

**CHEN 1310: Introduction to Computing for Engineers**  
**Syllabus (Spring 2026)**

**Course & Contact Information**

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Class Days/Times: Tuesdays & Thursdays; 8:00-8:50 AM

Classroom: Ramaley Biology (RAMY) C250

Labs: Engineering Center Classroom Wing (ECCR) 143. *Please refer to your course schedule ([buffportal.colorado.edu](http://buffportal.colorado.edu)) for weekly times.*

<u>CAs:</u>	<u>Email</u>	<u>Recitation Section, Day, Time (ECCR 143)</u>	
Alex Losee	<a href="mailto:Alex.Losee@colorado.edu">Alex.Losee@colorado.edu</a>	011	Mon 1:25-3:15
Jesus Ruiz	<a href="mailto:jesus.ruiz@colorado.edu">jesus.ruiz@colorado.edu</a>	012	Mon 3:35-5:25
Anthony Partida	<a href="mailto:Anthony.Partida@colorado.edu">Anthony.Partida@colorado.edu</a>	013	Tues 9:05-10:55
Kate Emeson	<a href="mailto:Kate.Emeson@colorado.edu">Kate.Emeson@colorado.edu</a>	014	Tues 1:25-3:15
Lilly Schirano	<a href="mailto:Lilly.Schirano@colorado.edu">Lilly.Schirano@colorado.edu</a>	015	Wed 3:35-5:25
Vinnie LaFrazza	<a href="mailto:Vinnie.LaFrazza-Schwartz@colorado.edu">Vinnie.LaFrazza-Schwartz@colorado.edu</a>	016	Thurs 11:15-1:05

Help Hours: info on Canvas home page → Basic Course Information module → Help Hours

Prerequisites: Prerequisite or corequisite course of APPM 1340 or 1345 or 1350, or MATH 1300 (minimum grade C-).

**Course Communication**

Canvas will be used for homework, lab information, learning modules, weekly quizzes, and other class information/resources. You are responsible for all the information that is posted there. Email is not an ideal way to clarify questions on the material; those questions should be answered in lecture, office hours, or lab. If you do need to email, please include both “CHEN 1310:” and a short description of your questions or issue in the subject line to help us identify course-related emails in our inboxes.

**Course Description**

This course introduces the use of computers in engineering problem solving, including elementary numerical methods. The focus is on teaching programming fundamentals, including modular programming and data and algorithm structure.

**Course Learning Outcomes:** By the end of this course, students should be able to:

- Solve basic math and science problems and open-ended engineering problems using Excel, VBA, and Python.
- Design and execute case studies on math, science, and engineering problems.
- Create simple plots in Excel (scatter plots, line graphs, bar graphs, and histograms).
- Perform regression analysis on sets of experimental data.
- Create code that carries out the three main programming structures: sequence, selection, and repetition.
- Implement numerical techniques such as iterative solving, the bisection method, the Golden Section search method, the Euler method, the Newton-Raphson method, and gradient descent.
- Solve optimization scenarios.

### **Required Materials**

- 1) Access to the Windows version of Microsoft Excel (Office 365 is readily available to all students through OIT's website: [oit.colorado.edu](http://oit.colorado.edu)). A personal laptop is NOT a requirement to take this course, but you do need to have regular access to a computer that runs the Windows version of Excel. Students in the past have been successful in taking this course even without a personal laptop. However, it will help a great deal to have your own computer that you can bring to class to work through examples. If you do not have a personal laptop/computer, then there are plenty of computer labs on campus with computers for you to use. The official version of Excel/VBA for the course is the Windows version of Excel 2019/Office 365. You may be able to use Excel 2013 but be forewarned that there are slight differences between Excel 2013/2016/2019. If you own a Mac, you can still use it (many students do) by running the Windows version of Excel (see "If You Own a Mac" below) or preferably through the "General Software Desktop" on Canvas (button on left sidebar).
- 2) This class utilizes the iClicker system to enhance learning and reward practice of the skills taught in class. We have posted detailed instructions for getting set up with your iClicker to the course Canvas site, so please read through these carefully to make sure you are registered and set up.

