

FALL 2014 - STAT 450 D100

**STATISTICAL THEORY (3)***Delivery Method: In Person***COURSE TIMES + LOCATION:**Mo 2:30 PM – 4:20 PM  
SECB 1011, BurnabyWe 2:30 PM – 3:20 PM  
SECB 1011, Burnaby**EXAM TIMES + LOCATION:**Dec 12, 2014  
8:30 AM – 11:30 AM  
AQ 3005, Burnaby**INSTRUCTOR:**Jinko Graham  
jgraham@sfu.ca  
778-782-3155  
Office: SC-K 10553**PREREQUISITES:**

Prerequisite: : STAT 330.

## Description

**CALENDAR DESCRIPTION:**

Distribution theory, methods for constructing tests, estimators, and confidence intervals with special attention to likelihood methods. Properties of the procedures including large sample theory. Quantitative.

**COURSE DETAILS:****Additional note regarding the pre-requisite:**

STAT 330 and its core concepts such as joint, marginal and conditional distributions; means, variances, covariances and correlations; distributions of functions of discrete bivariate random variables; and common families of distributions.

**Outline:**

Assuming the prerequisite background in chapters 1-4 of the text, the course will cover:

1. Review of distributions of functions of continuous bivariate random vectors (sections 2.1, 4.3 of text).
2. Estimation in finite samples: simple likelihood estimators; judging quality of estimators via MSE and unbiasedness and the use of sufficient statistics and the Rao-Blackwell theorem in this regard.
3. Testing in finite samples: Constructing likelihood ratio tests (LRTs); optimality of LRTs for point null and alternative hypotheses and the Neyman-Pearson lemma
4. Interval estimation in finite samples: Inverting test statistics; pivotal quantities
5. Convergence concepts for estimators: Central limit theorem; Weak Law of Large Numbers (convergence in

- probability); Slutsky's theorem; Delta-method for obtaining asymptotic distributions of functions of estimators
6. Large sample approximations to distributions of estimators: Normal approximations, bootstrap
  7. Testing and interval estimation in large samples: LRTs, Wald and Score tests.

## Grading

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Assignments	20%
Midterm	35%
Final	45%

### NOTES:

***All grading is subject to change.***

## Materials

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### REQUIRED READING:

#### Required Textbook:

***Statistical Inference (2nd ed.)*** by G. Casella and R. L. Berger. Publisher: Duxbury/Thompson Learning

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### 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](mailto:csdo@sfu.ca)

#### Tutor Requests:

Students looking for a Tutor should send an email to [stat@sfu.ca](mailto:stat@sfu.ca) with "Tutor Request" in the subject line. Please only include information that you would like forwarded to our tutors mailing list (contains people external to the University). We accept no responsibility for the consequences of any actions taken related to tutors.

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