INSTRUCTOR:

Lurdes Y.T. Inoue, PhD
Professor
Department of Biostatistics
University of Washington

CONTACT INFORMATION:

Office Hours: Wednesdays 8:00-9:00am or by appointment
Office: HSB F-666
Phone: (206)616-6398
E-mail: linoue@uw.edu

[For e-mail contact include in the subject header "BIOST511" -- preferred form of contact: via Canvas]

TEACHING ASSISTANTS:

Office hours in the HSB Library by the computer labs: schedule subject to changes.

[preferred form of contact: via Canvas]

Austin Schumacher (AS)
Email: aeschuma@uw.edu
Office Hours: Fridays, 10:30am-11:30am

Jun Hwang (JH)
E-mail: junhwang@uw.edu
Office hours: Mondays: 8:30am-9:30am and 3:30pm-4:30pm
Cooper Schumacher (CS)
E-mail: coop16@uw.edu
Office hours: Tuesdays: 10:30am-11:30am; and Fridays: 12:30pm-1:30pm

Travis Hee Wai (TH; providing only R support)
Email: theewai@uw.edu
Office hours: Mondays: 2:30pm-4:30pm

Michael P. Flanagin (providing support for grading)
Email: flanna@uw.edu

TUTORING TEACHING ASSISTANTS:

David Clausen
E-mail: dsc24@uw.edu (mailto:dsc24@uw.edu)
Office hours: Fridays, 2:30-4:00pm, T-341N (no office hours on Friday, October 14)

Gillian Tarr
E-mail: gtarr@gmail.com (mailto:gtarr@gmail.com%20)
Office hours: Tuesdays, 1:00-2:30pm T-341N

David Clausen and Gillian Tarr are Academic Support TAs, also referred to as "Tutoring TAs", who provide additional support for students in introductory Epidemiology and Biostatistics courses. These TAs are available for help bolstering basic skills, developing critical reading skills, understanding the intersections between Epidemiology and Biostatistics, and explaining R applications. They will facilitate study groups and direct students to additional resources. To get involved with a study group or set up a session for additional help, please contact them.

CLASS MEETING TIMES:  Lectures:Mon/Wed/Fr 9:30-10:20am
CLASS LOCATION:  Health Sciences Building, T625

DISCUSSION SECTIONS:

AA Friday 11:30am - 12:20pm T531 (HST (http://uw.edu/maps/?hst))
AB Wednesday 08:30am - 09:20am T639 (HST (http://uw.edu/maps/?hst))
AC Thursday 09:30am - 10:20am T625 (HST (http://uw.edu/maps/?hst))
AD Wednesday 12:30pm - 01:20pm T531 (HST (http://uw.edu/maps/?hst))
AE Monday 12:30pm - 01:20pm T639 (HST (http://uw.edu/maps/?hst))

Most of the discussion sections will be in the computer labs. Computer labs (rooms A & B) in the HS-Library are reserved for the entire quarter at the same times we hold regular discussion sections with only a few exceptions [noted below]. The discussion sections are designed to support and enhance your understanding of the material covered in this course.
Exceptions:

- Oct 21: Section AA will be in computer lab classroom B only
- Nov 04: Section AA will be in T531
- Nov 11: no discussion section (Veterans day*).
- Nov 18: Section AA will be in T531
- Nov 24-25: no discussion section (Thanksgiving*).
- Nov 30: Section AB will be in computer lab classroom C
- Dec 02: Section AA will be in T531

*Students enrolled in discussion sections that are affected by holidays, should plan to attend an alternative section.

DISCUSSION AND ANNOUNCEMENT BOARDS: On the canvas pages you will find links to the discussion and announcement boards. Any student in the class may post to the discussion board. Discussion topics will be organized by week in the quarter. Your instructors will monitor the board and answer questions. The announcement board is to be used by the instructors only. We will post general announcements (e.g. providing information to help you prepare for your exams, etc) and you are expected to check the announcement page at least once a week.

COURSE DESCRIPTION:

The objective of this course is to provide students an understanding of basic concepts and methods of statistical inference in the health sciences. The major topics are:

- Data Description and Exploratory Data Analysis
- Basic Issues in Study Design, including Sample Size Calculations
- Probability Concepts and Models
- Statistical Inference - Estimation
- Statistical Inference - Hypothesis Testing for one and two sample problems
- Categorical Data Analysis
- Introduction to Regression Analysis

Examples are drawn from the biomedical literature, and real data sets are analyzed by the students after a brief introduction to the use of a statistical computing package.

COURSE LEARNING OBJECTIVES:

Upon completion of the course, students should be able to

- Select and interpret appropriate graphical displays and numerical summaries for both quantitative and categorical data
- Explain the difference between observational and experimental studies
- Identify and describe cohort sampling, case-control sampling and cross-sectional sampling
- Recognize and explain the concepts of confounding and effect modification
- Describe the assumptions underlying the Binomial, Poisson and Normal probability models
- Define sensitivity, specificity and predictive values in the context of a binary screening test for a disease
- Translate scientific questions into appropriate null and alternative hypotheses
- Describe the assumptions underlying z-tests, t-tests and chi-square tests and use these tests appropriately
- Explain and interpret p-values and confidence intervals
• Describe the assumptions underlying simple linear regression and be able to fit and interpret a regression model
• Make predictions with a simple linear regression model
• Select and apply appropriate statistical methods (taught in the course) to analyze data and answer scientific questions of interest
• Critique the use of statistical methods in the published biomedical literature
• Use a statistical software to read data, describe data, and perform the statistical analyses covered in the course.

