UMass Boston CS 310, Summer 2020
Advanced Data Structures and Algorithms

Lectures	Monday, Wednesday 1:30pm – 4:30pm (All lectures, materials, and discussions etc. will be on Blackboard.)
Instructor	Hefei Qiu Email: hefei.qiu001@umb.edu Office hours: Tue, Thu 2pm – 3pm
Suggested Textbook	Data Structures and Problem Solving in Java, by Mark Allen Weiss, 4th Edition, Addison Wesley, 2010. Algorithms, by Robert Sedgewick and Kevin Wayne, 4th Edition

Course Description

This course is a systematic study of the methods of structuring and manipulating data in computing, and the design and analysis of algorithms. We will use Java (or Python) programming language.

Prerequisites

- CS 210: Java; basic data structures: arrays, lists, queues, priority queues, stacks, trees, hash tables, sets, maps; basic algorithms: searching, sorting
- CS 240: C, static and dynamic memory allocation
- CS 220: Applied Discrete Math

Evaluation

The total score consists of:

- Exams (60%)
  - 2 total, exam 1 - 25%, exam 2 - 35%.
  - There is no makeup test during the semester.
- Homework (40%)
  - Homework will be assigned every week or two (5-7 homework), the lowest score will be dropped.
  - Submit the electronic copy of the homework through Blackboard. For the electronic copy, Only .pdf, .java, .py, .txt file formats are accepted.
  - No late homework is accepted.
  - You are encouraged to discuss homework with your classmates. You should state whom you discussed with in your homework which will not lower your grade. But you **must** write up homework solutions independently. It is a cheating violation when solutions are copied or shared.
- Attendance and Class exercise
  - Attendance is not required, but highly encouraged. You are responsible for keeping yourselves up to date if you miss a class.

Use of Blackboard

Blackboard will be used as online platform for the course. Lecturing will be hosted there, course materials and assignments will be posted there, and grades will be submitted there as well. Discussion is also encouraged to be done on Blackboard discussion board. It is far better to post a question to the discussion board. Answers there would be available to all the students.

Tentative Schedule

- week 1: runtime analysis
- week 1-2: basic data structures
- week 2-3: searching sorting
- week 3: trees
- week 3: exam 1
- week 4: recursion, backtracking
- week 4-5: dynamic programming, greedy
- week 5-6: graphs
- week 6: exam 2
- (If have time) huffman coding, randomization, NP-complete

The total score S is converted to a letter grade according to the following table.

$90 \leq S$	A
$87 \leq S < 90$	A-
$84 \leq S < 87$	B+
$81 \leq S < 84$	B
$78 \leq S < 81$	B-
$75 \leq S < 78$	C+
$72 \leq S < 75$	C
$69 \leq S < 72$	C-
$66 \leq S < 69$	D+
$63 \leq S < 66$	D
$60 \leq S < 63$	D-
$S < 60$	F

Accommodation

The University of Massachusetts Boston is committed to providing reasonable academic accommodations for all students with disabilities. This syllabus is available in alternate format upon request. If you have a disability and feel you will need accommodations in this course, please contact the Ross Center for Disability Services, Campus Center, Upper Level, Room 211 at 617.287.7430. More information can be found on http://www.umb.edu/academics/vpass/disability/

After registration with the Ross Center, a student should present and discuss the accommodations with the professor. Although a student can request accommodations at any time, we recommend that students inform the professor of the need for accommodations by the end of the Drop/Add period to ensure that accommodations are available for the entirety of the course.

Code of Conduct

It is the expressed policy of the University that every aspect of academic life – not only formal coursework situations, but also all relationships and interactions connected to the educational process – shall be conducted in an absolutely and uncompromisingly honest manner. The University presupposes that any submission of work for academic credit is the student's own and is in compliance with University policies, including its policies on appropriate citation and plagiarism. In cases where academic dishonesty is discovered after completion of a course or degree program, sanctions may be imposed retroactively, up to and including revocation of the degree. Students are required to adhere to the Code of Student Conduct, including requirements for academic honesty, delineated in the University of Massachusetts Boston Bulletin, linked from: http://www.umb.edu/life$_o n_c ampus/policies/community/code$.

Reserve Clause

The instructor reserves the right to make changes in the syllabus when necessary to meet the learning objectives, to compensate for missed classes, schedule changes, or hardware, software, and network failures, or for similar legitimate reasons.