Modelling & Simulation
IT705C
Contracts: 3L
Credits- 3

Module-I: Introduction to Modelling and Simulation :
Nature of Simulation. Systems , Models and Simulation, Continuous and Discrete Systems, system modelling, Components of a simulation study, Introduction to Static and Dynamic System simulation , Application areas, Advantages ,Disadvantages and pitfalls of Simulation.

Module -II : System Dynamics & Probability concepts in Simulation :
Exponential growth and decay models, Generalization of growth models , Discrete and Continuous probability functions, Continuous Uniformly Distributed Random Numbers, Generation of a Random numbers, Generating Discrete distributions, Non-Uniform Continuously Distributed Random Numbers, Rejection Method.

Module-III : Simulation of Queuing Systems and Discrete System Simulation :
Poisson arrival patterns, Exponential distribution, Service times, Normal Distribution Queuing Disciplines, Simulation of single and two server queue. Application of queuing theory in computer system. Discrete Events ,Generation of arrival patterns ,Simulation programming tasks , Gathering statistics, Measuring occupancy and Utilization , Recording Distributions and Transit times .

Module-IV : Analysis of Simulation output :
Sensitivity Analysis, Validation of Model Results

Text Books:
1. Jerry Banks, John Carson, B.L.Nelson and D.M.Nicol " Discrete Event System Simulation", Fifth Edition, Pearson.
2. Narsingh Deo, 1979, System Simulation with Digital Computers, PHI.
3. Geoffrey Gordon, "System Simulation", PHI.
4. Averill M. Law and W.David Kelton, "Simulation Modelling and Analysis", Third Edition, McGraw Hill
5. J. N. Kapoor.. Mathematical Modelling, Wiley eastern Limited.

Reference Books:
1. Sankar Sengupta, "System Simulation and Modeling", Pearson.
2. C.Dennis Pegden, Robert E.Shannon and Randall P.Sadowski, 1995, Introduction to Simulation using SIMAN, 2nd Edn., Tata McGraw-Hill.
3. A.M.Law and W.D.Kelton.. Simulation Modelling and Analysis, T.M.H. Edition.