

STAT551B

Probability and Mathematical Statistics

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Office Hours: Mon 1.00-2.00, Wed 11.00-12.00 and Fri 2.00-3.00

Course Web Page:

<http://www-rohan.sdsu.edu/~jchenyp/STAT551B.htm>

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Probability and Mathematical Statistics

Textbook:

An Introduction to Mathematical Statistics and its Applications by Richard J. Larsen and Morris L. Marx, Prentice Hall (LMH), 4th Edition.

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Homework:

- Homework will be assigned on the course web page each Wednesday and will be due the following Wednesday at the beginning of the lecture. No late homework is accepted. One missing homework assignment is allowed. You may drop your lowest presented score;
- In writing up homework, it is not sufficient to give only the answer to a problem; you must show how it was calculated;
- Discussion of homework with fellow students is encouraged, but the final write-up must be your own. You are welcome to ask me if you have questions

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Exams:

There will be two mid-term exams and one final exam. The midterm will be held in class on the following dates:

- Mid-Exam I (tentative): Wednesday, March 5, 2008
- Mid-Exam II (tentative): Wednesday, April 9, 2008
- Final Exam: During exam period

All Exams are in-class and closed book. You may bring in a page of notes and a calculator.

Grading:

Homework (20%), Exam I (20%), Exam II (20%), Final Exam (40%)

Course Objectives:

- A prime objective of the STAT551B course is to present some basic and useful statistical techniques and inference methods. A related course, STAT670B, presents similar material at the advanced level.
- We will study the structure of the statistical inference procedures. How to use these useful statistical tools to analyze data. In particular, the theory of estimation, confidence interval, hypothesis testing, goodness-of-fit, regression analysis and their applications will be investigated.
- Students taking the course STAT551A and had some exposure to basic probability and statistics.

Syllabus for Stat551B:

- 1. Review probability models and its properties
 - (a) Random variable and probability distribution
 - (b) What is statistics?
 - (c) Some commonly used distributions
 - (d) Moment generating function
 - (e) Central Limit Theorem (CLT)
- 2. Estimation (CHAPTER 5)
 - (a) Point estimation— maximum likelihood estimator and moment estimator
 - (b) Interval estimation
 - (c) Properties of estimators
 - (d) Consistency
- 3. Hypothesis testing (CHAPTER 6)
 - (a) The decision rule

- (b) Testing normal data
- (c) Testing binomial data
- (d) Type I and II Errors
- 4. The normal distribution (CHAPTER 7)
 - (a) The student's t distribution
 - (b) The F distribution
 - (c) The Chi-Square distribution
- 5. Two-sample problems (CHAPTER 9)
 - (a) The two-sample t test
 - (b) The F test for the two variances
 - (c) Confidence intervals for the two-sample problem
- 6. Goodness-of-fit tests (CHAPTER 10)
 - (a) Goodness-of-fit test: All parameters known
 - (b) Goodness-of-fit test: Parameter unknown
- 7. Regression (CHAPTER 11)

- (a) The methods of least squares
- (b) The linear model
- (c) Covariance and correlation