Syllabus Stat 315, Spring 2025

Statistics I

Luc Rey-Bellet

Instructor

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Class Meeting

- Where: LGRC A201
- When: TuTh 2:30 PM – 3:45 PM

Office hours

- Wednesday 11:00 AM-12:00 PM in LGRT 1423 K or on ZOOM
- Friday 1:00 PM-2:00 in LGRT 1423 K or on ZOOM
- By appointment is always possible and welcome and/or ask your questions be email.

Course information and communication

- We will be using Canvas https://umamherst.instructure.com/courses/27131 to post supplementary materials and course information. In particular all class announcements are sent though Canvas and archived there. Make you sure you adjust your Canvas settings so that you receive all class annoucements.
- The quizzes will uploaded and and graded on gradesceope. You do not ned to enroll and it is linked to canvas.
- The homework is done on Webassign. You need to purchase a license for the homewokr and the ebook. Do it there https://startstrong.cengage.com/

Teaching assistants:

Class TAs

There are 3 course wide TA's. Help sessions are held every day in the evening.

- Monday: 5:30pm - 6:30pm (LGRT 206) Mst Afsana Mimi
- Tuesday: 4:15pm - 5:15pm (LGRC A301) Cheng Wang
- Wednesday: 5:30pm - 6:30pm (LGRT 171) Mst Afsana Mimi
- Thursday: 4:15pm - 5:15pm (LGRC A301) Rui Chen
- Friday: 5:30pm - 6:30pm (LGRT 206) Rui Chen

Supplementary Instruction

- Tuesday-Thursday 5:30 pm - 6:45 pm (Room TBA) Auden Cote-LHeureux (Worksheets with solution will be provided).

Class slides

- Slides00-Syllabus
- Slides01-Probability Basics
- Slides02-Counting
- Slides03-Conditional Probability
- Slides04-Conditioning and Bayes rule
- Slides05-Random variables and expected value
- Slides06-Functions of random variables and variance
- Slides07-Binomial random variables
- Slides08-Geometric random variables
- Slides09-Hypergeometric random variables
- Slides10-Poisson random variables
- Slides11-Joint discrete random variables: pdf and independence
- Slides12-Joint discrete random variables: covariance
- Slides13-Continuous random variables
- Slides14-Uniform random variables

- Slides15-Normal random variables
- Slides16-Exponential random variables

Course Description

This course provides a calculus based introduction to probability (an emphasis on probabilistic concepts used in statistical modeling). Coverage includes basic axioms of probability, sample spaces, counting rules, conditional probability, independence, random variables (and various associated discrete and continuous distributions), expectation, variance, covariance and correlation, probability inequalities, the central limit theorem, the Poisson approximation, sampling distributions, concentration inequalities and non-asymptotic statistics.

Learning objectives

Develop a working knowledge of the basic concepts in probability (mean, variance, covariance, conditional probability, independence, Bayes theorem, etc.) as well as the basic probability models (the classical discrete and continuous random variables and their interpretation as modeling tools). Learn multivariate analysis. Understand and apply the law of large numbers and the central limit theorem.

Prerequisites

Two semesters of single variable calculus (Math 131-132) or the equivalent, with a grade of "C" or better in Math 132. Math 233 is strongly recommended but not required; in particular, multivariable integration will be introduced/reviewed mid-semester.

Required materials:

The official text is **Mathematical Statistics with Applications**, Authors: Wackerly, Mendenhall, Schaeffer (ISBN-13: 978-0495110811), Edition: 7th. Some additional material will also be made freely available through the class Canvas site. WebAssign is required for your weekly online homework assignments and a online edition of the textbook is availabel in Webassign.

Weekly syllabus (subject to adjustments)

Week	Sections (Class)	Comments
#1: 1/30	2.1-2.3	
#2: 2/4, 2/6	2.4-2.7.	Add/Drop 2/5
#3: 2/11, 2/13	2.8-2.12.	
#4: 2/18,	2.12, 3.1-3.3	**Quizz 1** (2/18): 2.1-2.8
#5: 2/25, 2/27	3.4-3.8.	
#6: 3/4, 3/6	5.1-5.8 discrete	
#7: 3/11,3/13	4.1-4.6	**Quizz 2** (3/11): 2.9-2.12,3.1-3.8
Spring Break		Relax and enjoy!
#8: 3/25, 3/27	4.1-4.6, 5.2-5.4	**Quizz 3**(3/27):
#9: 4/1, 4/3	5.5-5.8,	Drop with W 4/3
#10: 4/8, 4/10	5.11 -3.9, 3.11	**Quizz 4**
#11: 4/15, 4/17	4.9-4.10.	
#12: 4/22, 4/24	6.3-6.5	**Quizz 5**
#13: 4/29, 5/1	7.3, 7.5 + LLN	
#14: 5/6, 5/8	7.2, Review	**Quizz 6**
#15: 5/15		**Final**

Homework (30%)

Here are the instructions to sign-up on Webassign The WebAssign homeworks are due roughly once a week, usually Friday night (unless otherwise specified). There is no drop-HW policy, but you can submit answers up to 5 days late for a 25% penalty (on submitted problems). Keep in mind, however, of the material you will be quizzed on. Make sure to follow the up-to-date HW due dates on your Canvas/Webassign pages.

