

## **EID/ENV 384 COURSE SYLLABUS**

Class hours: Tu/Th 1:00-2:20  
Office hours: MWF 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). 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 future reference. Students will present their research or design projects to the class in ppt format, and all references must be properly cited.

### **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 standards 2(b), 8(a)] [PO3] – EMERGING
- **Concepts & Principles** - Describe the concepts, principles, and theories of sustainability, and how they pertain to human welfare and the building industry. [CIDA standard 2(a)] [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 standards 2(d), 7(a)] [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 standards 14(a)] [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 standards 12(a)(e)(f)(g)(h), 13(d)] [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 standards 11(c)] [PO2] - EMERGING

### Course Modules:

#### MODULE I: OVERVIEW

- Week #1 Overview & environmental issues
- Week #2 Climate change
- Week #3 Initiatives & action
- Week #4 Exam #1; presentations

#### MODULE II: SYSTEMIC APPROACHES

- Week #5 New paradigms
- Week #6 Passive design
- Week #7 Economic perspectives; exam #2

#### MODULE III: DESIGN STRATEGIES

- Week #8 Renewable energy
- Week #9 Waste & water management
- Week #10 Indoor environmental quality
- Week #11 Materials & natural lighting
- Week #12 Exam #3; field trip

#### MODULE IV: INDUSTRY APPLICATIONS

- Week #13 LEED standards
- Week #14 LBC standards
- Week #15 Design presentations

### Primary Reference Texts:

- Cradle to Cradle*, M. Braungarten & W. McDonough
- The Sustainability Revolution*, Andres Edwards
- Biomimicry: Innovation Inspired by Nature*, Janine Benyus
- Green Building and LEED Core Concepts*, USGBC (PDF will be provided)

**Secondary Reference Texts:**

*Environmentally Responsible Design*, Louise Jones  
*Sustainable Design for Interior Environments*, Susan Winchip  
*Biophilic Design*, Stephen Kellert et.al.  
*Guide to the LEED Green Associate Exam*, Michelle Cottrell  
*Guide to the LEED Interior Design & Construction Exam*, Michelle Cottrell  
*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  
*A Green Hawaii: Sourcebook for Development Alternatives*, Ira Rohter  
*Fifty Simple Things You Can Do to Save Hawaii*, Gail Grabowsky  
*Rural Studio*, Andrea Oppenheimer Dean

**Tertiary Reference Texts:**

*Natural Capitalism*, Paul Hawken  
*Thinking Ecologically*, Marilyn Chertow  
*Silent Spring*, Rachel Carson  
*Collapse*, Jared Diamond  
*The Future of Life*, E.O. Wilson  
*Symbiotic Planet*, Lynn Margulis  
*The Vanishing Face of Gaia: A Final Warning*, James Lovelock  
*The Web of Life*, Fritjof Capra  
*Genetic Architectures*, Dennis Dollens

**Grade Evaluation:**

Your final grade will be weighted as follows:

Exams (3)	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. Cell phone use is strictly forbidden during class time.

**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**
- **CUH EID Professional Code of Conduct**

## EID/ENV 384 COURSE SCHEDULE

### MODULE I: OVERVIEW

#### **Week #1:**

Tu 8/25 **Course & Syllabus Overview** (3E's, catalysts, worldview, obstacles)  
Activities: review syllabus, pre-class poll, post-class poll  
References: Pope's encyclical, Symbiotic Planet handout  
Assignment: Select design project

Th 8/27 **Environmental Issues**  
Activities: student rubric, concept mapping  
References: Silent Spring, Collapse, Limits to Growth handouts

#### **Week #2:**

Tu 9/01 **Film: "An Inconvenient Truth"**  
Assignment: Twitter (highlight most salient point in documentary)

Th 9/03 **Historical Timeline** (recent events, building industry, areas of sustainability)  
Activities: pair discussion (description of future)  
References: news reports  
Assignment: outline of critical events and trends

