ASEN 1320: Aerospace Computing and Engineering Applications

Lecture: M/W/F 10:10 AM – 11:00 PM, ECCR 256

Instructor	Alexandra Le Moine (she/her/hers) Email: Alexandra.LeMoine@colorado.edu Office: Aero N209			
Teaching Assistant	Karina Rivera (karina.riveralopez@colorado.edu)			
Teaching Facilitators	Ankur Sharma (ankur.sharma@colorado.edu) Ben Watanapongse (benjamin.watanapongse@colorado.edu) Austin Hunter (austin.hunter-1@colorado.edu) Thomas Dunnington (thomas.dunnington@colorado.edu) Aidan Wood (aiwo9411@colorado.edu) Andrea Patella (andrew.patella@colorado.edu)			
Recitations	**Section**	**Time**	**Room**	**Recitation Lead**
	011	(Th) 3:10 – 4:00 PM	ECCR 143	Ankur Sharma
	012	(Th) 2:05 – 2:55 PM	ECCR 143	Ben Watanapongse
	013	(W) 9:05 – 9:55 AM	ECCR 143	Austin Hunter
	014	(W) 4:15 – 5:05 PM	AERO N100	Ben Watanapongse
	015	(Th) 9:35 – 10:25 AM	ECCR 143	Thomas Dunnington
	016	(Th) 10:40 – 11:30 AM	ECCR 143	Ankur Sharma
	017	(Th) 1:00 – 1:50 PM	ECCR 143	Aidan Wood

OFFICE HOURS: See Canvas for current information about office hours.

COURSE TEXTBOOKS (Loose-leaf or eBook of both texts is required):

1. Savitch, Walter (2016). *Absolute C++* (6th edition). Pearson.
2. Attaway, Stormy (2019), *MATLAB, A Practical Introduction to Programming and Problem Solving* (5th edition). Elsevier

COURSE WEBSITE – Canvas Course Link

COURSE PURPOSE - Most aerospace engineering programs require literacy in some programming language (e.g., C++, MATLAB) for automating various types of numerical and symbolic computation. This course is intended for students with little to no experience in programming and teaches basic programming concepts and useful tools for solving engineering problems with an emphasis on aerospace applications.

COURSE OBJECTIVES - The goal of this course is to build the foundation in computing and programming required to succeed in the sophomore and junior curriculum in aerospace engineering and other related domains of engineering. By the end of this course, students should be able to:

➢ Identify the overall structure of computing program.
➢ Explain the differences between a compiled (C++) and an interpreted language (MATLAB)
➢ Use different primitive data types such as integers, floating point, and strings.

- ➢ Implement fundamental programming constructs such as variables, assignment statements, expressions, conditionals, and iterative constructs.
- ➢ Create and manipulate 1D and 2D arrays, implement arrays within looping constructs, and pass arrays into functions.
- ➢ Understand the scope of functions and know how to use functional programming.
- ➢ Read/write data and use file I/O.
- ➢ Understand the concepts of class, object, and object-oriented programming.
- ➢ Develop skills to write, test, and debug code requited to solve basic aerospace engineering application problems.

POLICIES AND PROCEDURES

I. STUDENT EXPECTATIONS

o Students are expected to attend all class sessions in addition to completing all assignments by the requested deadline.

o Students are expected to prepare for each lecture and recitation. This includes: watching pre-recorded lecture videos, reading required textbook assignments, and taking online quizzes. Additionally, students are expected to turn in all classwork including in-class activities, recitation coding challenges, and C++ project. A passing grade will not be guaranteed by just showing up for lectures and recitations.

o B− grades and above are required to use ASEN 1320 as a prerequisite for CSCI 2270 (Data Structures) which is a pathway to a CS minor.

o Students may discuss and collaborate on the in-class programming assignments, but students are NOT free to copy another student's assignment. Additionally, the use of Generative AI (e.g., ChatGPT) is strictly prohibited. Students who are violating these rules will receive an "F" for the course and reported to the Honor Code office for further punitive action.

