

BIOST 521: Statistical Inference for Biometry I

Instructor: Gary Chan, Professor of Biostatistics
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Class meeting times: MWF 10:30AM-11:20AM
Class location: SOCC 350

Example classes: W 12:30PM-1:20PM
Class location: SOCC 350

Course description:

This is the first in a two-course sequence that introduces the theory of statistical inference that provides foundations to common biostatistical methods. Topics of the sequence include basic concepts of probability, parametric distributions, exact and asymptotic sampling distribution of statistics, maximum likelihood estimation, unbiased estimating equations, theory of hypothesis testing and Bayesian inference.

Course learning objectives:

By the end of the course, students will demonstrate the ability to: (1) Perform basic probability calculations. (2) Derive the common distributions for continuous, categorical and count data. (3) Derive exact or large sample distributions for sample mean, its transformation and multivariate generalizations. (4) Derive test statistics for contingency tables. (5) Derive rank statistics and their large sample distributions.

Pre-requisites:

STAT 395, 421, 423, 504 or BIOST 514 (can be taken concurrently)

Homework:

Homework will typically be handed out every other week. Homework will be handed in and returned online using Canvas. Homework should be submitted in .doc or .pdf format. Late homework will not be accepted. The homework in this class will be used to improve the learning process. Students will learn the material best if they attempt to work all homework problems on their own. However, after attempting solutions on their own, students are encouraged to seek help from the instructor, TAs, and other students. The submitted work should reflect only that student's work. While learning from other students are allowed, a student's answer cannot be a direct copy of another student's work.

Grading:	Homeworks	20% (top four out of five homework)
	Midterm tests	40%
	Final examination	40%

Important dates:

Homework due dates – 10/7, 10/21, 11/4, 11/18, 12/2

Midterm test dates – 10/14, 11/13

Final exam date – 12/9 8:30am-10:20am SOCC 350

Textbook:

Stapleton: Models for Probability and Statistical Inference. Wiley.

<https://onlinelibrary.wiley.com/doi/book/10.1002/9780470183410>

Optional references:

Casella and Berger: Models for Probability and Statistical Inference. Wiley.

Topics:

1. Basic probability
Random variables; distribution functions; expectation and other functionals;
Bayes theorem; independence; conditional probability.
2. Distribution of a datum
Univariate distributions (discrete and continuous); multivariate
distributions; transformation.
3. Sampling distribution of a statistic
 - a. Exact distribution
 - b. Asymptotic distribution
4. Ordered statistics
5. Contingency tables and goodness-of-fit tests

Learning environment:

To provide a supportive learning environment, I ask your commitment to showing respect to each other and to your instructor both inside and outside of class by avoiding behavior that might be offensive or distracting to others. Please turn off all cell phones before entering class. Please try to arrive early to allow enough time to settle when class begins.

Academic Integrity:

Students at the University of Washington (UW) are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity. The UW School of Public Health (SPH) is committed to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating and other misconduct are serious violations of the University of Washington Student Conduct Code (WAV 478-120). Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the University of Washington Community Standards and Student Conduct website.

Access and Accommodations:

If you have already established accommodations with UW Disability Resources for Students (DRS), please communicate your approved accommodations to the instructor at your earliest convenience. To request academic accommodations due to disability, please contact Disabled Student Services (448 Schmitz, 206-543-8924 V/TTY). If you have a letter from Disabled Student Services indicating that you have a disability that requires academic accommodations, please present this letter to me so that we can discuss the accommodations you might need in this class.

Religious Accommodations:

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at Religious Accommodations Policy (<https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/>). Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form (<https://registrar.washington.edu/students/religious-accommodations-request/>).