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Environmental Engineering Senior Design II

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CUNY City College

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ENGR 59870: Environmental Engineering Senior Design II

Grove School of Engineering, City College of New York - CUNY

Spring 2020, Mondays 3:00 pm – 5:50 pm, Steinman Hall Room 424

Instructor: Professor Pamela JB Clenace, Ph.D., CHMM - Office Hours by Appointment
pclenace@ccny.cuny.edu

Course Description:

Engineering Design – Engineering design is a process of devising a system, component, or process to meet desired needs and specifications within constraints. It is an iterative, creative, decision-making process in which the basic sciences, mathematics, and engineering sciences are applied to convert resources into solutions. Engineering design involves identifying opportunities, developing requirements, performing analysis and synthesis, generating multiple solutions, evaluating solutions against requirements, considering risks, and making trade-offs, for the purpose of obtaining a high-quality solution under the given circumstances. For illustrative purposes only, examples of possible constraints include accessibility, aesthetics, codes, constructability, cost, ergonomics, extensibility, functionality, interoperability, legal considerations, maintainability, manufacturability, marketability, policy, regulations, schedule, standards, sustainability, or usability.

Learning Objectives:

- learn the skill of professional collaboration
- engage in team design process
- master research and analytical skills
- participate and communicate in a team setting
- develop an engineering solution
- learn how to apply engineering codes and standards
- document team's technical process

Assignments:

In the second semester of engineering senior design, activities shall include the following:

- **Completing the engineering design project:** Each team member will be required to work on items according to the team's proposal submitted in the Fall semester, under the supervision of their technical mentor. Weekly meetings will be held in class with the course instructor. Students are also expected to make time to meet with their team and work on the implementation of their project outside of class time.
- **Progress Reports/Schedules:** At the beginning of the semester, each team shall submit a project schedule, which shall include critical paths. Each week a progress schedule, along with a brief summary outlining changes to the schedule shall be submitted. **The reports must include the information listed below (see 'Progress Reports' guidelines section). Students will be graded individually based on their reported design project activities.**

- **In-class Presentations:** Each team will present an updated presentation in March.
- **Final 90% Design Report:** Each team will prepare a written final project report, with complete documentation of the project design (see ‘Final Design Project Report’ guidelines section). The hardcopy of the 90% final design report must be submitted at the beginning of the class and on Blackboard on Monday, May 4th, by 2:30 pm. No late submittals will be accepted.
- **Panel Presentation:** Each team will make a final presentation based on their Design Report. All team members must participate in the team’s presentation. The presentation will be evaluated by a panel of faculty members and practicing professionals (see ‘Design Project Panel Presentation’ guidelines section). The final panel presentations will be held on May 4th, 11th, and 18th. Each team will have a maximum of 30 minutes for their presentation and there will be a maximum of 30 minutes for a question and answer session for the panelist and class. All students will be required to attend all the teams’ presentations, and this will be worth 5% of your final grade.
- **External Events:** All students are required to attend two external events (see instructions below). **Only one of these events may be a webinar.** The external event shall be related to a science and/or engineering topic. This is an individual assignment. The 1-2 page summary report shall consist of the date attended or the date of the webinar, the event name, purpose, location, key speakers, other relevant information, and what the student learned from the event shall be explained. Photos are encouraged. See schedule for due dates for external event summaries submittals on Blackboard.

All attachments or assignments are to be submitted in either a pdf or .doc (dot doc) format (do not upload .pages (dot pages)) on Blackboard.

Blackboard Use Policy:

1. You are required to use Blackboard in class for submitting all the assignments (no paper copies are allowed (except for the technical design reports or otherwise instructed). Your grades will be posted on Blackboard.
2. If you experience any issues logging in, please contact the Service Desk
 - a. Location: NA 1/301 (main desk: inside the cITy TECH Center)
 - b. Phone: 212 650-7878
 - c. <https://www.ccny.cuny.edu/it/help>
3. You are encouraged to bring your laptops/tablets/phones to the class as there may be in-class writing assignments as a part of your participation grade. You may want to borrow a laptop through the CCNY Laptop Loaner Program: <https://www.ccny.cuny.edu/it/laptop-loaner-program>.
4. You will not be penalized if you don’t bring your electronics to class. Please always have a notebook and a pen with you.

