RANDOMIZED ALGORITHMS

COMPUTER SCIENCE & ENGINEERING

PROF. BENNY GEORGE K
Dept. of Computer Science and Engineering
IIT Guwahati

TYPE OF COURSE : New| Elective | UG/PG
INTENDED AUDIENCE : Senior UG/PG/Ph.D
students Interested in computer science, combinatorics, etc.
PRE-REQUISITES : Basic Understanding of Algorithms and Probability
INDUSTRIES APPLICABLE TO : Google, Microsoft

COURSE DURATION : 12 weeks (28 Jan'19 - 19 Apr'19)
EXAM DATE : 27 April 2019

COURSE OUTLINE :

Algorithms are required to be "correct" and "fast". In a wide variety of applications, these twin objectives are in conflict with each other. Fortunately, neither of these ideals are sacrosanct. Therefore we can often try to optimize one of these goals by incurring a small penalty on the other. This takes us to the field of Randomized Algorithms. Often, the randomized variants, in addition to being faster than their deterministic counterpart, are simpler to understand and implement. In this course, we will study this tradeoff between correctness and speed. We will be learning a number of methods to design and analyze randomized algorithms.

ABOUT INSTRUCTOR :

Dr Benny George K is an Assistant Professor in the Department of Computer Science and Engineering at IIT Guwahati. He is interested in theoretical aspects of computer science.

COURSE PLAN :

Week 01 : Introduction to Randomized Algorithms

Week 02 : Probability Review

Week 03 : Moments and Deviation

Week 04 : The Probabilistic Method

Week 05 : Markov Chains – I

Week 06 : Markov Chain – II

Week 07 : Number Theoretic Algorithms

Week 08 : Graph Algorithms

Week 09 : Approximate Counting

Week 10 : Data Structures

Week 11 : Computational Complexity

Week 12 : Summary