### **If You Own a Mac**

Although some students have mentioned that VBA works on the most recent versions of Macs, the Mac version of Excel/VBA generally doesn't work well. Even in the first week of class, there are many optional activities in the Learning Modules that require macro-enabled Excel files (.xlsm); these will not work on a Mac. If you own a Mac and want to use it in the course, **please use Excel via the General Software Desktop (link in the left menu bar on Canvas) to ensure there are no issues with the version you are running.** Less-preferred alternatives include installing the Windows version of Excel with Office 365 provided by the University; running Boot Camp and partitioning your hard drive so that you can boot your computer with Windows and run the Windows version of Excel/VBA; or installing Parallels. It would likely require the help of OIT to accomplish those changes. You may not be able to complete the course

objectives, quizzes, and especially the assignments if you use the Mac version of Excel/VBA. You are expected to know the Windows version of Excel/VBA for homework assignments, Learning Modules, iClicker questions, and quizzes. If you choose to use a Mac running Windows Excel/VBA, *\*you\** (not instructors nor CAs) must know the differences and equivalent operations as well as the PC commands/code. In summary, you will not be able to use the Mac version of Excel/VBA in this course. Use Excel via the General Software Desktop on Canvas, and you should not encounter any issues.

### **Class Format**

You will be expected to complete several online “Learning Modules” (educational screencasts) before each class period and complete the questions that are found both within and at the end of them by 7:00 AM before each class period. We will also ask several “clicker” questions (see below) during each lecture, and these will count towards your overall grade at the end of the semester. There are fixed due dates for many of the items. Also, you will work through lab workshops during your lab/recitation, and you are expected to turn these in by 11:59 PM on Fridays, regardless of the day of your lab. Weekly quizzes taken on Canvas during lab will test your understanding of the material.

The instructors and CAs will hold a myriad of office hours throughout the week. Online Learning Modules can be played over and over, allowing you to pause them and practice side-by-side on your computer. *In summary, plenty of help will be available but it is up to you to take initiative to learn the course material.*

### **Grading**

Generally, this class contains the elements below and follows a standard grading scheme:

<b>Overall Grade Breakdown</b>		<b>Grading Scheme</b>	
25%	Homework (lowest dropped)	90/93.33/100	A-, A
15%	Labs (lowest dropped)	80/83.33/86.67/90	B-, B, B+
5%	Lab Attendance	70/73.33/76.67/80	C-, C, C+
15%	Learning Modules (lowest 5 dropped)	60/63.33/66.67/70	D-, D, D+
5%	Clicker Questions (lowest 4 days dropped)	<60	F
10%	The TANK		
25%	Weekly Mastery Quizzes (lowest dropped)		

This could change depending on the overall class average at the end of the semester. However, you will not get a grade that is worse than stated above. **NOTE: *we do not round scores up.*** *If you earn an 89.99% then this is a B+ and NOT an A-! Your work in the course = your grade.*

### **Homework**

There will be one homework assignment due most weeks (due by 11:59 PM on Fridays unless otherwise specified – see Course Schedule). Occasionally, you will be given a week off from homework. Homework assignments will cover material up through the previous week. Homework assignments are to be completed individually. While you may choose to work in study groups, each student must present/submit their own, original work. Working in groups is encouraged, but all work submitted in this course should represent your ‘final product’ from your thought/learning

process. This means that we would expect each student's homework to appear different from all other students' homework. The lowest single homework score is dropped at the end of the semester.

## Labs

You will be required to complete 14 lab assignments/workshops throughout the semester where attendance will be taken as a component of your final grade. The first hour of the lab will be dedicated to accessing and completing the weekly quiz (see below). Then, you will work through the workshop or if you have completed the workshop we encourage you to work on homework. Workshops are aligned with the schedule and homework assignments. Lab workshops are designed to provide you with instruction and examples to reinforce what you are learning elsewhere in the course. Lab workshops are to be submitted electronically to Canvas and are **due by 11:59 PM on Fridays** (this is to allow extra time in case you do not finish the lab during your lab/recitation section, although labs are designed such that you should be able to finish them during the allotted lab/recitation period). The single lowest lab at the end of the semester is dropped.

