Course website

http://math.pugetsound.edu/~jbernhard

Contact information

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For my office hours, see the course website. My office phone number is 253.879.3812, but the phone is usually one of the slowest ways to reach me. Email is usually much faster. (All of my email is forwarded to another account, so you may receive email from me at that account as well.) Neither phone nor email will necessarily reach me “after hours” (on nights and weekends), so please take that into account when you contact me via either one.

The course website is the best resource for information about the course. Among other things, it contains a complete calendar for the semester, including all assignments. Also, if you email me a password when I request one, you will be able to access your grade-to-date any time during the semester via the course website.

Course goals

The main goal of this course is for you to become an informed consumer of statistics. In order to achieve this goal, you will learn how to conduct and interpret basic types of statistical inference.

More specific learning objectives for this course are listed at the end of this document.

Prerequisites

The only prerequisite for this course is three years of high school mathematics. If you have a strong background in mathematics or science, or if you have taken an AP Statistics course, please see me about whether Mathematics 260 might be a more appropriate course for you.

Course materials

The primary text for this course is an online course text that I have written for the course. It is linked to from the course calendar on the course website. The second required text is Standard Deviations: Flawed Assumptions, Tortured Data, and Other Ways to Lie with Statistics by Gary Smith. This is available in the campus bookstore.
You won’t need any particular specialized technology for this course. For calculations in labs and projects it may be useful to have a computer, but if you don’t have one, you can use campus computers (such as those in the library).

**Coursework**

The coursework consists of:

- Approximately weekly **homework exercises**, which are to help you learn the mechanics of basic statistical procedures.
- Approximately weekly **reading quizzes**, which are to ensure that you have read the relevant material for our class discussions.
- Three statistical **projects** throughout the semester, which test both conceptual and computational statistical understanding.
- A take-home **reading test** at the end of the semester, which tests your understanding of how to read and understand real-world statistics.

**Grading**

Your grade will be based on **my assessment of your understanding of the material**. By default, I will weight the various components of the course as follows:

- Homework exercises 20%
- Reading quizzes 15%
- Project 1 15%
- Project 2 20%
- Project 3 20%
- Reading test 10%

However, these weights are subject to change due to individual circumstances, so if you believe the above components do not accurately represent your understanding of the material, please let me know. If the circumstances dictate, I can work with you to find another way to demonstrate your understanding of the material.

**Late work policy**

I will not accept late work **without an appropriate reason**, which you should explain to me before the work is late if possible. If you are falling behind or need to turn something in late, please see me so that we can discuss it.
Attendance policy

I will not be taking attendance in this class. You are responsible for the material that we cover in class whether or not you are in attendance. Since it is extremely difficult to keep up in the course without attending regularly, I expect absences to be rare. I do not ordinarily allow make-ups for in-class quizzes or tests, so if you must be absent during one of those, please let me know as early as possible so that we can discuss the situation.

Academic honesty

On homework exercises, you are allowed to work with anyone you like (including myself, other students, tutors, etc.) in any way that helps you learn the course material. (This means, of course, that your write-ups must be your own.)

On the reading quizzes and the reading test, you are not allowed to work with anyone. The reading quizzes will not be open notes, but you will be allowed to use your notes and course materials on the reading test.

On the projects, you are not allowed to work with anyone else. On a project, if you would like to have someone else help you with routine editing and proofreading, you must first obtain my approval to do so.

For general information on issues of academic honesty, see the official University of Puget Sound academic honesty policy at:

http://www.pugetsound.edu/student-life/student-resources/student-handbook/academic-handbook/academic-integrity/

Classroom Emergency Response Guidance

Please review university emergency preparedness, response procedures and a training video posted at www.pugetsound.edu/emergency/. There is a link on the university home page. Familiarize yourself with hall exit doors and the designated gathering area for your class and laboratory buildings.

If building evacuation becomes necessary (e.g. earthquake), meet your instructor at the designated gathering area so she/he can account for your presence. Then wait for further instructions. Do not return to the building or classroom until advised by a university emergency response representative.

If confronted by an act of violence, be prepared to make quick decisions to protect your safety. Flee the area by running away from the source of danger if you can safely do so. If this is not possible, shelter in place by securing classroom or lab doors and windows, closing blinds, and turning off room lights. Lie on the floor out of sight and away from windows and doors. Place cell phones or pagers on vibrate so that you can receive messages quietly. Wait for further instructions.
Office of Accessibility and Accommodations

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Peggy Perno, Director of the Office of Accessibility and Accommodations, 105 Howarth, 253.879.3395. She will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Copyright and Fair Use

Course materials are for educational purposes only and limited to students enrolled in the course. They are protected by copyright law and may not be copied, downloaded, stored, transmitted, shared or changed in any way.

Other

Feel free to contact me with any questions you have regarding the course. I very much want each and every one of you to succeed in this class.

I look forward to an enjoyable class with you this semester!
Learning objectives

The specific learning objectives for this course are as follows:

• To be able to define and apply the basic concepts of discrete probability theory, such as trial, outcome, event, sample space, complement, disjoint, independent, and probability function.

• To be able to state and apply the fundamental theorem of finite probability theory: if all outcomes are equally probable, then the probability of an event equals the number of outcomes in that event divided by the number of outcomes in the sample space.

• To be able to state and apply the definition of conditional probability.

• To be able to apply the three main methods used to compute discrete probabilities: counting, trees, and complements.

• To be able to state and apply the definitions of basic concepts related to discrete random variables, such as those of random variable, observation, distribution, random variable mean, random variable variance, and random variable standard deviation.

• To be able to define and apply the concepts of a Bernoulli trial and a Bernoulli random variable, and to be able to explain how these relate to binomial distributions.

• To be able to define basic concepts related to sampling random variables, such as sample, the distribution of a sample, sample mean, sample variance, sample standard deviation.

• To recognize the law of large numbers and the central limit theorem.

• To be able to conduct binomial distribution based hypothesis tests of whether a Bernoulli success probability equals 1/2.

• To be able to define and apply basic concepts related to continuous random variables, such as distribution, probability density function, and quantile.

• To be able to recognize the general shape of a normal distribution and to compute areas under normal distributions, both using a computer and using the 68-95-99.7 rule.

• To be able to standardize a random variable with a normal distribution.

• To be able to state and apply the basic things to look for in a histogram: shape, center, spread, and outliers.

• To be able to conduct and interpret normal distribution based hypothesis tests for a single proportion and to compare two proportions, and to be able to compute and interpret the confidence intervals associated with both of these types of hypothesis tests.

• To be able to conduct and interpret 1-sample, paired, and 2-sample t tests, and to be able to compute and interpret the confidence intervals associated with each of these types of hypothesis tests.

• To be able to conduct and interpret chi-square tests of independence.

• To be able to compute and interpret the coefficients in a simple linear regression analysis.