CS 3353
Data Structures and Algorithm Analysis I
Fall 2019
Course Syllabus

**Meeting Time and Place:** MW 4:00 pm - 5:15 am, AGH 202
**Required Textbook:** *Data Structures and Algorithms in Java, Sixth Edition* by M. T. Goodrich, R. Tamassia and M. H. Goldwasser, published by Wiley (and extra lecture notes will be provided as necessary)

**Instructor:** N. Park
**E-mail:** npark(at)cs.okstate.edu
**Course page:** D2L
**Office:** MSCS 211
**Office Hours:** MW 3:00 - 4:00 pm or by appointment

**Grad. Assist.:**
**E-mail:** (at)cs.okstate.edu
**Office:** MSCS
**Office Hours:** TBA

**Prerequisite:** CS 2133 (Computer Science II) and CS 3653 (Discrete Math). Also, Unix and Programming skills in any language of C/C++/Java)

**Tentative Grading:**

- Programming/Homework Assignments and Quiz: 50%
- Exams (3): 10% each (Tentative Dates: Sep.11, Oct.9, Nov.6)
- Final Exam (Comprehensive): 20% (Date: TBA)

**Tentative Grading Scale:** [90-100%] A, [80-89%] B, [70-79%] C, [60-69%] D, [0-59%] F

**Course Objective and Description:** Algorithm cost, data and information structures, trees and tree processing, graphs and graph processing, searching, sorting.

In this context, assignments will be given to analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions; and to apply computer science theory and software development fundamentals to produce computing-based solutions.

**Note:** Homeworks and program assignments are announced and posted on D2L and are due at the beginning of class on the date they are due (unless announced otherwise). Late homeworks will **not** be accepted. Late program penalty is **10%** per calendar day, according to the date and time on the printout. Only when verifiable extenuating circumstances can be demonstrated will make-up exams or extended assignment due dates be considered. Verifiable extenuating circumstances must be reasons beyond control of the students, such as illness or accidental injury. Poor performance in class is not an extenuating circumstance. Advise your instructor of the verifiable extenuating circumstances in advance or as soon as possible. In such situations, the date and nature of the make-up exams and the extended due dates for the assignments will be decided by the instructor.

**Attendance Policy:** Attendance is strongly encouraged, but not required or monitored. Students are responsible for any material covered in class. Some of the materials covered in class will not be in the textbook. Announcements about homeworks, projects, programming assignments, etc. will be made in class and/or by email (or by an announcement on my web-page). Students are to check their emails in their class accounts or my web-page regularly.

**Collaboration Policy:** Discussion of techniques and ideas covered in class is encouraged. However, every line of on all assignments must be **your own**.

- In **programming assignments**, discussion of techniques in a natural language (such as English) is allowed, but a discussion in a computer or algorithmic language is not allowed. (Computer language discussions and questions are to be limited to the language and should not concern the assignment.) Stealing, giving or receiving any code, drawings, diagrams, texts or designs is not allowed.
- In **examinations**, no discussion of any kind (except with the instructor) is allowed. No access to any type of written material is allowed.
- Students who do not comply with the above described collaboration policy will receive a grade of F in the course. Furthermore, the case will be reported to the University Officials.

**Tentative Course Outline:**

1. Fundamental data structures: arrays/linked lists
2. Algorithm analysis: growth rates, asymptotic analysis
3. Recursion: design and analysis
4. Stacks and queues
5. Trees
6. Priority queues: heaps, heap-sort

7. Hash tables
8. Tress: BST, AVL trees, Splay trees, (2,4) trees, RBT
9. Sorting and selection: merge-sort, quick-sort, linear time sorting, bounds and comparison, selection
10. Graph algorithms: depth first/breadth first traversal, DAG, shortest path, minimum spanning trees
11. B-trees