Instructor: Grigory Yaroslavtsev
Office hours: Thursday 11:00AM -- 12:30PM, https://gmu.zoom.us/j/7754003406
GTA: Shuai Wang
Office hours: Friday 1:00PM -- 3:00PM,
https://gmu.zoom.us/j/98045989195?pwd=bUZzM28wSkxkb01pMU13eVo1NGkzQT09

CS 583 Syllabus

Exams

Midterm exam will be in class at 04:30-07:10PM on Thursday, October 13 @ (Van Metre Hall, 113). All appeals for the midterm have to be submitted no later than one week after the exams are distributed.
Final exam will be in class at 04:30-07:10PM on Thursday, December 01 @ (Van Metre Hall, 113).

Contacting the Instructor and GTA

We have multiple ways of maintaining communication in addition to lectures and office hours:

- Keep an eye on announcements at all times.
- For questions/discussions about the course that you don't mind other people seeing, please use Piazza (sing up link here: http://piazza.com/gmu/fall2022/cdf0)
- For informal chats/interactions, use the Discussions tool of Blackboard.
- Only for confidential questions that you don't want even the GTA to see (e.g., you could not make it to class because you developed a reaction to your depression medication), email the instructor directly.

● Course Content/Outcomes

Algorithms are at the heart of any computer-related task. In this course, we will teach how to approach the meta-task of algorithm building, as well as look at individual algorithms. We will use mathematical tools for designing and analyzing our algorithms, and get some simple hands-on coding experience. At the completion of this course, you will be able to:

- Know, use, and, if necessary, modify a range of algorithms and data structures for well-known problems.
- Given a problem, be able to develop an algorithmic solution to it.
- Be able to analyze the above solution for correctness and efficiency.
- Given different algorithms, be able to analyze and compare them.
- Have basic knowledge of complexity, upper and lower bounds.
- Have basic experience in coding simple algorithms.

Course Requirements

Required Text

Introduction to Algorithms, **Third Edition**. Author(s): Cormen, Leiserson, Rivest, and Stein; ISBN-13: 978-0262033848, see e.g.: https://www.amazon.com/Introduction-Algorithms-3rd-MIT-Press/dp/0262033844/

Technical Requirements

You will need the following in order to participate in this course:

- Computer
- Reliable internet connection
- Open Blackboard in a browser

Assigned Grades

Grades will be assigned per the table below.

TOTAL   100%

Category	Percentage
Assignments	40%
Midterm Exam	30%
Final Exam	30%

Course Policies

If you are having difficulty with anything, please talk to the instructor or the GTA as soon as you can. The earlier we tackle difficulties, the easier it is to fix them.

General

- All assignments, projects, exams are supposed to be individual work, unless the instructor agrees to a different scheme before the work is started.
- Programming assignments can be written in C/C++, Java, or Python.
- Dates and deadlines are strict, no makeups will be given unless the student can show extenuating circumstances. Oversleeping is not one of them.

- **Late Penalty**
  - Late penalty is 20% of total points per day for four days; afterwards you receive a 0. You will have a week for written assignments and two weeks for programming assignments. Please submit your work early in case you have server problems, as we will use the server's submission date as the date that you submitted your work.

- **Integrity**

There is to be NO group work on the assignments and test; violations will be considered Honor Code offenses. Please, make sure that you are familiar with the GMU Honor Code here: https://oai.gmu.edu/mason-honor-code/

It is critical that you maintain academic integrity throughout this course. Beside obvious forms of cheating, accepting help for a program from another student and/or using any part of their code, using answers/subroutines/etc. from the web, presenting others' work as your own in a report without proper citation, as well as other offenses not listed here, are considered plagiarism.

Attendance and Absences

Attendance is up to the student; however, it is the student's responsibility to make up for any absences.

University Policies

Accommodations for Students with Disabilities

Every attempt will be made to accommodate qualified students with disabilities (e.g. mental health, learning, chronic health, physical hearing, vision neurological, etc.). You must have established your eligibility for support services through the appropriate office that services students with disabilities. Note that services are confidential, may take time to put into place and are not retroactive; captions and alternate media for print materials may take three or more weeks to get produced. For more information please see: https://ds.gmu.edu/university-policies/

Title IX Sexual Misconduct

Please check the university policy regarding Title IX here: https://diversity.gmu.edu/title-ix

List of Topics (Tentative)

Week 1. Introduction, Analysis of Algorithms and O/Omega-notation, Insertion Sort.
Week 2. Asymptotic Analysis, Divide and Conquer.
Week 3. Dynamic Programming.
Week 4. Randomized Quicksort
Week 5. Binary Heaps and Priority Queues and Heapsort.
Week 6. Greedy Algorithms and Huffman Codes.
Week 7. Hash Tables
Week 8. Midterm
Week 9. Hash Functions and Open Addressing.
Week 10. Binary Search Trees.
Week 11. Graphs Elementary Graph Algorithms.
Week 12. Depth-First Search and Applications.
Week 13. Breadth-First Search.
Week 14. Thanksgiving

Week 15: Final