Date: Friday, April 5, 2013
Time: 10:30 am
Place: Career Center Seminar Room, SSB 3.107.

Title: "**Introduction to Monte Carlo Simulation**"

Source: This presentation is based on the article "*Microsoft Excel Data Analysis and Business Modeling*" by Wayne L. Winston, a well-known statistician and business professor who specializes in creative, practical applications of Excel.

General description:

We would like to be able to accurately estimate the probabilities of uncertain events. For example, what is the probability that a new product's cash flows will have a positive net present value (NPV)? What is the riskiness of our investment portfolio? What is the optimal plant capacity that should be built for each drug by a pharmaceutical company? Monte Carlo simulation enables us to model situations that present uncertainty and play them out thousands of times on a computer.

A little bit of history:

During the 1930s and 1940s, many computer simulations were performed to estimate the probability that the chain reaction needed for the atom bomb would work successfully. The Monte Carlo method was coined then by the physicists John von Neumann, Stanislaw Ulam and Nicholas Metropolis, while they were working on this and other nuclear weapon projects (Manhattan Project) in the Los Alamos National Laboratory. It was named in homage to the Monte Carlo Casino, a famous casino where Ulam's uncle would often gamble away his money.

Objectives:

1. Learn about who uses Monte Carlo simulation.
2. Refresh Excel basic skills: learn what happens when we enter =RAND() in a cell.
3. Understand how to simulate values of a discrete random variable.
4. Understand how to simulate values of a normal random variable.
5. Learn about how Monte Carlo simulation could be used to determine how many cards a greeting card company should produce.
6. Understand advantages of the Monte Carlo simulation over *deterministic,* or "single-point estimate" analysis.