CE 100S – First Year Seminar
Civil and Environmental Engineering &
Drawdown: Innovative Strategies for Reversing Global Warming

Fall 2021

Lecture: Wednesdays, 1:25 - 2:15pm, 107 EE West
(*Note that while we hope that classes remain in person all semester, we need to remain flexible as conditions continue to evolve. Your health and safety, and those of our community, are our number one priority.)

Instructor: Rachel A. Brennan, Ph.D., P.E.
231K Sackett Building; rab44@psu.edu; 814-865-9428
https://sites.psu.edu/rachelbrennan/

Office hours: W 10 – 11am via Zoom (https://psu.zoom.us/j/92156583980); or by appointment. You may also email questions directly to rab44@psu.edu.

Course objectives: The primary purpose of the course is to broadly introduce you to engineering at Penn State; acquaint you with the tools, resources and opportunities available in the College of Engineering and the University; expose you to some of the professional skills and competencies associated with academic study and professional engineering practice; introduce you to different focus areas within engineering, co-curricular opportunities, and possible career paths. The seminar will include guest lectures, readings, classroom discussions, and independent activities.

Course theme: The Penn State College of Engineering (COE) recognizes that to be competitive throughout your career, you must attain rigorous core knowledge and problem-solving skills to “develop innovative solutions to the world’s most pressing challenges”. There is arguably no greater global challenge today than climate change: there is scientific consensus that the Earth’s climate is warming due to human activities, and that immediate interventions are required to stop it. There is increasing understanding that we must not only reduce greenhouse gas emissions to stop global warming, but also “draw down” and sequester carbon to reverse it. Fortunately, there are many innovative methods of reducing and reversing carbon emissions, spanning technological, ecological, and social solutions across all sectors of the economy and society. In this interactive seminar, we will explore some of the 100 strategies that have been identified for reducing and reversing carbon emissions within the broad categories of: Buildings; Electricity; Food, Agriculture, & Land Use; Health & Education; Industry; Sinks (Coastal & Ocean, Land); and Transportation. Learn more at: drawdown.org

Required text (also available electronically):

Grading: All assignments must be uploaded to Canvas as a PDF by 11:59pm on the due date. Late assignments will be penalized 20% for each 24 hour period (or any fraction of 24 hours, not pro-rated) that they are late (for example, if you submit an assignment 10 minutes late, you will receive -20%). All documents must be typed. Professional language style, grammar, punctuation, and neatness count, and may be penalized at the discretion of the instructor.

<table>
<thead>
<tr>
<th>Attendance and Participation</th>
<th>= 45 points = 45%</th>
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<tbody>
<tr>
<td>Engineering Path to Success</td>
<td>= 20 points = 20%</td>
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<tr>
<td>Drawdown Quizzes</td>
<td>= 25 points = 25%</td>
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<tr>
<td>Drawdown Team Presentation</td>
<td>= 10 points = 10%</td>
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<tr>
<td><strong>Total</strong></td>
<td>= 100 points = 100%</td>
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The standard grading system will be used to assign final letter grades in the course (A = 94 – 100%; A- = 90 – 93%; B+ = 87 – 89%; B = 84 – 86%; B- = 80 – 83%; C+ = 76 – 79%; C = 70 – 75%; D = 60 – 69%; F = 0 – 59%).
Exams
There are no exams in this class.

Attendance and Participation (45 points)
All students are expected to attend class regularly; consequently, attendance will be taken every class period and feedback will be gathered following each session. Students are also strongly encouraged to participate actively in class discussions. If you come to class, provide feedback, and participate in discussions, then you will receive full credit (3 points per class) in this category. If not, you will get less.

Engineering Path to Success (20 points)
Engineering First Year Seminars (FYS) are designed to engage students in learning and facilitate the transition to college life.
1. To introduce students to university study
2. To introduce students to Penn State as an academic community, including fields of study and areas of interest available to students.
3. To acquaint students with the learning tools and resources available at Penn State.
4. To provide an opportunity for students to develop relationships with full-time faculty and other students in an academic area of interest to them.
5. To introduce students to their responsibilities as part of the University community.

