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| بسم الله الرحمن الرحيم | |
| King Saud University | جامعة الملك سعود |
| College of Computer and Information Sciences | كلية علوم الحاسب والمعلومات |
| Department of Computer Science | قسم علوم الحاسب |

CSC 512 Syllabus (Spring 2020)

**Course title:** Analysis and Design of Algorithms (a graduate course)

**Instructors:** Dr. Aqil Azmi ([aqil@ksu.edu.sa](mailto:aqil@ksu.edu.sa))

**Telephone:** 467-6574

**Credit hours:** 3

**Goals of the course:** This is an introductory level graduate course in the design and analysis of algorithms. The aim of the course is to provide a solid background in designing and analyzing of algorithms. It is hoped that a student will be able to analyze and pick an appropriate algorithm for their efficiency and also design a proper working and efficient algorithm based on the many algorithm design paradigms.

**Recommended textbooks:** There is no official textbook for this course; however, I highly recommend any of those listed below:

* Cormen, Leiserson, Rivest and Stein, *Introduction to Algorithms*, 3/e, MIT Press, 2009.
* Kleinberg and Tardos, *Algorithm Design*, Addison Wesley, 2006.

##### Topics (tentative):

Mathematical preliminaries. Asymptotic notations. Practical complexities. String matching algorithms. Advanced data structures (heaps, disjoint set union/find). Common design techniques and examples: divide and conquer, greedy algorithms, dynamic programming, backtracking. Network Flow. Randomized algorithms. Introduction to NP theorem.

**Evaluation:**

Assignment 5 points

Group Term Project 15 points

Midterm exams (2) 40 points

Final exam 40 points

**Midterm Dates:**

Midterm-I, Monday, March 9, 2020

Midterm-II, Monday, April 6, 2020