

1 Introduction of Mechanical Engineering - MECH 103 - Fall 2020

1.1 COVID-19 - Please Be Understanding

This is the first thing I am putting on the syllabus so I clearly think it is important. Due to COVID-19, the way that I traditionally teach this course (and the way that students traditionally learned it) has changed dramatically. I have put in a ton of work to figure out as many of the problems ahead of time as possible. However, it is inevitable that something has slipped through the cracks and I may need to make adjustments in real time. As such, I wanted to start out my syllabus by asking you for the following:

- Please be understanding if things need to get tweaked mid-semester.
- Please understand that it may take me a little bit of time to reply to your emails.
- Please be ready to learn without a ton of external motivation. I can't look over your shoulder online. This is asking a lot from you.

The one thing I am confident in is my excitement to teach you in this class. With all that out of the way, lets get on to normal syllabus stuff.

1.2 Course Administration

Instructor: Dr. Samuel Bechara (Dr.B)

Email: samuel.bechara@colostate.edu

Lecture Time: MW(F), 9:00-9:50AM Section 001 or 8:00-8:50AM Section 003

My Office: Engineering A105 (but due to COVID you probably won't get to see it)

My Office Hours: MW 1-2PM *or by appointment*

COVID-19 NOTE: *All office hours will be virtual.* There may be opportunities to meet in person if you would prefer that. Check Canvas for more detailed instructions about how to attend the virtual office hours.

If you need to meet with me outside of my office hour times (and can't get your questions answered by MESA, tutoring, TA's, etc) then just drop me an email with your availability in the next 48 hours and briefly explain why you need to meet. I will do my best to schedule a meeting with you personally.

Graduate Teaching Fellows (GTF):

The graduate teaching fellows are graduate students that are receiving specific training to be instructors. They are an excellent option to meet with as they have the skills necessary to help you succeed. They should be one of your first options when you need help.

- Siddesh Bhoite

Email: siddhesh.bhoite@colostate.edu

Office Hours: Monday 6-7pm, Tuesday 5-6pm, Friday 10am-11am

- Alex Preston

Email: alexander.preston@colostate.edu

Office Hours: Wednesday 4-5pm, Thursday 11am-12pm, Friday 11am-12pm

Graduate Teaching Assistants (GTA):

The GTA's for this course are also an excellent option when you need help. They are graduate students in the department and will have the skills necessary to figure out your problems. Like the GTFs, they should be a first-choice option when you need help or clarifications.

- Erik Brodin

Email: erik.brodin@colostate.edu

Office Hours: Monday 5-6pm, Tuesday 5-6pm, Thursday 5-6pm

- Dylan Giardina

Email: dylan.giardina@rams.colostate.edu

Office Hours: Monday 4-5pm, Wednesday 5-6pm, Friday 1-2pm

1.2.1 A Note on Learning Assistants

In this class we will use learning assistants (LAs). LAs are undergraduates who have previously taken the course that are here to help you learn. All of the labs are led by LAs and some may have office hours (TBD). Please be respectful to the LAs. They are working hard for your learning!

1.3 Course Contract (This Syllabus)

It is your responsibility to read this syllabus in its entirety. The syllabus has a lot of details about the course and my expectations for your learning and participation. **There will be no exceptions to the policies detailed in this syllabus.** I will not entertain any pleas for exceptions to the policies outlined in this syllabus.

1.4 A Note on Inclusion

Everyone is welcome in my classroom. I understand that each of you has an individual history that is unique. I just want to let you know I am here for you *whoever* you are. If you ever feel like you are being discriminated against for any reason at CSU, I want you to know that you can always reach out to me and I will do everything in my power to make it right. That includes but is not limited to the following:

- I say something that makes you feel uncomfortable. I assure you it is never my intent, but I will not retaliate if you feel that you need to correct something I say in class.
- Your fellow classmates are making you feel uncomfortable because of race, gender, or any other reason that you feel is inappropriate. Even if you just overhear something, I need to know.
- You feel hostility in any environment related (or even not related) to the course.
- Someone at CSU has harassed you for any reason and you need someone to talk to.

Please know that you are not alone. Even if I can't relate to your situation exactly, I can empathize. My goal is that *everyone* feels safe, welcomed, and ready to learn.

