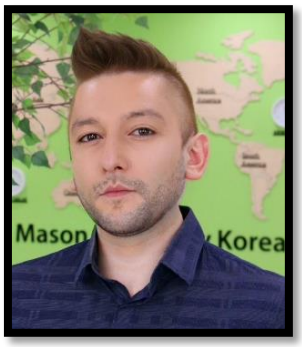
CDS 130 Syllabus (Spring 2022)

Introduction to Computational and Data Sciences

Section K01

In this course, you will learn how computer algorithms are developed to model events, how they are used to solve problems and how to use MATLAB programming as a tool to simulate a model in solving the problem.

For many students, CDS-130 may be their first formal computer language course. To accommodate students with different levels of coding experience, the course is presented as if all students are learning to code for the first time. As a result, CDS-130 focuses on the basics of turning data into information. CDS 130 meets the Mason Core Requirements for Information Technology with Ethics.



Your section of CDS 130 is taught by Professor Brian Colchao from the Department of Computational and Data Sciences.

Your tutor for this course is Jungwon Youn.

- She can be reached through Slack.

Description

CDS-130 is an introductory course to algorithm design and modeling. Modeling is a problem-solving methodology where computational tools are used to solve scientific problems. Modeling approaches problem-solving by first developing a theoretical model to represent what is happening in a natural event and then converting that model into a computer simulation to solve the problem being investigated. Examples of natural problems that will be solved in CDS-130 include modeling animal populations over time, the mass of compounds as they decay, and how to use probability with random numbers to simulate a game with dice.

- **Classroom:** G205
- **Meeting times:** Mondays and Wednesdays 10:30AM – 11:45PM.
- **Office Hours:**
  - Jungwon Youn: Thursdays 12PM – 1PM.
  - Colchao: Wednesday 4:00 – 5:00 PM; Monday – Friday afternoons upon request
- **Credit hours:** 3.0 credit hours.
- **Prerequisites:** None, but a background in algebra is assumed.
- **Mason Core:** Mason Core Requirements for Information Technology.

Objectives

By the end of the course, students will be able to:

- Select and evaluate relevant information and computing technologies to organize and analyze information and use it to guide algorithm design and model building.
- Choose and apply appropriate algorithmic methods to solve problems.

Materials

Textbooks

- None: All class materials are made available through the class website on Blackboard.

Hardware and Software

- Students are required to provide their own computer and internet access or be able to use a GMU provided computer with access to the Internet.

- The computer must have:
    - Reliable internet connection
    - Video camera for RESPONDUS and Zoom video conferencing capabilities
    - RESPONDUS Lockdown Browser, to be used during a quiz or exam
    - MATLAB: Students MUST have access to a copy of MATLAB software.
        - A downloadable version of MATLAB may be found on the course Blackboard page on the left side panel called “Getting MATLAB”.
        - NOTE: Issues loading MATLAB should be brought to your professor’s attention during the first week of the course
    - Note: Calculators are NOT needed for CDS-130. Calculators may NOT be used on exams.

Policies

Contact policy

All correspondence is to be done using the private, invite-only Slack workspace for the course. **Direct messages on Slack are to be used for contacting me instead of emails**. My ground rules for direct messages are as follows:

- Help will always be given in CDS 101 to those who ask for it. If you are stuck, please reach out to your professor or the tutors on Slack. You are welcome to message us 24 hours a day, 7 days a week.
- Allow up to 24 hours for a response.
- Questions about an assignment should be asked before the due date. Questions asked after 5:00pm on a due date may not receive a response until after the time the assignment is due.

- Messages received over weekends and holidays may receive delayed responses.
- If your questions are complicated, I may ask you to join me in a Zoom meeting or in my office to work through it.
- Emails sent during the first week of classes will be responded to, but I will respond to you using Slack. Emails sent to me after the first week will be redirected to Slack.

Tech support

When posting or messaging about an issue, here are some basic questions to answer that will help with troubleshooting:

1. What is happening when you run your code? What did you expect?
    a. If there's an error message, write what it is. You must provide a screenshot. Be sure to take a real screenshot, not a photograph of your screen using your phone.

Illness and emergencies

It is a student's responsibility to inform me about illnesses or personal/family emergencies that will interfere with submitting work on time. This must be done as soon as possible. In case of illness, you may be asked to provide a doctor's note before being granted an assignment extension or exemption. During the COVID-19 pandemic this is more important than ever.

I understand that certain emotional or physical situations can impact a student's willingness and ability to communicate what is going on and that it can take a few days to inform me about a personal emergency or severe illness. At the same time, all students are expected to exercise personal responsibility. It is not acceptable to wait to tell me about the impacts of a personal illness or emergency until you're about to fail the course due to missing multiple submission deadlines.

Late work policy

Unless otherwise noted, assignments are to be submitted by 11:59pm on the due date.

Students are responsible for informing me about any religious holidays, scheduled varsity sports trips, or other school-sponsored activities that will interfere with submitting an assignment on time. Extensions are to be completed within the time-frame I set forth. Exemptions may be granted at my discretion.

Extra credit and grading curves policy

Individual requests for extra credit or a grading curve will not be granted, no exceptions. Any opportunities to earn extra points will be offered to the entire class. Grading curves are handled on a per-assignment basis and are applied to all students equally.

