FALL 2023 - STAT 350 D100

LINEAR MODELS IN APPLIED STATISTICS (3)

Class Number: 6308 *Delivery Method: In Person*

COURSE TIMES + LOCATION:

Sep 6 – Oct 6, 2023: Tue, 12:30–2:20 p.m.
Burnaby

Oct 11 – Dec 5, 2023: Tue, 12:30–2:20 p.m.
Burnaby

Sep 6 – Dec 5, 2023: Fri, 12:30–1:20 p.m.
Burnaby

EXAM TIMES + LOCATION:

Dec 11, 2023
Mon, 3:30–6:30 p.m.
Burnaby

INSTRUCTOR:

Rachel Altman
rachelm@sfu.ca
1 778 782-3288

PREREQUISITES:

STAT 285, MATH 251, and one of MATH 232 or MATH 240, all with a minimum grade of C-.

Description

CALENDAR DESCRIPTION:

Theory and application of linear regression. Normal distribution theory. Hypothesis tests and confidence intervals. Model selection. Model diagnostics. Introduction to weighted least squares and generalized linear models. Quantitative.

COURSE DETAILS:

Outline:

1. Linear models: Definition, simple and multiple linear regression models, ANOVA models. Incorporating different types of predictor variables and their interactions in the model. Matrix notation. Interpretation of the parameter estimates.
2. Estimation methods: Least squares, maximum likelihood. Algebraic and geometrical interpretations.
3. Properties of least squares estimators: Mean, variance, and covariance of least-squares estimators. Expected value of residual sum of squares.
4. Diagnostic tools: Residual plots, multicollinearity, outliers, influential observations, goodness-of-fit tests.
5. Inference: Hypothesis tests, p-values, confidence intervals, prediction and intervals. I
6. General Linear Hypotheses: Additional sum of squares principle. Test for lack of fit based on the pure error sum of squares.
7. Model selection: Difficulties in model selection due to multicollinearity. Automatic variable selection procedures, warnings, and recommendations.
8. Introduction to generalized linear models.
9. Selected topics

Grading

Assignments	20%

Midterm 1	20%
Midterm 2	20%
Final Exam	40%

NOTES:

Above grading is subject to change. You must pass the final exam in order to pass the course.

Materials

RECOMMENDED READING:

Introduction to Linear Regression Analysis, 6th ed. by Montgomery, Peck, Vinning. Publisher: Wiley
ISBN: 978-1-119-57872-7

REQUIRED READING NOTES:

Your personalized Course Material list, including digital and physical textbooks, are available through the SFU Bookstore website by simply entering your Computing ID at: shop.sfu.ca/course-materials/my-personalized-course-materials.

DEPARTMENT UNDERGRADUATE NOTES:

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

Tutor Requests:
Students looking for a tutor should visit https://www.sfu.ca/stat-actsci/all-students/other-resources/tutoring.html. We accept no responsibility for the consequences of any actions taken related to tutors.

REGISTRAR NOTES:

ACADEMIC INTEGRITY: YOUR WORK, YOUR SUCCESS

SFU's Academic Integrity website http://www.sfu.ca/students/academicintegrity.html is filled with information on what is meant by academic dishonesty, where you can find resources to help with your studies and the consequences of cheating. Check out the site for more information and videos that help explain the issues in plain English.

Each student is responsible for his or her conduct as it affects the university community. Academic dishonesty, in whatever form, is ultimately destructive of the values of the university. Furthermore, it is unfair and discouraging to the majority of students who pursue their studies honestly. Scholarly integrity is required of all members of the university. http://www.sfu.ca/policies/gazette/student/s10-01.html

RELIGIOUS ACCOMMODATION

Students with a faith background who may need accommodations during the semester are encouraged to assess their needs as soon as possible and review the Multifaith religious accommodations website. The page outlines ways they begin working toward an accommodation and ensure solutions can be reached in a timely fashion.