CS 261 – Data Structures

Catalog Description: Complexity Analysis. Approximation Methods. Trees and Graphs. File Processing. Binary Search Trees. Hashing. Storage Management.

Credits: 4

Prerequisites: CS 162, (MTH 231 or CS225)

Courses that require this as a prerequisite: CS 311, CS 321, CS 325, CS 361, CS 362, CS 372, CS 381, CS 440, CS 450

Structure: Three 50-minute (or two 80-minute) lectures, and one 50-minute recitation per week

Instructor: Ron Metoyer

Course Content:
- Abstract data types (collection, bag, stack, queue, deque, indexed, set, etc.)
- Data structures (implementations of ADTs, including vectors, linked lists, sorted vectors, skiplists, binary search trees, AVL trees, hash tables)
- Complexity analysis (space, time requirements)

Learning Resources: [Revised Fall 2009]
- *C Pocket Reference*, Prinz/Kirch-Prinz
- Course notes and on-line material

Course Learning Outcomes: (* indicates quantitative outcome—see Criterion 4)
At the completion of the course, students will be able to…
1. **Describe** the properties, interfaces, and behaviors of basic abstract data types, such as collection, bag, indexed collection, sorted collection, stack, and queue* (ABET Outcomes: A, J, I)
2. **Read** an algorithm or program code segment that contains iterative constructs and **analyze** the asymptotic time complexity of the algorithm or code segment   (ABET Outcomes: A, J)
3. **State** the asymptotic time complexity of the fundamental operations associated with a variety of data structures, such as vector, linked list, tree, and heap   (ABET Outcomes: A, J)
4. **Recall** the space utilization of common data structures in terms of the long-term storage needed to maintain the structure, as well as the short-term memory requirements of fundamental operations, such as sorting (ABET Outcomes: A, B, J)
5. **Design** and **implement** general-purpose, reusable data structures that implement one or more abstractions* (ABET Outcomes: A, B, C, K, I)
6. **Compare** and **contrast** the operation of common data structures (such as linear structures, priority queues, tree structures, hash tables, maps, and graphs) in terms of time complexity, space utilization, and the abstract data types they implement (ABET Outcomes: A, B, J)

Students with Disabilities:

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

Link to Statement of Expectations for Student Conduct, i.e., cheating policies
http://oregonstate.edu/admin/stucon/achon.htm