



# STAT 100

## Chance and Data Analysis

Spring 2010  
Day Course  
Statistics Workshop

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*Students requiring accommodations as a result of disability, must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca*

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**This course may be applied to the  
Certificate in Liberal Arts**

**Instructor:** [Dr. Larry Weldon](#)  
**Lab Instructor:** [Robin Insley](#)

### **Prerequisite:**

**None.** Intended to be accessible to all SFU students, the purpose of the course is to indicate the wide scope and utility of statistical tools and concepts. Students with credit for STAT 101, 201, 203, 270 or BUEC 232 will not receive additional credit for this course.

### **Textbook:**

*Statistics: A Guide to the Unknown, 4<sup>th</sup> ed.*, by R.Peck, G.Casella, G.Cobb, R.Hoerl, D.Nolan, R.Starback, H.Stern, publisher: Duxbury, 2006

### **Calendar Description:**

Chance phenomena and data analysis are studied through simulation and examination of real world contexts including sports, investment, lotteries and environmental issues. **Quantitative/Breadth-Science**

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

### **Outline:**

1. Introduction. Basics of Data Analysis. Simulation.
2. Use of Graphics to Extract Information from Data. Time Series.
3. Randomness in Real Life. Illusions of Predictability.
4. Risk. Insurance. Investment. Diversification.
5. Targeted Collection of Data. Observational Collection of Data. Causality.
6. Models and the Utility of them for Extracting Information from Data.
7. Sampling Surveys. Confidentiality Constraints.
8. Coincidences. Lotteries.
9. Survival Analysis.
10. Spatial Distributions.
11. Statistical Process Control. Reduction of Variability. Reliability.
12. Mining Available Data.
13. Testing Hypotheses with Data.

The above techniques and concepts will be illustrated in a variety real world contexts including Sports, Crime, Environment, Cell Phones, Advertising, Investment, Public Health, the Mind, DNA, Animal Populations, Spam Mail, Schools, HIV, Automobile Accidents, and Journalism.

The course will involve little calculation but quite a bit of reading and writing, and thinking!

### **Grading Scheme:**

Assignments – 20%  
2 Midterms – 15% each  
Final Exam – 50%

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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 November 2009