As a component of FYS, the Engineering Path to Success will provide you with a variety of activities to help you meet the goals above. You will need to complete a total of FOUR activities, and write a 1-page reflective essay about each activity afterward. There are TWO core activities that are required for everyone, and then you can choose TWO activities from the additional list.

Core activities (both required, 5 points each):
1. Attend a Major Night
2. Attend a World in Conversation (WIC) Dialogue
   World in Conversation trains students to facilitate dialogues that initiate collaborative critical thinking on topics that are timely and complex. WIC facilitators, students like you, lead these dialogues. The simple goal of a WinC dialogue is for participants to be able to express their different perspectives and to learn from each other in the process. Each session is 95 minutes in duration and will occur outside of your regular class meeting times. One week before the sessions for this class begin, you will receive an email explaining how to register. This email will be sent to your PSU account. In order to receive credit, your attendance will be recorded. But keep in mind: you will not be able to attend the program (or receive credit) if you are more than 5 minutes late. Any questions about WinC should be directed to the WinC staff (not your professor): 814-865-5692 or http://worldinconversation.org/help.

Additional activities (select two of the following, 5 points each):
1. Attend an Engineering Student Organization meeting
2. Tour the Engineering Library
3. Attend a Career Fair
4. Attend a Drawdown Event led by various Penn State student orgs
5. Complete the "Academic Integrity" module
6. Attend a university (not engineering) student organization meeting
7. Attend a second Major Night.

Guidelines for completing the Engineering Path to Success are provided on Canvas for you to work on over the course of the semester. All reflective essays must be uploaded to Canvas by 11:59pm on Wednesday, November 17, 2021.

Drawdown Assignments
Drawdown Quizzes (25 points): Five short quizzes on current articles/videos will be given periodically throughout the semester to support the course content. Each quiz will be worth 5 points, and must be completed by 11:59pm on the due date. Quiz assignments will be posted on Canvas approximately one week in advance of the quiz.

Drawdown Presentation (10 points): Select one of the Drawdown sectors that interests you, and sign up with a classmate to summarize two of the solutions within that sector in one of the time slots as shown
in the syllabus. Presentations should be conducted in PowerPoint, last approximately 10 minutes per team, clearly articulate the current and upcoming challenges related to your chosen solutions, and describe the potential environmental and societal impact that implementing the solutions could have on the world. Be sure to consult at least 5 reputable references, and describe how application of the solutions will help meet the UN Sustainable Development Goals of 2030 and the Engineering Grand Challenges of the 21st Century (if applicable). After your team’s presentation, be prepared to answer questions from the audience for ~5 minutes. PowerPoint slides must be uploaded to Canvas no later than 12pm (noon) on the day of the presentation.

**Masking:** Penn State University requires everyone to wear a face mask in all university buildings, including classrooms, regardless of vaccination status. **ALL STUDENTS MUST wear a mask appropriately (i.e., covering both your mouth and nose) while you are indoors on campus.** This is to protect your health and safety as well as the health and safety of your classmates, instructor, and the university community. Anyone attending class without a mask will be asked to put one on or leave. Instructors may end class if anyone present refuses to appropriately wear a mask for the duration of class. Students who refuse to wear masks appropriately may face disciplinary action for Code of Conduct violations. If you feel you cannot wear a mask during class, please speak with your adviser immediately about your options for altering your schedule.

**Cell phone policy:** Cell phone use during class is distracting, disrespectful, and rude. It is expected that students are in class to learn the course material; therefore, all cell phones should be turned off at the beginning of class. Any student who has a cell phone go off during class will be rewarded with a pop quiz for everyone in class. Students caught texting, etc., during class will be asked to leave.

**Academic Integrity:** Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity includes a commitment by all members of the University community not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others. If cheating or copying is suspected, all students involved will receive a zero for that assignment. **Cheating or plagiarism** on any graded activity will be penalized with a minimum of zero points for the assignment, and up to a failing grade in the class. I will also place academic integrity violation reports in the offenders’ permanent files. If you are not familiar with what constitutes an academic integrity violation, I encourage you to read Penn State’s policies on the following web site: [http://www.engr.psu.edu/CurrentStudents/acadinteg.asp](http://www.engr.psu.edu/CurrentStudents/acadinteg.asp).

