CE 423 Fall 2024
Civil Engineering Senior Design

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This course prepares students for their transition into the real world of professional engineering. One focus of the course is the development of the necessary skills needed to work as part of a team. Most large engineering companies require professionals to work in teams comprised of fellow co-workers who bring in additional areas of expertise. A team member needs to share, understand and plan the project. They also need skills in leadership, organization, staffing, directing and controlling the process to meet the needs of the design.

FORMAT AND STRUCTURE:
Senior Design class is a framework for teams of students to complete a design project. This design will be completed in the same team throughout the full academic year. There are two separate courses associated with Senior Design. Students will receive two independent grades for each course. CE 423 is held in the fall semester and, among other deliverables required by your sponsor, focuses on understanding the design problem and using sound engineering principles and appropriate design codes and standards to develop design plans and alternatives. CE 424 is held in the spring semester and, among other deliverables required by your sponsor, focuses on using appropriate engineering methods, drawings, calculations, tools, and a schedule and budget to support the selected design solution.

Senior Design is integrated with IDE 401 & 402, the Innovation and Entrepreneurship sequence, that further guides the teams in identifying, describing, analyzing and presenting the potential entrepreneurial and/or business value of their design.

Periodic presentations and written submissions will be required during the semester. These will detail findings, methods used, decisions made, etc. The presentations and written reports will form the basis for the final design report due at the end of the semester. Teams must meet among themselves and with their project sponsors and faculty advisors, as required for their design (minimum requirements listed below). Site visits are required, and all costs associated with the site visits will be paid for by the CEOE (Civil, Environmental, and Ocean Engineering) department. Prior to arranging a

site visit or in-person meeting, the team must receive approval from the instructor. Students who do not have approval will not have their visit paid for by the CEOE department. Students should also limit these visits to a maximum of three visits throughout the full academic year.

COURSE MATERIALS:
Relevant resources will be made available to the student teams and distributed on the course home page on Canvas. These will include many of the codes and standards your designs must adhere to. Examples include but are not limited to:
https://www.state.nj.us/transportation/eng/documents/BSDM/pdf/2016DesignManualforBridgesandStructures20210729.pdf
https://www.fhwa.dot.gov/programadmin/standards.cfm
https://www.njstormwater.org/bmp_manual2.htm
https://www.nj.gov/dca/divisions/codes/offices/rsis.html
https://developersguide.njfuture.org

Teams will consider the UN Sustainable Development Goals and the ASCE (American Society of Civil Engineers) Envision Rating system while completing their designs.
https://www.un.org/sustainabledevelopment/sustainable-development-goals/
https://sustainableinfrastructure.org/envision/use-envision/

COURSE REQUIREMENTS:
Class/Team Meetings: Teams must meet at least twice a week (typically, every Tuesday and Thursday from 2:30 – 4:20 pm, in person or via Zoom). These meetings may include your sponsor and/or faculty advisor. Students must attend at least 50% of all scheduled class times in the designated classroom, in-person with the course instructor. During meetings, teams must review the previous week's progress and plan next week's activities with clear responsibilities and expected outcomes. Progress, issues and action items/assignments must be captured in Meeting Minutes.

Students must attend all but one scheduled session in the Professor Seminar Series. These seminars are scheduled to assist students in developing critical skills and interact with industry professionals. These seminars may count towards the attendance requirement.

Design progress: Each team should keep track of their design progress using a dedicated "drive" which must be maintained on a regular basis. This will be where you record research findings, insights, ideas, sketches, and other thoughts relevant to the project. The drive should be organized and evolve with the design. The name of the drive must include your project name and academic year, 2024-25. Once the drive is set up, make sure to share it with Prof. Jagupilla, your advisor, and sponsor.

Meetings with Sponsor and Advisor: Each team will schedule meetings with sponsors and advisors at mutually agreed frequencies (a minimum of 5 meetings each over the semester, a total of 10) are expected. If both sponsor and advisor are present at a meeting, you can count that as 2 meetings. However, even in this case, there must be a minimum

of 8 meetings over the semester. At least, one of these meetings must be off campus, with approval from the course instructor.

