

Converting a Large, Project-Based Course to a Hybrid Modality

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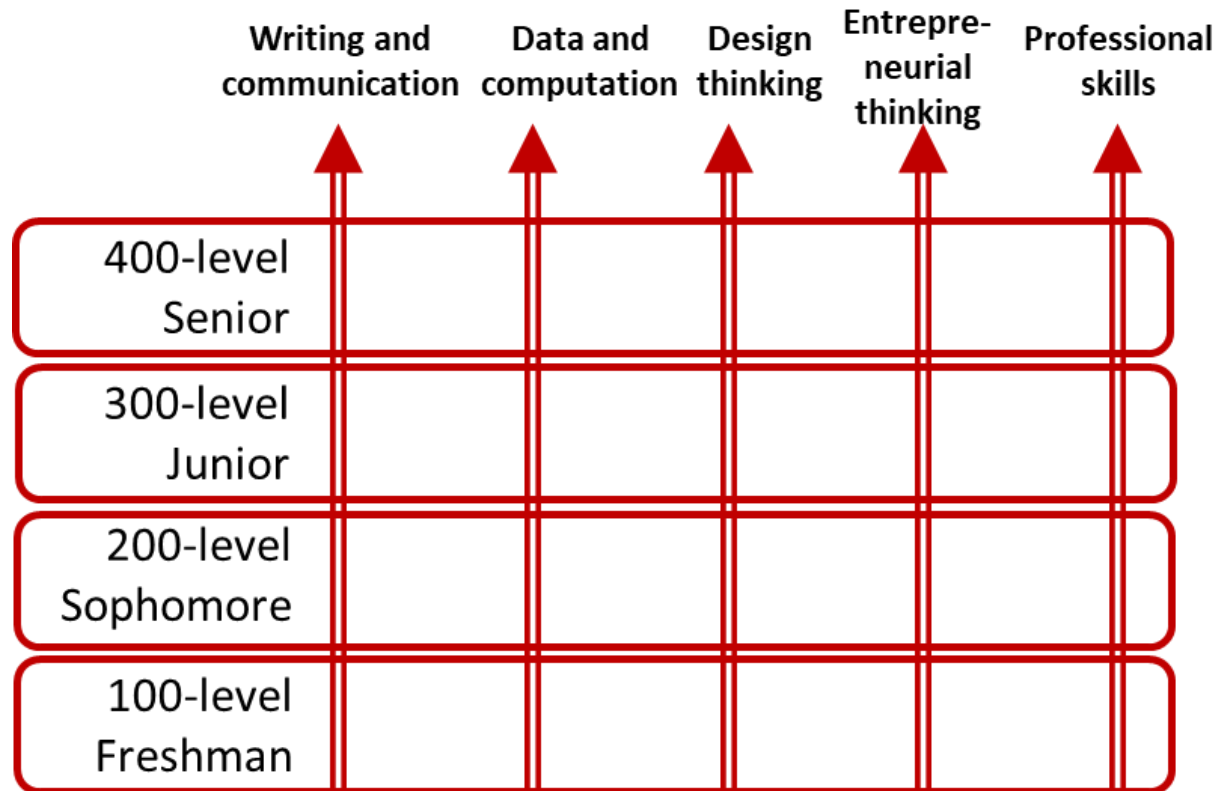
University of Illinois at Urbana-Champaign



Learning Objectives

- Describe the goals of the introductory course overhaul
- List key changes to key course components

Introductory Course Redesign



- Prior course was seminar-based to share information about the various areas in the CEE department
- Ongoing curriculum innovation around intentional professional development themes
- Course development has been in progress >5 years

New Course Objectives

Learning Objectives

Describe the areas of study in the CEE department

Describe potential career paths for CEE graduates

Manage assignments and meet deadlines

Process and present data

Communicate through written and oral presentation

Work as a team to complete an engineering feasibility study

New Course Objectives

Learning Objectives	Curriculum Themes
Describe the areas of study in the CEE department	Professional skills
Describe potential career paths for CEE graduates	Professional skills and Entrepreneurial thinking
Manage assignments and meet deadlines	Professional skills
Process and present data	Data and Computation
Communicate through written and oral presentation	Writing and Communication
Work as a team to complete an engineering feasibility study	Professional skills and design thinking

Course Design

- Sections of a report → Lecture, In-class exercises
- Skill assignments → In-class exercise, reflection
- Case study speakers → Lecture, reflections
- Field trips → Reflection
- Feasibility project → Group work, mentoring, research, writing

Course Logistics

- Instructional Team
 - 3 Faculty
 - 4 Graduate teaching assistants (TA's)
- Technology
 - Live streaming software
 - iClickers
 - LMS and homework management

Moving the course online 2020

- Partial roll-out (90 students)
 - Simulcast lectures to 2 rooms
 - Regular use of Zoom breakout rooms
 - In-class exercises
 - Group project
 - Monitored by a TA
 - Zoom field trips
- Covid Restrictions
 - Rooms at $\frac{1}{2}$ capacity
 - 6 ft social distancing
 - Masks required
 - Regular testing, contact tracing, building access control