**Disability Accommodation:** Penn State welcomes students with disabilities into the University's educational programs. To receive consideration for reasonable accommodations, you must contact the appropriate Office for Disability Services (ODS) at the campus where you are officially enrolled ([http://equity.psu.edu/ods/doc](http://equity.psu.edu/ods/doc)), participate in an intake interview, and provide documentation ([http://equity.psu.edu/ods/doc-guidelines](http://equity.psu.edu/ods/doc-guidelines)). If the documentation supports your request for reasonable accommodations, your campus’s ODS will provide you with an accommodation letter. Please share this letter with me and discuss the accommodations as early as possible.

**Counseling and Psychological Services:** Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients’ cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

[Counseling and Psychological Services at University Park (CAPS): 814-863-0395](http://www.caps.psu.edu)
Penn State Crisis Line (24 hours/7 days/week): 877-229-6400
Crisis Text Line (24 hours/7 days/week): Text LIONS to 741741

**Educational Equity / Report Bias:** Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation,
or veteran status are not tolerated and can be reported through Educational Equity via the Report Bias webpage.

Adherence to course schedule: Due to the number of outside speakers, I expect that we may deviate slightly from the class schedule to accommodate unforeseen conflicts; however, significant changes will be discussed and noted in the course syllabus posted on Canvas. The following page provides a tentative course schedule for the semester.

Tentative CE 100S Course Schedule
Fall 2021

<table>
<thead>
<tr>
<th>Week Number</th>
<th>Date</th>
<th>Session Topic</th>
<th>Deliverable</th>
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<tbody>
<tr>
<td>1</td>
<td>Aug 25</td>
<td>Introduction to FYS; ASCE presentation; Concrete Canoe &amp; Steel Bridge teams</td>
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<tr>
<td>2</td>
<td>Sept 1</td>
<td>What is Drawdown? (and its relation to the UN Sustainable Development Goals, the Water-Energy-Food Nexus, and the Engineering Grand Challenges)</td>
<td>Student survey due</td>
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<tr>
<td>3</td>
<td>Sept 8</td>
<td>Eco-Reps; Engineers for a Sustainable World (ESW); Engineers Without Borders (EWB)</td>
<td>Sign up for sector presentations</td>
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<td>4</td>
<td>Sept 15</td>
<td>Virtual Water and International Impacts</td>
<td>Quiz #1</td>
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<tr>
<td>5</td>
<td>Sept 22</td>
<td><strong>Building sector – Student presentations</strong></td>
<td>Team presentations</td>
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<tr>
<td>6</td>
<td>Sept 29</td>
<td>The changing environment and infrastructure in the Arctic – Research (Dr. Xiao)</td>
<td>Quiz #2</td>
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<tr>
<td>7</td>
<td>Oct 6</td>
<td><strong>Energy sector – Student presentations</strong></td>
<td>Team presentations</td>
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<tr>
<td>8</td>
<td>Oct 13</td>
<td>Energy – Research (Dr. Logan)</td>
<td>Quiz #3</td>
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<tr>
<td>9</td>
<td>Oct 20</td>
<td><strong>Transportation sector -- Student presentations</strong></td>
<td>Team presentations</td>
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<tr>
<td>10</td>
<td>Oct 27</td>
<td>Transportation – Research (Dr. Gayah)</td>
<td>Quiz #4</td>
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<tr>
<td>11</td>
<td>Nov 3</td>
<td><strong>Food, Agriculture, &amp; Land Use sector – Student presentations</strong></td>
<td>Team presentations</td>
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<tr>
<td>12</td>
<td>Nov 10</td>
<td>Food, Agriculture, &amp; Land Use – Research (Dr. Brennan)</td>
<td>Quiz #5</td>
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<tr>
<td>13</td>
<td>Nov 17</td>
<td>Financial Literacy Overview</td>
<td>Engineering Path to Success Deadline</td>
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<tr>
<td>14</td>
<td>Nov 24</td>
<td>Thanksgiving Break</td>
<td></td>
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<tr>
<td>15</td>
<td>Dec 1</td>
<td>Careers in Research vs. Consulting</td>
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<tr>
<td>16</td>
<td>Dec 8</td>
<td>Students’ Choice! -- TBA</td>
<td>Individual reflection</td>
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