II. INSTRUCTOR EXPECTATIONS

o You can expect your instructor, TA, and TFs to be courteous, punctual, well-organized, and prepared for lecture and other class activities; to answer questions clearly; to be available during office hours or to notify you beforehand if they are unable to keep them; to provide a suitable guest lecturer when they are traveling; and to grade uniformly and consistently according to the posted guidelines.

III. COMMUNICATION

o Communication of any medical or studies-related needs of absence that are known (non-emergency) should be communicated as soon as possible, and (when possible) any expected impact to assignments/exams should be coordinated with the instructor prior to, ***not after the fact***, of missing a course deadline.

o **Email** – **Email will not be a primary communication method used** in course correspondence for general questions about homework, syllabus & class policy, etc. Emails sent to instructors or TFs on such topics will go unanswered. Students should only email the instructors with questions or concerns regarding individual scheduling conflicts or personal issues. Instead, students are encouraged to use Piazza for general questions about homework, syllabus, class policy, etc.

o **Piazza** – General questions about homework assignments, syllabus & class policy, and assessments should be posted to the Official Course Piazza channel.

o **Canvas** – Canvas is the official webpage for this course. All general announcements, assignments, course materials, and grades will be available via Canvas. Direct Canvas

messages to instructor will not be a primary communication method. Any Canvas DM sent to the instructor may go unanswered.

- o **Deadlines –** Student communication that occurs within 24 hours of project, quiz, or exam deadlines, are not guaranteed to be addressed.

- o **Hours of Operation –** All correspondence to instructors and TFs will be handled during regular business hours: M-F 9-5 PM. Any messages sent to the instructional team outside these hours or during the weekend will go unanswered.

IV. FLIPPED CLASS METHOD
- o In this course, the traditional classroom dynamic is turned upside down. You, the student, will take the lead in your own learning journey as we embrace the flipped classroom model. Rather than the instructor delivering 50-minute lectures during class time, you will engage with the course materials independently before class, allowing our "in-person sessions" to focus on active learning, discussions, and problem-solving. Get ready to take control of your learning and explore the exciting world of the flipped classroom!

- o Before each lecture, you must preform the required reading assignment, watch the pre-recorded video, and complete the online Canvas quiz.

V. PRE-RECORDED VIDEOS
- o There are short, pre-recorded video lectures which contain important information to support the reading assignment and quiz.

- o **You must watch the required videos before coming to lecture.**

VI. CANVAS QUIZZES
- o There will be quizzes based on the pre-recorded videos and reading assignments that will be taken online via Canvas.

- o **Quizzes must be completed before coming to lecture.** Failure to take and submit quizzes prior to lecture will result in a 0 for that assignment. Once the quiz is started, students will have 10 minutes to complete the quiz.

- o **The lowest 3 quiz grades will be dropped from your final grade.**

VII. ATTENDENCE
- o Regularly attending lectures is required as each lecture contains a graded activity.

- o Students are allowed to miss up to 3 lectures without any penalty to their grade.

VIII. IN-CLASS ACTIVITIES
- o Each lecture contains a graded activity that students must complete before the end of lecture.

- Late work will not be accepted, and students cannot make up missed work.

- Students are allowed up to 3 missed in-class activities to account for sickness or other absences.

- In-class activities are graded as either a 1 or a 0. Students who make a reasonable effort to complete the in-class activity will receive credit. Students who do not make a reasonable effort to complete the activity will receive no credit.

- **Students who fail to turn in more than 3 in-class activities will not be eligible for an A or A- in this course.**

IX. CODING CHALLENGES

- There will be weekly coding challenges that take place during recitation.

- Coding challenges are individual weekly assessments of a student's programming abilities. The assignments must be completed and submitted during their assigned recitation time. Access to Coding Challenge prompt, attempting to "reverse engineer" the problem based on Canvas information, or working on the code before recitation is in **violation of the CU Honor Code.**

- Late work will not be accepted, and students cannot make up missed work.

- **The lowest Coding Challenge grade will be dropped from your final grade.**

- Students are not allowed to work with other students, access generative AI, or access any other online resource during the coding challenge.

- Students may bring an 8.5 x 11 sheet of paper containing C++ syntax. Note that non-syntax code is not allowed on these sheets. Sheets will be inspected by recitation leads.

