BASIC INFORMATION

Lectures: Tue, Thr, 3:30am – 4:50am, TTLMAN 0401B

Instructor: Haibin Ling (hbling AT temple.edu)
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Office Hours: Tuesday 1:30pm – 3:30pm or by appointment.

TA: Chao Han (chao.han AT temple.edu)
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Office Hours: Monday 10am-12pm or by appointment

PREREQUISITES

Grade of C- or better in CIS 2166, CIS 2168, and Math 1042.

TEXTBOOKS

The major textbook for the class is:
Recommended textbooks:

GRADING

• Homework: 30%
• Quiz: 35%
• Final exam: 35%

HOMEWORK POLICY

♦ Your homeworks should be well organized and neatly written.
♦ If you are asked to provide an algorithm, you need to provide an actual algorithm with pseudo odes, rather than just some words.
♦ Homeworks are due in one week in class; no late homeworks will be accepted.
♦ You are encouraged to discuss the homework problems with your classmates. However, you must write up your own solution and submit your own work.

ACADEMIC HONESTY

♦ We will strictly follow the policies and procedures developed by the university.

TOPICS

♦ The following is a detailed listing of the topics covered in the course. The section numbers refer to the current text.

0. Prologue
♦ 0.1 Books and algorithms
♦ 0.2 Enter Fibonacci
♦ 0.3 Big-O notation
1. Algorithms with numbers
   ◆ 1.1 Basic arithmetic
   ◆ 1.2 Modular Arithmetic

2. Divide-and-conquer algorithms
   ◆ 2.1 Multiplication
   ◆ 2.2 Recurrence relations
   ◆ 2.3 Mergesort
   ◆ 2.4 Medians
   ◆ 2.5 Matrix multiplication

3. Decompositions of graphs
   ◆ 3.1 Why graphs?
   ◆ 3.2 Depth-first-search in undirected graphs
   ◆ 3.3 Depth-first-search in directed graphs
   ◆ 3.4 Strongly connected components

4. Paths in graphs
   ◆ 4.1 Distances
   ◆ 4.2 Breadth-first search
   ◆ 4.3 Lengths on edges
   ◆ 4.4 Dijkstra's algorithm
   ◆ 4.5 Priority queue implementation
   ◆ 4.7 Shortest paths in dags

5. Greedy algorithms
   ◆ 5.1 Minimum spanning trees
   ◆ 5.4 Set cover

6. Dynamic programming
   ◆ 6.1 Shortest paths in dags, revisited
   ◆ 6.7 Independent sets in trees

7. Linear programming and reductions
   ◆ 7.1 An introduction to linear programming
   ◆ 7.2 Flows in networks
   ◆ 7.6 The simplex algorithm

8. NP-complete problems
   ◆ 8.2 NP-complete problems

Other topics may be included, if time permits.