

Theoretical Methods in Computer Science, CPSC 460/560

Spring 2005, Tu Thu 2.30-3.45

The course covers basic concepts, methods and results from Theoretical Computer Science at the advanced undergraduate / beginning graduate level. The main areas covered are Computability, Complexity of Computing and Algorithms.

Book : There is no text book. The reference books are : Hopcroft and Ullman : Introduction to Automata Theory, Languages and Computation AND J. Kleinberg and E. Tardos : Algorithms, soon to be published. (I will hand out copies of relevant sections.)

I will also often hand out brief notes of the lectures. The notes will not give you all the details presented in class.

Note that Undergraduate Algorithms is a prerequisite for this course. If you are not familiar with the material of this course or have forgotten it, please brush up your knowledge of this material by rereading it.

Syllabus (subject to modification)

TOPIC	No. LECTURES
Dynamic Programming, poly time	3
Finite Automata, Regular Sets	2
Context free languages	2
Turing Machines - Intro	1
Decidability, Recursive, Recursively enumerable sets	3
Computational Complexity, Time, space	2
Poly. time and space, NP-completeness	4
Graph Algorithms	4
Algorithms for integers, polynomials	2
Randomized Algorithms	2
Parallel Algorithms	1

Grading There will be 4-6 homework assignments, one in-class mid-term examination and a final. The grade will be based approximately on :

Homework - 33 %
Mid-term - 33 %
Final - 33 %