



ENVE T480  
Coronavirus & Engineering  
On Line



Professor Charles N Haas

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on line via appointment

Regular Zoom open hour: Wednesdays 4-5pm EDT (link will be emailed)

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This course is designed to cover issues surrounding to the ongoing COVID-19 (SARS-COV-2) outbreak that intersect with what skills engineers could contribute. As a result, contents and order of presentation may change.

**Course Description:** The ongoing outbreak of SARS-COV-2 certainly has major medical and public health aspects. Engineers and quantitative scientists have much to bring to the table in understanding, predicting and mitigating this and other outbreaks. This course, which will be based on rapidly unfolding knowledge, will give students understanding of the key issues to which engineers can contribute.

**Prerequisite(s):** (BIO 122 or 141) and (MATH 210 or 262 or ENGR 232) or permission.

**Credit Hours:** 3

**Text(s):** There will be no textbook, but links and videos for lectures will be posted in BBLearn

**Course Objectives:**

At the completion of this course, students will be able to:

1. Explain what SARS-COV-2 is and how it is detected and measured
2. Understand processes whereby people become exposed
3. Understand processes for fate and transport of the virus
4. Know how risks to individuals are computed
5. Know how population risk using epidemiologic models is computed
6. Know what non-pharmaceutical interventions, including engineering controls, can be used to reduce risk and how they work

*This will be my first time teaching online, and for many of you it may be the first time you are taking a totally on line course. I will do my utmost to avoid glitches, but there may be some. I will be understanding as you encounter glitches, and will try to help resolve them.*

## Grade Distribution:

Online quizzes	40%
Discussion posts	35%
Term project	25%

During the term, three online quizzes will be released covering material since the previous quiz. They will be available for the entire week.

There will be several ungraded discussion boards set up for discussion of general course operations and other issues. During the course of the term, three graded discussion boards will be set up to discuss topics posed by the instructor. Rubrics for grading of the discussion posts will be set up by the instructor. You will have until the end of the week to make a cogent response to the question posed. You are advised to write your posts outside the BBLearn shell (e.g. in a word processor) and after you have edited your content post it into a thread within the discussion post.

I encourage students to engage in all discussions and I will review them periodically and comment.

## Term Project:

By the Friday of Week 9 of the course, a term project will be due. This is to be no more than 5 pages (double spaced) plus references, figures and tables on the topic of how the particular major you are in can work to better understand, mitigate and/or solve the issues of COVID19. I will distribute instructions for submitting this.

## Letter Grade Distribution:

The instructor reserves the right to make the grading more generous (i.e., reduce the point range for a given letter grade).

$\geq 93.00$	A	73.00 - 76.99	C
90.00 - 92.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	B	63.00 - 66.99	D
80.00 - 82.99	B-	60.00 - 62.99	D-
77.00 - 79.99	C+	$\leq 59.99$	F

## Course Policies:

- **General**

- Notice: Appropriate Use of Course Materials

It is important to recognize that some or all of the course materials provided to you may be the intellectual property of Drexel University, the course instructor, or others. Use of this intellectual property is governed by Drexel University policies, including the policy found here: <https://drexel.edu/it/about/policies/policies/01-Acceptable-Use/>

Briefly, this policy states that course materials, including recordings, provided by the course instructor may not be copied, reproduced, distributed or re-posted. Doing so may be considered a breach of this policy and will be investigated and addressed as possible academic dishonesty, among other potential violations. Improper use of such materials may also constitute a violation of the University's Code of Conduct found here: <https://drexel.edu/cpo/policies/cpo-1/> and will be investigated as such.

- **No makeup quizzes or exams will be given.**

- **Grades**

- Grades in the **C** range represent performance that **meets expectations**; Grades in the **B** range represent performance that is **substantially better** than the expectations; Grades in the **A** range represent work that is **excellent**.
- Grades will be maintained in the LMS course shell. Students are responsible for tracking their progress by referring to the online gradebook.

- **Quizzes and Assignments**

- Students are expected to work independently. **Offering** and **accepting** solutions from others is an act of **plagiarism**, which is a serious offense and **all involved parties will be penalized according to the Academic Honesty Policy**. Discussion amongst students is encouraged, but when in doubt, direct your questions to the professor, tutor, or lab assistant.
- **No late assignments will be accepted under any circumstances.**

- **On Line Materials** Students are expected to review materials every week by the end of the week.

## **General University Policies**

- Academic Integrity, Plagiarism, Dishonesty and Cheating Policy. [http://www.drexel.edu/provost/policies/academic\\_dishonesty.asp](http://www.drexel.edu/provost/policies/academic_dishonesty.asp)
- Student with Disability Statement <http://drexel.edu/oed/disabilityResources/students/>
- Course Add/Drop Policy. <http://www.drexel.edu/provost/policies/course-add-drop>
- Course Withdrawal Policy <http://drexel.edu/provost/policies/course-withdrawal>

## **Declaration**

Online submission of, or placing one's name on an exam, assignment, or any course document is a statement of academic honor that the student has not received or given inappropriate assistance in completing it and that the student has complied with the Academic Honesty Policy in that work.

**Tentative Course Outline:**

The weekly coverage might change as it depends on the progress of the class, and ongoing developments with the COVID-19 outbreak. However, you must keep up with the materials posted and the discussions.

I expect to release each week's material by Monday morning (Eastern Time).

<b>Week</b>	<b>Content</b>
Week 1 - Apr 6	<ul style="list-style-type: none"><li>• Introduction</li><li>• Role of engineers</li><li>• Basic biological concepts</li></ul>
Week 2 - Apr 13	<ul style="list-style-type: none"><li>• Basic biological concepts cont.</li><li>• Prior coronaviruses</li></ul>
Week 3 - Apr 20	<ul style="list-style-type: none"><li>• Source terms for the virus &amp; evidence</li><li>• Decay terms</li><li>• Exposure efficiencies</li></ul>
Week 4 - Apr 27	<ul style="list-style-type: none"><li>• Fate and transport indoors</li><li>• The risk assessment process</li></ul>
Week 5 - May 4	<ul style="list-style-type: none"><li>• Dose response and incubation</li></ul>
Week 6 - May 11	<ul style="list-style-type: none"><li>• Disease transmission models</li></ul>
Week 7 - May 18	<ul style="list-style-type: none"><li>• Non-pharmaceutical interventions: engineering controls &amp; disinfection</li></ul>
Week 8 - May 25	<ul style="list-style-type: none"><li>• Non-pharmaceutical interventions: PPE</li></ul>
Week 9 - June 1	<ul style="list-style-type: none"><li>• TBD</li></ul>