1.5 Labs

The labs will be held on Fridays in lieu of lecture. Your lab will be led by a Learning Assistant and the goal is for you to learn about engineering computer technologies that will be critical in your academic career.

You will be randomly assigned a computer lab time and location. It is your responsibility to understand which lab you are assigned to, and where the lab is located. All of this information will be posted on Canvas. *Most* labs are held during the normal class time so there will be no conflict. Due to classroom constraints, some of the labs are in the afternoon. If you have a legitimate conflict (must be either work, commute, or class conflict related) with the lab time you are assigned, please gather supporting documentation and make an appointment with the instructor as soon as possible.

COVID-19 NOTE: *The laboratory is the only portion of the class that will be conducted face-to-face. However, face-to-face attendance of the labs is not required. If you would prefer to do the labs virtually, just let me know via email and I will remove you from the face-to-face roster you are assigned. Attendance will not be taken during lab sessions but you will only be allowed to attend the lab session that you are assigned to.*

1.5.1 Lab Kits

The labs will require that you pick up a lab kit. In the first few weeks of the semester I will make an announcement about when and where you can pick up your lab kit.

COVID-19 NOTE: If you are planning on attending the course online and are unwilling to come to campus to pick up your lab kit, you may have to purchase a lab kit yourself to have it shipped to your address. We will try our best to accomidate social distancing and other best practices when it comes to picking up your lab kit. More information about this will be announced on canvas before the first lab kit project is to start.

1.6 Course Overview

This course is an introduction into the discipline of Mechanical Engineering. The course will cover some of the tools used in the profession and also help as a starting point in your academic and professional career in Engineering.

1.6.1 Course Objectives

- Research, discuss, and formulate opinions on engineering related ethical issues.
- Demonstrate the skills necessary to function on multidisciplinary teams.
- Improve the ability to communicate technical content in a clear and concise manner.
- Identify various dimensions and units and apply these to basic mathematical and physical principles.
- Introduce and apply analysis, plotting, and organizational techniques in Microsoft Excel.
- Define and implement foundational MATLAB programming capabilities.
- Expose students to a range of resources, disciplines, and career paths in relation to Mechanical Engineering.
- Understand the role that diversity plays in an efficient and effective engineering environment.

1.6.2 Upon completion of this course, students should be able to:

- Make engineering decisions related to ethical questions.
- Effectively work as a member of a diverse team.
- Formulate both written reports and oral presentations on technical content in a concise and clear fashion.
- Know the most common units for engineering problems and use dimensional analysis to determine proper units.
- Utilize Microsoft Excel and MATLAB to analyze and present data.

1.7 Textbooks

1.7.1 Required Text 1: Introduction to Mechanical Engineering by: Samuel Bechara

The textbook we will use in the course was written specifically for this class by Dr. Samuel Bechara (yes, that is me). I decided to write a textbook for this course for a couple of reasons:

1. Traditional introduction to engineering textbooks are *boring*. I wrote a book that includes all of the material you need to be successful, but it is fun to read!
2. Traditional textbooks are **insanely expensive**. The previous textbook used for this course cost \$250 and you *didn't even get to keep it when the semester was finished*.

For these two reasons I embarked on a two year journey to write a better and less expensive engineering textbook. The publisher I used is called TopHat and they agreed to help me create a fun, interactive text that is much less expensive for students. **You will receive an email from TopHat shortly after the semester starts to purchase the textbook. I highly recommend that you purchase the textbook through TopHat directly (as opposed to purchasing it in the bookstore) because the CSU bookstore marks the textbook up a little bit.**

You are required to purchase the e-Text in order to complete the homework and assignments that are automatically built into the textbook. However, if you would like to purchase a print copy of the text, I will post a PDF copy of the book onto canvas that you can print. If enough students are interested (minimum 20), I can order hardcover printed copies of the book and will sell them at cost.

1.7.2 Required Text 2: How to be an Antiracist by: Ibram X Kendi

This one may come as a bit of a surprise for an engineering course but in my opinion, it is time that we address some of our society's systemic problems in engineering. You will likely notice that most of your classmates are white and male. I am not saying that if you are a white male that you don't belong, but I am challenging you to think why we don't have more women and why we don't have more students of color. I also am going to challenge you this semester to consider that this lack of diversity actually is a disadvantage from an engineering perspective. As such, we will have bi-weekly reading assignments and class discussions from chapters of this book.

