STAT22000 Summer 2020 Syllabus

Class Meeting: MWF 1:30-3:30 pm Chicago Time on Zoom. Recordings of lectures will be provided after each lecture.

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Course Webpage – Canvas: https://canvas.uchicago.edu/ (Login with CNet ID)

Course Goals

1. Recognize the importance of data collection, identify limitations in data collection methods, and determine how they affect the scope of inference.
2. Use statistical software to summarize data numerically and visually, and to perform data analysis.
3. Have a conceptual understanding of the unified nature of statistical inference.
4. Apply estimation and testing methods to analyze single variables or the relationship between two variables in order to understand natural phenomena and make data-based decisions.
5. Model numerical response variables using a single (or multiple) explanatory variables.
6. Interpret results correctly, effectively, and in context without relying on statistical jargon.
7. Critique data-based claims and evaluate data-based decisions.

Course Prerequisite MATH 13100 or MATH 15100 or AP Calculus

- If you have AP Statistics credit (with a score of 5 or above) but wish to take STAT 22000, please be aware that you will forego your AP Statistics credit upon completion of either STAT 22000 or STAT 23400.
- An AP Statistics credit can count for general education mathematics credit and can be used to meet the prerequisite for Statistics courses that requires STAT 22000 as the prerequisite.

Textbook *OpenIntro Statistics*, 3th edition, by Diez, Barr, and Cetinkaya-Rundel.
Available for free download at `www.openintro.org/stat/textbook.php?stat_book=os`.

Software – R & RStudio Both are available for FREE.
See Lab 01 `http://www.stat.uchicago.edu/~yibi/s220/labs/lab01.html` for instructions of installation. to install R and RStudio on your computer.

Office Hours — TBA

Grade Components

- Homework (30%): Lowest TWO HW scores will be dropped
- Midterm (35%)
- Final (35%): Friday, July 24

Final Grade Options

- A Quality Grade (A, A-, B+, B, B-, C+, C, C-, D+,D, or F) will be given unless the student has registered for the grade of R (auditing) or arranges a P/F, I or W grade as outlined below.
- A P/F (Pass/Fail) grade or W (Withdrawal) may be given upon written request to the instructor (email is fine) **before the final exam starts**. The grade of P will be awarded only for work of C- quality or better.
- The grade I (Incomplete) will be given only in clear cases of emergency and must be approved by the department chair. See also the University Policy on Incompletes:

`http://collegecatalog.uchicago.edu/thecollege/gradingandacademicstatus/#incompletes`

Tentative Course Schedule

Week	Date	Topic	Textbook
1	M June 22	Exploring Numerical Data	1.2, 1.6
	W June 24	Exploring Numerical & Categorical Data	1.6-1.7
	F June 26	Data Collection – Experiments & Observational Studies	1.3-1.5
2	M June 29	Data Collection – Sampling Probability I	1.4 2.1-2.2
	W July 1	Probability II Random Variables, Means, Variances	2.1-2.2 2.4
	F July 3	Normal distribution	3.1
3	M July 6	Binomial distributions	3.4
	W July 8	Central Limit Theorem & Sampling Distributions Overview of Confidence Intervals	4.1, 4.4 4.2
	Th July 9	**Midterm: 1:30-3:30 pm, Location TBA**	
	F July 10	General Framework of Hypothesis Testing One-Sample Test about a Population Mean	4.3 4.3, 4.5
4	M July 13	Two Sample t-Procedures Analysis of Paired Data	5.3 5.2
	W July 15	Inference for One and Two Proportions Correlation	6.1,6.2 7.1-7.2
	F July 17	Residuals, Least Square Regression Inference for Linear Regression	7.2-7.3 7.4
5	M July 20	Inference for Linear Regression Testing for goodness of fit using chi-square	7.4 6.3
	W July 22	Testing for goodness of fit using chi-square Review	6.3
	F July 24	*Final Exam*	