

Ecological Issues in Sustainability & the Built Environment

DCP 6205 | ARC 6680 • 03 Credits
School of Architecture | University of Florida

Summer 2025

Class Meeting: Attendance is required
Day: Wednesday
Time: T-Th 3:00pm to 5:30pm EDT
Room: Zoom Meeting (see Canvas portal for link)
MIRO Board:
https://miro.com/app/board/uXjVl4okdHw=?share_link_id=594358662009

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Office Hours: by appointment

Course Description: Design challenges are investigated through theoretical, conceptual, and practical applications of architecture that are responsive and linked to ecology, energy, and resource systems through analytical and speculative inquiry.

In memory of Artist, Architect, and Emeritus Professor Ira Winarsky

It is not the strongest of the species that survives, nor the most intelligent. It is the one that is the most adaptable to change.

Charles Robert Darwin, Naturalist

...architecture is conceivable in its contradictory task only through understanding it as a poetic manifestation; poetic imagery is capable of overcoming contradictions of logic through its polyvalent and synthetic imagery. As Alvar Aalto once wrote: 'In every case [of creative work] one must achieve the simultaneous solution of opposites. Nearly every design task involves tens, often hundreds, sometimes thousands of different contradictory elements, which are forced into a functional harmony only by [wo]man's will. This harmony cannot be achieved by any other means than those of art'.

Juhani Pallasmaa

There is no reflective ego at one end of the creative process, and no completed and immutable work at the other end. There is instead a poetic force, initially directed by the poet-maker (perhaps at random or guided by his or her life project), but necessarily recreated by the spectator-participant. The poet in love is the only one who is capable of revealing the truth.

Alberto Pérez-Gómez

Introduction

Students will explore the relations and interactions among humans and the environments in which they dwell – the metabolic, the natural, and the built. Humans have uniquely harnessed and deployed energy reserves, materials, and natural resource flows to create what James Marston Fitch refers to as the 'Third Environment' – Architecture – interposed between humans and nature. Architecture allowed early humans free themselves from the intensities and stresses of the natural environment – hot, cold, wind, rain. This 'comfort' germinated and nurtured the evolution of a civilized humanity with a highly technical support infrastructure and sophisticated social order. In this evolution of aesthetically driven social culture, Architecture must go far beyond merely moderating environmental stresses. Architecture must also provide an inspiring and evolving typology of specialized cultural activity spaces – home, office, school, store, auditorium, laboratory, hospital bedroom, church, theater, plaza, street, etc. Yet, architecture must still mitigate the environmental stresses, must meet the functional and aspirational requirements of these evolving cultural spaces, and must also be a steward of limited environmental resources that are becoming scarce as they are mostly finite, and use is accelerating with global population growth and industrialization.

We shape our buildings; and afterwards our buildings shape us. Winston Churchill

At the onset of the 21st Century, scientists clearly understood and have made the case that there are: (1) measurable limits to our environmental resources; (2) significant effects from human action on the environment that are changing it in dramatic ways; and (3) that the impending consequences – warming of earth's atmosphere and/or subsequent sea level rise for example, are real and must be directly addressed. Rather than more 'sustainability' – as was the call for action in the later part of the 20th Century – 'resiliency' will guide us in the 21st Century. Resiliency, rather than expecting a sustained equilibrium, accepts inherent contradiction, conflict, and change and subsequently embraces challenges as opportunities for cultural advancement and enrichment. What is Architecture's role in the current phase of this evolution? And, how can individuals, as Architects, address and respond to this challenge in meaningful ways? This course will study these issues philosophically, conceptually, and practically, at multiple scales. Regionally, we will try to understand resources as an ecology (an interrelated system) and energy flow as a cyclical phenomenon. At the scales of site and architecture, we will seek to advance our ability to test and evaluate the interaction of theory and the experience of place and to then work back out to the larger scales of ideas and responses. At the scale of the individual, we will seek to understand the relationship between well-being, comfort, and architectural space. Working within and between these scales, we may gain better insights into humanity in terms of the ecologies of resources, architecture, and human well-being.

Content

Research, modeling, thinking, discourse and lectures are the modes of learning that will be employed. We will develop theoretical, conceptual, and practical insights into the relations between the architecture and context – local, regional, and global contexts such as climate, available energy, material resources, and other economic drivers.