1.8 MATLAB

We are going to be using MATLAB throughout this semester to solve problems. Please familiarize yourself with how to access MATLAB as a CSU student.

As of 2018, CSU now provides MATLAB licenses to students **FOR FREE**. This is huge and you should take advantage of it. A MATLAB license costs about \$500 so download it on your personal computer and learn how to use it!

[Click here](#) to go to the CSU MATLAB Portal and download your copy.

1.9 Online Systems

We will be using several online systems this semester to administer the course. These were not chosen arbitrarily and although you will have several systems to navigate and sign up for, you should be able to access everything through Canvas. Please take a moment to familiarize yourself with all of the systems and understand how they work so that you do not miss critical assignments and due dates.

1.9.1 Canvas

- Used for: **MAIN HUB FOR COURSE**, Notifications, Exams, Quizzes, Most Assignments, Lecture Recordings, and *official* grades.
- How to signup: You are automatically signed up with your CSU ID.

Canvas is going to be the main hub for the online course. You will be able to access the other systems via links provided on Canvas so you plan on Canvas being your first stop for all material related to the course.

I am going to contact the class using canvas announcements exclusively. I will periodically send out announcements using canvas and it is *your responsibility* to check for announcements. I recommend allowing canvas to send you notifications.

You will also complete and submit all of your quizzes, homework assignments, labs, and discussion posts through Canvas. It is a good idea to spend a few minutes to learn how to use this learning management system. It is fairly intuitive and easy. The canvas gradebook will be the *official* gradebook for the course. Although the other online systems will have gradebooks associated with them, the Canvas gradebook is the one that you should pay most attention to.

1.9.2 TopHat

- Used for: Readings, Some homework.
- How to signup: You can purchase access through the University bookstore however I recommend waiting for me to send you an email so you can purchase access directly through TopHat to avoid the bookstore upcharge.

TopHat is a system and book publisher that I worked with to write the text for this course. It allowed me to make something interactive and unique. I hope that you enjoy it.

Further, some textbook and end-of-chapter problems may be assigned through TopHat. Remember, all of your assignments in TopHat will be accessible via links in Canvas so you should check Canvas first before going to TopHat.com.

1.9.3 MATLAB Grader

- Used for: Some Assignments, Laboratories
- How to signup: You will need to signup using your official CSU email address and your student ID. Before the first MATLAB Grader assignment, detailed instructions will be posted to canvas outlining the signup procedure. Please do not sign up until you get the detailed instructions.

MATLAB Grader is the an important piece of the online puzzle. We are using it because it allows you to practice your MATLAB programming skills in an online environment and grades them *in real time*. The value in this is that you can submit an unlimited number of submissions until you get the assignment or lab completed accurately. There is no reason anyone in the course should have less than 100% on MATLAB Grader assignments. I am of the opinion that learning is our main goal and you learn best when you can get real-time accurate feedback about your progress. Just like all the other assignments, you will be able to access links for MATLAB Grader assignments via Canvas.

1.9.4 Microsoft Teams - Live Online Components

Finally, we will be using Microsoft Teams for the live online components of this course. That includes:

- Online office hours
- Live lectures (they will be recorded and posted on Canvas within a few hours of airing)
- Breakout discussions

I will post links to all of the above on Canvas. It is best if you think of each Microsoft Teams link as a “classroom”. For example, I will have a link that you will use *everytime* for the live lecture. So think of that as the classroom link. Similarly, I will have a *different* link that I will use for my virtual office hours every week, so think of that as my “office”. Etc.

I *highly* recommend that you download the official Microsoft Teams application for your laptop / computer. The nice thing about using teams is that I can (and will) invite students to turn on their webcams and share things on their screens. So be prepared for me to call on you during our live lectures, have a webcam and microphone ready. Teams also has a pretty nice and robust chat feature that I will do my best to monitor and actively participate in.

1.10 Course Evaluation

Assignments will be weighted as follows (for more information, see corresponding section below):

Category	Percentage
Participation	5%
Quizzes	10%
Homework	15%
Labs	15%
Exams	50%
Final Project	5%

Grading will be assigned according to a fixed grade scale and use

the +/- grade system per the CSU catalog. You will be given the grade that you **earn** based on the scale below.

