STATISTICS FOR THE LIFE SCIENCES (3)

Class Number: 4111   Delivery Method: In Person

COURSE TIMES + LOCATION:

Mo, We, Fr 2:30 PM – 3:20 PM
RCB IMAGTH, Burnaby

EXAM TIMES + LOCATION:

Dec 13, 2016
12:00 PM – 3:00 PM
RCB IMAGTH, Burnaby

INSTRUCTOR:

Marie Loughin
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Office: SC-P9317

PREREQUISITES:

30 units. Students with credit for any of STAT 101, 203 or 270 may not take STAT 201 for further credit,

Description

CALENDAR DESCRIPTION:

Research methodology and associated statistical analysis techniques for students with training in the life sciences. Intended to be particularly accessible to students who are not specializing in Statistics. Quantitative.

COURSE DETAILS:

This course may be applied to the Certificate in Liberal Arts

Lab Instructor: Marie Loughin

Outline:

Aimed at a non mathematical audience, this course discusses procedures that are most commonly used in the summary of statistical surveys and in the interpretation of experimental data. Either STAT 101 or STAT 201 is a satisfactory prerequisite for STAT 302. This course will cover most of the chapters of the Moore (7th edition) text.

1. Descriptive Statistics (Chapters 1, 2 and 4 of text). Basic graphical statistics (e.g. bar graphs, pie charts, histograms, time plots, scatterplots) and basic numerical statistics (e.g. mean, median, mode, quartiles, standard deviation, correlation) are discussed. Scales of measurement are distinguished (e.g. nominal, ordinal, ratio and interval).
2. Probability (Chapters 3, 10 and 11 of text). The normal distribution is introduced along with probability rules and sampling distributions.
3. Sampling (Chapter 8 of text). Various sampling designs such as simple random sampling are discussed. The implementation of sampling procedures is also presented.
4. Experiments and Observational Studies (Chapter 9 of text). The design of experiments is introduced with an emphasis on randomization, treatments, subjects, factors, pairing and controls. Comparisons are made with observational studies.

5. Inference (Chapters 14, 15 and 16). Concepts related to the construction of confidence intervals (e.g. confidence level, width, interpretation, the effect of sample size) are discussed. Also basic concepts related to the testing of hypotheses (e.g. hypotheses, p-values, statistical significance) are presented.

6. Estimation and Testing for One Sample Problems (Chapters 18 and 20 of text). Procedures for means and proportions are discussed with an emphasis the interpretation of results.

7. Estimation and Testing for Two Sample Problems (Chapter 19 of text). Procedures for means are discussed with an emphasis on the interpretation of results.

8. One Way ANOVA (Chapter 25 of text). One way analysis of variance procedures are discussed.

9. Chi-Square Tests (Chapter 23 of text). Procedures for testing in contingency tables are presented.

10. Regression (Chapter 5 and 24 of text). Simple linear regression is introduced with an emphasis on carrying out regression on actual data using statistical software and the interpretation of results. Related concepts including residuals, least squares fit, testing and the construction of confidence intervals is addressed.

Grading

Assignments	10%
Term Tests	40%
Final	50%

NOTES:

All grading is subject to change.

Materials

MATERIALS + SUPPLIES:

IClickers - these are available in the SFU Bookstore

JMP statistical software can be downloaded free of charge from IT Services.

REQUIRED READING:

Required Textbook:

The Basic Practice of Statistics (7th ed.), by D. S. Moore, W. I. Notz, M. A. Fligner. Publisher: W.H. Freeman The textbook package is available at the SFU Bookstore. You do not need to purchase the Statistics Portal Edition or add ons. Alternately, students may purchase the online text at the Freeman website: http://www.bfwpub.com/

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