IE 603: DISCRETE EVENT SYSTEM SIMULATION   **Jul-Nov 2010**
Slot 4: Mon 11.35-12.30, Tue: 8.30-9.25, Thu 9:30 to 10:25;   Room ME208; 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.

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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)

Evaluation Scheme (To be confirmed)
10% Assignments   15% Quiz
10% Mini-project   25% Midterm Exam   40% Final Exam
Audit students need to have sufficient performance so as to get at least a CC grade to get Audit grade.

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

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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.