Percentage	Grade
100-94	A
93-90	A-
89-87	B+
86-84	B
83-80	B-
79-75	C+
74-70	C
69-66	D
<66	F

1.10.1 Participation

Historically, I used a “random student caller” that I developed to call on students during class to ensure class participation. Obviously, this won’t work in a virtual classroom, as such, my participation policy needs to be adjusted. You will be awarded participation points based off of the following categories:

- Your active participation in the bi-weekly “How to be an Antiracist” discussions. If you are a student that is planning on attending most of the class asynchronously, you are going to have to coordinate with the other asynchronous students to have a discussion outside the normal class time. I will be providing some more information about this when we get closer to the first discussion.
- Answering the in-class questions that I propose. Don’t worry, if you are not attending lectures live, you will have 24 hours to watch the lecture and answer the questions. Note: it is *your responsibility* to make sure that you watch the lectures and answer the questions within 24 hours. *I will not entertain any pleas to extend this deadline for any reason.*
- I will still use my random-student-calling app but you won’t get deducted points if you aren’t present in lecture.

Please see “A Final Note on Grading” below for a very important way that participation features in your grade.

1.10.2 Quizzes

Approximately 5 quizzes will randomly be assigned during the semester. ~~You must be present and in class to take the quiz.~~ COVID-19 Update: You must complete the quiz within 24 hours of it being assigned. Each quiz will take approximately 10 minutes and is designed to test your knowledge on current course topics. Your lowest quiz score will be dropped to accommodate *excused* absences. Please let the instructor know if you miss two quizzes due to excused absences.

1.10.3 Absences

~~This course typically has ~200 students and it is very difficult for me to keep track of attendance so I do not try. I also understand that life happens and that you may have to miss class for some reason. If you miss class for a university sanctioned event or other excused reason it is *your responsibility* to seek instructor permission for the excused absence **and** to keep and save the documentation / correspondence that shows the excused absence. For example, at the end of the semester if you missed two classes because of excused absences and both of those dates you were called on by the `random_student_gui()`, I may ask for the documentation showing that those absences were excused.~~

COVID-19 NOTE: Now that the course is virtual and online, there will be *very few excused absences from the lecture*. Since all of the lectures will be recorded, it will be expected that you watch and actively participate in the lecture activities within 24 hours of them being uploaded at the latest. I will consider exceptions to this on a case-by-case basis given substantial evidence. Please note that “my internet stopped working 23 hours after the lecture was uploaded” is not a good excuse. Please try and get your work done with enough of a margin so that this isn’t a problem for you.

1.10.4 Homework Assignments

Homework assignments will be assigned periodically throughout the semester and will usually be due by the next class period (unless otherwise noted on the assignment). The assumption from you should be that it is due by the next class period unless otherwise noted on Canvas. Homework assignments will all be turned in online via one of the online systems specified above.

Late work is not accepted for any reason, however I will drop your lowest homework score. You are welcome to work with your classmates on homework but you are not allowed to access homework solutions from previous semesters. *Letting someone copy your work is considered cheating and will be dealt with as such.* I will drop your lowest homework assignment score.

1.10.5 A Final Note on Grading

I will round everybody's final grade up at the end of the semester to the nearest integer using the MATLAB function `ceil()` if you have a perfect participation score. If you do not have a perfect participation score, I will not round your grade up nor will I consider *any* exceptions to this policy.

If you are unfamiliar with how this function works, please see the cooresponding MATLAB documentation. Please note, *this is the only form of curving, rounding, extra credit that I offer.* It does not matter how close your grade is to the next grade, to ensure the integrity of the course and out of fairness to everyone **I WILL NOT ENTERTAIN PLEAS TO CHANGE GRADES FOR ANY REASON.** The only exception to this is if a grade was entered incorrectly, in that case, I will be happy to change it to the correct grade.

1.11 Rough Course Schedule (subject to change)

Week	Lecture Topic
1-4	Intro, Units, Dimensions
5-8	Excel
9-15	MATLAB

Please be sure to check canvas regularly for more specific reading and homework assignments.

The instructor reserves the right to revise course policies, procedures, and schedule as required.

