

STATISTICAL THEORY (3)

Class Number: 4121 Delivery Method: In Person

COURSE TIMES + LOCATION:

Mo 10:30 AM – 12:20 PM
AQ 2104, Burnaby

We 10:30 AM – 11:20 AM
AQ 4120, Burnaby

EXAM TIMES + LOCATION:

Dec 9, 2016
12:00 PM – 3:00 PM
AQ 5016, Burnaby

INSTRUCTOR:

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PREREQUISITES:

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

Assignments	15%
Midterm	30%
Final Exam	55%

NOTES:

All grading is subject to change.

The term paper will be due by email by midnight November 22. It will be a short expository paper on some aspect of statistical theory; the goal will be to describe the impact on practice of some piece of statistical theory without formulas.

Materials

RECOMMENDED READING:

Recommended Textbook:

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

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:

Students looking for a Tutor should visit <http://www.stat.sfu.ca/teaching/need-a-tutor-.html>. We accept no responsibility for the consequences of any actions taken related to tutors.

REGISTRAR NOTES:

SFU's Academic Integrity web site <http://students.sfu.ca/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>

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