

1.	Title of the course	Randomized Algorithms
2.	Course number	CS525L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To CS5228/14
6.	To be offered by	Department of Computer Science and Engineering
7.	To take effect from	July 2022
8.	Prerequisite	CoT
9.	<b>Course Objective(s):</b> To introduce randomization techniques and paradigms used in the development and probabilistic analysis of algorithms.	
10.	<b>Course Content:</b> Introduction: randomization in algorithms design, motivation; Review of basic probability; Applications: randomized quick-sort, Karger's min-cut, median finding, Miller-Rabin primality test; Concentration inequalities: Markov, Chebyshev, Chernoff, Bernstein, Hoeffding; The probabilistic method; Sampling: Karp-Luby's DNF solution counting, using Markov chain; Random walks; Randomized data structures; Hashing; Balls and bins; Algebraic techniques; Randomized incremental construction; Yao's minimax lemma; Derandomization techniques.	
11.	<b>Textbook(s):</b> 1. Mitzenmacher M and Upfal E, <i>Probability and Computing: Randomized Algorithms and Probabilistic Analysis</i> , 2nd Edition, Cambridge University Press (2017). 2. Motwani R and Raghavan P, <i>Randomized Algorithms</i> , 1st Edition, Cambridge University Press (2004).	
12.	<b>Reference(s):</b> 1. Feller W, <i>An Introduction to Probability Theory and Its Applications, Volume 1</i> , 3rd Edition, Wiley (1968). 2. Dubhashi D P and Panconesi A, <i>Concentration of Measure for the Analysis of Randomized Algorithms</i> , 1st Edition, Cambridge University Press (2012).	