

GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT

Department of Computer Science and Engineering

Academic Year: **2016-17**

Semester: **EVEN**

COURSE PLAN

Semester: **VIII**

Subject Code& Name: **10CS82 & System Modeling and Simulation**

Name of Subject Teacher: **ARVIND R**

Name of Subject Expert (Reviewer): **J SOMASEKAR**

For the Period: From: 13-02-17 to 02-06-17

Details of Book to be referred:

Text Books	T1: Jerry Banks, John S Carson II, Barry L Nelson, David M nicol:Discrete Event System Simulation,5 th edition, Pearson Education,2010.
Reference Books	R1: Lawrence M Leemis ,Stephen K Park :Discrete Event Simulation :A First Course, Pearson Education,2006. R2: Averill M Law: Simulation Modeling and analysis,4 th edition, Tata McGraw Hill,2007.

Lecture NO	Topic Planned	Practical Applications & Brief objectives	Book referred with Pg No.	Planned Date	Executed Date	Deviation Reasons thereof	How Made Good / Reciprocate arrangement	Remarks by HOD
1.	Introduction to the subject Unit-1 :Introduction -When simulation is the appropriate tool and when it is not appropriate	Objective: Introduce the concept of simulation along with single channel and multi channel	T1:1-3	13-02-17				
2.	-Advantages and disadvantages of simulation -Areas of application		T1:3-7,10-11	14-02-17				

	-Systems and system environment -Components of a system	<p>queue</p> <p>Application: Manufacturing Industry, Military, airports, Health care, Super Markets</p> <p>Outcome: Able to understand the simulation and its tools along with system components examples</p>							
3.	-Model of a system -Types of models -Discrete event system simulation		T1:12-14	14-02-17					
4.	-Steps in a simulation study -The basics of spreadsheet simulation, Simulation examples		T1:14-19, 25-27	15-02-17					
5.	Simulation of queuing systems in a spreadsheet		T1:41-45	15-02-17					
6.	Simulation of queuing s/m in a spreadsheet contd...		T1:46-52	16-02-17					
7.	Simulation of queuing s/m in a spreadsheet contd...		T1:53-58	20-02-17					
8.	Simulation of queuing s/m in a spreadsheet contd...		T1:59-65	21-02-17					
9.	Simulation of queuing s/m in a spreadsheet contd.,...		T1:65-68	21-02-17					
10.	Revision/Unit Test			22-02-17					
11.	Unit-2 :General Principles, Simulation Software: -Concepts in Discrete event simulation -The event-scheduling /Time-Advance algorithm.		<p>Objective: Helps in understanding discrete event and manual simulation with event scheduling algorithm.</p>	T1:91-95 R2:7-11	23-02-17				
12.	The event-scheduling /Time-Advance algorithm: World views	T1:96-100		27-02-17					

13.	Manual simulation Using Event Scheduling	Application: Operating System, Design of Compilers OUTCOME: Analyze the concept of scheduling w.r.t time and events, simulation analysis	T1:100-105	28-02-17				
14.	Manual simulation Using Event Scheduling contd..		T1:105-108	28-02-17				
15.	Manual simulation Using Event Scheduling contd..		T1:109-110	01-03-17				
16.	-Manual simulation Using Event Scheduling contd.. -List Processing		T1:110-116	02-03-17				
17.	Simulation in JAVA Simulation in GPSS		T1:128-133	06-03-17				
18.	Revision/Unit Test		T1:139-143	07-03-17				
19.	Unit 3:Statistical Models in Simulation -Review of terminology and concepts	Objective: Introduce concepts of probability distribution, poisson process Application: Probability, Sampling, Image Processing OUTCOME: Able to understand different distributions with statistical methods	T1:171-175	07-03-17				
20.	-Review of terminology and concepts -Useful statistical models		T1:176-183	08-03-17				
21.	Discrete distributions		T1:183-189	13-03-17				
22.	Continuous distributions		T1:189-195	14-03-17				
23.	Continuous distributions contd..		T1:195-206	14-03-17				
24.	Continuous distributions contd..		T1:207-211	15-03-17				
25.	-Poisson Process -Empirical distributions		T1:211-218	16-03-17				
26.	Revision / Unit Test			20-03-17				

