



Course Weekly Outline

Course Instructor	Assist. Prof. Dr. Hanaa Mohsin Ahmed				
E_mail	Salmanhanna2007@yahoo.com				
Title	Modeling and simulation				
Course Coordinator					
Course Objective					
Course Description	Introduction to Simulation, Simulation Examples, General Principles in Simulation, Simulation Software, Statistical Models in Simulation, Queuing Models, Random-Number Generation, Random-Variant Generation, Input Modeling, Output Analysis for a Single Model, Simulation of Computer Systems, Simulation of Computer Networks				
Textbook					
References	<ol style="list-style-type: none"> 1. Narsingh Deo, System Simulation with Digital Computer, Prentice Hall of India, 1999 2. Averill Law, Simulation Modeling and Analysis (3rd ed.), Tata McGraw-Hill, 2007 3. G. Gordan, System Simulation (2nd ed.), Pearson Education, 2007. 4. A.F. Seila, V. Ceric and P. Tadikamalla, Applied Simulation Modeling (International Student Edition), Thomson Learning, 2004 5. Jerry Banks, Handbook of Simulation: Principles, Methodology, Advances, Applications, and Practice, Wiley Inter Science, 1998 6. J. Banks, J.S. Carson, B.L. Nelson, Discrete Event System Simulation (4th ed.), Prentice-Hall of India, , 2004 7. N.A. Kheir, Systems Modeling and Computer Simulation, Marcel Dekker, 1988. 8. B.P. Zeigler, T.G. Kim, and H. Praehofer, Theory of Modeling and Simulation (2nd ed.), Academic Press, 2000. 				
Course Assessment	Term Tests	Laboratory	Quizzes	Project	Final Exam
	(30%)	---	(10%)	----	(60%)
General Notes					



Course weekly Outline

week	Date	Topics Covered	Lab. Experiment Assignments	Notes
1	16/9/2014	System and environment: Concept of model and model building,		
2	23/9/2014	model classification and representation,		
3	30/9/2014	Use of simulation as a tool, steps in simulation study		
4	7/10/2014	Continuous-time and Discrete-time systems: Laplace transform, transfer functions, state space models,		
5	14/10/2014	order of systems, z-transform, feedback systems,		
6	21/10/2014	Stability, observability, controllability.		
7	28/10/2014	Statistical Models in Simulation: Common discrete and continuous distributions, Poisson process,		
8	4/11/2014	empirical distributions		
9	11/11/2014	Random Numbers: Properties of random numbers,		
10	18/11/2014	generation of pseudo random numbers,		
11	25/11/2014	techniques of random number generation		
12	2/12/2014	tests for randomness		
13	9/12/2014	random variant generation using inverse transformation		
14	16/12/2012	direct transformation,		
15	23/12/2012	convolution method,		
16	30/12/2012	acceptance-rejection		
Half-year Break				
17	10/2/2015	Design and Analysis of simulation experiments: Data collection, identifying distributions with data,		
18	17/2/2015	parameter estimation, goodness of fit tests,		
19	24/2/2015	selecting input models without data,		
20	3/3/2015	multivariate an time series input models,		
21	10/3/2015	verification and validation of models, static and dynamic simulation output analysis,		
22	17/3/2015	steady-state simulation, terminating simulation,		
23	24/3/2015	confidence interval estimation,		
24	31/3/2015	Output analysis for steady state simulation,		
25	7/4/2015	variance reduction techniques		
26	14/4/2015	Queuing Models: Characteristics of queuing systems, Notation,		
27	21/4/2015	Transient and steady-state behavior,		
28	28/4/2015	Performance, Network of queues		
29	5/5/2015	Large Scale systems: Model reduction,		
30	12/5/2015	Hierarchical control		
31	19/5/2015	Decentralized control,		
32	26/5/2015	Structural properties of large scale systems		

Instructor Signature:

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