Quizzes (35%)

There will be 6 **in-class** quizzes, usually about 30 minutes and 2 problems in length. You can bring up **1 page (8.5 by 11 inches) of hand-written notes single-sided** and a calculator. No internet-based devices are allowed. The lowest quiz will be dropped. Make sure to follow the up-to-date quiz dates on your Canvas page. The quizzes will be uploaded into gradescope and graded there. You gradescope class is https://www.gradescope.com/courses/965889 and is linked to canvas, you will be enrolled automatically.

Final Exam (30%)

The uniform (all-section) final exam is tentatively scheduled for **TBA**. This may change so keep track of the date on your Spire page. You can bring **a single page of (8.5 by 11**

inches) hand-written notes double-sided, no calculator. No internet devices are allowed. The z-table from the book will be included with your exam booklet, if it is needed. The exam will cover all the material from the main textbook (the sections covered in Chapters 2-7), which is also the material covered in WebAssign. The questions on the exam will be very similar in style to the quiz questions and WebAssign questions. Look at your Canvas page for old exams and other relevant information.

In-class attendance (5%)

Regular attendance and participation is required. This being said, stuff happens and I understand if you miss a class her or there, but regular presence is needed.

Grading Scheme

- Quizzes: 35%
- Final exam: 30%
- WebAssign Homework: 30%
- In-class attendance/particpation: 5%
- Number-to-letter conversion: These cutoffs might be slightly adjusted, but only in the downward direction, after the final exam.

A	A−	B+	B	B−	C+	C	C−	D +	D	F
93	89	85	80	75	70	65	60	55	50	<50

Drop, Withdrawal, and Incomplete

- The last day to drop/add with no record is February 5th.
- The last day to drop with a W is April 3th.
- An incomplete is possible only if all of the following apply: (1) you have a compelling personal reason, e.g., serious illness; (2) your work so far would receive a passing grade; and (3) there is a good chance you will complete the course with a passing grade within the allotted time. Thus, *expecting to fail the class is no reason to ask for an incomplete.*

Absence during quizz/exams

- You should contact me at the beginning of the semester if you must miss a quiz or exam due to religious observance.
- If you must miss a quiz or exam due to medical reasons, you should notify me at least two weeks in advance of the exam.

- If you have a medical or non-medical emergency, you should notify me as soon as possible. In either case, barring exceptional circumstances, you need to provide documentation, for example from your medical provider or the Dean of Students. You need not disclose any details, but there must be enough information to allow the absence to be excused.
- If you have a final exam conflict that entitles you to a make-up exam from me (for example, three final exams in one day and our exam is in the middle), you must notify me at least 2 weeks in advance to schedule the make-up after the regular exam time. You must also provide proof of conflict from the Registrar's office. Make sure to not book any travel during exams. Travel is not an excuse to miss the exam.
- It is impossible to anticipate all of the possible things that can occur. In case of an exceptional event beyond those covered above, contact me and explain the problem. You should be prepared to provide a written statement if necessary.

Inclusion:

This page https://www.umass.edu/studentlife/advocacy-inclusion-support links to support centers for different groups of students.

Class etiquette statement:

- Except for emergency, do not send text messages/emails or make/receive phone calls during lectures.
- If you arrive late to class, sit in the first seat you can find so as not to disturb others, and do not come up to the front of the room to pick up or hand in papers.
- You can use laptops and tablets during class provided that you do not disturb your fellow classmates or my lectures. They are not allowed during exams.
- Please read *Guidelines for Classroom Civility and Respect*: http://www.umass.edu/dean_students/campus-policies/classroom

Accommodation statement

The University of Massachusetts Amherst is committed to providing an equal educational opportunity for all students. If you have a documented physical, psychological, or learning disability on file with Disability Services (DS), you may be eligible for reasonable academic accommodations to help you succeed in this course. If you have a documented disability that requires an accommodation, please notify me within the first two weeks of the semester so that we may make appropriate arrangements.

Academic honesty statement

Since the integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, academic honesty is required of all students at the University of Massachusetts Amherst. Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to: cheating, fabrication, plagiarism, and facilitating dishonesty. Appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty. Instructors should take reasonable steps to address academic misconduct. Any person who has reason to believe that a student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair. Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent, see http://www.umass.edu/dean_students/codeofconduct/acadhonesty/. Seeking answers from websites like Chegg, Discord, etc is a clear violation of the academic honesty policy, while submitting course materials to these sites or similar ones is a violation of the instructor's copyright.

Title IX statement

In accordance with Title IX of the Education Amendments of 1972 that prohibits gender-based discrimination in educational settings that receive federal funds, the University of Massachusetts Amherst is committed to providing a safe learning environment for all students, free from all forms of discrimination, including sexual assault, sexual harassment, domestic violence, dating violence, stalking, and retaliation. This includes interactions in person or online through digital platforms and social media. Title IX also protects against discrimination on the basis of pregnancy, childbirth, false pregnancy, miscarriage, abortion, or related conditions, including recovery. There are resources here on campus to support you. A summary of the available Title IX resources (confidential and non-confidential) can be found at the following link:https://www.umass.edu/titleix/resources. You do not need to make a formal report to access them. If you need immediate support, you are not alone. Free and confidential support is available 24 hours a day / 7 days a week / 365 days a year at the SASA Hotline 413-545-0800.