BASIC INFORMATION
Lectures:   Tue, Thr, 3:30am – 4:50am, TTLMAN 0401A
Instructor: Haibin Ling (hbling AT temple.edu)
            Office: SERC 382, 215-204-6973
            Office Hours: Tuesday 1:30pm – 3:30pm or by appointment.
TA:       Fengjiao Li (tuj42942 AT temple.edu)
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            Office Hours: Thursday 1:30pm – 3:30pm 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 codes, 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 rst-search in undirected graphs
   ♦ 3.3 Depth rst-search in directed graphs
   ♦ 3.4 Strongly connected components

4. Paths in graphs
   ♦ 4.1 Distances
   ♦ 4.2 Breadth rst 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.