Pramod Parajuli
Simulation and Modeling, CS-331

Course Curriculum

Source: www.csitnepal.com

Introduction to Simulation

- System Concepts
- System Modeling
- Mathematical Models: their nature and assumptions
- Calibration and Validation

Discrete and Continuous Systems

- Queuing System
- Markov Chains
- Differential and Partial Differential Equations

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Generation of Random Variables

- Uniform Random Generators

- Testing of Uniform Random Generators

- Methods of Generating Non-uniform Variables

- Inversion, Rejection, composition

Analysis of Simulated Output

- Estimation Methods

- Simulation Run Statistics

- Replication of Internal Bias

3

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Simulation Languages

- Discrete Systems Modeling and Simulation with GPSS

- Basic Concepts

- Resources in GPSS, GPSS Programs, Applications

- Continuous Systems Modeling and Simulation with CSMP

- Structural Data and Control Statements, Hybrid Simulation

- Feedback System, Typical Applications

Text Books

- Gordon, Geoffrey – *System Simulation*, 2nd Edition - PHI (must)

- Law, Kelton – *Simulation Modeling and Analysis*, 3rd Edition - Tata McGraw-Hill (must)

- Banks, Carson, Nelson, Nicol – *Discrete Event System Simulation*, 3rd Edition – PHI

- Deo, Narsingh – *System Simulation with Digital Computer* – PHI

- Books, Manuals, Tutorials covering GPSS and CSMP.

5

Note

- 4-periods per week

- Practical – using GPSS and CSMP. If time allows, we will see Vensim and Arena also.

- Project - simulation model development and testing of some real world scenario

- Website:
  - http://192.168.100.46/sim