Course Number: 3460:435/535  
Course Name: Analysis of Algorithms  
Course Credits: 3  
Schedule: Alternate Springs  

Syllabus Date: October 10, 2007  
Prepared By: Dr. Margush (modified by Dr. Pelz)  

Prerequisites:  
Completion of 316 and 418, or equivalents with grades of C- or better  

Text:  

Bulletin Description:  
The design and analysis of efficient algorithms for random access machines and the derivation of pattern classification algorithms is explored.  

Detailed Description:  
This course begins by covering the basic mathematical ideas needed to analyze the running times of algorithms, including asymptotic analysis and solutions to common recurrence relations. These tools are then utilized to analyze running time of basic solutions to a variety of classic problems. In many cases, alternative approaches are demonstrated to realize significant speedups. This course not only prepares students to understand the fundamental principles of analysis of algorithms, but also introduces important algorithms for commonly encountered problems. An introduction to NP-Complete problems may be included.  

Course Goals:  
To study the design of efficient algorithms for classic problems in computer science  
To understand the basic foundations of algorithm analysis and related mathematical techniques  

Topics:  
- Mathematical Foundations  
- Medians and Order Statistics  
- Dynamic Programming  
- Greedy Algorithms  
- Disjoint Sets  
- Graph Algorithms  
- String Matching  
- Computational Geometry  
- NP-Completeness and Approximation  

Computer Usage:
Programming assignments are common to illustrate the various algorithms. In some cases, empirical results are generated by the programs for comparison to theoretical expectations.

References: