	**Guests**: Kelly Lerner, Mark Serhus: *Straw Bale Construction* • The REDI guide • Alternative construction materials and methods for the Willamette Valley	***Readings:*** Sturges: "Toward a Definition..." Maser: "Ends and Means..." Franklin: "A Kinder, Gentler Forestry..."
	Th., May 5	**Field Trip:** Weyerhaeuser Particle Board Facility and Full Spectrum Recycling Facility	
7.	Tu., May 10	**Guests**: Kyle Anderson and *Downtown Eugene Design Team(s)* • Sustainability in Urban Design	***Readings:*** Cole, Rousseau: "Environmental Aspects..." Viera: "Checklist for Sustainable..." Wilson: Checklist for Design...
	Th., May 12	**Guests**: Jim Goddard (METRO) and Mike O'Brien • Building re-use and recycling • Healthy Houses	
8.	Tu., May 17	**Guests**: G.Z. Brown, Don Corner, and Ron Kellet • Manufactured Housing • Design Tools	***Readings:*** Boyer: "Building Legal and Institutional..." Ruckleshaus: Toward a Sustainable World"
	Th., May 19	PART IV: PROTECTING THE COMMONS • Discussion: *Regulations and Policies* • Design Guidelines	
9.	Tu., May 24	**Guest**: Robin Collin (School of Law) • The Right to Sustainability • Public Policy	***Reading:*** Hawken: "A Declaration of Sustainability"
	Th., May 26	• Discussion: *The Next Step* • The Future of the Profession • The *Guardian Role* in Architecture	
10.	Tu., 5/30 - 6/3	STUDIO REVIEW WEEK	
11.	Tu., June 6 - 10	FINAL EXAMS • Final Projects due Thursday, June 8, 5:00 P.M.	

Pollution Prevention in Architecture
NATIONAL POLLUTION PREVENTION CENTER FOR HIGHER EDUCATION

Preservation Technology and Building Rehabilitation

Robert A. Young
Arch-558, Winter 1994
University of Utah

National Pollution Prevention Center for Higher Education • University of Michigan
Dana Building, 430 East University, Ann Arbor MI 48109-1115
Phone: 313.764.1412 • Fax: 313.936.2195 • E-mail: nppc@umich.edu

Syllabus: Young
May 1996

Winter, 1994
GRADUATE SCHOOL OF ARCHITECTURE
UNIVERSITY OF UTAH
Professor: Robert A. Young, P.E.

COURSE OUTLINE

DESCRIPTION

This course provides the foundation for documenting, evaluating, and planning the rehabilitation and/or restoration of historic buildings by introducing the student to historic building materials and technologies; the Secretary of Interior's Standards for Historic Preservation; economic incentives for preservation; and general approaches to the rehabilitation of historic buildings. The domain of this course includes buildings built in the United States from the late 17th century through the early 20th century.

OBJECTIVES

The objectives of this course are to teach the student to understand:

- the procedures for planning a rehabilitation project from a preservationist's perspective;
- the mechanics of producing an historic structures report;
- the role of the Secretary of Interior's Standards for Historic Preservation in the rehabilitation process;
- the evolution of building technology in the United States from the late 17th century to the early 20th century;
- the process of identifying, rehabilitating and/or maintaining materials commonly found in historic buildings;
- the technological development, use, and maintenance of building systems commonly found in historic buildings;
- the economic incentives available for rehabilitating historic buildings;
- the restoration techniques in common use today;
- the environmental safety issues related to the rehabilitation of buildings;
- the effect of building codes on the use, operation, and maintenance of historic properties in the future;
- the resources available for preservation/rehabilitation planning activities.

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ORGANIZATION

Class Hours: 6:30 - 9:30 P.M., Room 228 AAC, Thursdays. Attendance is mandatory.

Class Assignments: The following assignments will be given:

(1) Topic Bibliographic Review
(2) Field Project (Historic Structures Report)
(3) Field Project Presentation

Office Hours: Room 240 AAC, Tuesdays and Thursdays 11:00 A.M.-Noon; other times by appointment.

Examination: The midterm exercise is scheduled for February 10, 1994.

Site Visits: As part of the midterm exercise, the class will be visiting a house currently in the process of preservation planning. The site visit will be Saturday February 5, 1994.

The class will also visit the Salt Lake City City-County Building on Saturday March 5, 1994

Attendance for both site visits is mandatory.