Precedent analysis, measurements, drawing and modeling will be deployed toward developing an intuitive knowledge base and conceptual understanding of energy flows and stores. Precedent research will evaluate noted architectural projects with regard to embodied energy, resource use, and energy efficiency as aspects of both sustainability and design. Students will conduct this research individually and collaboratively and present findings to broaden the discourse and to provide individual insights for seminar discussion.

Pedagogical Objectives:

- Understand human interactions with their environment – physiological (emotive, physical, and qualitative properties);
- Understand energy flows, sources, and accessibility;
- Develop an awareness of the various energy sources utilized globally and understand how those sources are commonly used in buildings;
- Understand the properties of heat exchange as they relate to human comfort and energy use.
- Understand ecologies as systems or networks of interactions – natural, urban, architectural, human;
- Understand measurement and the applications and limitations of field measurements and computer models.

Design Applications:

- Be able to evaluate precedent projects through drawing, measurement, and analysis;
- Be able to translate precedent concepts and applications into new architectural proposals that demonstrate viable ecologically sensitive design responses;
- Be able to draw relationships between philosophical ideas of ecologically sensitive living and architectural design proposals that extend those ideas into potential application.

Course Structure

The seminar course will include organized seminars, topical lectures, student presentation, open discussions and design collaboration time where we will review and critique project proposals.

Students will work individually and collaboratively to explore issues through research and design toward a design proposal represented through computer and/or physical scale model studies, simple energy calculations, conceptual diagrams, and product specifications. Students will develop design proposals guided by Leadership in Energy and Environmental Design (LEED) guidelines, individual research, site and program analysis and course critiques. This mode of inquiry and assimilation will carry the projects from conception through concept design drawings while including preliminary material selections, architectural space, programmatic requirements, and energy efficiency.

The Seminar. Sem-i-nar (Oxford English Dictionary)

- 1: a group of advanced students studying under a professor with each doing original research and all exchanging results through reports and discussions
- 2 a (1): a course of study pursued by a seminar
(2): an advanced or graduate course often featuring informality and discussion
b: a scheduled meeting of a seminar or a room for such meetings
- 3: a meeting for giving and discussing information

For a seminar to be an effective environment for learning, active participation in the reading, informed discourse around the topical issues is critically important. Students need to engage the course positively by contributing to the discussions regularly and bringing issues to the seminar for discussion. Reading assignments and course discussions will occur on a regular basis. Students are required to read and prepare points of discussion from the readings prior to the class meeting.

Project Sequence

Course pedagogy will be engaged through three typological modes of inquiry – research, analysis, and design. Throughout the semester we will explore physical and psychological human responses and relationships to the natural environment (ecology), and energy flows through readings, short lectures, and participatory discourse. The project will parallel that model as an individual exercise for each student.

Project in two parts

Part 1: Choose a place. This can be any place on the planet in which you are interested in developing a residential dwelling to inhabit. Students will evaluate the ecology, climate, resources, and culture toward an informed position on what dwelling means in that place and how architecture might connect people to the place. A Part 1 assignment with additional details will be provided.

Part 2: Respond to place. Develop a residential architecture that responds to the issues identified and prioritized in Part 1. A Part 2 assignment with additional details will be provided.

Required Course Texts:

Required readings will be excerpted from a variety of texts and made available in PDF format for the use of students for the purposes of this course. It is suggested that students add the texts from these excerpts to their personal library for further reading and future reference. Distribution of the PDF's beyond the class is not permitted in accordance with US copyright provisions.

Electronic Interface

Reference information, articles and other important information for the course can be found on the course Canvas site in the "files" link on the menu bar.

Academic Commitment

Students are required to attend all class meetings and scheduled outside field trips (to be arranged with student input). Students are expected to come to class on time prepared to discuss, in the seminar forum, the course readings. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Academic Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester. Contact the Disability Resource Center at: (352-392-8565, www.dso.ufl.edu/drc/).

