The Hong Kong University of Science and Technology

UG Course Syllabus

Course Title: Honors Design and Analysis of Algorithms

Course Code: COMP3711H

No. of Credits: 4-credit

Any pre-/co-requisites: (Grade B+ or above in COMP 2011 / COMP 2012 / COMP 2012H) AND (Grade A- or above in COMP2711 / COMP 2711H / MATH 2343)

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Course Description

Techniques for designing algorithms, proving their correctness, and analyzing their running times. Topics covered include: sorting, selection, heaps, balanced search trees, divide-and-conquer, greedy algorithms, dynamic programming, and graph algorithms. The class will also provide an introduction to advanced techniques such as amortized analysis and the design of randomized and approximation algorithms, as well as providing exposure to more advanced algorithmic solutions to optimization problems, e.g. linear programming and network flow.

Assessments:

[List specific assessed tasks, exams, quizzes, their weightage]

Assessment Task	Contribution to Overall Course grade (%)
4 assignments	20%
Midterm exam	35%
Final exam	45%
Total	100%

Required Texts and Materials

Textbooks

- Algorithms by Dasgupta, Papadimitriou, and Vazirani – Prepublication version available online
- Algorithm Design by Kleinberg and Tardos, Addison-Wesley

[Optional] Additional Resources

Reference books

- Introduction to Algorithms (4th ed)
  - Cormen, Leiserson, Rivest and Stein. MIT Press
  - E-version available from the university library
- Programming Pearls (2nd ed)
  - Bentley. Addison Wesley
- Problems on Algorithms *(*2nd ed)
  - Ian Parberry and William Gasarch (free book)
- Algorithms
  - Jeff Erikson (free book)