Grading: Final grades will be determined from the accumulation of points as follows:

Topic Bibliographic Review	30 points
Midterm Exercise	20 points
Field Project Report	40 points
Field Project Presentation	10 points
Total	100 points

Grades will be assigned as follows:

Points	Grade	Points	Grade
96-100	A	65-69	C
90-95	A-	60-64	C-
85-89	B+	55-59	D+
80-84	B	50-54	D
75-79	B-	45-49	D-
70-74	C+	0-44	E

Text: Conserving Buildings A Guide to Techniques and Materials, by Martin Weaver; published by John T Wiley, 1993.

Other Readings: Available at the Reserve Desk at Marriott Library

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TOPIC SCHEDULE

Date	Subject
January 6	Introduction Course Agenda Department of Interior Standards Building Inspection/Documentation Overview of Historic Construction Methods Structure, Framing, and Foundations
January 13	Exterior Materials - Part 1 Walls Roofs Cladding/Finishes/Veneers
January 20	Exterior Materials - Part 2 Ornamentation Doors Windows
January 27	Building Exterior Elements and Site Features Porches/Entranceways Lighting Landscaping
February 3	Interior Materials Wall Finishes Floor Coverings Ceilings
February 10	**Midterm Exercise**
February 17	Building Systems Plumbing Heating/Cooling Lighting
February 24	Current Issues in Preservation Technology - Part 1 Economics Energy Conservation Maintenance
March 3	Current Issues in Preservation Technology - Part 2 Safety Fire Protection Accessibility Catastrophe Planning
March 10 &17	**Presentations of Field Projects**

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READINGS & ASSIGNMENT SCHEDULE

Date	Subject
January 6	Introduction to Preservation Technology Required:Weaver: 1-11; Morton: v-xii. Review: TPS; Preservation Briefs; Preservation Tech Notes. Suggested: Morton: 47-52; Kay: 1-47; Simmons: 3-57; London: 25-41, 63-87; Shivers: 57-89; Nash: 14-43, 103-129, 173-219.
January 13	Exterior Materials - Part 1 Required: Weaver: 12-98, 161-174 239-253 Suggested: Morton: 1-28; McKee: 7-79; London: 42-62, 89-193; Nash: 131-171,189-205; Plumridge: 162-202. **Topic Bibliographic Review Confirmation Due**
January 20	Exterior Materials - Part 2 Required: Weaver: 99-147, 232-8; 232-238 Suggested: McKee: 81-89; NYCLC: 97-164; Nash: 73-189; **Field Project Subject Property Confirmation Due**
January 27	Building Exterior Elements and Site Features Required: Weaver: 175-215; Suggested: Morton: 29-46, 67-74; Kahn: 77-124; Nash: 207-219.
February 3	Interior Materials Required: Weaver: 147-160, 216-231, 260-264; Suggested: Morton: 53-60; Shivers: 91-183; Nash: 220-61. **Site visit: Saturday, February 5, 1994.**
February 10	**Midterm Exercise** **Topic Bibliographic Review: Due at start of class.**
February 17	Building Systems Required: None Suggested: Kay: 49-263; Morton: 61-66; Elliott; Konzo: 125-36, 203-214; 239-244; Nash: 263-331.
February 24	Current Issues in Preservation Technology - Part 1 Required: Maddex: 40, 92-94, 102-107; ACHP-2: 1-14. Suggested: Morton: 83-94.
March 3	Current Issues in Preservation Technology - Part 2 Required: ACHP-1: 1-22. Suggested: Morton: 95-104; Nelson. **Site Visit: Saturday, March 5th.** **Field Project: Due Monday, March 7th, by 5:00 P.M.**
March 10&17	**Presentations of Field Projects**

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RESERVE READINGS

Notation in parenthesis indicates Marriott Library Call Number.

Required:

Advisory Council on Historic Preservation [ACHP-1]. Fire Safety Retrofitting in Historic Buildings. Washington: Government Printing Office, 1989. (DOC Y3.H62:2F51)

_____ [ACHP-2]. Preservation and Energy Conservation. Washington: Government Printing Office, 1992. (DOC Y3.H62:2P92)

Maddex, Diane (gen. ed.). Landmark Yellow Pages. Washington: Preservation Press, 1990. (E159.L28)

Morton, W. Brown; Hume, Gary; Weeks, Kay and Jandl, H. Ward. The Secretary of Interior's Standards for Rehabilitation and Illustrated Guidelines for Rehabilitating Historic Buildings.Washington: Government Printing Office, 1992. (DOC I29.9/2:R26/992)

U.S. Department of the Interior/National Park Service. Preservation Briefs. (see below)