## Pre-Class Learning Modules

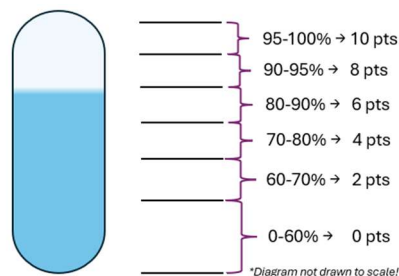
Before most classes, there are Learning Modules on Canvas (online) that are due. A Learning Module consists of a short (typically 4-9 minutes) screencast with 1-5 in-video questions that you must answer. These are designed to prepare you for class, and these **must be completed with questions answered by 7:00 AM each class day**. Each Learning Module has the same weight/value. If there is only one Learning Module assigned on a given day, this is worth only a quarter of the points on a day when four Learning Modules are assigned. Thus, it is important not to miss Learning Modules on the days when several of them are assigned and due. You can answer most in-video questions twice (i.e., you have two attempts for each question). **IMPORTANT:** The lowest FIVE (5) pre-class Learning Modules are dropped at the end of the semester. This is in case you are sick, absent, accidentally forget to do them, or encounter a technical difficulty.

## Clicker Questions

During each class, we will ask clicker questions. You must be in class to get credit for clicker questions; the lowest FOUR (4) days will be dropped. Please see the document posted on Canvas for more information on how to register your clicker account.

## The TANK

Throughout the semester, you will have many opportunities in the Learning Modules to fill your TANK. By the end of the semester, you will receive a score between 0 and 10 depending on how full your TANK is. (Note: The scale is not linear!) Please see the document "FILL YOUR TANK" on Canvas for information.



## Weekly Mastery Quizzes

Every week of the semester except for Weeks 1 & 8 you will be required to take a Mastery Quiz during the first hour of your lab section. These are online (on Canvas), timed (1-hour maximum), and will consist of 5-10 multiple choice and/or true/false questions. It is important to note that these quizzes are cumulative and will test you on main concepts from earlier in the semester. The lowest quiz score will be dropped. Note that there is no Final Exam in this course! While you may use relevant course software during the quizzes (Excel/VBA, Python), you may not use generative AI (monitored by CAs).

### **Late Policy & the Importance of Planning Ahead**

All work in this class needs to be completed in the required time frame. Late work will not be accepted unless due to severe emergencies. In those rare cases, you are expected to inform the instructors ideally before the assignment is due or within one day of the due date. All assignments need to be submitted through Canvas and should not be emailed directly to the instructors. Be aware that technology failures (computer crashing, connectivity issues, etc.) will not be excused, nor will extensions be granted for these types of issues. Technology fails! Make sure you plan early so if a technology failure arises, there will be plenty of time to meet your deadline.

### **What to Do If You Are Sick**

Unexpected illness may arise during the semester. To account for this, at the end of the semester the lowest grades are dropped (see Overall Grade Breakdown above for details). Make sure to start your homework and Learning Modules early; if you become sick the night before something is due, we will tell you, “It’s been available on Canvas for almost a week!” Start early!

### **What To Do If You Are Struggling in The Course**

- Come to office hours for help!
- <https://www.colorado.edu/engineering-advising/academiccoaching>
- <https://www.colorado.edu/engineering-advising/workshops>

### **Availability of Assignments, Pre-Class Learning Modules, and Submission Policies**

Pre-Class Learning Modules will generally be available Thursday (after class) the week before they are due. Homework assignments are generally available a week before they are due. You must submit all your assignments via Canvas. Homework, quizzes, and labs must all be submitted directly to Canvas. Canvas provides a confirmation email when an assignment is submitted. Please create a folder in your email service/provider and keep all copies of these submission confirmation emails in case there is a submission issue/problem. We will make every effort to grade and provide feedback on homework assignments, labs, and other assessments within two weeks. You are responsible for keeping copies of all work you submit for grading.

### **Classroom Environment**

The main goal of this course is to help you build a foundation of computing tools and approaches to tackle engineering problems. We learn from mistakes and failure. Those are an essential part of learning and are not a determination of your abilities. To support the messy side of learning and focus on the process (rather than the product of the “right answer” or the highest grade), a culture of respect is essential. We expect you to help create that culture. We will need patience or

courage or imagination or any number of qualities in combination to engage in our materials, with our classmates, and to leverage our ideas and experiences for learning and growing.