Meetings with your sponsor and/or faculty advisor must include a professional set up email, a calendar invitation, a reminder email and an agenda which outlines the team's goals for the meeting. The agenda must be sent at least two business days prior to the meeting to the attendees. Meetings with your sponsor and/or faculty advisor must also include a short presentation, which provides an update on the team's progress and a summary of next steps. Each team member must serve as Project Manager on a rotating basis (about 3–4 weeks per member). The Project Manager is responsible for coordinating the tasks to be completed, compiling the progress presentation, summary of the design progress and tracking all issues/concerns that arise, and submitting meeting minutes.

Sponsor/Advisor Relationship Management: You are expected to maintain a professional and courteous relationship with anyone that supports you throughout your project. Some components of a good relationship are – keeping appointments, commitments and deadlines, staying in regular communication about project progress as well as any issues which arise. Every meeting with a sponsor/advisor should be documented in the form of meeting minutes (which must be submitted on canvas).

Presentation Skills: Presentations are expected to be given professionally and concisely. This includes your appearance (business casual), your delivery, mannerisms, and interaction with the audience before, during and after the presentation. It also includes the general narrative/flow of your presentation and the design of the presentation material. The content itself will be graded as part of the Presentation grade. All presentations must be uploaded to Canvas as noted in the assignments. Rubrics for the presentations will be available on Canvas.

GRADING AND OTHER PROCEDURES:
Grades will be based on:
Assignments (25%) –
Team Name and Logo (5%) (Instructor) (Sept 10)
Introductory Communications to Sponsor and Advisor (5%) (Instructor) (Sept 17)
UN Sustainable Development Goals (5%) (Instructor) (Sept 24)
Codes and Standards (5%) (Instructor) (Oct 1)
Professional Seminar Series (5%) (Instructor) (Sept 3, 10, 12, 17, Nov 12, 19 are set)
Professionalism – Team Meetings/Minutes & Dynamics (30%)
Meetings – Setup Email, Agenda, Calendar Invite, Email Reminder, Minutes (15%) (5 submissions by December 3, approximately once every two weeks) (December 3)
Teammate (10%) (Teammates) (December 3)
Leadership, Ethics, Lifelong Learning - **In Spring**
50% Attendance and Required Meetings (5%) (Instructor)
Professional Skills Assessments (45%)
Midterm (10%) (Instructor, Sponsor, and Advisor) –

Report Outline and Preliminary Text (10%) (October 20)
Final (35%) (Instructor, Sponsor, and Advisor) –
      Final Presentation (20%) (December 6) 20 minutes
      Final Report (15%) (December 6)

Register with NCEES (National Council of Examiners for Engineering and Surveying) (1% Extra Credit) (December 3)

Email Policies:
All emails sent to your faculty advisors and sponsor should be written in a professional manner correctly formatted with a subject, appropriate greeting (do not use first names), body text and signature. Please take care to remember attachments and any other relevant information. Emails must be sent from your Stevens email address.

File Naming Convention:
Each design team will have access to a drive on Canvas and may also choose to use a Google Drive or other type of drive. Make sure to provide a link between the Canvas Drive and the other drive (this can be done with a file providing the link).
When naming your drive use the convention noted below: Project #X "Team Name" 2024-25 Any file you submit via Canvas must follow a similar naming convention: Project #X "Assignment Name" _Team Name.

Final Grade – A – 93 and above, A- - 89 – 92.99, B+ - 85 – 88.99, B – 81 – 84.99, B- - 77 – 80.99, C+ - 73 – 76.99, C – 69 – 72.99, C- - 65 – 68.99, D+ - 61 – 64.99, D – 57 – 60.99, Fail - <57

Please refer to the syllabus template for more general institute guidelines/policies.
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