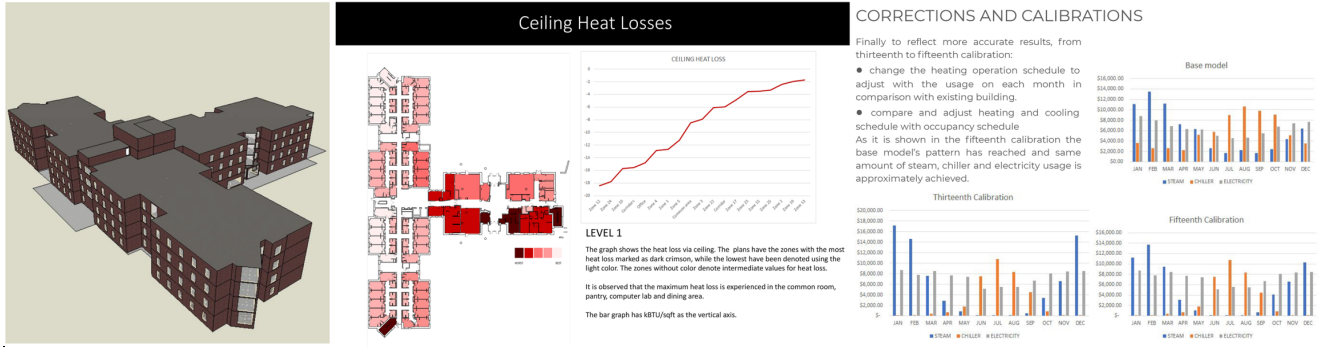


ARCH
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2021FA

High Performance Building Design

FALL 2021
Rev 01-22-2021



Final Report of Campus Building Energy Use with DesignBuilder

Course Information

Class Days/Time:	Tuesday 2:00 PM - 4:50 AM CT.
Classroom:	Zoom or Architecture Building #4W
Instructor:	Yun Kyu Yi, Ph.D
Office Location:	TBH M232
Telephone Number:	217-300-4886
Email Address:	ykyi@illinois.edu
Office Hours:	Tuesday, 4:50 AM – 5:10 AM, or by appointment

On-line LMP

Canvas will be platform for communication with additional support from ConceptBoard and Box.

Overall Course Goals or Student Learning Objectives

This course is one of a graduate elective course for Technology and Performance. The primary goals of this course are to introduce students to theoretical and analytical approaches to evaluate building performance through computational simulation. Students will learn how to utilize computational tools at an advanced level, and utilize them as applications to examine an existing building. Using the results of analytical techniques, the students will develop sustainable design strategies.

Course Content Learning Outcomes

- Observe, Analyze and diagram existing building indoor condition with using sensors and meter data.
- Build and simulate an existing campus building's whole-building energy model.
- Calibrate whole energy model to reflect actual building energy use and analyzing energy usage and finding problems.
- A proposed design solution to improve energy usage and indoor comfort.
- The test proposed design strategies and find its performance.

- Represent your work to successfully communicate your findings to a professional audience of faculty, students, and architects.

Upon successful completion of this course, you will be able to:

- Learn how to use computational simulation tools.
- Learn how to analyze building performance.
- Learn how to test and evaluate the proposed design with the support of computational simulation tools.

Technology Requirements for this Course

This course requires the use of a notebook computer that complies with the hardware specifications that were communicated to you by the Admissions Office when you enrolled in the program. This course will require your use of the software applications in Rhino6, Grasshopper, ClimateStudio, DesignBuilder, and Fluent. It is your responsibility to ensure you have a working computer with the required software installed and functional for this course.

Assignments and Grading Policy

There will be 4 modules in addition to one presentation. Student participation will be considered throughout the semester and factored into the grade of each module. Each module will have a specific breakdown of components that will be graded on both outcome and process. The points for each module are listed below:

Module:

1. Module 1: Whole Building Energy Modeling	15 points
2. Module 2: Whole Building Energy Simulation	15 points
3. Module 3: Whole Building Energy Calibration	20 points
4. Module 4: High Performance Design	20 points
<u>5. FINAL Presentation</u>	<u>30 points</u>
TOTAL	100 points

Tentative Course Schedule

- Week 1 Whole Building Energy Modeling I
- Week 2 Whole Building Energy Modeling II
- Week 3 Whole Building Energy Modeling III
- Week 4 Whole Building Energy Modeling VI
- Week 5 Whole Building Energy Modeling I
- Week 6 Whole Building Energy Simulation II
- Week 7 Whole Building Energy Simulation III
- Week 8 Whole Building Energy Calibration I
- Week 9 Whole Building Energy Calibration II
- Week 10 Whole Building Energy Calibration III
- Week 11 Whole Building Energy Calibration VI
- Week 12 High Performance Design I (Final Project)
- Week 13 High Performance Design II (Final Project)
- Week 14 Holiday
- Week 15 Final Presentation