APMA 0650 Essential Statistics

01/24/2022

Canvas website: **https://canvas.brown.edu/courses/1087083**
Class Hours: TTh 9-10:20am ET — Class Room: 85 Waterman Street 015 & Zoom

Teaching team:

Instructor: Wenjun Zhao (wenjun_zhao@brown.edu)
Office: 182 George Street, Room 219 — Office Hours: TTh 10:30am-12pm

UTAs: Anna Shi (xiangkun_shi@brown.edu)
Kameel Dossal (kameel_dossal@brown.edu)

Office Hours/Locations: See Canvas for details

Course Description

A first course in probability and statistics emphasizing statistical reasoning and basic concepts. Topics include visual and numerical summaries of data, representative and non- representative samples, elementary discrete probability theory, the normal distribution, sampling variability, elementary statistical inference, measures of association. Examples and applications from the popular press and the life, social and physical sciences. No prerequisites.

Textbook

Freedman, Pisani, Purves, *Statistics (4th ed)*

Prerequisites

None!

Grading Policy

The grade will count the assessments using the following proportions:

- **40%** of your grade will be determined by 9 weekly assignments.
- **30%** of your grade will be determined by two in-person midterm exams (15% each). They are tentatively scheduled on Mar 3 and Apr 7.
- **30%** of your grade will be determined by the cumulative, in-person final exam (tentatively scheduled on May 11 as listed on Courses@Brown).

In accordance with Brown's grading system, ABC/NC or S/NC grades will be **tentatively** assigned based on the following cutoffs:

- **ABC/NC**: 90%-100% (A), 75%-89% (B), 60%-74% (C), 0%-60% (NC).
- **S/NC**: 60%-100% (S), 0%-60% (NC). S with distinction is equivalent to A.

*Note that I reserve the right to adjust the grades or cutoffs slightly, but only in a nice way. *

Course Policies

Required technology (all accessible through canvas)

- **Zoom:** course video/audio communication during synchronous meetings and office hours.
- **Media library:** lecture/review session recordings.
- **Gradescope:** assigning/grading weekly assignments.
- **Ed discussion:** posting questions and getting answers from other students/instruction team.

Policies on Assignments

- Problem sets will be posted on Canvas about one week in advance of the due date (every Thursday). The assignments will be submitted via Gradescope (accessible through Canvas). You can submit regrading requests with clear explanations through Gradescope if you disagree with the released grades. The instructor will get back to the requests within specified regrading windows (usually 1 week).
- There is a 12-hour grace period to account for any possible technical difficulties. Assignments not submitted by the end of that will not be accepted unless a valid excuse (illness/emergency) is communicated to the instructor before the deadline with verification (dean's note). Any requests for late deadlines or late assignments should be directly emailed to the instructor. TAs can not grant homework extensions.
- You are encouraged to discuss the problems in the homework with your classmates, however you are supposed to independently write up your own solution. Students who are suspected of copying part of an assignment will receive a zero on the assignment and may be referred to the Case Administrator of the Academic Code. You are supposed to report the names of your collaborators on the top of every assignment.

Academic Integrity and Honesty

Students are required to comply with the university policy on academic integrity. Please see Brown's Academic code for details. Students who are suspected of violating the Academic Code will may be reported to the Case Administrator of the Academic Code.

Accommodations for Disabilities

Brown University is committed to full inclusion of all students. Please inform me early in the term if you may require accommodations or modification of any of course procedures. You may speak with me after class, during office hours, or by appointment. If you need accommodations around online learning or in classroom accommodations, please be sure to reach out to Student Accessibility Services (SAS) for their assistance (`seas@brown.edu`, 401-863-9588). Students in need of short-term academic advice or support can contact one of the academic deans in the College.

Books, Supplies, and Materials

If your Brown undergraduate financial aid package includes the Book/Course Material Support Pilot Program (BCMS), concerns or questions about the cost of books and course materials for this or any other Brown course (including RISD courses via cross-registration) can be addressed to `bcms@brown.edu`. For all other concerns related to non-tuition course-related expenses, whether or not your Brown undergraduate financial aid package includes BCMS, please visit the Academic Emergency Fund in E-GAP (within the umbrella of "E-Gap Funds" in UFunds) to determine options for financing these costs, while ensuring your privacy.

Class Recording and Distribution of Course Materials

The course will be presented in a hybrid mode: the lectures will be held in person while synchronously live-streamed over Zoom. The recordings will be posted for students that are enrolled but cannot be present. Lectures and other course materials are copyrighted. Students are prohibited from reproducing, making copies, publicly displaying, selling, or otherwise distributing the recordings or transcripts of the materials. The only exception is that students with disabilities may have the right to record for their private use if that method is determined to be a reasonable accommodation by Student Accessibility Services. Disregard of the University's copyright policy and federal copyright law is a Student Code of Conduct violation.

Schedule (Tentative)

Jan 27: Welcome and overview
Feb 1: Observation versus experiment; Sampling biases
Feb 3: Graphical and numerical summaries of data;
Feb 8: Standard deviations; Normal approximations;
Feb 10: Scatterplots and correlation; Assignment 1 due
Feb 15: Regression;
Feb 17: Probability; Assignment 2 due
Feb 24: Conditional probability and independence; Assignment 3 due
Mar 1: Review for Midterm 1
Mar 3: Midterm 1;
Mar 8: Counting, Binomial formula;
Mar 10: Random variables; Sampling; Assignment 4 due
Mar 15: Expected values; Law of large numbers;
Mar 17: Expected values; Standard deviation; Assignment 5 due
Mar 22: Central limit theorem; Normal approximation;
Mar 24: Statistical inference; Confidence intervals;; Assignment 6 due
Apr 5: Review for Midterm 2
Apr 7: Midterm 2;
Apr 12: Confidence intervals;
Apr 14: Hypothesis testing; Assignment 7 due
Apr 19: Hypothesis testing;
Apr 21: Hypothesis testing; Assignment 8 due
Apr 26: Chi-squared tests; Simple linear regression;
Apr 28: Final review; Assignment 9 due
May 11: Final exam