CDS 130: Computing for Scientists
Summer 2020 Section A02
Syllabus and Class Policies

Instructor: Dr. John W. Lyver, IV, Ph.D., C.S.P., LCDR-USN-Retired
Associate Professor (Term)

Office and Office Hours:

- Dr. Lyver will not have an office on campus during the Summer 2020 term.
- Dr. Lyver will hold office hours virtually. Students may contact Dr. Lyver anytime between 9am and 8pm for help. Many afternoons, Dr. Lyver will hold "Virtual Office Hours" via Blackboard Collaborate Ultra on the Class Website during the week. See the Class Website for the schedule of ALL Virtual Office hours for Dr. Lyver and the STARS.
- Dr. Lyver may be contacted using: e-mail, text, and by using the "Ask the Professor" discussion on the left side of the website as well as in-person. Dr. Lyver's responses on "Ask the Professor" will be available to all class members.
- All meetings via phone and outside of published office hours are by appointment only. Students wishing to meet with Dr. Lyver are asked to send an e-mail or text to Dr. Lyver requesting a meeting time. Be sure to list when you are available to meet and how you want to meet.
- Dr. Lyver will endeavor to answer e-mail questions within 24 hours. Please note that questions received during the weekends may be delayed.
- If Dr. Lyver will be away from email for more than one day, times will be posted on the announcement tab in the Blackboard course folder.
- Dr. Lyver will announce any General Help Sessions being held on the class website. Sessions will be held via Blackboard Collaborate and/or in person.

CDS-130 STARS:

- STARS working primarily with Section A02 will be Ms. Brianna Tilghman.

Emails, Telephone and SMS Text

- Dr. Lyver JLyver@GMU.EDU 707/ 559-8374 (cell: voice and text)
- Ms. Brianna Tilghman BTilghma@GMU.EDU TBD (voice and text)

(Additional contact information for other helpful resources will be provided later)

Course Introduction and Overview

CDS-130 Overview:

CDS-130 is an introductory course in how to think computationally. Thinking computationally is a problem-solving methodology where computational tools (e.g., MATLAB) are used to solve scientific problems. Thinking computationally 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 the population of rabbits on an island over time, the quantities of chemicals as they decay, or how to use random numbers to play a game with dice.

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 the tool MATLAB, to simulate the model in the problem solving. Developing computer algorithms is a process methodology which will be directly applicable in many scientific and business careers.

By the end of CDS-130, students will be able to solve a problem such as the problem NASA had in predicting the heat output of power sources used on spacecrafts traveling to Mars and beyond.

Follow-on CDS courses provide the opportunity for students to build on the basic methodologies learned in CDS-130 with learning other computer language tools, more advanced techniques for more complex problems, and solving problems involving large amounts of data. Following this course, you may consider going on to complete a minor or a major in this field.

Results of salary surveys in 2016-2018 clearly showed that young professionals in the Washington, DC, area with backgrounds in computational data sciences are in high demand. In fact, one 2016 the survey showed that skills in computational data science is among the fastest growing talent needed. The survey found many job openings requiring CDS skills of qualified candidates. The result was that salaries for early career professionals with CDS skills were about $5,000 to 10,000 higher than their peers.

The CDS-130 instructors understand that for many students, CDS-130 may be their first formal computer language course. As a result, CDS-130 focuses on the basics of turning data into information. Additionally, CDS 130 meets the Mason Core Requirements for Information Technology with Ethics.

CDS-130 Learning Outcomes:

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

- Students will be able to use technology to locate, access, evaluate, and use information, and appropriately cite resources from digital/ electronic media.
- Students will understand the core IT concepts in a range of current and emerging technologies and learn to apply appropriate technologies to a range of tasks.
- Students will understand many of the key ethical, legal and social issues related to information technology and how to interpret and comply with ethical principles, laws, regulations, and institutional policies.

- Students will understand the essential issues related to information security, how to take precautions and use techniques and tools to defend against computer crimes.

