IE 603: DISCRETE EVENT SYSTEM SIMULATION **Jul-Nov 2009**

Slot 5: Mon & Fri: 9:30am to 10:55am; Video Lab (Maths Bldg); 6 credits

Instructor Jayendran Venkateswaran, ME 319, 7533, jayendran@iitb.ac.in

Course website http://www.ieor.iitb.ac.in/~jayendran/ie603/index.htm
http://moodle.iitb.ac.in/ [Check site regularly]
Used for general class announcements, posting of syllabus, homework etc.

Teaching Assistants Damodar Garg, damodargarg@iitb.ac.in

Course Introduction

Simulation is one of the primary tools used by operations researchers. 'Simulation' is the process of designing a computerized model of a **system** (or **process**) and conducting experiments with this model for the purpose (1) understanding the behavior of system or (2) evaluating various strategies for the operation of the system. In DES, the operation of a system is represented as a chronological sequence of events. Each event occurs at an instant in time & marks a change in state of system.

Course Topics

1. Introduction to Simulation
2. Review of probability & statistics
3. Mechanism of discrete event simulation
4. Random number/ variate generation
5. Input data analysis
6. Output data analysis
7. Verification & Validation of models
8. Evaluating & comparing alternatives
9. Simulation Optimization
10. Monte Carlo simulation
11. Advanced topics in simulation
12. Simulation modeling using software

Textbook/ References

1. J. Banks, J. S. Carson, B. L. Nelson and D. M. Nicol (2001), *Discrete Event System Simulation*, 3rd ed., Pearson Education International Series
2. A. M. Law and W. D. Kelton (2000), *Simulation Modeling And Analysis*, 3rd ed., McGraw Hill International edition.
3. Sheldon M. Ross (2002), *Simulation*, 3rd Ed., Academic Press.
4. W. D. Kelton, R. P. Sadowski and D. A. Sadowski (2004), *Simulation With Arena*, 3rd Ed., McGraw Hill International edition (with CD-ROM)

Specific Goals

1. To develop student's ability to model and analyze real systems using DES. Student will understand the power, characteristics and limitations of DES.
2. To develop student's ability to implement & verify the model in a computer system.
3. To develop student's ability to evaluate and analyze the model output, compare alternatives and make appropriate suggestions for the real system.

Computer Usage

1. Students need to use DES software to aid in assignments and projects
2. Use of statistical software tools for analysis & use of word processing software for reports

Evaluation Scheme

12%	Assignments	13%	Mini-projects		
10%	Quiz	25%	Midterm Exam	40%	Final Exam

Those who wish to audit the course **must** perform ALL in-semester evaluations & maintain attendance.

Attendance is compulsory to clear the course, as per the Institute rules.
Cheating, copying and plagiarism is not allowed in assignments, quizzes, exams etc. Detection of such practices will result in the appropriate penalties as prescribed by the Institute.
Please make sure that whatever you submit under your name is your own work.