Course Schedule

Week	Date	Topics	Prep Reading*
1	5/13	Course introduction Architecture and Culture Project 1 Introduction	01 <u>People and Their Senses: Perception and Cognition</u> , Martin Gold. Environmental Technology in Architecture, Cognella, 2025, (read in class) 02 <u>The Architecture of the Well-tempered Environment</u> , Chapter 1. Unwarranted Apology. Reyner Banham, Second Edition. (read in class)
	5/15	Energy Systems Ecology Model Sources, stores, and access. Project discussion	03 <u>A Prosperous Way Down</u> , Chapter 4: The Ways of Energy, Odum. (read in advance). 04 <u>Biomimicry</u> , Chapter 3: How Will We Harness Energy?, Janine Benyus (read in advance)
2	5/20	Ecology Climate, Geography, Resources. Place selections and initial ecology analysis (short presentations)	05 <u>American Building</u> , Chapter 9: Integration and Climate (pp 257-274), Fitch. (read in advance)
	5/22	Place and Precedent Reading and Discussion Phase 1 submission.	05 <u>American Building</u> , Chapter 9: Integration and Climate (pp 275 – 298), Fitch. (read in advance)
3, 4, 5 & 6	na	International Travel – no class meetings Gather precedent concepts and applications – add to your MIRO	
7	6/24 & 6/26	Summer Break – No Class Meeting	
8	7/01	Place and Precedent Revisited Present updated Phase 1 concepts and place Discuss design response phase of project	06 <u>Art of Architecture in the Age of Ecology</u> , James Wines (SITE), Sustainable Architecture White Pages, Earth Pledge Foundation. (read in advance)
	7/03	Life Cycle Theory and resource cycling	07 <u>Cradle to Cradle</u> , Eco Effectiveness, McDonough & Braungart. (read in advance)
9	7/15	Thermal Properties & Psychrometrics Heat Flow and materials – radiation and conduction Estimating and modeling heat flow.	08 <u>American Building</u> , Chapter 3: Fair and Warmer, Fitch. (read in advance)
	7/17	Mechanical Cooling Human Comfort, water-air relationships and cooling systems Project reviews and discussion	09 <u>Architectural Graphic Standards</u> , 9 th Edition, Ramsey and Sleeper, excerpted (read in advance)
10	7/22	Project reviews and discussion	Reading in class – TBA
11	7/22	Project reviews and discussion	Reading in class – TBA
12	7/29	Tuesday – Final Submissions Due Project reviews and discussion	No reading

* Readings must be completed in preparation for the discussion on the date they are listed.

** Attendance at all project presentations is required for full credit in the course

Academic Integrity and Honesty

Students must take responsibility for developing their academic and professional integrity, the pressure and consequences of poor decisions in this regard typically increase over time. Integrity is a nurtured skill that must regularly be exercised. All work submitted in the course shall be the sole work of the author with properly crediting sources and collaborators. Claims of authorship or submissions found to be plagiarized in any form will be referred to the Dean of Students and may be cause for disciplinary action that could result in failure in the course or suspension from the University. Please refer to the UF Student Honor Code: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>

UF students are bound by The Honor Pledge which states:

We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

The Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor.

Student Evaluation – Attendance, Expectations, Make-up

As a graduate seminar, consistent attendance and active topical contributions by students is required as part of the learning process. It is not possible to make up for missing a discussion. More than two (2) unexcused absences may result in failure in the course. There are no quizzes or exams. Enthusiastic engagement in the seminar and discussion mode of learning will be rewarded in the final evaluations. Interim reading/discussion assignments will be given and will count toward the participation portion of the student evaluation. Two project phases will comprise the remainder of the performance evaluation. Grades will be assigned in accordance with UF grading policies: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/#gradestext>

Participation	15%
Project Part 1: Place & Precedent	35%
Project Part 2: Design Response	50%
Total	100%

The grading scale below outlines the qualitative assessment that will be used to evaluate student performance in this course. The depth and breadth of discussion contribution, analysis work, and your design proposals require a relative and subjective interpretation. The evaluation and grade will be based on the quality of work produced based on the levels of achievement outlined below:

Qualitative Calibration of Grade Scale:

- A Outstanding work only (far exceeds minimum requirements)
- A-
- B+
- B Good work (above average – quality work that exceeds minimum requirements)
- B-
- C+
- C Average work (just meets minimum requirements)
- C-
- D+
- D Poor work (does not meet minimum requirements)
- D-
- E Inadequate or incomplete work

Numeric Grading Scale:

<u>Percent</u>	<u>Grade</u>	<u>Grade Points</u>
90.0 - 100.0	A	4.00
87.0 - 89.9	A-	3.67
84.0 - 86.9	B+	3.33
81.0 - 83.9	B	3.00
78.0 - 80.9	B-	2.67
75.0 - 79.9	C+	2.33
72.0 - 74.9	C	2.00
69.0 - 71.9	C-	1.67
66.0 - 68.9	D+	1.33
63.0 - 65.9	D	1.00
60.0 - 62.9	D-	0.67
0 - 59.9	E	0.00

Course Evaluation by Students

Feedback from students is critical toward continued improvement in course content and delivery. Students are highly encouraged to use the anonymity of the evaluation process to freely express concerns and suggestions for improvement. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>

Campus Resources

There are times when the stresses of college, issues arising in our families, or the insensitivity of others cause either debilitating or overwhelming difficulties in our lives. UF as a supportive community of students, staff, and faculty, has a network of resources to assist students during these times. Please let me know if I can help in any way and you may also contact the Dean of Students or UF health and Wellness: <https://care.dso.ufl.edu>

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see the Notification to Students of FERPA Rights: <https://archive.registrar.ufl.edu/catalog0910//policies/regulationferpa.html>

Campus Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling.

Library Support, Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints Campus https://dso.ufl.edu/documents/UF_Complaints_policy.pdf

On-Line Students Complaints <https://distance.ufl.edu/getting-help/student-complaint-process/>

Health and Wellness Resources

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or police.ufl.edu.

Course Reference Texts:

The following texts are recommended for further reading:

- A Prosperous Way Down: Principles and Policies, Howard T. Odum & Elisabeth C. Odum, University Press of Colorado, 2001. ISBN: 0-87081-610-1
- American Building: The Environmental Forces That Shape It, James Marston Fitch with William Bobenhausen, Oxford University Press, 1999. ISBN: 0-19-511040-4
- Architectural Graphic Standards (12th Edition), Ramsey/Sleeper, Wiley, 2016, ISBN-10: 9781118909508, ISBN-13: 978-1118909508, ASIN: 111890950X
- Biomimicry: Innovation Inspired by Nature, Janine M. Benyus, Perennial, 2002. ISBN: 0-688-16099-9
- Cradle to Cradle: Remaking the Way We Make Things, William McDonough & Michael Braungart, North Point Press 2002, ISBN: 0-86547-587-3
- Combinatory urbanism: The Complex Behavior of Collective Form, Morphosis on Urban Planning, edited by Stephen Rigolot, Stray Dog Café, 2011. ISBN: 10-0983076308
- Eco Urbanism - Sustainable Human Settlements: 60 Case Studies, Miguel Ruano, editor, GG, Barcelona, 1999.
- Getting Smarter About Smart Cities, Tormer, A., & Puentes R., Brookings Institute, April, 2014.
- Green Cities of Europe, Edited by Timothy Beatly, Island Press, 2012. ISBN: 978-1-59726-d975-9
- Grey World – Green Heart: Technology, Nature, and the Sustainable Landscape, Robert Thayer, Jr., John Wiley and Sons, Inc. 1994. ISBN: 0-471-57273-X
- From Eco-Cities to Living Machines: Principles of Ecological Design, Nancy Jack Todd and John Todd, North Atlantic Books, 1993. ISBN: 1-55643-150-3
- Man Climate & Architecture, B. Givoni, Van Nostrand Reinhold, 1969, ISBN: 0-442-26296-5
- Natural Capitalism: Creating the Next Industrial Revolution, Hawken, Lovings, Lovings, Little Brown and Company, 1999. ISBN: 0-316-35316-7
- Sun, Wind & Light, Second Edition, G. Z. Brown and Mark Dekay, John Wiley & Sons, Inc., 2001, ISBN 0-471-34877-5
- Sustainable Architecture White Papers, Earth Pledge Foundation, 2000. ISBN: 0-9675099-1-2
- The Nature of Economies, Jane Jacobs, Vintage Books, 2000. ISBN: 0-375-70243-1
- The Architecture of the Well-tempered Environment, Reyner Banham, University of Chicago Press, 1984. ISBN: 0-226-03697-9
- Who's Your City?, Richard Florida, Basic Books, 2008. ISBN: 0-465-00352-4