K L University
Department of Electronics & Computer Engineering
M.Tech (Embedded Systems)

Course No. : 15-EM51A3
Course Title : System Modeling and Simulation
Course Structure : 3-0-0
SYLLABUS:

Unit – I
Basic Simulation Modeling, Systems, Models and Simulation, Nature of Systems, event Driven Models, Simulation of Single Server Queuing System, event Driven Models, Characterizing Systems, Simulation Diagrams.

Unit – II
Stochastic generators: Uniformly Distributed Random Numbers, Statistical Properties of U[0,1] generators, Generation of Non-Uniform and Arbitrary Random Variates, Random processes, Characterizing and Generating Random
Processes, White Noise. Modeling Time Driven Systems: Modeling Input Signals, Discrete and Distributed Delays, System Integration, Linear Systems.
Exogenous Signals and Events: Disturbance Signals, State Machines, Petri Nets and their Analysis, System Encapsulation.

Unit – III
Markov Process: Probabilistic Models, Discrete Time Markov Processes, Random Walks, Poisson Processes, Exponential Distribution, Simulating a Poisson Process, Continuous Time Markov Process Event Driven Models: Simulation Diagrams, Queuing Theory, M/M/I Queues, Simulating Queuing Systems, Finite Capacity Queues, Multiple Servers, M/M/C Queues.

Unit – IV
System Optimization: System Identification, Searches, Alpha / Beta trackers, Multidimensional Optimization, Modeling and Simulation Methodology.

Unit – V
Simulation Software and Building Simulation Models:
Comparison of Simulation Packages with Programming Languages, Classification of Simulation Software, Desirable software features, General Purpose Simulation Packages-Arena, Extend; Guide lines for determining the level of Model detail, Techniques for increasing Model Viability and credibility.

TEXT BOOKS:
1. System Modeling and Simulation: An Introduction – Frank L. Severance, 2001,John Wiley&Sons.

2. Simulation Modeling and Analysis - Averill M.Law, W.David Kelton, , 3 ed., 2003, TMH.
REFERENCES:
1. Systems Simulation-Geoffery Gordan, PHI.