STA 101: Data Analysis and Statistical Inference
Duke University, Summer I 2021

Instructor: Fan Bu (fan.bu1@duke.edu)
Course time: Every weekday, 10:00-11:15 am (via Zoom)
Course website: access through https://sakai.duke.edu/
Teaching Assistants: TAs undecided
Lab time: TBD
Office hours:
- Fan Bu: TBD
- TAs: TBD

Learning objectives. By the end of this course, you will be able to

1. Comprehend the process of data collection, identify potential limitations in data collection methods and other sources of statistical bias, and determine how they affect the scope of inference.
2. Possess beginner-level experience with statistical software (e.g., R) to summarize data numerically and visually, and to conduct data analysis.
3. Understand basic concepts of statistical inference.
4. Apply estimation and testing methods to analyze single variables or the relationship between two variables, in order to investigate natural phenomena and make data-based decisions.
5. Model numerical response variables using a single explanatory variable or multiple explanatory variables in order to study relationships between variables.
6. Communicate modelling results correctly, effectively, in context and in a manner that is understandable to non-technical audiences.
7. Critique data-based claims and evaluate data-based decisions.
8. Carry out research projects with rigorous statistical data analysis.

Grading policy. Your final grade will consist of (100% in total):
- Class participation (5%). Answer or ask questions in class, OR discuss on Piazza.
- Assignments (40%). Includes problem sets, application exercises, and labs (submit via Gradescope).
- Mid-term exam (25%). Online test on Sakai. Time: flexible, June 2-6.
- Final exam (35%). Online test on Sakai. Time: flexible, June 21-23.

Don't be late! 50% of the points will be deducted if you are late *no more than* 24 hours, and you will lose all credit if you are more than 24 hours late.

The lowest score of all your assignments will be dropped.

Schedule.

DATE	CONTENT	NOTE
May 12	Start Chapter 1: Intro to data	
May 13	Application Exercise 1 posted	Due: 11:59pm, May 15
May 17	Start Chapter 2: Summarizing data	
May 18	Application Exercise 2.1 posted	Due: 11:59pm, May 20
May 19	Application Exercise 2.2 posted	Due: 11:59pm, May 21
	Problem Set 1 posted **PS1: 1.5, 1.35, 1.37, 2.25, 2.27, 2.29**	Due: 11:59pm, May 24
May 20	Start Chapter 3: Probability	
May 21	Application Exercise 3.1 posted	Due: 11:59pm, May 23
May 24	Application Exercise 3.2 posted	Due: 11:59pm, May 26
May 26	Start Chapter 4: Distributions of random variables	
May 27	Application Exercise 4 posted	Due: 11:59pm, May 29
May 28	Problem Set 2 posted **PS2: 3.5, 3.27, 3.31, 3.43, 4.13, 4.31**	Due: 11:59pm, June 3
June 1	Start Chapter 5: Foundation for inference	
June 2	Mid-term Exam open	Finish by 11:59pm, June 6
June 3	Application Exercise 5 posted	Due: 11:59pm, June 5
June 3	Start Chapter 6: Inference for categorical data	
June 7	Application Exercise 6 posted	Due: 11:59pm, June 9
	Problem Set 3 posted **PS3: 5.29, 5.36, 6.19, 6.33, 6.41, 7.7, 7.31, 7.33**	Due: 11:59pm, June 14
June 8	Start Chapter 7: Inference for numerical data	
June 10	Application Exercise 7 posted	Due: 11:59pm, June 12
June 11	Start Chapter 8: Intro to linear regression	
	Application Exercise 8 posted	Due: 11:59pm, June 13
June 15	Problem Set 4 posted **PS4: 8.21, 8.29, 8.35, 9.3, 9.9, 9.13**	Due: 11:59pm, June 21
June 16	Start Chapter 9: Multiple & logistic regression	
June 18	Application Exercise 9 posted	Due: 11:59pm, June 20
June 21	Final Exam open	Finish by 12pm(!), June 23

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Students with Disabilities. Students who require special accommodations in class or during exams should follow the procedures outlined by the Disability Management Program https://access.duke.edu/students. Students with disabilities who believe they may need accommodations in this class are encouraged to contact the Student Disability Access Office at (919) 668-1267 as soon as possible to better ensure that such accommodations can be made.

Privacy Policies. Student records are confidential.