_____. Preservation Tech Notes. (see below)

Technical Preservation Services [TPS]. Interpreting the Secretary of the Interior's Standards for Rehabilitation, Volume II. Washington: Government Printing Office, 1985. (DOC I29.2:R26/V.2)

Weaver, Martin. Conserving Buildings A Guide to Techniques and Materials. New York: John Wiley & Sons, 1993. (NA105.W43)

Suggested:

Elliott, Cecil. Technics and Architecture. Cambridge MA: MIT Press 1993. (TH18.E45)

Kahn, Renee, with Meagher, Ellen. Preserving Porches. Washington: Preservation Press, 1990. (NA8375.K34)

Kay, Gersil Newmark. Mechanical & Electrical Systems for Historic Buildings. New York: McGraw-Hill, 1992. (TH6021.K29)

Konzo, Seichi, with MacDonald, Marylee. The Quiet Indoor Revolution. Champaign IL: Small Homes Council-Building Research Council, 1992. (TH7226.K65)

London, Mark. Respectful Rehabilitation: Masonry How to Care for Old and Historic Brick and Stone. Washington: Preservation Press, 1988. (TH199.L66)

McKee, Harley J. Introduction to Early American Masonry, Stone, Brick, Mortar, and Plaster. Washington: Preservation Press, 1973. (TH1199.M2)

Morton, W. Brown; Hume, Gary; Weeks, Kay and Jandl, H. Ward. The Secretary of Interior's Standards for Rehabilitation and Illustrated Guidelines for Rehabilitating Historic Buildings. Washington: Government Printing Office, 1992. (DOC I29.9/2:R26/992)

Nash, George. Renovating Old Houses. Emmaus PA: Taunton Press, 1992. (TH4817.N38)

Nelson, Carl. Protecting the Past from Natural Disasters. Washington: Preservation Press, 1991. (TH441.N45)

New York City Landmarks Commission. Repairing Old and Historic Windows. Washington: Preservation Press, 1992. (TH2275.R47)

Plumridge, Andrew, and Meulenkamp, Wim. Brickwork. New York: Harry Abrams, 1993. (TH1301.P55)

Shivers, Natalie. Respectful Rehabilitation: Walls and Molding How to Care for Old and Historic Wood and Plaster. Washington: Preservation Press, 1990. (TH2239.S45)

Simmons, H. Leslie. The Architect's Remodeling, Renovation, & Restoration Handbook. New York: Van Nostrand-Reinhold, 1989. (NA106.S57)

Winkler, Gail Caskey. Well Appointed Bath. Washington: Preservation Press, 1989. (TH6255.W44)

Supplemental:

Ashurst, John and Ashurst, Nicola. Practical Building Conservation: English Heritage Technical Handbook. Vol. 1, Stone Masonry. New York: John Wiley & Sons, 1988. (TH3351.A84)

_____. Practical Building Conservation: English Heritage Technical Handbook. Vol. 2, Brick, Terracotta & Earth. New York: John Wiley & Sons, 1988. (TH3351.A84)

_____. Practical Building Conservation: English Heritage Technical Handbook. Vol. 3, Mortars, Plasters & Renders. New York: John Wiley & Sons, 1988. (TH3351.A84)

_____. Practical Building Conservation: English Heritage Technical Handbook. Vol. 5, Wood, Glass & Resins. New York: John Wiley & Sons, 1988. (TH3351.A84)

Feilden, Bernard M. Conservation of Historic Buildings. London: Butterworths Scientific, 1982. (NA109.G7)

Frieland, Edward P. Antique Houses Their Construction and Restoration. New York: Dutton Studio Books, 1990. (TH4817.F75)

Hutchins, Nigel. Restoring Houses of Brick & Stone. New York: Van Nostrand Reinhold, 1982. (TH4816.H88)

Litchfield, Michael. Renovation. Englewood Cliffs: Prentice-Hall, 1991. (TH4816.L57)

~~ARCH 557~~ARCH-558: Preservation Technology and Building [illegible]
Winter, 1994
GRADUATE SCHOOL OF ARCHITECTURE
UNIVERSITY OF UTAH
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U.S. Department of the Interior/National Park Service. Preservation Briefs.