Dr. Lyver's Preliminary Advice to Succeed in CDS-130:

1) It is strongly recommended that you stay on top of the workload for this! There is a HUGE amount of work to be done in CDS-130.
   a) Experience shows that CDS-130 assignments become highly demanding for students who choose not to invest time in their readings and other assignments - or both.
   b) It is realized that MATLAB is probably the first exposure to a scientific programming language for most students, so the course is paced to help everyone.
   c) Lectures and MATLAB skills are cumulative.
2) **HINT**: Students who begin homework early in the week have the time to ask the instructors for help on questions or clarification on skills and concepts.
   a) Remember that the only dumb question is the one you don't ask.
   b) I can guarantee that someone else has the exact same question.
   c) So, asking not only helps yourself, but will help your classmates.

Textbook: None.

- All class materials are made available through the class website on Blackboard.
- Presentations are made available in the native PowerPoint (.pptx) format as well as in '4—slides-to-a-page' Adobe (.pdf) format. Additionally, transcripts (.txt) files and closed captioning is available for all presentations as well.
- All printed materials are available for download as well. Most materials are available in the native Microsoft Word (.docx) format and in Adobe (.pdf) formats as well.

Course Logistics

This course will use a distance learning format; the primary meeting space is MASON's Blackboard application; and we will use other means of keeping in touch such as: email, telephone, and text.

In a typical week:

- You will read about 3 articles and watch about 10 videos
- Accomplish on-line activities as a part of video mini-lessons, complete a pair of summary problems due every evening Monday thru Saturday.
- All activities and assignments are submitted through Blackboard by the due date listed.
- Post discussions on ethics topics with your classmates
- Though the delivery method is different, it should take you the same amount to time as a typical full-semester course. You should expect to spend approximately 9 hours on coursework each week (this includes the time you would have spent in a classroom).
- Since the material is cumulative, it is critical that you keep up with weekly requirements.
- Activities and assignments will ONLY be accepted until the due date. Late items will **NOT** be accepted.

- For each week, a weekly module is provided giving links to reading/videos, and activities/assignments to accomplish in that week. You can find the Weekly Modules under the tab on the left side of the website labeled "What's Due".

Computer Requirements

CDS-130 is an on-line course. 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:

Hardware minimums:

- Reliable Internet connection
- Sufficient capabilities to run MATLAB software. Click on the following link to see MATLAB's listing of software needed for MATLAB Version R2017a or later. (https://www.mathworks.com/support/sysreq.html)
- Video camera (aka: Web Cam) which is required to be used when taking exams with RESPONDUS.
- A Thumb Drive or other computer storage. Only a few mega-bytes will be needed. (This will give you a means to save your MATLAB code so codes can be reused. Also, handouts are recommended to be saved as well.
- Calculators are NOT needed for CDS-130.
  (The addition/multiplication needed during CDS-130 is quite simple. In fact, calculators may **NOT** be used on exams.)

Software minimums:

- MS Office suite (or equivalent) is required for viewing classroom materials.
  (A free copy of MS Office 365 can be downloaded from GMU IT Services at: http://tsd.gmu.edu/services/office365/first-time.cfm)
- E-mail access to MasonNet e-mail account

  (**Note**: ONLY GMU.EDU e-mail accounts may be used in CDS-130. Other e-mail addresses will **NOT** be responded to.)

- RESPONDUS Lockdown Browser must be running on the computer when a quiz, or Exam is being taken. Week #1 Computer Check will have you load RESPONDUS.
  (A free copy of the RESPONDUS Lockdown Browser may be downloaded without charge from GMU/IT Services at: https://coursessupport.gmu.edu/Students/index.cfm?audiencename=Students&categoryname=Bb%20Assessments&datname=Respondus%20Lockdown%20Browser)
- SMS text capability. Dr. Lyver uses a service called "REMIND" to send out class-wide messages which are time critical. Students DO NOT need to create an account on REMIND.COM or download an app. (SMS texting may be on a desktop computer, laptop, tablet, and/or smartphone.)

