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

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**Instructor:** [Dr. Jinko Graham](#)

**Prerequisite:**

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.

**Textbook:**

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

**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.**

**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 Scheme:**

Assignments: 20%

Midterm: 35%

Final: 45%

*Grading is subject to change.*

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*Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Students are encouraged to review policies pertaining to academic integrity available on Student Services webpage at <http://students.sfu.ca/academicintegrity.html>*

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**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.**