It is our intent that students from all backgrounds and perspectives belong in this course, that students' learning need to be addressed both in and out of class, and that the various perspectives that students bring to this class be framed as a resource, strength, and benefit. It is our intent to present materials and activities that are respectful of all backgrounds. Your suggestions are encouraged and appreciated. Please do not wait until the end of the semester to give this feedback. Please let us know ways to improve the effectiveness of the course.

### **Academic Integrity Consequences**

See below for the CU Boulder policy regarding academic integrity and the Honor Code. Any assignments submitted that are not original work and violate the Honor Code (e.g., were produced via cheating, copying, plagiarizing, etc.) will automatically be given a grade of 0 and those grades will not qualify for the lowest scores dropped at the end of the semester.

### **University Policies**

#### *Honor Code*

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the [Honor Code](#). Violations of the Honor Code may include but are not limited to: plagiarism (including use of paper writing services or technology [such as essay bots]), cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. Understanding the course's syllabus is a vital part in adhering to the Honor Code.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: [StudentConduct@colorado.edu](mailto:StudentConduct@colorado.edu). Students found responsible for violating the [Honor Code](#) will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Visit [Honor Code](#) for more information on the academic integrity policy.

#### *Accommodation for Disabilities, Temporary Medical Conditions, and Medical Isolation*

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or [DSinfo@colorado.edu](mailto:DSinfo@colorado.edu) for further assistance. If you have a temporary medical condition, see [Temporary Medical Conditions](#) on the Disability Services website.

If you have a temporary illness, injury or required medical isolation for which you require adjustment, please reach out to me directly via email so that we can discuss an appropriate supportive path forward.

### *Accommodation for Religious Obligations*

Campus policy requires faculty to provide reasonable accommodations for students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please communicate the need for a religious accommodation in a timely manner. In this class, please reach out to me directly via email so that we can discuss a suitable accommodation. See the [campus policy regarding religious observances](#) for full details.

### *Preferred Student Names and Pronouns*

*CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.*

### *Classroom Behavior*

*Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote, or online. Failure to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, marital status, political affiliation, or political philosophy.*

*For more information, see the [classroom behavior policy](#), the [Student Code of Conduct](#), and the [Office of Institutional Equity and Compliance](#).*

### *Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation*

*CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits [protected-class](#) discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner abuse (dating or domestic violence), stalking, and related retaliation by or against members of our community on- and off-campus. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who have been subjected to misconduct can contact OIEC at 303-492-2127 or email [CUreport@colorado.edu](mailto:CUreport@colorado.edu). Information about university policies, [reporting options](#), and [OIEC support resources](#) including confidential services can be found on the [OIEC website](#).*

*Please know that faculty and graduate instructors are required to inform OIEC when they are made aware of incidents related to these concerns regardless of when or where something*

occurred. This is to ensure that individuals impacted receive outreach from OIEC about their options and support resources. To learn more about reporting and support for a variety of concerns, visit the [Don't Ignore It](#) page.

### *Mental Health and Wellness*

*The University of Colorado Boulder is committed to the well-being of all students. If you are struggling with personal stressors, mental health or substance use concerns that are impacting academic or daily life, please contact [Counseling and Psychiatric Services \(CAPS\)](#) located in C4C or call (303) 492-2277, 24/7.*

*Free and unlimited telehealth is also available through [Academic Live Care](#). The [Academic Live Care](#) site also provides information about additional wellness services on campus that are available to students.*

### *Acceptable Use of AI in this Class*

While you may use generative artificial intelligence (Gen AI) tools to help you learn, you may not submit any work for any assignment that was produced by Gen AI tools. All work submitted in this class must be your own, original work.

You may use generative AI tools in this course as you see fit in the draft stages but ***you must edit to make this work your own and accurate***. It is your responsibility—not the tool's—to ensure the quality, integrity, and accuracy of work you submit in any college course. In addition, you must be wary of unintentional plagiarism or data fabrication. Please act with integrity for the sake of both your personal character and your academic record.