- **MATLAB**: Students MUST have access to a copy of MATLAB software. MASON provides copies of MATLAB for no cost via the Virtual Computing Library (https://VCL.GMU.EDU) or on campus in Computer laboratories. Students may purchase a copy of MATLAB for $49 directly from MATLAB's parent company MATLWORKS. Information is on the Class website.

Scanning Capability:

- For CDS-130, you **will** need to be able to scan a handwritten page(s) and then upload the scan to the Class Blackboard site to answer MATLAB programming problems. You are welcome to do this using the method that most available to you. Here is a listing of available methods that I am aware of:
  - Use a scanner (hardware item). At home I have an HP Printer that also scans.
  - Use a MASON scanner. While on MASON campus, you can use one of the Print Stations to scan a document and then e-mail it to yourself.
  - Use your Smartphone with a scanning software.
    - **For iPhone/IOS Devices: (***I am an iPhone user*.) I use a software on my iPhone called "**Evernote Scannable**". It is a free app that has been certified as safe to use on Mac devices. The software can be downloaded from:
      - Apple iTunes: https://itunes.apple.com/us/app/evernote-scannable/id883338188?mt=8
    - **For Android Devices:**
      - IF you already have the Adobe suite is "Adobe Scan". It can be downloaded at: https://play.google.com/store/apps/details?id=com.adobe.scan.android I am not familiar with this app.
      - There is a phone scanner app put out my Microsoft which I understand works well, but I am not familiar with it.

  - **Other SCANNING software/hardware devices/methods are acceptable. HOWEVER, DO NOT TAKE PHOTOS** of the handwritten page or a screen on your computer. Photos are **EXTREMELY** hard to read, have low resolution when being reviewed by your Instructors on Blackboard to grade your submissions. Photos should **NOT** be used! Also, Photos are HUGE files that take long times to upload/download/open when using Blackboard. **DO NOT TAKE Photographs and submit them!**
  - When you submit a scan for an assignment, you are asked to ONLY can use the formats.png or .pdf. Other graphic file formats are not 100% reliable. Please note that unreadable scans will **NOT** receive any credit for that assignment!

PLEASE NOTE: *There is a folder on the "Weekly Modules" tab under "Week #1 Module" called "Computer Check" that will allow students to check their computers to make sure that all of the above hardware and software is installed correctly. EVERYTHING in that folder MUST be completed PRIOR to beginning the work with Week #1. Completion of the checks listed are REQUIRED to be completed by the end of the first week.*

Email Requirements:

- ALL e-mails to your instructors and STARS MUST be from your Mason Net e-mail account. E-mail from non-Mason e-mail accounts will NOT be responded to.
- Mason Mail MUST be checked daily at a minimum for announcements, discussion inputs, or updates.
- Since Dr. Lyver teaches sections other than your own, PLEASE put CDS-130 A02 in the subject line and PLEASE include your first name in closing your message.

E-mail Tips:

- Keep your mailbox maintained so that messages are not rejected for being over quota.
- You may forward your Mason e-mail to other accounts but always communicate with your instructors and your fellow students using Mason e-mail for verification of your identity and YOUR security.
- Students are responsible for the content of university communications sent to their MasonNet email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account. [See https://masonlivelogin.gmu.edu/].

Grading

Final Course Numerical Grade / Final Course Letter Grade Correspondence

A+	> 97.00	C+	77.00 - 79.99
A	93.00 - 96.99	C	73.00 - 76.99
A-	90.00 - 92.99	C-	70.00 - 72.99
B+	87.00 - 89.99	D	60.00 - 69.99
B	83.00 - 86.99	F	< 60.00
B-	80.00 - 82.99		

Grading Items:

- "**Ethics Discussions**" (13%): Most weeks, an "Ethics Question of the Week" will be posted in Blackboard Discussion. These are required.
  - By 1st day of the week evening at 11:59pm, students are required to enter a short post (usually 2-3 sentences will do) to answer the question.
  - By 2nd day of the week evening at 11:59pm, students are to comment on 2 classmate responses to the question of the week (usually 1-2 sentences will do). Grade assigned will be based on subjective quality of the answers and insightfulness of comments.
  - Additionally, Ethics Quizzes will appear throughout the course and are **required**.
- "**Your Turn Exercises"** (YTE) (9%):
  - Throughout the course, most mini-lectures and video presentations will have YTE's following a part of the presentation or after the presentation.

- YTE's are made up of a small number of quick-to-do problems to check your understanding of the material. The problems will be multiple choice, fill-in the blank or short answer questions. Most problems are graded by Blackboard and answers will be available immediately.
- YTE's should be completed **BEFORE** continuing on with the next video. If you get a Your Turn Exercise wrong, it is suggested to re-view the lecture.
- All YTE for the week **must** be completed by the date listed on the "Week-at-a-Glance" schedule, but no later than the 2nd day of the week they are assigned at 11:59pm.

- "**Mid-Week Exercises"** (MWE) (13%):
  - Mid-Week Exercises **MUST** be completed by 1st day of the week evening at 11:59pm.
  - These 2 or 3 MATLAB programming problems will review the programming skills covered that week.
  - Most MWE must be done in MATLAB and then uploaded to Blackboard for grading.
  - Answers to MWE problems will be available the 2nd morning of the week at 12:30am.
  - MWE problems are precursors to the problems on the "Weekly Assignments" (as well as the quizzes and Exams).
- "**Weekly Assignments**" (WA) (18%):
  - Each week a set of WA questions will be posted, and **MUST** be completed by 2nd day of the week evening at 11:59pm.
  - WA questions are a combination of multiple-choice, fill-in-the-blank, short answer, Ethics problems, and MATLAB programming problems.
  - WA questions may be from anything covered earlier in the course up through that week but will mostly focus on that week's material.
  - Answers to WA will be available at 12:30am on the day immediately after they are due.
  - WA questions are precursors to the problems on the quizzes and Exams.
- **Stage Exams** (20%):
  - There will be 2 "Stage" Exams in approximately weeks 5 and 10.
  - The Stage Exams will be a combination of multiple-choice, fill-in-the-blank, short answer, Ethics problems, and MATLAB programming problems.
  - About 2 weeks prior to the Stage Exams, a "Study Advice" will be posted providing more sample problem to help students prepare for the exam. The answers to the "Study Advice" will be posted about a week prior to the exam. The "Study Advice" is optional and is student-self-graded.
- **Final Exam** (25%):
  - The Final Exam will be a combination of multiple-choice, fill-in-the-blank, short answer, Ethics problems, and MATLAB programming problems.
  - The Final exam will mostly focus on materials after the 2nd Stage Exam cut-off but will cover materials from the entire course.
  - About 4-5 days prior to the Final Exam, another "Study Advice" will be posted providing more sample problem to help students prepare for the exam. The answers to the "Study Advice" are included with this "Study Advice" when it is posted. The "Study Advice" is optional and is student-self-graded.

- "**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):**
  - Throughout the course there will be ECQ's. These quizzes will add bonus points to one of the above grading categories. ECQ's are **OPTIONAL**.
  - About a week prior to the Extra Credit Quiz, a "Study Advice" will be posted provide a few problems to help you prepare for the ECQ.

Dr. Lyver's Comments on Grading:

- Grades for each category listed above will be mathematically determined for each category as the total points earned divided by the total points available. The semester grade will be a weighted sum of the grades from each category.
- There is **NO** grade curve for this course. Assigned semester final grades are from the mathematical calculation of the earned credit.
- There are no extra credit assignments/projects available for CDS-130. There is about 7% extra credit built in throughout the term in each of the above categories.
- YTE, MWE, WA, Stage Exams, and Final Exam **may** contain BONUS points embedded in the assignment/exam.
- Due dates are **ABSOLUTE**! Assignments submitted after the published due date will be reviewed but will NOT receive a grade for the assignment. Time extensions are only given for extreme circumstances PRIOR to the start of week and may ONLY be granted by Dr. Lyver and must be in writing from Dr. Lyver and will give a specific time to be provided to Dr. Lyver.
- While correct answers are important, it is more important in how you arrived at those answers. Completeness in answers (compete thoughts, complete codes, complete plots) is about ½ credit for the problem.
- Students will be REQUIRED to show their GMU ID card PRIOR to beginning either exam on the webcam operating with the RESPONDUS Lockdown Browser. (Remember: "No GMU ID, No exam, No exception") More details to follow.

Notes on Exams:

- You are "ON YOUR HONOR" to not cheat on Exams. MASON's Honor Code will be STRICTLY imposed.
- **Important:** You will use the RESPONDUS Lockdown Browser to take the Stage Exams and Final Exam with the video camera turned on. The RESPONDUS Lockdown Browser allows you to take tests in a remote location. The exam sessions will be monitored and recorded. The RESPONDUS Lockdown Browser software can be downloaded at no cost via the class Blackboard site. If you have any privacy concerns, please contact me within the first week of class.
- You are permitted to use scratch paper on Exams. IF you use scratch paper, you are REQUIRED to forward the scratch paper to Dr. Lyver within 24 hours of completing the exam. Then you are REQUIRED to destroy the scratch paper.

Netiquette For On-line Discussions[1]

- Class discussions should be collaborative, not combative; you are creating a learning environment, sharing information and learning from one another. Respectful communication is important to your success in this course and as a professional.
- Please re-read your responses carefully before you post them so others will not to take them out of context or as personal attacks.
- Be positive to others and diplomatic with your words and I will try my best to do the same.
- Be careful when using sarcasm and humor. Without face-to-face communications your joke may be viewed as criticism.
- Experience shows that even an innocent remark in the online environment can be easily misconstrued.

Collaboration & Plagiarism

- All CDS-130 activities are subject to GMU's Honor Code and IT policies.
- **Collaboration**: Students are encouraged to discuss problems with each other. Discussion means each student working the problem may talk with someone else (aka: conversation on the logic or software needed to compete the assignment) but will fully work the assignment on their own.
- **Plagiarism** will not be tolerated at any time. Students will be given a zero for any assignment or exam where plagiarism is suspected by the Instructor. If plagiarism is suspected a second time for any student, an automatic grade of "F" will be assigned for the course with a report sent to the College of Science Assistant Dean of Student Affairs for further action.
- Collaboration becomes plagiarism when: A STUDENT COPIES THE WORK OF SOMEONE ELSE, EITHER FROM STUDENTS AND TA/STARS/GTAs CURENTLY TAKING CDS-130, OR SOMEWHO WHO HAS TAKEN CDS-130 IN THE PAST OR BY COPYING THE WORK FROM ANY PUBLISHED OR UNPUBLISHED SOURCE. Copying from sources like CHEGG.com are considered plagiarism.
- All assignments and exams, including computer programs and associated outputs, turned in for grading must represent the student's own work.
- Students may not discuss exam problems with anyone other than Dr. Lyver, other CDS-130 Instructors, or the CDS-130 STARS.
- COLLABORATION DURING AN EXAM IS NOT AUTHORIZED AT ANY TIME AND THUS IS PROHIBITED AND IS CONSIDERED PLAGIARISM!
- All plagiarism violations will be reported by your Instructor in writing to the Dean's office.

Prohibited Equipment Use During Exams:

[1] Netiquette prepared by Charlene Douglas, Associate Professor, College of Health & Human Services, GMU.

- Exams are closed book/closed notes.
- RESPONDUS Lockdown Browser MUST be used with the video camera turned on.
- NO other electronic equipment (including phones of any type) may be used.

Disability Accommodations

If you have a documented learning disability or other condition that may affect academic performance students MUST:

- Have the need for accommodation on file with Office of Disability Services
- (SUB I, Rm. 4205; 703-993-2474; http://ods.gmu.edu);
- Provide the Instructor with a copy of the Office of Disability Services accommodation determination prior to receiving any accommodations. The Instructor will closely protect this information as private and will not share the information with anyone other than the class assistants unless authorized in writing by the student or the Office of Disability Services.
- PLEASE NOTE: If you are having ANY difficulties with CDS-130 due to personal limitations, PLEASE discuss them with your Instructor.

We want to help you succeed in CDS-130 and in your GMU career!