Moving the course online 2021

- Full roll-out (190 students)
 - 1 room set for active learning
 - Zoom use reduced
 - Field trips
 - Temporary absences
 - Remote guest speakers
- Covid Restrictions
 - Rooms at full capacity
 - No social distancing
 - Masks required
 - Regular testing, contact tracing, building access control




Sections of a Report and Skills

- Pre-covid
 - Lecture
 - In-class small group discussion
- During covid
 - Short pre-lecture video with a quiz
 - Class period for exercises and writing feedback
 - Mix of group and individual efforts

Scenario

- Facilities and services has sent out a request for proposal (RFP) for a feasibility study of a pedestrian crossing (bridge or tunnel) at Springfield Avenue by Grainger Library.
- In teams of 3-4 students, find 2 less reliable sources and 3 reliable sources on feasibility of a pedestrian bridge or tunnel at Springfield Ave-Grainger Library.
- Draft a written 4 to 6 sentence objective for this request.
- You and your team must work together to complete this task in the next **25 minutes or 3:55**.

Proposed Crossing Location



Deliverables

- Write a 1-paragraph objective
- Provide 5 references (2 + 3 sources) and citations
- Submit single pdf document to Compass with names of team, objective, & 5 citations.

Objectives + Outline → Working Definitions → Tips → In-Class Activity



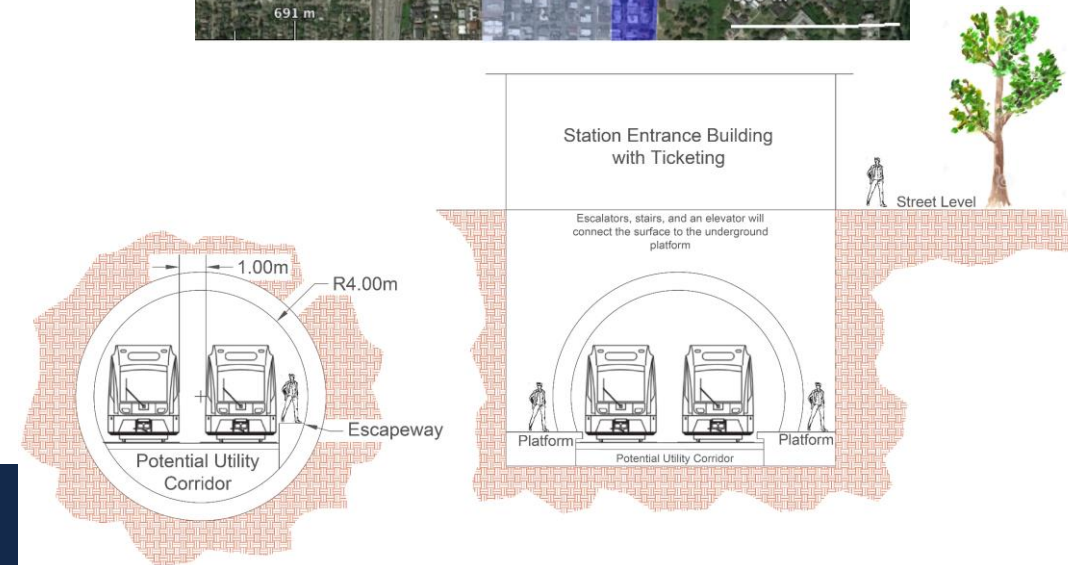
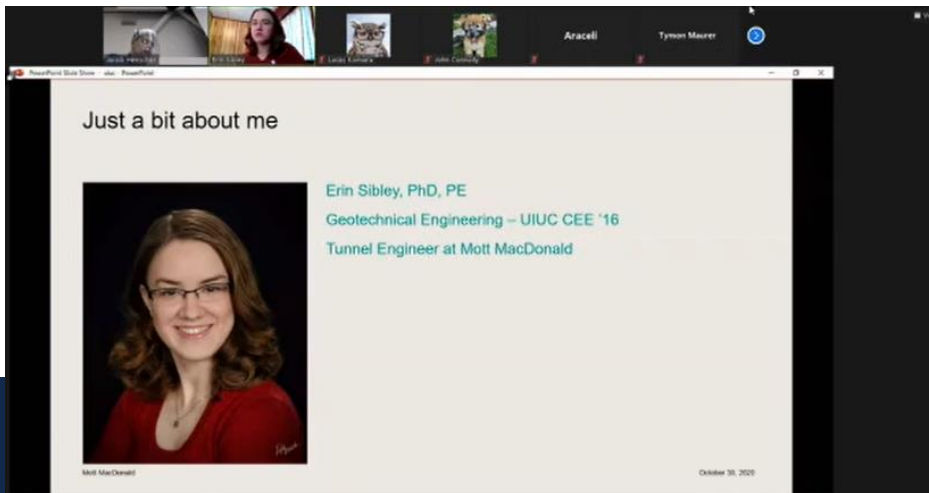
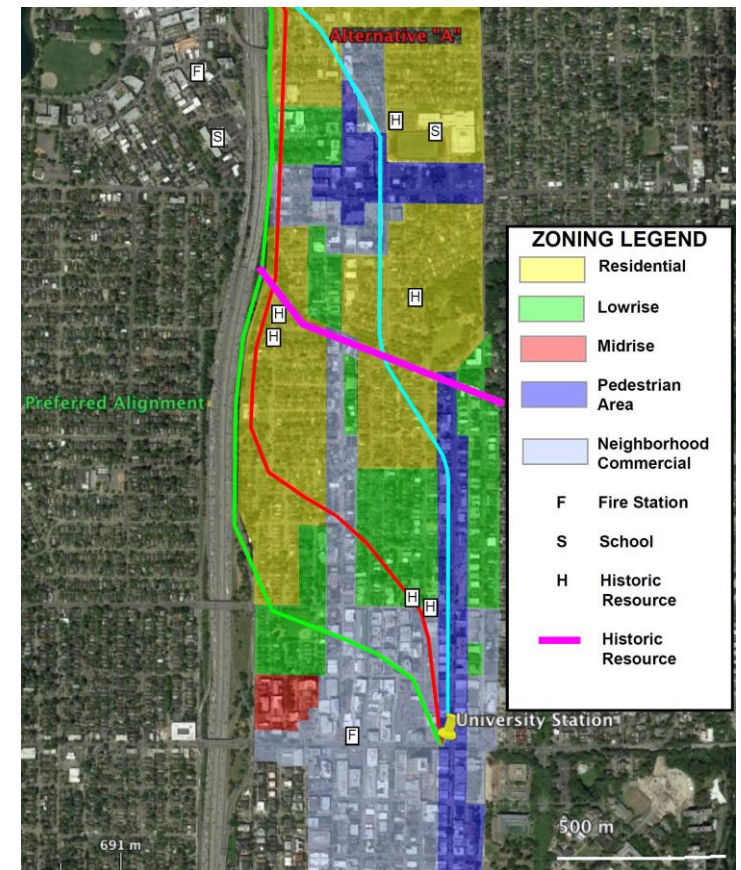
Field Trips