Grading Policy:

The Final Grade will be based on fulfilling the following requirements:

Draft Design Report (5%) and Final Design Report (20% (Team Grade 10%, Ind. Grade 10%)) - 25%

Final Design panel presentation (Team Grade 15%, Ind. Grade 10%) - 25%

External Events (2 events, Individual Grade) - 10%*

In Class Technical Presentation (Individual Grade) - 10%

Participation in class discussions and regular attendance (Individual Grade) -10%

Weekly team reports and weekly project schedules (Team Grade) - 10%*

Attendance for all final presentations*** - 5%

Respect** - 5%

Total: 100%

*3% of the grade per day will be deducted for each assignment submitted after the deadline (this includes weekends). After two weeks of no submission of the assignment, a zero grade will be given.

** Respect will entail coming to class on time, being prepared for class, no cell phone or computer (except for remote learning) usage during class (unless directed by the instructor), respecting the instructor, guest speakers, and your fellow classmates. Only appropriate language and tone is to be used (no offensive or threatening language, no yelling, and no physical abuse), and no rude gestures or emails/texts are to be used or sent to anyone.

*** Attendance for the final presentations is mandatory. Since classes are currently conducted remotely, students must have video and audio access available during the entire presentations. Deduction of the 5% grade will be made if students are not immediately available to answer requests or questions via chat or verbally, or if they are not present or are away from his/her during the presentations.

Extra Credit:

Extra credit may be issued upon the instructor's discretion.

Grading Late Submissions:

To acknowledge the effort of those who do submit their papers on time and discourage students from late submissions, **3% of the performance grade per day will be deducted** for each assignment submitted after the deadline (this includes weekends). In other words, if the assignment was 24 hours late, the grade would be 3% lower than it would have been if the assignment was submitted on time. The grade would be 6% less if the assignment was submitted 48 hours after the deadline, and so on. **If the assignment is not handed in after two weeks after the deadline, the student will receive a zero grade for the assignment.** This rule does not apply to students who requested (and received) an extension via email before the assignment

due date and to students who gave me a letter issued by the AccessAbility Center/Student Disability Services (AAC/SDS).

Should you experience an extraordinary hardship, you may request a deadline extension. I will grant these on a case by case basis.

To request an extension, please do the following:

1. Contact me in writing to request the extension prior to the deadline (the same day will not suffice)
2. Describe the status of your assignment and the reason you feel you deserve an extension
3. Propose a new deadline date
4. Wait to hear back from me, as I will grant extensions at my discretion

Absolutely no bulk submission of past due assignments after the last day of classes!

Quality of Performance	Letter Grade	% Range	GPA
Excellent - work is of exceptional quality	A+	97 - 100	4
	A	94 - 96.9	
	A-	90 - 93.9	3.7
Good - work is of above average quality	B+	87 - 89.9	3.3
	B	84 - 86.9	3
	B-	80 - 83.9	2.7
Satisfactory	C+	77 - 79.9	2.3
	C	73 - 76.9	2
Poor	C-	70 - 72.9	1.7
	D+	67 - 69.9	1
	D	64 - 66.9	
	D-	60 - 63.9	
Failure	F	< 59.9	0

Class and Civil Decorum:

No food or drink is allowed in the classroom except water. All trash including paper and water bottles must be removed from the room after class.

