University of Delaware -- Computer and Information Science

CISC829 – Spring 2009

Advanced Algorithms

Instructor: Professor Errol Lloyd
416 Smith Hall
831-1958
Email: elloyd@udel.edu

Office Hrs: Tuesday: 11:00-12:00
Thursday: 2:00-3:00
By appointment or dropin

Text: Cormen, Leiserson, Rivest and Stein, *Introduction to Algorithms* (2nd edition) McGraw-Hill & MIT Press.

References: CLRS and various papers that will be distributed.

Homework: There will be 8 to 10 homework problems, ranging in difficulty from easy to hard. All problems will be solved individually.

In solving these problems the following are considered cheating and will be dealt with accordingly: looking the solution up in any source other than those listed above; looking up the solution by locating a paper in the literature; looking in any way at solutions from prior years or from other courses; posting the problem on the Internet, seeking a solution; etc. You *may* ask others for clarifications of the problem statement. If in doubt, ask the instructor.

Each student will be involved in grading (and possibly writing a solution for) two homework problems. Separate instructions are provided for how this will be done.

Lecture: Each student will give one lecture on a mutually agreeable topic in algorithm design and analysis. Separate instructions are provided.

Grading: Homework: 80% more or less
Lecture: 20%

Class participation - this is the more or less

Exam: No exam is currently scheduled, however the instructor reserves the right to give a final exam on the last day of class. IF an exam is given, then the grading scale will be revised as follows: Homework – 60%, Lecture – 20%, Exam – 20%

Website: **http://www.cis.udel.edu/~elloyd/cis829.html --** the course webpage. Copies of assignments, announcements, problem solutions, etc may be found here.

Objective: To provide a detailed look at a range of topics in algorithm design and analysis at the advanced level. Although subject to change, specific topics expected to be covered are:

Approximation algorithms

Traveling salesperson
Vertex cover
Subset sum – FPTAS
Graph coloring
Bin packing
Relay node placement

Assorted short topics

Task scheduling
Pattern matching
Scapegoat trees
Network flow
Linear programming
Planar separator theorem

Parallel algorithms

PRAM model
Prefix sums
Finding the max
List merging
Cycle 3-coloring
List ranking