Accommodations policy

Students with disabilities who need academic accommodations, please contact Joanna Park (spark214@gmu.edu) at the Office of Disability Services (ODS) at +82-32-626-5071. All academic accommodations must be arranged through the ODS: http://ds.gmu.edu/ during the first 2 weeks of class. Please notify me after your accommodation has been approved by the Office of Disability Services.

Campus Closure or Class Cancelation/Adjustment Policy

If the campus closes, or if a class meeting needs to be canceled or adjusted due to weather or other concern, students should check Blackboard and Slack for updates on how to continue learning and for information about any changes to events or assignments.

Expectations

Weekly

- Discussions (13%):
  - Discussion posts must be completed by **Thursday** by 11:59PM KST.
  - There will be a variety of readings and videos on IT security and ethics. Some will require you to post your responses to Slack
  - There will also be quizzes on the information.
- Mid-Week Exercises (MWE) (13%):
  - Mid-Week Exercises MUST be completed by **Thursday** at 11:59pm KST.
  - Answers will be available at 12:30am on the day after they are due.
  - These MATLAB problems will review the programming skills covered that week.
  - MWE problems are simpler versions of the Weekly Assignments.
- Your Turn Exercises (YTE) (9%):
  - Your Turn Exercises MUST be completed by **Sunday** at 11:59pm KST.
  - Most lectures will have YTE's following a part of the presentation.
  - The problems will be multiple choice, fill-in the blank or short answer questions.
- Weekly Assignments (WA) (18%):
  - Weekly Assignments MUST be completed by **Sunday** at 11:59pm KST.
  - WA questions are a combination of multiple-choice, fill-in-the-blank, short answer, Ethics, and MATLAB programming problems.
  - Answers will be available at 12:30am on the day after they are due.
  - WA questions are simpler versions of the problems on the quizzes and exams.

Other

- Stage Exams (20%):
  - The Stage Exams will be a combination of multiple-choice, fill-in-the-blank, short answer, Ethics problems, and MATLAB programming problems.
  - Students will be REQUIRED to show their GMU ID card PRIOR to beginning the exams on the webcam with the RESPONDUS Lockdown Browser.
- Final Exam (25%):
  - The Final exam will mostly focus on materials after the 2nd Stage Exam cut-off but will cover materials from the entire course.
  - Students will be REQUIRED to show their GMU ID card PRIOR to beginning the exams on the webcam with the RESPONDUS Lockdown Browser.
- Participation Points (2%):
  - There will be several activities throughout the course which will be mandatory.
  - Completion of these activities will earn participation points.
- Extra Credit Quizzes (ECQ):
  - These are optional quizzes that will add bonus points to one of the other categories.

Grading Schema

Based on the final total score, your final grade will be determined as follows: A+ [97-100], A [93-96], A- [90-92], B+ [87-89], B [83-86], B- [80-82], C+ [77-79], C [73-76], C- [70-72], D [65-69], F [<65].

Conduct

Academic integrity

"Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work."

All course materials and class sessions are considered as Intellectual Property and therefore copyrighted by the instructor. Sharing of any recorded, copied, or other class materials without the professor's written permission is considered stealing and is STRICTLY prohibited.

Students are permitted to ask questions about the assignments on Slack and discuss assignments in private communications, however it is important to make sure that you write your assignments by yourself and in your own words, meaning that students are not permitted to collaborate on write-ups for assignments and projects. Do not duplicate another person's material or ideas and represent them as your own. It is not a sign of respect and both students will be punished. "Individual assignment" is the default classification for all assignments, exams, and projects in the course. Content that comes from a resource or another student should be properly cited.

ANY MATERIAL THAT IS TAKEN FROM ANOTHER SOURCE AND NOT PROPERLY CITED WILL BE TREATED AS A VIOLATION OF MASON'S ACADEMIC HONOR CODE.

Other violations of Mason's Honor Code will be treated similarly. Suspected violations will be reported to the Office of Academic Integrity. This report goes to both Mason Korea and the Fairfax campus. The minimum sanctions I will recommend are:

- Minor infraction (e.g. improper citation, copying from another student's assignment):
  - First offense (university-wide): 0% on the assignment
  - Second offense: F for the course
  - Third offense: Suspension from the university
- Major infraction (e.g. cheating in an exam, or copying from another student's project):
  - First offense: F for the course
  - Second offense: Suspension from the university
  - Third offense: Expulsion from the university

Decorum/discourse

Students are expected to be civil in their conduct and respectful of their fellow classmates and the professor for the duration of the course on all discussion platforms. Students are expected to follow proper grammar and punctuation in their posted messages and to refrain from using internet slang, abbreviations, and sarcasm.

I will address violations of classroom decorum on a case-by-case basis and reserve the right to

enact grade-based penalties for disruptive or repeat violations. Penalties for decorum violations cannot be negotiated or appealed.

Mason diversity statement

George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals. Diversity is broadly defined to include such characteristics as, but not limited to, race, ethnicity, gender, gender identity, religion, age, disability, and sexual orientation. Diversity also entails different viewpoints, philosophies, and perspectives. Attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard and respected.

Disclaimer

The professor reserves the right to modify this syllabus at any time during the course to improve the learning experience and classroom environment. The professor reserves the right to adjust grades as he/she deems appropriate. The pacing of the course and the list of covered topics may also be adjusted in response to student progress.