The class environment is to be respectful, conducive to learning, and free from hostility. Therefore, no verbal or physical abuse will be tolerated. The instructor reserves the right to ask a student to leave the class if the student has demonstrated unacceptable behavior, e.g., use of

threatening or foul language, verbal or physical abuse, class disruption, being argumentative and/or rude, or harassment of any type, etc). This will be considered as an unexcused absent. Also, if the student refuses to leave, the campus security will be called to escort the student from the class.

NOTE: The course instructor reserves the right to change the syllabus/schedule/grading policy/assignments

Lateness & Absence Policy:

Attendance is mandatory and will be taken at the beginning of each class. Two late arrivals will be treated as an absence. No more than two absences per semester may be excused due to a personal matter. A 15 min break will be given during class. Long periods (greater than 10 mins) of unexcused or multiple breaks during class will be counted as half an absent per class.

The CCNY Bulletin states the following Policy on Lateness and Absence: Students are expected to attend every class session of each course in which they are enrolled and to be on time. A WU grade will be assigned to a student by the instructor for excessive absence. Students are advised to understand the instructor's policy at the first-class session. They should note that an instructor may treat lateness as equivalent to absence. No distinction is made between excused and unexcused absences. Each instructor retains the right to establish his or her own policy, but students should be guided by the following general College policy. In courses designated as clinical, performance, laboratory or fieldwork courses, the limit on absences is established by the individual instructor. For all other courses, the number of hours absent may not exceed twice the number of contact hours the course meets per week.

AAC/SDS Statement:

The AccessAbility Center/Student Disability Services ensures equal access and full participation to all of City College's programs, services, and activities by coordinating and implementing appropriate accommodations. If you are a student with a disability who requires accommodations and services, please visit the office in NAC 1/218, or contact AAC/SDS via email (disabilityservices@ccny.cuny.edu), or phone (212-650-5913 or TTY/TTD 212-650-8441).

Academic Integrity:

Academic dishonesty of any sort is strictly prohibited at The City College of New York.

Plagiarism is the act of presenting another person's ideas, research or writing as your own. Examples of plagiarism include:

- Copying another person's actual words or images without the use of quotation marks and footnotes attributing the words to their source.
- Presenting another person's ideas or theories in your own words without acknowledging the source.

- Failing to acknowledge collaborators on homework and laboratory assignments.
- Internet plagiarism, including submitting downloaded term papers or parts of term papers, paraphrasing or copying information from the internet without citing the source, or “cutting & pasting” from various sources without proper attribution.

Visit <https://www.ccny.cuny.edu/about/integrity> to download a copy of the University’s academic integrity policy handout.

Or see <https://www.ccny.cuny.edu/sites/default/files/2014-Reasonable-Accommodations-Faculty-Guide-to-Teaching-Students-with-Disabilities.pdf> on page 56.

Guidelines for the Final 90% Design Project Reports:

The final report shall include:

1. Acknowledgements: list your mentor(s) and any others that may have contributed data, resources, expertise knowledge, funding, etc.
2. Executive Summary (1 page or less) summarizes the project and the proposed solution: grading 5%)
3. Introduction (grading: 10%)
 - a. Problem Statement
 - b. Background Information
4. Technical Approach (grading: 25%)
 - a. Methodology
 - b. If applicable: sampling analysis, technical analysis, product testing, etc.
 - b. Uncertainty Analysis
 - c. Breakdown of each team member’s role in the project
5. Risk Assessment (grading: 15%)
 - a. Qualitative and quantitative analysis
 - b. Life-cycle assessment/Sustainability
6. Project Cost Estimate (grading: 10%)
 - a. Capital cost (cost of fixed assets)
 - b. Annual O&M cost
7. Conclusion (grading: 25%)
 - a. Project outcomes, recommendations, and estimated construction/implementation time
 - b. Design documents: drawings/procedures/specifications/diagrams
 - b. Final Project Schedule and an analysis of deviations from the original schedule
 - c. Deliverables outside of class: patents, contest entries, websites, stakeholder presentations, etc. (*if applicable*)

10% of the report grade will be determined by grammar/narrative style/formatting. The final report should be concise, easy to read, and professional in tone and appearance.

Guidelines for the Design Project Panel Presentation:

Each team will prepare an oral presentation, which will be presented to the course instructor and a team of experts at the end of the semester:

- The panel must include your technical mentor, additional experts in your field, and the course instructor.

Guidelines for Weekly Progress Reports and Project Schedule:

Team leaders must submit a progress report and an updated project schedule each week. The progress report should be no more than 1 page (bullets are acceptable), attached with the progress schedule.

This semester, you will receive a group grade each week:

- Weekly progress reports are to be submitted on Blackboard every Friday by 11:59 pm (Jan 31st to April 22nd). Team leaders are responsible to submit the weekly reports and weekly project schedules to their mentors by the same dates. All team members should be copied on the weekly progress reports and project schedules.
- Weekly progress reports should include:
 - o Date/times and attendees of team meetings/calls (inside and outside of class, with and without mentors)
 - o An overview of each team members' activities, successes and challenges.
 - o An updated project schedule and an explanation of any changes to the schedule.

The following schedule is subject to change.

Course Schedule:

• Monday, 27 January 2020

- Review of course syllabus
- Discussions: Basic Project Management
- Team meetings with course instructor

• Monday, 3 February 2020

- Guest Speaker: Mr. John Clenace, P.E. - The Importance of Project Scheduling
- Team meetings with course instructor

• Monday, 10 February 2020

- Discussion: What is Risk Assessment?
- Team meetings with course instructor

• Monday, 17 February 2020 – NO CLASS

• Monday, 24 February 2020

- Guest Speaker: Mr. Ed Linky - Ethics
- Team meetings with course instructor

• Monday, 2 March 2020

- Discussion: Understanding the Importance of U.S. EPA and Regulations

- Team meetings with course instructor
- **Monday, 9 March 2020**
 - Submittal of first external event summary
 - Guest Speakers: Prof. Barry Gross and Prof. Gilesen
 - Team meetings with Course instructor
- **Monday, 16 March 2020 (No Class due to remote teaching instructions)**
- **Monday, 23 March 2020**
 - Discussion: What is Superfund?
 - Team meetings with course instructor
- **Monday, 30 March 2020 – No Class due to Recalibration of Educational Equity - March 27th – April 2nd**
- **Monday, 6 April 2020**
 - Team presentations: Update of team’s progress – 15 mins max (but absolutely no more than 20 mins)
- **Monday, 13 April 2020**
 - Submittal of 60% design report on Blackboard by 3:00 pm (you don’t have to submit a hard copy)
 - Discussion: Showed 6 videos relating to epidemiology, Convid19 impacts on the environment (2), how do you know you have Convid19, how to be safe caring for someone with Convid19, and how to properly wear a mask
 - Team meetings with course instructor
- **Monday, 20 April 2020**
 - Discussion: Will go over the draft 60% design, address comments from the class, and will discuss requirements for final 90% design report
 - Team meetings with course instructor
- **Monday, 27 April 2020**
 - Submittal of second external event summary
 - Discussion: Review of presentations skills and practical industry work tips
 - Team meetings with course instructor
- **Monday, May 4, 2020**
 - All teams shall submit the 90% final design report, which shall include the project schedule, and a copy of the team’s presentation by 2:30 pm on Blackboard and a hard copy of the report at the beginning of the class (late submittals will not be accepted).
 - Teams 5 and 3 will present their design project
- **Monday, May 11, 2020**
 - Teams 1 and 2 will present their design project

• Monday, **May 18, 2020**

- Team 4 will present their design project
- Discussion: Course summary recap

Key dates:

February 17th - No Class

April 8th – 10th 16th – Spring Break

May 14th – Last day of classes

May 22nd – End of Spring Term

May 25th – Holiday - College Closed

May 27th – Commencement

May 28th – Final grade submission deadline