Subject Code	
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06CS82	
IA Marks	
:	
25	
No. of Lecture Hrs./ Week	
:	
04	
Exam Hours	

:

03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1

INTRODUCTION: When simulation is the appropriate tool and when it is not appropriate; Advantages and disadvantages of Simulation; Areas of application; Systems and system environment; Components of a system; Discrete and continuous systems; Model of a system; Types of Models; Discrete-Event System Simulation; Steps in a Simulation Study. Simulation examples: Simulation of queuing systems; Simulation of inventory systems; Other examples of simulation.

8 Hours

UNIT - 2

GENERAL PRINCIPLES, SIMULATION SOFTWARE: Concepts in Discrete-Event Simulation: The Event-Scheduling / Time-Advance Algorithm, World Views, Manual simulation Using Event Scheduling; List processing. Simulation in Java; Simulation in GPSS.

 6 Hours

UNIT - 3

STATISTICAL MODELS IN SIMULATION: Review of terminology and concepts; Useful statistical models; Discrete distributions; Continuous distributions; Poisson process; Empirical

distributions.

6 Hours

UNIT - 4

QUEUING MODELS: Characteristics of queuing systems; Queuing notation; Long-run measures of performance of queuing systems; Steady-state behavior of M/G/1 queue; Networks of queues.

6 Hours

PART - B

UNIT - 5

RANDOM-NUMBER GENERATION, RANDOM-VARIATE GENERATION: Properties of random numbers; Generation of pseudo-random numbers; Techniques for generating random numbers; Tests for Random Numbers. Random-Variate Generation: Inverse transform technique; Acceptance-Rejection technique; Special properties.

8 Hours

UNIT - 6

INPUT MODELING: Data Collection; Identifying the distribution with data; Parameter estimation; Goodness of Fit Tests; Fitting a non-stationary Poisson process; Selecting input models without data; Multivariate and Time-Series input models

6 Hours.

UNIT - 7

OUTPUT ANALYSIS FOR A SINGLE MODEL: Types of simulations with respect to output analysis; Stochastic nature of output data; Measures of performance and their estimation; Output analysis for terminating simulations; Output analysis for steady-state simulations.

6 Hours

UNIT - 8

VERIFICATION AND VALIDATION OF SIMULATION MODELS, OPTIMIZATION: Model building, verification and validation; Verification of simulation models; Calibration and validation of models. Optimization via Simulation.

6Hour

TEXT BOOK:

1. **Discrete-Event System Simulation** – Jerry Banks, John S. Carson II, Barry L. Nelson, David M. Nicol, 4th Edition, Pearson Education, 2007.

REFERENCE BOOKS:

1. **Discrete – Event Simulation: A First Course** – Lawrence M. Leemis, Stephen K. Park, Pearson Education/ Prentice-Hall India, 2006.

2. **Simulation** – Sheldon M. Ross, 4th Edition, Elsevier, 2006.

3. **Simulation Modeling and Analysis** – Averill M. Law, 4th Edition, Tata McGraw-Hill, 2007.