27.	Unit-4 :Queuing Models Characteristics of queuing systems:	<p>Objective: Deals with queuing systems along with finite and infinite models</p> <p>Application: Networking, Graph Theory, queuing techniques</p> <p>OUTCOME: Understand queuing models along with its performance</p>	T1:228-234	21-03-17				
28.	-Queuing Notation -Long-run measures of performance of queuing systems		T1:234-237	21-03-17				
29.	Long-run measures of performance of queuing systems contd..		T1:237-240	22-03-17				
30.	Steady-State behavior of M/G/1 queue		T1:240-246	23-03-17				
31.	Steady-State behavior of M/G/1 queue contd.. -Networks of queues		T1:247-254,263-264	27-03-17				
32.	Rough-Cut Modeling :An Illustration		T1:265-266	28-03-17				
33.	Revision / Unit Test			28-03-17				
34.	Unit-5:Random-Number Generation : - Properties of random numbers -Generation of pseudo random numbers	<p>Objective: Deals with random number generation and variates with different testing techniques</p> <p>Application: Computer programming, Testing of hypothesis, Statistics</p>	T1:275-277	30-03-17				
35.	Techniques for generating random numbers		T1:277-281	03-04-17				
36.	Techniques for generating random numbers		T1:281-284	04-04-17				
37.	Test for random numbers		T1:284-291	04-04-17				
38.	Random-Variate Generation: Inverse transform technique		T1:298-309 R2:424-430	05-04-17				
39.	Inverse transform technique contd..		T1:309-314 R2:448-455	06-04-17				

40.	Acceptance-Rejection Technique	OUTCOME: Helps to understand how to generate random numbers with different testing techniques	T1:314-318 R2:460-466	10-04-17				
41.	Acceptance-Rejection Technique		T1:319-321	11-04-17				
42.	Special properties		T1:321-325	11-04-17				
43.	Revision / Unit Test			12-04-17				
44.	Unit-6:Input Modeling Steps in input modeling -Data collection	Objective: Introduce the concept of modeling along with different testing techniques	T1:331-337	13-04-17				
45.	Steps in input modeling -Identifying the distribution with data.		T1:337-345	20-04-17				
46.	Steps in input modeling -Parameter estimation	Application: Time series analysis, Random data collection, Census	T1:346-354	24-04-17				
47.	Goodness of Fit-Tests		T1:355-358	25-04-17				
48.	Goodness of Fit-Tests		T1:359-362	25-04-17				
49.	Fitting a non-stationary poisson process		T1:362-363	26-04-17				
50.	Selecting input models without data	OUTCOME: Able to understand how to analyse different models w.r.t random input data	T1:363-365	27-04-17				
51.	Multi-variate and Time Series input models.		T1:365-372	02-05-17				
52.	Revision / Unit Test			02-05-17				
53.	Unit-7:Estimation of absolute performance Types of simulation w.r.t output analysis:.		T1:413-419	03-05-17				
54.	Stochastic nature of output data	T1:419-421	04-05-17					

55.	Absolute Measures of Performance and their Estimation	<p>Application: Mission Testing, Military applications, Organizations</p> <p>OUTCOME: Understand about input and output analysis of different organizations along with real time applications</p>	T1:421-425	08-05-17				
56.	Output Analysis for Terminating Simulations		T1:425-433	09-05-17				
57.	Output Analysis for steady-state Simulations		T1:433-442	09-05-17				
58.	Output Analysis for Steady-state Simulations		T1:442-451	10-05-17				
59.	Revision/Unit Test			11-05-17				
60.	Unit-8: Verification, optimization, calibration and validation -Model building -Verification and Validation	<p>Objective: Deals with how to model, calibrate, verify and validate a software model along with simulation</p> <p>Application: Software Engineering, Operations Research</p> <p>OUTCOME: Analyzes how to build a software model using optimization techniques</p>	T1:387-388	18-05-17				
61.	Verification of simulation models		T1:388-392	22-05-17				
62.	Calibration and validation of models		T1:393-402	23-05-17				
63.	Calibration and validation of models		T1:403-411	23-05-17				
64.	Optimization via simulation		T1:489-493	24-05-17				
65.	Optimization via simulation		T1:493-498	25-05-17				
66.	Revision / Unit Test			29-05-17				
67.	Revision			30-05-17				

68.	Revision	Solving VTU Question Paper		30-05-17				
69.	Revision			01-06-17				
70.	Revision			01-06-17				

Prepared By: ARVIND R
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