FALL 2013 SYLLABUS

CS 360: Data Structures and Algorithms (4-0) Four hours. Basic concepts of data, linear lists, strings, arrays, trees, graphs, and the related storage of representations and structures along with algorithms for searching, sorting, and optimization including applications on trees and graphs.

Prerequisites: Math 301 and CS 250 and CS 260. Prerequisite or concurrent: Math 302 and (CS 350 or CS 351 or CS 352).

Instructor: Richard Borie, borie@cs.ua.edu, office 3417 SEC, 348-1668. Office hours: MWF 12:00–12:45 and 2:15–4:00. (usually also MWF 11:15–12:00)

GTA: Bo Fu, bfu1@crimson.ua.edu, office 3425 SEC, 348-9150. Office hours: Fri 2:00–4:00.

Course website: Visit http://cs360.cs.ua.edu frequently to view the current tentative schedule of lecture topics, textbook readings, assignments, quizzes, and other relevant information and policies.

Textbook: Choose either Data Structures and Algorithm Analysis in Java (3rd or 2nd edition) or Data Structures and Algorithm Analysis in C++ (4th or 3rd edition), both by Mark Weiss.

Topics:
- Chapter 1: Math review and C++/Java programming fundamentals.
- Chapter 2: Algorithm analysis.
- Chapter 3: Lists, stacks, queues.
- Chapter 4: Trees.
- Chapter 5: Hash tables.
- Chapter 6: Heaps.
- Chapter 7: Sorting.
- Chapter 8: Disjoint sets.
- Chapter 9: Graphs.
- Chapter 10: Algorithm design techniques.
- Chapters 11, 12: Additional data structures (as time permits).

Goals and objectives:
At the completion of this course, students should be able to:
- Understand data structures and algorithms that are fundamental to computer science.
- Adapt these data structures and algorithms to solve new problems.
- Implement these data structures and algorithms in a high-level programming language.
- Analyze the efficiency of a program, algorithm, or data structure operation.
- Develop improved problem-solving skills using standard design techniques.
Grade computation:
- Your semester average will be computed as the numerical average of your highest 60 out of these 70 scores:
  - Daily quizzes (about 40 to 42).
  - Comprehensive final exam (will count 8 to 10 times).
  - Programming assignments: first project counts 2 times, and remaining six projects each count 3 times (total of 20).
So your lowest 10 scores among these 70 scores will be dropped.
- Semester grade cutoffs will be determined as follows: A+ 96, A 92, A– 88, B+ 84, B 80, B– 76, C+ 72, C 68, C– 64, D+ 60, D 56, D– 52. However, grades may be scaled at the instructor’s discretion.

Policies:
- Students are expected to attend all class meetings. If you are absent from a lecture, you are responsible for catching up as quickly as possible.
- All assignments must be your individual work with no assistance from others. Suspected violations of this policy may be reported as academic misconduct.
- All quizzes and exams are closed-book and closed-notes, with no electronic devices permitted (unless explicitly specified otherwise).
- If you are absent from any quizzes or the final exam, or if you do not submit some assignments on time, these will count as dropped scores. However, if you are absent from N ≥ 11 quizzes due to valid excuses, you will be permitted to make-up or replace N–10 of these scores. In this case, see the instructor to make arrangements.
- Valid excuses for absences include pre-approved university-sponsored trips and medical emergencies. If you believe you have a valid excuse, notify the instructor and provide documentation of the reason for your absence to request approval in advance, or at the earliest possible time in case of an emergency.
- Please see the course website for additional general course policies regarding academic conduct, disability accommodation, cultural diversity, severe weather protocol, etc.

Guidance:
- Prepare for quizzes and exams by reading the textbook, listening and participating in class, doing the assigned projects, working quizzes and exams from previous semesters, and also solving as many other exercises from the textbook as you can.
- Active learners will generally perform better in this course than passive learners.
  - Passive learners attend classes, take notes, and believe that it is their teachers’ responsibility to tell them everything they need to know. Passive learners often don’t understand why they are unable to solve problems on their own, and why they are not making high grades. Passive learners usually only achieve shallow learning.
  - Active learners believe that it is the students’ responsibility to learn, and that their teachers can assist them in this task. Active learners pursue knowledge using all available resources including the teacher, the textbook, the library, the worldwide web, etc., and they invest time to practice their problem-solving skills. Active learners can achieve deep learning.