X. EXAMS

- There will be two exams during the semester. Each exam will contains 2 portions: a 50-minute theory-based exam taken during lecture and a 50-minute practical exam taking during recitation.

- *All exams will be closed-book, closed-notes, closed-internet.* **Students who access unauthorized materials during the exam will receive an automatic failure and will be found in violation of CU Honor Code.**

- **Missed Exams** – There will be no make-up exams unless extenuating circumstances caused the student to miss the exam. This will be considered on a case-by-case basis and is at the sole discretion of the instructor.

- **Accommodations –** We schedule separate rooms for students with accommodations to take the exams. Accommodations will only be provided when the instructor has received the official accommodation letter from Disability Services prior to 48 hours of the exam.

If the student has received an unofficial accommodation letter from Disability Services and emails that to the instructor at least 48 hours before the exam, then that accommodation will be honored.

XI.   HOMEWORK
- o   <u>There is no homework in the class</u>. Instead, each lecture focuses on students actively completing programming assignments via in-class activities and weekly coding challenges.

~~XII.   C++ Project~~
- ~~o   There will be a comprehensive C++ Project due immediately after Fall Break.~~

- ~~o   The C++ Project will be an individual assignment. Collaboration (in the form of classmates or Generative AI) is strictly prohibited.~~ **~~Students who use unauthorized materials during the development of their project will receive an automatic failure and will be found in violation of CU Honor Code.~~**

XIII.   CALCULATION OF COURSE GRADE

Grades for this course will be assigned based on the following weighted breakdown:

Assessment	Weight
Lecture Quizzes	5%
In-Class Activities**	5%
Coding Challenges	20%
Exam 1	20%
Exam 2	20%
Final Exam	30%

*** Students who fail to submit more than 3 in-class activities will not be eligible for an A or A- in this class. This is equivalent to missing more than 1 week of classwork.*

CU BOULDER POLICIES

CLASSROOM BEHAVIOR

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. Those who fail 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, 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.

REQUIREMENTS FOR INFECTIOUS DISEASES

Members of the CU Boulder community and visitors to campus must follow university, department, and building health and safety requirements and all public health orders to reduce the risk of spreading infectious diseases.

The CU Boulder campus is currently mask optional. However, if masks are again required in classrooms, students who fail to adhere to masking requirements will be asked to leave class. Students who do not leave class when asked or who refuse to comply with these requirements will be referred to Student Conduct & Conflict Resolution. Students who require accommodation because a disability prevents them from fulfilling safety measures related to infectious disease will be asked to follow the steps in the "Accommodation for Disabilities" statement on this syllabus.

For those who feel ill and think you might have COVID-19 or if you have tested positive for COVID-19, please stay home and follow the further guidance of the Public Health Office. For those who have been in close contact with someone who has COVID-19 but do not have any symptoms and have not tested positive for COVID-19, you do not need to stay home.

ACCOMMODATION FOR DISABILITIES, TEMPORARY MEDICAL CONDITIONS, AND MEDICAL ISOLATION

Disability Services determines accommodations based on documented disabilities in the academic environment. If you qualify for accommodations because of a disability, submit your accommodation letter from Disability Services to your faculty member in a timely manner so your needs can be addressed. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance.

If you have a temporary medical condition or required medical isolation for which you require accommodation, please contact you instructor immediately. Also see Temporary Medical Conditions on the Disability Services website.

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.

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.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: honor@colorado.edu, 303-492-5550. 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.

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 sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, protected-class discrimination and harassment, and related retaliation by or against members of our community on- and off-campus. These behaviors harm individuals and our community. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who believe they have been subjected to misconduct can contact OIEC at 303-492-2127 or email cureport@colorado.edu. Information about university policies, reporting options, and support resources can be found on the OIEC website.

Please know that faculty and graduate instructors have a responsibility to inform OIEC when they are made aware of any issues related to these policies regardless of when or where they occurred to ensure that individuals impacted receive information about their rights, support resources, and resolution options. To learn more about reporting and support options for a variety of concerns, visit Don't Ignore It.

RELIGIOUS HOLIDAYS

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance.

See the campus policy regarding religious observances for full details.

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.