



# STAT 100

## Chance and Data Analysis

Fall 2007  
Day Course  
Statistics Workshop

*Students requiring accommodations as a result of disability, must contact the Centre for Students with Disabilities 604-291-3112 or csdo@sfu.ca*

This course may be applied to the  
Certificate of Liberal Arts

Instructor: Gaitri Yapa (Surrey)

### Prerequisite:

**None.** Students can choose which of STAT 100 and STAT 101 they take as their first STAT course. However, to receive credit for both STAT 100 and STAT 101, STAT 100 must be taken first. This course should not be taken by students who have 60 or more credits. Intended to be particularly accessible to students who are not specializing in Statistics.

### Textbook:

*Statistics A Guide To The Unknown, 4th edition*, by Peck, et al., publisher: Duxbury, 2006

### Calendar Description:

An Introduction to chance phenomena and data analysis through simulation and examination of real world contexts including, sports, investment, lotteries and environmental issues. **Quantitative/Breadth-Science**

### Outline:

**Computing:** No computing background is assumed. However, the instructor will introduce the statistical computing language R, and provide students with an opportunity to observe certain statistical phenomena using R. R is freeware, readily downloadable from the web.

### Outline:

1. Introduction. Basics of Data Analysis. Distributions. Basics of Chance. Simulation.  
Peck xvii: Introduction;  
Peck 3-18: Statistics in the Courtroom.
2. Graphics – one and two variables. Time Series.  
Peck 183-194: Space Debris: Yet Another Environmental Problem;  
Peck 293-306: To Catch a Thief: Detecting Cell Phone Fraud;  
Peck 339-358: Assuring Product Reliability and Safety;  
Peck 373-390: Advertising as an Engineering Science.
3. Random Walks. Illusion of predictability. Stock Market Application.  
Peck 171-182: Statistical Weather Forecasting;  
Peck 359-372: Randomness in the Stock Market.
4. Risk: Insurance and Investment. Diversification. Variability.  
Peck 359-372: Randomness in the Stock Market.
5. Study Design.  
Peck 89-101: Designing National Health Care Surveys to Inform Health Policy;  
Peck 211-226: The Las Frontier: Understanding the Human Mind;  
Peck 255-270: DNA Fingerprinting;  
Peck 373-390: Advertising as an Engineering Science.
6. Models.  
Peck 105-118: Monitoring Tiger Prey Abundance in the Russian Far East;  
Peck 119-134: Predicting the African Bee Invasion;  
Peck 135-148: Statistics and the War on Spam;  
Peck 197-210: Modeling an Outbreak of Anthrax;  
Peck 307-322: Reducing the Junk Mail Using Data Mining Techniques.

7. Sampling. Randomized Response Technique.  
Peck 69-88: Evaluating School Choice Programs;  
Peck 227-242: Leveraging Chance in HIV Research.
8. Lotteries. Average and actual returns. Assessment of Coincidences.
9. Survival. Aging of cars, cells, and people.
10. Optimization. Spatial distributions.
11. Quality Control.  
Peck 323-338: Improving the Accuracy of a Newspaper: A Six Sigma Case Study of Business Process Improvement;  
Peck 339-358: Assuring Product Reliability and Safety.
12. Estimation. Change point detection.  
Peck 293-306: To Catch a Thief: Detecting Cell Phone Fraud;  
Peck 183-194: Space Debris: Yet Another Environmental Problem.
13. Significance Testing.  
Peck 3-18: Statistics in the Courtroom. (and previous selections).

### **Grading Scheme:**

Homework Assignments: 30%

Midterm: 30%

Final: 40% (or 70% if better than the midterm)

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*Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Please consult the General Guidelines of the calendar for more details.*

Revised June 12, 2007