Calculus-based Introduction to Statistics (S1201)

Summer 2022

Instructor:	Ye Tian	**Time:**	MTWR 6:15pm-7:50pm
Email:	ye.t@columbia.edu	**Place:**	516 Hamilton Hall

Course Pages: On courseworks.

Office Hours:

- Ye: Book on https://calendly.com/yt2661/ye-t-oh. 20-min one-to-one Zoom meeting (can book in group). Up to 4 meetings every week. Please don't double-book in one week.

- Yizi: Wed 4-5pm, Sat 10-11am (all online, zoom link on courseworks)

TA: Yizi Zhang (yz4123@columbia.edu).

References:

- Devore, J. L. (2011). Probability and Statistics for Engineering and the Sciences. Cengage learning. (9th edition) [Optional, for reading]

- Diez, D. M., Barr, C. D., & Cetinkaya-Rundel, M. (2012). OpenIntro statistics (pp. 174-175). Boston, MA, USA:: OpenIntro. [Optional, for reading. Free online, download here: https://leanpub.com/os]

Objectives: To introduce the most important statistics concepts and methods to students. After this course, students are expected to be able to understand real-life phenomenons from statistics perspective. Also they are expected to be capable of taking more advanced statistics courses to explore these concepts and methods more deeply.

Prerequisites: Basic algebra and single-variable calculus (differentiation and integration). Before we use the simple calculus results, I will briefly review them in class.

Tentative Course Outline:

- Week 1 (July 5-7): Basic concepts, descriptive statistics, data visualization, probability basics

- Week 2 (July 11-14): Probability basics, counting techniques, conditional probability, Bayes Theorem, independence, random variables, distributions

- Week 3 (July 18-21): Expectations, variance, commonly used distributions, law of large numbers, central limit theorem, midterm exam

- Week 4 (July 25-28): Point estimation, confidence intervals

- Week 5 (Aug 1-4): Confidence intervals, Hypothesis testing

- Week 6 (Aug 8-11): Study days, final exam

Grading Policy:

- Homework (40%), Midterm (30%), Final (30%).

Final weighted score	Letter grade
[96%, 100%]	A+
[93%, 96%)	A
[90%, 93%)	A-
[85%, 90%)	B+
[80%, 85%)	B
[75%, 80%)	B-
[70%, 75%)	C+
[65%, 70%)	C
[60%, 65%)	C-
[0%, 60%)	F

- The grades will not be curved.

Important Dates:

Midterm (online) .... July 21
Final Exam (online) .... Aug 10