



University of New York, Tirana
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Design and Analysis of Algorithms

Fall 2007

Lecturer: Eralda CAUSHAJ
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Class Hours: Monday 15-18.00
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Course Description:

This course introduces basic methods for the design and analysis of efficient algorithms emphasizing methods useful in practice. Different algorithms for a given computational task are presented and their relative merits evaluated based on performance measures. The following important computational problems will be discussed: sorting, searching, elements of dynamic programming and greedy algorithms, advanced data structures, graph algorithms (shortest path, spanning trees, and tree traversals), string matching, elements of computational geometry, NP completeness.

Course Outline

Programming, Sorting

Sorting Algorithms
Comparison vs. Non-comparison Sorting Algorithms

Binary Search Trees
Simple and Balanced

Dynamic Programming
Matrix Chain Mult. Optimal Binary Search

Greedy Algorithms
Knapsack problem, Huffman codes

Graph Algorithms
Minimum Spanning Tree, Single-Source Shortest Paths, Rete Algorithm (optional)

Linear Programming
Simplex Algorithm

NP-Completeness (non-deterministic polynomial time)

P and NP classifications, NP-complete problems, Polynomial Reductions, Techniques to cope with NPC problems.

Textbooks:

Anany Levitin Introduction to the Design and Analysis of Algorithms, International edition.

Exams: Two examinations will be taken, one during week seven of the course and a final exam covering all course content during the final examination period.

Individual Tutorials:

Students are welcome to arrange a tutorial session with the instructor on an individual basis. An announcement of my office hours is placed outside my office, Administrational Building, 3th floor.

Basis for Student Evaluation:

1. Participation: 10 %
2. Mid-Term Exam: 30 %
3. Assignment 20%
4. Final Exam: 40 %

Grading Scale:

A-F (UNYT standard grading scale).

Grading Scale and Quality Points:

Grade	Percentage	Quality points
A	95-100	4.00
A-	90-95	3.67
B+	87-89	3.33
B	83-86	3.00
B-	80-82	2.67
C+	77-79	2.33
C	73-76	2.00
C-	70-72	1.67
D+	67-69	1.33
D	63-66	1.00
D-	60-62	0.67
F	0-59	0.00

Technology Expectations: Power point presentations will be used in every class meeting that we will have.

Assignments are to be word-processed. Continuing and regular use of e-mail is expected.

General Policies:

1. Regular attendance is expected. If there is an urgent reason to be absent, please email the instructor in advance.
2. Assignments will be collected at the beginning of the class session.
3. Any form of unethical activity, e.g. cheating, will result in an automatic F on assignments and/or exam. The University's rules on academic dishonesty (e.g. cheating, plagiarism, submitting false information) will be strictly enforced. Please familiarize yourself with STUDENT HONOR CODE.
4. Make-up exams will be given in the case of a confirmed medical excuse. If possible, please advise the instructor in advance by email.