COSC2430: Programming and Data Structures

Instructor: Arjun Mukherjee

1 Course information

Available at official course webpage: http://www2.cs.uh.edu/~arjun/courses/ds/

2 Learning Objectives and Course Contents

This is an introductory level course on data structures and algorithms, as well as how to program them in Java. This course assumes basic computer science knowledge, programming experience with the C/C++ or Java languages and basic background on mathematics. The textbook is [1]. Any good book on Java stressing OOP and good programming constructs (I recommend Head First Java) and discrete mathematics are helpful for additional reference.

Topics include the following. Basics of OOP: pointers, encapsulation, abstract data types, inheritance, methods, overloading. Fundamentals of programming and OOP design: proving program correctness, evaluating program speed; testing, debugging, and control flow. Fundamental data structures: linked lists, queues, stacks, trees, heaps, maps, hash tables. Sorting and search algorithms: selection, heap, quick, merge sort; linear, binary, tree-based, hash-based search. Graphs: storage, search, traversal, shortest path, search and spanning trees. Theory: recursion, time complexity analysis, algorithm design and analysis techniques.

3 Assignments and Grading

- 75%: 5 programming assignments each with a 15% weight.
- 30%: Exam 1
- 10%: Classwork/Lab attendance and working out assignments in class.
- 5%: Lab attendance

Programming assignments are a fundamental component of learning for this course. All programming homeworks must be turned in and the student is required to obtain the passing score in Exam 1 for passing the course. All components add to 120%, however students will be evaluated on 100% allowing some leeway to account for the student to makeup if the performance declines. Programs will be evaluated in the Linux environment. Programming assignments are individual. Some examples input and output will be posted together with each HW, but the programs will be tested with different test cases. Programs are thoroughly tested by the TAs, and graded on a [0-100] scale: A non-submitted program grade is ZERO, a non-working program (i.e. compiles, but does not run, or produced incorrect output) will be dealt on a case by case basis and may be eligible for partial credits.

4 Instructions concerning COVID19 Accommodations and Policies

Excused Absence Policy

Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston Undergraduate Excused Absence Policy and Graduate Excused Absence Policy for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and
University-sponsored activity or athletic competition. Additional policies address absences related to military service, religious holy days, pregnancy and related conditions, and disability.

Interim Undergraduate Grading Policy (required for undergraduate courses)

Due to the unique and unprecedented challenges associated with the COVID-19 pandemic, the University of Houston has implemented an Interim Undergraduate Grade Policy for undergraduate grades which applies to all undergraduate students in courses offered in all sessions during fall 2020. Under this policy, students have the option of converting final assigned letter grades to S (Satisfactory, applicable to any letter grade from A to D-) or NCR (No Credit Reported COVID-19, applicable to grades of F) on their transcripts. Please visit FAQs for additional information.

Recording of Class (required for all courses)

Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the Center for Students with Disabilities. If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor’s recordings for their own studying and notetaking. Instructor’s recordings are not authorized to be shared with anyone without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

Syllabus Changes (required for all courses)

Due to the changing nature of the COVID-19 pandemic, please note that the instructor may need to make modifications to the course syllabus and may do so at any time. Notice of such changes will be announced as quickly as possible through email and other communications (e.g., lectures).

Resources for Online Learning

The University of Houston is committed to student success, and provides information to optimize the online learning experience through our Power-On website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, and Blackboard; requesting a laptop through the Laptop Loaner Program; using your smartphone as a webcam; and downloading Microsoft Office 365 at no cost. For questions or assistance contact UHOnline@uh.edu.

UH Email

Email communications related to this course will be sent to your Exchange email account which each University of Houston student receives. The Exchange mail server can be accessed via Outlook, which provides a single location for organizing and managing day-to-day information, from email and calendars to contacts and task lists. Exchange email accounts can be accessed by logging into Office 365 with your Cougarnet credentials or through Access UH. They can also be configured on iOS and Android mobile devices. Additional assistance can be found at the Get Help page.

Webcams

Access to a webcam is required for students participating remotely in this course. Webcams must be turned on during exams and whenever requested by the TAs/Instructors to ensure fair academic conduct.
Honor Code Statement

Students may be asked to sign an honor code statement as part of their submission of any graded work including but not limited to projects, quizzes, and exams: “I understand and agree to abide by the provisions in the (select: University of Houston Undergraduate Academic Honesty Policy, University of Houston Graduate Academic Honesty Policy). I understand that academic honesty is taken very seriously and, in the cases of violations, penalties may include suspension or expulsion from the University of Houston.”

References