**PRE-REQUISITES:** Basic algebra.

**GRADING** will be based on:
• Midterm (on Nov 2)
• Final exam (on Dec 14)
• Data Analysis Plan (part I due on Oct 26; part II due on Nov 23)
• Data Analysis Report (due on Dec 7)
• Homework Assignments - lowest score dropped
• Participation

**HOMEWORK:** Homework will (typically) be handed out on Wednesday and due on the following Wednesday by noon. Homework will be handed in and returned online using the course dropbox available on 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. Homework will be marked credit/no credit based on whether or not it represents a good faith effort to answer all questions. You do not need to give a correct answer for the questions, but you do need to provide evidence of your thought processes on each question so that graders can tell that you made an effort. We encourage students to work together or in small groups on the homework problems. A good strategy is for everyone in the group to work on the problems individually and then get together to discuss the more difficult ones. **However, the final version you hand in should reflect your own interpretation and understanding.** That is, support and assistance with developing answers is encouraged; copying answers is not (copied assignments will not receive credit. Note that this is considered academic misconduct and the case will be reported to the Dean's office). Finally, except where we explicitly request it, no unedited computer output should be included in your answers to the homework questions.

**DATA ANALYSIS PLAN:** Each student will be required to submit a data analysis plan for a proposed scientific problem. More details later in the quarter.

**DATA ANALYSIS REPORT:** Each student will be required to submit a short data analysis report based on the implementation of his/her proposed data analysis plan. More details later in the quarter.

**TEXTBOOKS:**

Optional Text:

Recommended Books:

_Previously used as a text for this course._

Previously used as a text for this course. Lots of problems.


*Emphasizes concepts; very few formulas; selected as "favorite statistical text" (out of 34 reviewed) by a group of undergrads at South Carolina.*


*A short, easy to read, virtually equation free book that discusses, with examples, the many biases and "gotcha's" that can occur in biomedical research. Strongly recommended.*


*A great book of case-studies written for non-statisticians*


*Classic book on the practice and pitfalls of data display.*

**Reserves:** Recommended textbooks, and possible additional materials are available at the Health Sciences Library on reserve or in a “Library use only” section.

**SOFTWARE:** You will need access to a software package that can do descriptive statistics, graphics, basic hypothesis testing and linear regression. This includes most common statistical packages. The standard software package for the class will be R, which is available on the machines in the Health Sciences Library computer lab. Examples presented in class and discussion sections will be analyzed using R. Additional R help resources may be found at the [R resources page](https://canvas.uw.edu/courses/1063492/pages/r-resources).

We note that you are not required to use R. You can use other statistical packages. Some support will be provided to those who elect to use Stata. Note, however, that we will not be able to provide support for other statistical packages.

**ACADEMIC CONDUCT:** 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 (WAC 478-120)](http://www.washington.edu/cssc/student-conduct-overview/student-code-of-conduct/). We expect you to know and follow the university’s policies on cheating and plagiarism, and the [SPH Academic Integrity Policy](http://www.washington.edu/cssc/student-conduct-overview/student-code-of-conduct/). 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](http://www.washington.edu/cssc/student-conduct-overview/student-code-of-conduct/).

Here are links for the text that is highlighted above in boldface:

UW Student Conduct Code (WAC 478-120)

SPH Academic Integrity Policy

http://sph.washington.edu/students/academicintegrity/ (http://sph.washington.edu/students/academicintegrity/)

Community Standards and Student Conduct


Notice: The University has a license agreement with VeriCite, an educational tool that helps prevent or identify plagiarism from Internet resources. Your instructor may use the service in this class by requiring that assignments are submitted electronically to be checked by VeriCite. The VeriCite Report will indicate the amount of original text in your work and whether all material that you quoted, paraphrased, summarized, or used from another source is appropriately referenced.

ACADEMIC ACCOMMODATIONS: Your experience in this class is important to us, and it is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law. If you experience barriers based on disability, please seek a meeting with DRS to discuss and address them. If you have already established accommodations with DRS, please communicate your approved accommodations to your instructor at your earliest convenience so we can discuss your needs in this course.

Disability Resources for Students (DRS) offers resources and coordinates reasonable accommodations for students with disabilities. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. If you have not yet established services through DRS, but have a temporary or permanent disability that requires accommodations (this can include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu (mailto:uwdrs@uw.edu) or disability.uw.edu (http://depts.washington.edu/uwdrs/)

LEARNING ENVIRONMENT: To provide a supportive learning environment, I ask your commitment to showing respect to each other and to your instructors both inside and outside of class by avoiding behavior that might be offensive or distracting to others.

If you have any concerns about the class or your TA, please see the TA about these concerns as soon as possible. If you are not comfortable talking with the TA or not satisfied with the response that you receive, you may contact the Department of Biostatistics Associate Director of Academic Affairs (biostgp@uw.edu). If you are still not satisfied with the response that you receive, you may contact the Department of Biostatistics Chair (bchair@uw.edu). You may also contact the Graduate School at G-1 Communications Building, by phone at 206-543-5139 or by email at raan@uw.edu (mailto:raan@uw.edu)

Assignments Summary:

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<table>
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<td>Wed Oct 5, 2016</td>
<td>Homework 1</td>
<td>12pm</td>
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<td>Wed Oct 12, 2016</td>
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<td>Wed Oct 19, 2016</td>
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<td>Data Analysis Plan - Part I</td>
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<td>Wed Dec 7, 2016</td>
<td>Data Analysis Report</td>
<td>12pm</td>
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<td>Wed Dec 14, 2016</td>
<td>Final Exam</td>
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