

EID/ENV 384 COURSE SYLLABUS

Class hours: Tu/Th 1:00 – 2:20
Office hours: W/F 12:30 – 1:30

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Catalog Description:

This course examines principles of sustainable design from a systemic perspective, focusing on environmental issues and how they relate to economics, social equity, and human health. Topics in the course include: cradle-to-cradle principles, biomimetic design, passive building design, renewable energy, water and waste, sustainable materials, and indoor environmental quality. Course culminates with a review of applications in the building industry.

Course Format:

Because sustainable design is a rapidly developing field, with new technologies and practices constantly emerging, the course will be reading and research intensive. Along with regular exams that cover the information presented in lectures, there will also be several in-class activities, exercises, and assignments. At the end of the semester, students will have the option to either present a design project from a previous or current studio that has been reconsidered in a sustainable design context, integrating the technologies, principles, practices, etc., they have learned about in the course; or write an in-depth (4000 word) research paper on a topic of your choice (to be approved by instructor). The student may propose other alternatives for a final project, such as building (or inventing) a sustainable technology. Through these various assignments, students are expected to make an active contribution to the knowledge base of the course. An online course library will be created in order to archive information sources and innovations in the field for reference.

Course Outcomes:

Student work will be assessed by evidence of achievement in the following course outcomes. In the first half of the course—which will establish a theoretical foundation in the field—students should be able to:

- **Environmental Factors** - Identify the historical, sociopolitical, and economic factors that have contributed to the global environmental crisis we find ourselves at present.
[CIDA 4, 10] [PO3] – EMERGING
- **Concepts & Principles** - Describe the concepts, principles, and theories of sustainability, and how they pertain to human welfare and the building industry.
[CIDA 7] [PO3,4] - EMERGING
- **Industry Impacts** - Recognize how the fields of environmental and interior design have been influenced by, and in turn can help advance, the goals of the sustainability movement.
[CIDA 6, 13, 14] [PO1] - DEVELOPING

In the second half of the course—which will examine practical applications within the design profession—students should be able to:

- **Design Standards** - Reference sustainability guidelines and regulations established by professional organizations in the field.
[CIDA 16] [PO3] - DEVELOPING
- **Building Systems** - Apply sustainable principles in the areas of passive design, lighting design, thermal design, acoustic design, indoor environmental quality, renewable energy, building materials, waste management and water conservation.
[CIDA 14, 15] [PO4] - DEVELOPING
- **Emerging Technologies** - Scan for new or emerging technologies, materials, and products, and evaluate them based on a range of properties and performance criteria.
[CIDA 13, 14] [PO2] - EMERGING

Course Modules:

MODULE I: OVERVIEW

Week #1 Environmental Issues (pollution, natural resources, habitat destruction)
Week #2 Climate Change
Week #3 Legislative Initiatives
Week #4 Exercise #1; presentations

MODULE II: SYSTEMIC APPROACHES

Week #5 Sustainability Paradigms (Cradle to Cradle, Biomimicry)
Week #6 Passive Design (PassivHaus, Green Roofs)
Week #7 Economic Perspectives; Exercise #2

MODULE III: DESIGN STRATEGIES

Week #8 Renewable Energy
Week #9 Waste & Water Management
Week #10 Indoor Environmental Quality (air, light, thermal, noise, EM radiation)
Week #11 Materials & Daylighting
Week #12 Exercise #3; Field trip (Sullivan Center)

MODULE IV: INDUSTRY APPLICATIONS

Week #13 LEED standards
Week #14 Standards (LBC, WELL, ReGreen)
Week #15 Design presentations

Primary Texts:

Laudato Si, Pope Francis

The Sustainability Revolution, Andres Edwards

Cradle to Cradle, M. Braungarten & W. McDonough

Biomimicry: Innovation Inspired by Nature, Janine Benyus

Green Building and LEED Core Concepts, USGBC (PDF will be provided)

Grade Evaluation:

Your final grade will be weighted as follows:

Exams (3) @ 15%	45%
Design/Research project	25%
Future Scenarios	10%
Exercises	10%
Technology research presentation	5%
In-class participation	<u>5%</u>
TOTAL	100%

Because student participation and in-class activities are an essential component of the course, regular attendance is crucial. However, should you have to miss a class, please inform the instructor in advance when possible; in any case, you will be responsible to make up any missed work *on your own*. Please make arrangements with one of your classmates to review what was missed in class; do not expect the instructor to repeat the lecture or make special accommodations due to absence.

All projects and exercises must be complete and submitted on time, unless otherwise arranged. Any unexcused late submissions will be marked down by one letter grade. Any assignments submitted over one week late will not be accepted. In the event of three unexcused absences or three unexcused tardies your course grade will be lowered by one letter grade.

Grade Calculation:

A = 90-100%

B = 80-89%

C = 70-79%

D = 65-69%

F = below 65%

Refer to CUH Student Handbook for mandatory adherence to the following policies:

- **Academic Honesty**
- **ADA Accommodation**
- **Title IX Compliance**
- **E+ID Professional Code of Conduct**

Reference Texts:

Environmentally Responsible Design, Louise Jones

Sustainable Design for Interior Environments, Susan Winchip

Biophilic Design, Stephen Kellert et.al.

Health, Sustainability, and the Built Environment, Dak Kopec

Cradle to Cradle Home Design, Anna Baker-Marshall

Net Zero Energy Design, Thomas Hootman

Biomimetics in Architecture, Petra Gruber

Biomimicry in Architecture, Michael Pawlyn

Cats' Paws and Catapults, Steven Vogel

Design for Life, Sim van der Ryn

Green Hawaii: A Guide to a Sustainable and Energy Efficient Home, Kevin Whitton

Rural Studio, Andrea Oppenheimer Dean

Natural Capitalism, Paul Hawken

Thinking Ecologically, Marilyn Chertow