#### **Week #3:**

Tu 9/08 **Initiatives, History of Action**  
Activities: online jeopardy; pair discussion (prescription for future)  
References: normative forecasting methods  
Assignment: outline potential solutions to cited problems; vision for the future

Th 9/10 **Future Scenarios** (descriptive, prescriptive)  
Activities: futures methodologies; how to write scenarios  
References: backcasting methods  
Assignment: write scenario paper; study for exam

#### **Week #4:**

Tu 9/15 **Exam #1** (foundation)

Th 9/17 **Scenario Pair Presentations**

### MODULE II: SYSTEMIC APPROACHES

#### **Week #5:**

Tu 9/22 **Cradle to Cradle**  
Activities: review exam; TED talk video (William McDonough?), key idea, muddiest point  
References: Cradle to Cradle handout

Th 9/24 **Biomimicry**  
Activities: TED talk video (Janine Benyus, Michael Pawlyn), key idea, muddiest point  
References: Biomimicry handout

**Week #6:**

Tu 9/29

**Passive Design**

Activities: key idea, muddiest point; online jeopardy

References:

Assignment:

Th 10/01

**Green Roofs**

Activities: design green roof for hypothetical context

References:

Assignment: emerging technology research

**Week #7:**

Tu 10/06

**Sustainability Paradigms or Business/Economic Perspectives**

Activities:

References:

Assignment:

Th 10/08

**Exam #2** (concepts & principles)

MODULE III: DESIGN STRATEGIES

**Week #8:**

Tu 10/13

**Renewable Energy** (solar, wind)

Activities: review exam; 3-minute emerging technology slam #1

References: website

Assignment: select design project; identify aspects for design project integration

Th 10/15

**Renewable Energy** (geoexchange/thermal, ocean, biomass, hydroelectric)

Activities: student exam questions (renewable energy); online jeopardy

References: website

Assignment: identify aspects for design project integration

**Week #9:**

Tu 10/20

**Waste Management**

Activities: 3-minute emerging technology slam #2

References: website

Assignment: identify aspects for design project integration

Th 10/22

**Water Conservation**

Activities: student exam questions (waste & water)

References: website

Assignment: identify aspects for design project integration

**Week #10:**

Tu 10/27

**Indoor Environmental Quality** (IAQ, thermal, acoustic)

Activities: 3-minute emerging technology slam #3

References: website

Assignment: identify aspects for design project integration

Th 10/29

**Indoor Environmental Quality** (light, electricity)

Activities: student exam questions (IEQ); online jeopardy

References: website

Assignment: identify aspects for design project integration

**Week #11:**

Tu 11/03      **Building Materials & Finishes**  
Activities: TED talks (Dan Phillips), 3-minute emerging technology slam #4  
References: website  
Assignment: identify aspects for design project integration

Th 11/05      **Natural Lighting**  
Activities: student exam questions (materials & lighting)  
References: website  
Assignment: identify aspects for design project integration

**Week #12:**

Tu 11/10      **Exam #3** (design strategies)  
Th 11/12      **Field Trip:** Honolulu Convention Center Green Roof  
Assignment: design project

MODULE IV: INDUSTRY APPLICATIONS

**Week #13:**

Tu 11/17      **LEED Standards & Certification**  
Activities: online jeopardy  
References: LEED pdf  
Assignment: LEED take-home exercise

Th 11/19      **LBC Standards & Certification**  
Activities: online jeopardy  
References: PBD pdf  
Assignment: LBC take-home exercise

**Week #14:**

Tu 11/24      **Case Studies or Field Trip** (Punahou Omidyar School)  
Activities: online jeopardy  
Assignment: LEED/LBC exercises due  
Th 11/26      **Thanksgiving** (holiday)  
Assignment: sustainable behaviors reflection

**Week #15:**

Tu 12/01      **Design Project Presentations**  
Th 12/03      **Sustainable Behaviors & Reflections**