CST 311: Algorithm Design and Analysis
OIT: Summer 2003

Course
    Class: 3-Credit   CST311 Analysis of Algorithms
    Day: Monday   4-6PM   June 23 – August 15
    Classroom: Room 1045 Capital Center
    Coordinator: Al Lake   lakea@oit.edu   503-390-7576
    Prerequisites: Programming Language, Data Structures

Prerequisite by Topic:
Computational structures such as finite automata, context-free languages, pushdown automata, Turing machines, Chomsky language hierarchy and Church's thesis

Text: Introduction to Algorithms, Second Edition, ISBN: 0262531968, by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein

Objectives:
This class is an introduction to design, analysis and implementation of algorithms. The course topics will include: Mathematical foundations, a review of elementary data structures, sorting, searching, and graph algorithms, string matching, algorithmic design models and an introduction to NP-completeness.

Homework Assignments:
Due by the beginning of the next class unless otherwise noted. Weekly homework assignments will generally be given. Unless otherwise indicated, programming assignments and written assignments must represent your own work. It is permissible to discuss the assignments with other students, including the solution to the problem, but ensure that the work is your own.

Projects
Assignments will be given to implement algorithms and compare the running time of the implementations to that predicted by formal analysis. Any program that is written must be provided (i.e., full documentation, test data…). In addition, assignments consisting of problems that require written solutions are given. Problems solutions may require formal proofs.

Grading:
There will be no quizzes in the course. There will be one exam, a final exam, which will be a take home exam. The final exam will include any material that was covered in the course and will consist of about 10 problems. The take home final is due by Wednesday, August 13.
There will be weekly exercises and problems assigned, as shown on the course schedule. There will be four required programs.
Cheating on assignments and exams is not acceptable; see the OIT Dishonesty Statement below. Written homework and programming projects are individual assignments and it is expected that each student will do their own work. Cheating and plagiarism will not be tolerated.

Course Schedule:

Date	Description	Chapter	Exercises/Problems
6/23	Introduction to Algorithms Basic concepts Analyzing and designing algorithms Growth of functions	1, 2, 3	p. 27 2.2-2 p. 37 2.3-3 p. 37 2-1 (not 2-1 c.) p. 50 3.1-1, 3.1-3
6/30	*no class*		
7/7	Recurrences Heapsort Quicksort	4.1-4.3,6,7	p. 72 4.2-5 p. 129 6.1-1 p. 136 6.4-1 Heapsort program
7/14	Hash tables Binary Search trees Red-Black Trees	11,12.1-12.3, 13	p. 229 11.2-1 p. 256 12.1-2 p. 287 13.3-3 Red-Black program
7/21	Dynamic Programming Greedy Algorithms	15, 16.1-16.3	p. 338 15.2-4 p. 379 16.1-3 Binary Search program
7/28	Elementary graph algorithms Minimum Spanning trees	22, 23	p. 531 22.1-7 p. 566 23.1-4 Hashed table program
8/4	NP-Completeness Final review	34	take home final exam provided
8/11	Final turn-in		

Students with Disabilities

If you might need a course adaptation or academic accommodation because of a disability, or if you have emergency medical information to share with me, or if you might need special arrangements in case the room or building must be evacuated, please see me as soon as possible. Also, please contact the office of Services for Students with Disabilities in the Learning Resource Center by calling (541) 885-1031.

Academic Dishonesty

OIT considers academic dishonesty to be a serious offense. Students are expected to demonstrate their knowledge with honesty and integrity in this course. The disciplinary procedures outlined in the OIT student handbook will be followed for any incident of academic dishonesty. Please refer to the student handbook regarding policies on academic dishonesty.

OIT Dates

June 23	First day of classes
July 3	Last day to add/drop – no record
July 7	Late fees begin
Aug 1	Last date to drop – "W" recorded
Aug 8	Last day to withdraw from all courses