IEMS 415 Computer Simulation for Risk & Operations Analysis

Fall Quarter 2013

Instructor: Dr. Barry L. Nelson
Office Hours: Tuesday 5:30-6:15 pm. Feel free to send e-mail any time to set up a phone call or meeting
Office: Tech C216 (inside C210), 847/491-3747
 nelsonb@northwestern.edu
http://www.iems.northwestern.edu/~nelsonb/

Course Summary

This is a hands-on course on computer simulation for analytics in business, services and manufacturing applications that are subject to uncertainty or risk. General principles of spreadsheet and systems simulation will be covered, using @Risk (www.palisade.com) and Simio (www.simio.com) software for class projects. Upon completion of the course students will be able to develop complex simulation models, design the simulation experiment to be run on the model, and analyze and interpret the results. Management of simulation projects is also addressed. This course is only open to MEM, MSiA, MMM and other professional M.S. and McCormick M.S. students.

Course Materials

- There are two books for the course:
    - W. David Kelton, Jeffrey S. Smith, David T. Sturrock. 2011. *Simio and Simulation: Modeling, Analysis, Applications*, 2nd edition, McGraw-Hill Learning Solutions. ISBN-13: 978-0-07-340892-7. Purchase information can be found at http://www.simio.com/publications/SASMAA/ **You may want to purchase the electronic version of this book to save money.**
    - J. A. Joines and S. D. Roberts. 2012. *Simulation Modeling with SIMIO: A Workbook*, 2nd edition. Simio LLC. ISBN-13: 978-1-938207-76-1. Purchase information can be found at http://www.simio.com/publications/SMSWorkbook/index.html **It is strongly recommended that you purchase the hard copy of this book as you will need to build models from the book on your computer.**

- Course pack: Lecture notes, assignments and @Risk labs will be on Blackboard.

- Students **must** download @Risk (for free) and Simio (for roughly $25). Both the @Risk and Simio downloads include the user manual.

Preparation

- IEMS 407 or equivalent
- Computing, especially the use of spreadsheets and menu-driven programs (no lower-level programming required)
- Statistics at the introductory level (IEMS 201)

Computing

All course computing can be accomplished using the software downloads. Access to a computer running a recent version of the Windows operating system (or emulator on a Mac) for which you have administrator privileges and MS Excel installed are required to do homework assignments and projects. Students are encouraged to bring a laptop to class if at all possible.

Grading

Component	Percent of Grade
Homework	25%
Simulation Projects (3)	75%

Class Policies

- Working together: You are encouraged to discuss homework problems, but all computing and analysis is to be done individually.

- Projects: The 3 course projects involve reading a mini-case, developing an appropriate simulation model, running and analyzing a simulation experiment on that model, and making recommendations to a technical manager via a written report. Analysis and interpretation are weighted just as heavily as model correctness in these assignments. One project is a spreadsheet simulation; the other two are systems simulations.

- *While your laptop may remain open during class, the expectation is that you will not be on the Internet or working on other projects during class.*

- On-time attendance in IEMS 415 is expected. Videos of the lectures are primarily for review and to allow for unavoidable work-related travel. Students may miss one class session without penalty; additional absences will result in a 1/3 letter grade reduction, unless permission is obtained from the instructor by Monday before the missed class.