

SPRING 2015 - STAT 340 D100

INTRODUCTION TO STATISTICAL COMPUTING AND EXPLORATORY DATA ANALYSIS (3)*Class Number: 2823 Delivery Method: In Person***COURSE TIMES + LOCATION:**

Tu 8:30 AM – 10:20 AM

EDB 7618, Burnaby

Th 8:30 AM – 9:20 AM

EDB 7618, Burnaby

EXAM TIMES + LOCATION:

Apr 21, 2015

12:00 PM – 3:00 PM

SWH 10081, Burnaby

INSTRUCTOR:**Carl Schwarz**

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Office: SCK-10559

PREREQUISITES:

Prerequisite: : STAT 285 or STAT 302 or STAT 305 or equivalent.

Description

CALENDAR DESCRIPTION:

Statistical computing in R and SAS. Data management: reading, editing and storing statistical data; querying databases with SQL. Data exploration and representation: summarizing data with tables, graphs and other statistical tools. Data simulation: model-based and empirical. The SAS component of the course will give students a good start for writing the SAS programming certification exams. Quantitative.

COURSE DETAILS:**Course Outline:**

Part 1. SAS component

1. What is SAS?

- Downloading and installing
- Overview of the system

2. Data management in SAS

a. Data input and structures

- DATA step
- Reading specially formatted files
- Date/time/character formats and manipulations
- Derived variables
- Exporting

b. Data access: from database systems using query languages

c. Merging and reshaping data

- sorting/subsetting (set/if/where statements)/ merging/transposing

- processing using DO LOOPS and SAS arrays
 - modify variable attributes
3. Data exploration and representation in SAS
 - basic procs (print, plot, tabulate, means, univariate, freq)
 - by statement and uses in analysis and simulation
 - output delivery system to extract information from analyses
 4. Data simulation in SAS

Part 2 R component

1. What is the R programming environment
 - Downloading and installing
 - Basics of writing R functions
 - Basics of loops/if/while and other control-flow constructs
2. Data management in R
 - Reading and writing data: plain text files and spreadsheets, other file formats
 - Using R to query databases with SQL
 - Merging and re-shaping data
3. Data exploration and representation in R
 - Graphical displays. Customizing and extending these displays for your own research purposes.
 - Cross-tabulations and tests of association.
4. Data simulation and resampling in R
 - a. Generating data from parametric distributions: uses in evaluating statistical procedures and in understanding classical large-sample results.
 - b. Generating data by resampling: introduction to permutation, bootstrapping, cross-validation and their uses.

Grading

Assignments	20%
SAS Term Test	20%
R Term Test	20%
Final Exam	40%

NOTES:

All grading is subject to change.

Materials

RECOMMENDED READING:

Recommended Text:

SAS and R, Data Management, Statistical Analysis, and Graphics, 2nd ed, by Ken Kleinman and Nicholas J. Horton, Publisher: CRC Press

DEPARTMENT UNDERGRADUATE NOTES:**Students with Disabilities:**

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

Tutor Requests:

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