DOC I29.84:1	"The Cleaning and Waterproof Coating of Masonry Buildings"
DOC I29.84:2	"Repointing Mortar Joints in Historic Brick Buildings"
DOC I29.84:3	"Conserving Energy in Historic Buildings"
DOC I29.84:4	"Roofing for Historic Buildings"
DOC I29.84:5	"Preservation of Historic Adobe Buildings"
DOC I29.84:6	"Dangers of Abrasive Cleaning to Historic Buildings"
DOC I29.84:7	"The Preservation of Historic Glazed Architectural Terra-Cotta"
DOC I29.84:8	"Aluminum and Vinyl Siding on Historic Buildings"
DOC I29.84:9	"The Repair of Historic Wooden Windows"
DOC I29.84:10	"Exterior Paint Problems on Historic Woodwork"
DOC I29.84:11	"Rehabilitating Historic Storefronts"
DOC I29.84:12	"The Preservation of Historic Pigmented Structural Glass"
DOC I29.84:13	"The Repair and Thermal Upgrading of Historic Steel Windows"
DOC I29.84:14	"New Exterior Additions to Historic Buildings: Preservation Concerns"
DOC I29.84:15	"Preservation of Historic Concrete: Problems and General Approaches"
DOC I29.84:16	"The Use of Substitute Exterior Materials on Historic Building Exteriors"
DOC I29.84:17	"Architectural Character: Identifying the Visual Aspects ..."
DOC I29.84:18	"Rehabilitating Interiors in Historic Buildings"
DOC I29.84:19	"The Repair and Replacement of Historic Wooden Shingle Roofs"
DOC I29.84:20	"The Preservation of Historic Barns"
DOC I29.84:21	"Repairing Historic Flat Plaster -- Walls and Ceilings"
DOC I29.84:22	"The Preservation and Repair of Historic Stucco"
DOC I29.84:23	"Preserving Historic Ornamental Plaster"
DOC I29.84:24	"Heating, Ventilating, and Cooling Historic Buildings..."
DOC I29.84:25	"The Preservation of Historic Signs"
DOC I29.84:26	"The Preservation and Repair of Historic Log Buildings"
DOC I29.84:27	"The Maintenance and Repair of Architectural Cast Iron"
DOC I29.84:28	"Painting Historic Interiors"
DOC I29.84:29	"The Repair, Replacement, and Maintenance of Historic Slate Roofs"
DOC I29.84:30	"The Preservation and Repair of Historic Clay Tile Roofs"

U.S. Department of the Interior/National Park Service. Preservation Tech Notes.

DOC I29.84/3:1	Temporary Protection Number 1 "Historic Stairways"
DOC I29.84/3-2:1	Historic Interior Spaces Number 1 "Preserving Historic Corridors in Open..."
DOC I29.84/3-2:2	Historic Interior Spaces Number 2 "Preserving Historic Building Corridors"
DOC I29.84/3-3:1	Museum Storage Collection Number 1 "Museum Storage ...Using Prefab..."
DOC I29.84/3: 9	Windows Number 9 "Interior Storm Windows: Magnetic Seal"
DOC I29.84/3-4:11	Windows Number 11 "Installing Insulating Glass in Existing Wood Sash..."
DOC I29.84/3-4:12	Windows Number 12 "Aluminum Replacements for Steel Industrial Sash"
DOC I29.84/3-4:13	Windows Number 13 "Aluminum Replacement Windows with Sealed Insul..."
DOC I29.84/3-4:14	Windows Number 14 "Reinforcing Deteriorated Wooden Windows"
DOC I29.84/3-4:15	Windows Number 15 "Interior Storms for Steel Casement Windows"
DOC I29.84/3-4:16	Windows Number 16 "Repairing and Upgrading ...Wooden Mill Windows"
DOC I29.84/3-4:17	Windows Number 17 "Repair and Retrofitting Industrial Steel Windows"
DOC I29.84/3-4:18	Windows Number 18 "Aluminum Replacement Windows W/True Divided..."
DOC I29.84/3-6:1	Exterior Woodwork Number 1 "Proper Painting and Surface Preparation"
DOC I29.84/3-6: 3	Exterior Woodwork Number 3 "Log Crown Repair and Selective Replace..."
DOC I29.84/3-7:1	Masonry Number 1 "Substitute Materials: Replacing...Serpentine Stone..."
DOC I29.84/3-7:2	Masonry Number 2 "Stabilization and Repair of Historic Terra-Cotta Cornice"
DOC I29.84/3-7:3	Masonry Number 3 "Water Soak Cleaning of Limestone"
DOC I29.84/3-8: 1	Metals Number 1 "Conserving Outdoor Bronze Sculpture"
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DOC I29.84/3-9:1	Mechanical Systems Number 1 "Replicating Historic Elevator Enclosures"
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