1.12 Exam Date and Location

~~Exams will likely be administered in an alternative classroom. In class and canvas announcements will be made to let you know where the exams will take place.~~

COVID-19 NOTE: With COVID-19 the exams will now all be administered online. The exam policy may change with each exam so keep an eye out for Canvas announcements about what will be required for each exam.

Exam	Date	Location
Exam 1	30 September 2020	Online
Exam 2	18 November 2020	Online
Final Exam	<i>Depends on section</i>	Online

For the final exam, you can view the final exam schedule here and determine the date and time for your particular section: <https://registrar.colostate.edu/final-exams/>

1.13 Classroom Expectations

The classroom is a learning environment in which everyone is respected and everyone gets the opportunity to learn. I will expect it to be treated as such. When you come to class, you should be ready, willing, able to learn, and to help your classmates to learn. *I expect you to be engaged and working when we are in class.* For example, I don't have a cellphone or laptop policy because you are adults and both of those tools have legitimate educational utility. However, if you are playing candy crush or browsing reddit in class, I will get upset because you are not only wasting your time, but it is distracting to your classmates.

COVID-19 NOTE: Even though the class is online and you can hide behind that anonymity, I still expect that you pay attention and are ready to learn in class. Please plan on taking this course seriously.

1.13.1 Class Policies

- No makeup exams will be accepted. (Exceptions will be made in extenuating circumstances after conference with, substantiation, and approval of the instructor in accordance with CSU policy).
- No late homework assignments will be accepted for any reason. Please do not ask for exceptions.
- It is *your responsibility* to get notes from a classmate if you miss class. Do not ask the instructor or the TA for notes. ~~You are expected to attend all classes~~ **COVID-19 NOTE:** You are expected to watch all lectures either live, or within 24 hours of them being uploaded to Canvas.
- If you feel that a mistake has been made during grading, they must be brought up no later than *one week* after they are returned. If you have a grading question, please meet with the instructor and have a written explanation as to why your question was graded incorrectly.
- Only PE exam approved calculators will be allowed in Exams. Currently that is limited to:
 - Texas Instruments: All TI-30X and TI-36X models (must have "TI-30X" or "TI-36X" in its model name)
 - Hewlett Packard: The HP 33s and HP 35s models, but no others
 - Casio: All fx-115 and fx-991 models (Any Casio calculator must have "fx-115" or "fx-991" in its model name.)
 - NO OTHER CALCULATORS WILL BE ALLOWED ON EXAMS
- ~~I randomly call on students in class to give you an opportunity to highlight your learning. You run the chance of getting called on at any point in class to answer any question. That means it is ok to get it wrong, but it is not ok to not put in any effort.~~
- If we are working on a problem in class, and it is easy to you, you need to help your classmates that are finding it difficult. If you struggle, it's ok, but you need to find someone in class to help you. It's ok if you don't understand everything, that is the point of learning! It's not ok to not try, or to be distracting.
- ~~Do not pack your stuff to leave class until I am finished. A lot of my lectures come down to the wire and it is uncommon for me to lose track of time. It is disrespectful to your professors and distracting to your classmates to pack up before lecture is done.~~ **COVID-19 NOTE:** Well we don't have in person classes anymore but this is still a good policy to keep in mind for your in person classes.
- When I invite a guest to speak to the class I expect that you treat them with the upmost respect. Nothing will get you on my bad list faster than disrespecting a guest speaker. Understand that it reflects poorly on me when a class is disrespectful to a guest speaker. It doesn't matter how boring you think it is, I expect you to give the guest speakers your undivided attention.

1.14 Academic Dishonesty and Class Conduct

It is your responsibility to make sure you are familiar with the CSU Academic Dishonesty Policy. You can find it by clicking [here](#). I take cheating in any form *very seriously* and will punish offenders.

Any breach of the academic integrity policy will result in an automatic F grade for the course. Exceptions to this policy are at the discretion of the instructor.

When it comes to class conduct, you should always refer to your professors as either Professor [Last Name], or Dr. [Last Name] unless they tell you differently. This applies to emails, phone calls, or any other professional

communication. Respect and professionalism should always be your default. Furthermore, when dealing with the TA's I expect you to treat them the same way you treat your professors.

Relevant PhD Comic

1.15 Special Needs

CSU Strives for an inclusive learning environment. If you anticipate or experience any barriers related to the format or requirements of this course please contact Resources for Disabled Students.