Course Number: 3460:316
Course Name: Data Structures and Algorithms II
Course Credits: 3 credits
Schedule: Fall, Spring, sometimes Summer

Syllabus Date: August 27, 2007
Modification Date: October 8, 2007
Prepared By: Dr. Wolfgang Pelz
Modified By: Dr. Kathy Liszka

Prerequisites:
Completion of 210 and 3450:221 or 3450:215 with grades of C- or better

Text:

Bulletin Description:
A continuation of topics in 210. Topics include: graphs and graph algorithms, external sorting, hashing, advanced tree and file structures

Detailed Description:
Fundamental techniques in design and analysis of non-numerical algorithms and data structures. Topics include lists, stacks, queues, trees, graphs, searching, sorting, and hash algorithms.

Course Goals:
Data structures and algorithms provide the building blocks and tools for the construction of software systems. After successfully completing this course, the student should be able to manipulate the data structures, implement the algorithms and analyze the advantages and disadvantages of competing techniques in terms of time and space complexity.

Topics:
1. Review of mathematical concepts and recursion
2. Binary trees including traversals, search trees, heaps, and Huffman coding trees
3. General trees and K-ary trees
4. Internal sorts including comparison sorts and radix sorts
5. Searching
6. Graphs, graph algorithms, and spanning trees
7. Indexing, 2-3 trees, B-trees, and generalizations
8. Advanced trees including AVL and Red-Black trees
9. Java Collections, Sets and Maps

Computer Usage:
Typically 4-5 programming assignments involving data structures and their implementations.

References: