

UNIVERSITY of ILLINOIS CHICAGO

CME 494 Sustainable Construction

Course Purpose Document

Catalog Description

Coverage of construction methods and techniques that employ the principles of sustainable development. Materials and methods of construction, infrastructure planning and development, and environmental implications of construction activities. Lecture: three hours

Textbooks and Other Course Materials

- Kibert, Charles J. *Sustainable construction: green building design and delivery*. John Wiley & Sons.
- Energy+ software a whole building energy simulation program that engineers, architects, and researchers use to model both energy consumption—for heating, cooling, ventilation, lighting and plug and process loads—and water use in buildings. <https://energyplus.net/>
- Additional reading material for selected topics in the course will be announced or handed out in class

Course Objectives

Upon successful completion of this course students will have:

1. Illustrate the impacts of climate change and sustainability, how they affect the built environment and the ethical responsibilities of owners, design professionals and contractors (project stakeholders).
2. Analyze sustainable strategies for the built environment and how these strategies are addressed in green building assessment certification programs, such as the US Green Building Council's Leadership in Energy and Environmental Design (LEED).
3. Analyze occupants comfort in terms of thermal comfort, lighting quality, and indoor air quality in the building and their impact on the built environment.
4. Analyze the consumption of energy and the carbon footprint of the built environment and outline emerging strategies to reduce consumption.
5. Analyze materials and resources utilized in the built environment and revise current techniques of implementation and documentation of materials, such as life cycle assessment and environmental product declarations (EPDs).
6. Analyze how design and indoor materials affect the quality of the indoor environment, and review current techniques of implementation and documentation of materials such as health product declarations (HPDs).

7. Learn building energy monitoring and simulation programs such as Energy+ to evaluate the energy consumption performance buildings in actual cases studies including the economic effects to project stakeholders.

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Online Content

I will upload certain lectures into Blackboard. I will advise the class via email when a lecture is available for viewing. Students are expected to view the lectures in preparation for the in-class discussions. *Online lectures are like any other lecture; i.e., they are of equal importance to in-class lectures and I will include the content on quizzes/exams.*

Guest Lectures

For certain topics, I will invite industry practitioners to speak to the class. Students are expected to read assigned materials in preparation of the lecture. Additionally, each student is **required** to ask the speaker at least one question relevant to the presentation. *Guest lectures are like any other lecture; i.e., they are of equal importance to our lectures and I will include the content on quizzes/exams.*

Course & Instructor Policies

Attendance: You are allowed one grace absence, so use it judiciously. Your final grade will be reduced by 3% for each absence thereafter. Students are responsible for any information disseminated in classes from which they were absent.

Individual Meeting: Students with questions or wishing any kind of follow-up from class should speak with the instructor during class or during regular office hours. If you wish to meet with your instructor outside of regular office hours, you should email your instructor to make an appointment. Although email is commonly used, sometimes it can limit the effectiveness of the communication and may not be the best way for instructors to respond to some student questions, especially those requiring a demonstration of concepts or models covered in the course or if there are some more personal concerns. Depending on the nature of your situation, your instructor may ask that you follow up with a telephone call or personal meeting.

Communication: I use Blackboard extensively, so check the class website often. Also, confirm that your email address in BannerWeb is correct, as I will frequently use email to communicate with the class.

I receive numerous emails every day, some of it SPAM. Consequently, it is important that the emails received from students are clear and to the point; i.e., businesslike. Communications regarding the class must be treated as if sent to a client or employer (as opposed to as if in a chat room). Emails from students must include a descriptive subject line, a proper honorific, a clear and concise message, and a signature. When you send an email to your instructor, put the course code on the subject line: "CME3213: Question about data collection for project", then follow the rules explain in the following link:

<http://www.wikihow.com/Email-a-Professor>

Internet & Electronic Communication Devices: Any surfing of the Internet during lectures that is not directly related to the class discussion is distracting and forbidden. Additionally, the use of any electronic devices (e.g., cellular phones) for e-mailing, text-messaging, etc. is ALLOWED for emergency purposes. However, these electronic devices should be used in SILENT MODE! In this regard, it is within the discretion of the instructor to determine the appropriate grade for the “class participation” component. The instructor reserves the right to ask students to leave the classroom before continuing lecture if they are being disruptive.

Grading Policy

Class Points	Grade Letter
90 and above	A
80 – 89	B
70 – 79	C
61 – 69	D
60 and below	F

Tentative Schedule

Week	Topic
1	Course Outline & Introduction
2	Sustainable Development
3	Green Building Design and Assessment
4	Building Energy Monitoring, Modeling and Simulation
5	Lab Session: Building Energy Monitoring, Modeling and Simulation -1
6	Water Efficiency Modeling in Buildings
7	Sustainable Construction Materials
8	Economic Analysis of Buildings and Life Cycle Cost
9	Lab Session: Building Energy Monitoring, Modeling and Simulation - 2
11	Case Study Presentations
12	Sustainable Urban Planning and Smart Growth & Solid Waste Management
13	Occupants Behavior Impacts on Building Energy Consumption
14	Exam
15	Lab Session: Building Energy Monitoring, Modeling and Simulation - 3
16	Term Project Presentations