- Guided walking tours around campus landmarks
- Pre-recorded tours of off-campus facilities

Case Studies

- Pre-covid
 - Lectures from faculty and traveling alumni
- During covid
 - Increased flexibility for alumni and faculty speakers
 - Live question-response with iClickers



Semester Project

- Project ideation
 - 3 sessions of brainstorming and refinement
- Group formation
 - Students self-select projects and groups
 - Groups mix in-person and remote

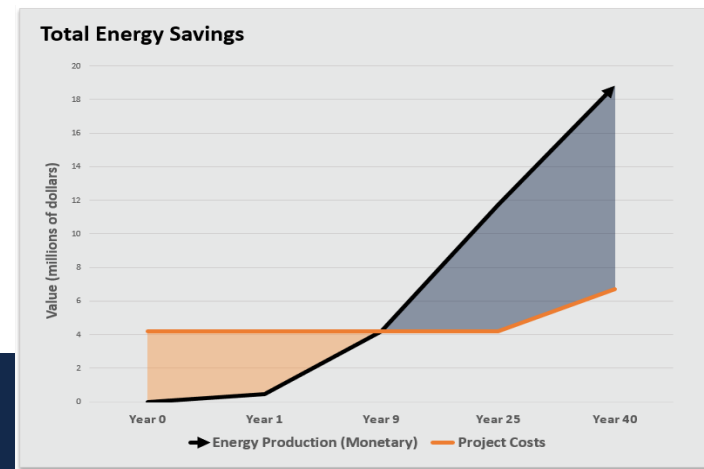
CEE190 - Journal #1 Statistics (Fall 2021)

CEE Category	Idea 1	Idea 2	Idea 3	Combined Ideas
Solid Waste/Recycling	5	10	19	34
Structures/Buildings	15	15	17	47
Pavements/Materials	9	15	11	35
Energy	39	35	45	119
Transportation	83	68	49	200
Stormwater	9	9	12	30
Wastewater	0	4	3	7
Water	8	9	12	29
Construction Management	4	3	2	9
Other	4	8	6	18
Sum	176	176	176	528



Semester Project

- Data collection and analysis
 - Support from UIUC facilities
- Final Reports
 - Poster to Zoom presentation
 - Final written report and reflection



Outcomes and Future Work

- Student feedback has been generally positive and informed further changes
- Technical writing reinforced throughout curriculum
- Positive feedback from alumni panelists about final presentations

- Data collection to assess outcomes
- Longitudinal study with subsequent courses