SARDAR PATEL UNIVERSITY
Programme: MCA
Semester: V
Syllabus with effect from: June 2015

Paper Code: PS05CMCA02	**Total Credit: 4**
Title Of Paper: Distributed Systems, Parallel Computing and Simulation	

Unit	Description in detail	Weighting (%)
1	**Distributed Systems - I** Basic concepts Advantages and Disadvantages of Distributed systems Tightly coupled and Loosely coupled systems, Hardware and Software Requirements Design Issues.	
2	**Distributed Systems - II** Implementation Methodologies : System Models for Organization of processors in a Distributed systems Processor Allocation Models Distributed File system Design Synchronization Aspects	
3	**Parallel Computing** Introduction to parallel processing Parallel processing terminology: decomposition, complexity, throughput, speedup, data dependence, resource dependence, levels of parallelism in programs Basic Architectures: multiprocessors, vector processors, pipeline, array, systolic, cube, hypercube, CCC, pyramid, prism, butterfly, and shuffle exchange Elementary Parallel Algorithms: Odd-Even, Bitonic Merge	
4	**Simulation - I** Introduction Applications Advantages & Disadvantages **Examples of simulation** Continuous system simulation • Examples • Numerical Integration Vs. Continuous system simulation • Analog Vs. Digital simulation	
5	**Simulation - II** Discrete system simulation • Examples • Fixed time-step & Event-to-event model Simulating randomness Generation of non-uniformly distributed random numbers Monte-Carlo Computation and its applications. System, System environment, attributes, activities, types of activities Types of models • Principles used in modeling System Studies	

6	**Simulation - III** Types of system study Different computational techniques used in simulation • Distributed lag models • Cobweb model Process of simulating Design and Evaluation of Simulation Experiments Validation Introduction to Simulation Language	

Basic Text & Reference Books

- Tanenbaum Andrew S: Distributed Operating System, Addison Wesley, 2001
- Quinn Michael J: Parallel Computing – Theory and Practice (second edition), McGraw-Hill Pub., 1994
- Hira D. S. : System Simulation, S Chand & Co., Ltd., 2001
- Gordon Geoffrey : System Simulation, Prentice-Hall of India, New Delhi, 2001
- Deo Narsingh : System Simulation with Digital Computer, Prentice-Hall of India, New Delhi, 1999
- Law A M & Kelton W D: Simulation Modeling & Analysis, Tata McGraw-Hill, International Series, 2000