## CHEN 1310 Schedule – Spring 2026

Wk	Tuesday	Thursday	Assignments
1		C1 (1/8): Class Introduction	
2	C2 (1/13): Excel Fundamentals - Cell referencing - Naming & selecting	C3 (1/15): Excel Fundamentals - Order of operations - Built-in functions - Basic case study	- Lab 1 due Fri. (1/16) 11:59 PM - Quiz 1 during lab
3	C4 (1/20): Excel Fundamentals - Case studies using one-way and two-way data tables - Matrix multiplication - Array formulas	C5 (1/22): Targeting & Optimization - Systems of linear equations - Goal Seek and Solver - Plotting	Due to MLK, there are no Mon recitations - Lab 2 due Fri. (1/23) 11:59 PM - Homework 1 due Fri. (1/23) 11:59 PM - Quiz 2 due online by Fri 11:59 PM
4	C6 (1/27): Targeting & Optimization - Optimization using Solver - Circular Calculations	C7 (1/29): Targeting & Optimization - Bisection method	- Lab 3 due Fri. (1/30) 11:59 PM - Homework 2 due Fri. (1/30) 11:59 PM - Quiz 3 during lab
5	C8 (2/3): Targeting & Optimization - Golden Section technique	C9 (2/5): Advanced Excel - Lookup functions - Linear and multilinear regression	- Lab 4 due Fri. (2/6) 11:59 PM - Homework 3 due Fri. (2/6) 11:59 PM - Quiz 4 during lab
6	C10 (2/10): VBA Basics - Macro recording - Absolute vs. relative referencing	C11 (2/12): VBA Basics - Declaration of variables - Troubleshooting	- Lab 5 due Fri. (2/13) 11:59 PM - Homework 4 due Fri. (2/13) 11:59 PM - Quiz 5 during lab
7	C12 (2/17): VBA Basics - VBA expressions - Built-in functions - User-defined functions	C13 (2/19): VBA Basics - More user-defined functions - Troubleshooting functions	- Lab 6 due Fri. (2/20) 11:59 PM <b>- NO HOMEWORK</b> - Quiz 6 during lab
8	C14 (2/24): VBA Basics - Objects, properties, methods - Input and output in subroutines	(2/26): READING DAY – NO CLASSES	<b>- Lab 7 due Fri. (2/27) 11:59 PM</b> - Homework 5 due Fri. (2/27) 11:59 PM <b>- NO QUIZ</b>
9	C15 (3/3): VBA Programming - One-way If...Then - Two-way If...Then - Multi-alternative If...Then	C16 (3/5): VBA Programming - Do... Loops - For...Next Loops	- Lab 8 due Fri. (3/6) 11:59 PM - Homework 6 due Fri. (3/6) 11:59 PM - Quiz 7 during lab
10	C17 (3/10): Advanced VBA - All about arrays	C18 (3/12): Advanced VBA - Array functions - Examples	- Lab 9 due Fri. (3/13) 11:59 PM - Homework 7 due Fri. (3/13) 11:59 PM - Quiz 8 during lab
<b>SPRING BREAK: NO CLASS 3/17 &amp; 19</b>			
11	C19 (3/24): Advanced VBA - User forms	C20 (3/26): Advanced VBA - Advanced user forms	- Lab 10 due Fri. (3/27) 11:59 PM - Homework 8 due Fri. (3/27) 11:59 PM - Quiz 9 during lab
12	C21 (3/31): Intro to Python - Jupyter notebooks, expression entry	C22 (4/2): Python - Data types, built-in functions, Numpy arrays, basic plotting	- Lab 11 due Fri. (4/3) 11:59 PM - Homework 9 due Fri. (4/3) 11:59 PM - Quiz 10 during lab
13	C23 (4/7): Python - Functions (user-defined) - Lambda functions - Fitting polynomials	C24 (4/9): Python - SciPy solvers - Root finding - Optimization	- Lab 12 due Fri. (4/10) 11:59 PM <b>- NO HOMEWORK</b> - Quiz 11 during lab
14	C25 (4/14): Python - More solvers - Advanced data visualization with matplotlib	C26 (4/16): Python - Control Flow (Part 1) - If statements - For/while loops	- Lab 13 due Fri. (4/17) 11:59 PM - Homework 10 due Fri. (4/17) 11:59 PM - Quiz 12 during lab
15	C27 (4/21): Python - Control Flow (Part 2; examples) - Vectorization	C28 (4/23): Euler method & Intro to pandas	- THE TANK due Thurs. (4/23) 11:59 PM - Lab 14 due Thurs. (4/23) 11:59 PM - Homework 11 due Thurs. (4/23) 11:59 PM - Quiz 13 during lab
<b>NO FINAL EXAM</b>			