

API-201 Schedule, Materials & Deliverables (Fall 2023)

Note: All readings are optional unless explicitly marked with an asterisk (*).

[Syllabus](https://docs.google.com/document/d/1PDsUdyPLQ_knJ2zm7YW-Xk8wg130elshJnwQoG5jsiU/edit?usp=sharing) | [Reporting Absences](https://docs.google.com/forms/d/e/1FAIpQLSfhZmmEHODV6Ja1wg6ghuSsTQNaZOWpY4Qe0yc_99oUJVcncg/viewform?usp=sf_link)

[Teaching team office hours](https://docs.google.com/document/d/1wPWoUW-R3bOfTC_fgXsxudjY4uCCW3Bse-niZSH3atk/edit?usp=sharing) | [Class slides](https://5harad.com/empirical-methods)

[R summer training](https://canvas.harvard.edu/courses/125663/pages/intro-r-summer-assignment)

I - DESCRIBING DATA

Date	Class	General Topic	Materials & Readings	Handouts
8/31 (Th)	1	Welcome & Introduction	Case studies on <u>voting</u> (<u>podcast</u>) (<u>https://www.thisamericanlife.org/630/things-i-mean-to-know/act-one-1/</u>) and <u>policing</u> (<u>https://5harad.com/papers/stop-and-frisk.pdf</u>)	<u>Handout</u> (<u>https://drive.google.com/file/d/1-77VkBxXMxsDhSYcU66p77c/view?usp=sharing</u>)
9/5 (Tu)	2	Intro to R	R4DS - <u>Ch. 1</u> (<u>https://r4ds.hadley.nz/intro</u>) and <u>Ch. 3</u> (<u>https://r4ds.hadley.nz/workflow-basics</u>) In-class <u>exercises</u> (<u>https://colab.research.google.com/github/5harad/API-201-2023/blob/main/lecture/intro-to-R-exercises.ipynb</u>) and <u>answers</u> (<u>https://colab.research.google.com/github/5harad/API-201-2023/blob/main/exercises.ipynb</u>)	<u>Handout</u> (<u>https://drive.google.com/file/d/1-8-FcvED5212X2TdpAu8njI/view?usp=sharing</u>)

			<u>/lecture/intro-to-R-answers.ipynb)</u>	
9/7 (Th)	3	Grammar of data analysis - I	<p>R4DS - <u>Ch. 4</u>  (https://r4ds.hadley.nz/data-transform.html)</p> <p>In-class <u>exercises</u>  (https://colab.research.google.com/github/5harad/API-201-2023/blob/main/lecture/grammar-data-analysis-exercises.ipynb) and <u>answers</u>  (https://colab.research.google.com/github/5harad/API-201-2023/blob/main/lecture/grammar-data-analysis-answers.ipynb)</p>	<u>Handout</u>  (https://drive.google.com/file/d/1-85Y5EpVwMfqYi6ljV-pQbCquR/view?usp=sharing)
9/12 (Tu)	4	Grammar of data analysis - II	<p>R4DS - <u>Ch. 4</u>  (https://r4ds.hadley.nz/data-transform.html)</p> <p>In-class <u>exercises</u>  (https://colab.research.google.com/github/5harad/API-201-2023/blob/main/lecture/grammar-data-analysis-exercises.ipynb) and <u>answers</u>  (https://colab.research.google.com/github/5harad/API-201-2023/blob/main/lecture/grammar-data-analysis-answers.ipynb)</p>	<u>Handout</u>  (https://drive.google.com/file/d/1-Ab6_ITDoWvYsvozW0EbFJ/view?usp=sharing)
9/14 (Th)	5	Visualizing data	<u>An Economists Guide to Visualizing Data</u>  (https://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.28.1.209)	<u>Handout</u>  (https://drive.google.com/file/d/1-9qUCXsjmE3cwiiCYKANvOq/view?usp=sharing)

		R4DS - Ch. 2 ↗ (https://r4ds.hadley.nz/chapter-02.html) In-class exercises ↗ (https://colab.research.google.com/github/5harad/API-201-2023/blob/main/lecture/grammar-graphics-exercises.ipynb) , and answers ↗ (https://colab.research.google.com/github/5harad/API-201-2023/blob/main/lecture/grammar-graphics-answers.ipynb)	
9/19 (Tu)	6	The grammar of graphics	Handout ↗ (https://drive.google.com/file/d/1J6R0egGXF96PNxF9R_bMeI/view?usp=sharing)
9/21 (Th)	7	Selecting the right statistic	MMC - 1.3 - 1.4 Handout ↗ (https://drive.google.com/file/d/1NpBENwqJ_qmCAXtyLt_-RzI/view?usp=sharing)
9/26 (Tu)	8	Cause and effect	Handout ↗ (https://drive.google.com/file/d/18YKnd7FhNeWKdk7617jdDoc/view?usp=sharing)
9/28 (Th)	9	Strategies for causal inference	Natural Experiments in the Social Sciences ↗ (https://www.cambridge.org/core/books/natural-experiments-in-the-social-sciences/96A64CBDC2A2952DC1C68AF77DE675AF) Chs. 1 - 3 Handout ↗ (https://drive.google.com/file/d/1-54acu38ljW8inql4hz72nBw/view?usp=sharing)

9/29 (F)	Due Date	Final Exercise Proposals Due	<u>Proposal form</u> <u>https://canvas.harvard.edu/courses/125663/assignments/749718</u>	
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II - PROBABILITY

Date	Class	General Topic	Materials & Readings	Handouts
10/3 (Tu)	10	Intro to probability	MMC: 4.5, 2.6 OIS: 3.1, 3.2	<u>Handout</u> ↗ (https://drive.google.com/file/d/1-O8Pi0fjLFbLpQxy9aDroYysyN5KALdn/view?usp=sharing)
10/5 (Th)	11	Bayes' rule	<u>New York Times (2016)*</u> (https://canvas.harvard.edu/courses/125663/files/18369897?wrap=1) ↴ <u>Oster (2014)*</u> ↗ (https://fivethirtyeight.com/features/are-mammograms-worth-it/) MMC: 4.5 (pp. 292-293); OIS: 3.2.8	<u>Handout</u> ↗ (https://drive.google.com/file/d/1-QSduC7pTF2qDB0Dr4WnNkhoGXJ0DwpE/view?usp=sharing)
10/10 (Tu)	12	Application: public pensions in Mexico	<u>Providing Pensions for the Poor</u> (https://canvas.harvard.edu/courses/125663/files/18369898?wrap=1) ↴ (https://canvas.harvard.edu)	<u>Handout</u> ↗ (https://drive.google.com/file/d/1-aYr1zDJmk9X47B4UctGggJEwjI6Q1hq/view?usp=sharing)

			/courses/125663/files 18369898 /download?download_frd=1) *	
10/12 (Th)	13	Thinking Probabilistically about the world		Handout ↗ (https://drive.google.com/file/d/105LyuIYZzU6P6GudjbM5FwjzjRGJ3srA/view?usp=sharing)
10/13 (F)	Due Date	MIDTERM EXAM (12:00 PM - 1:15 PM; Location TBA)		

III - STATISTICAL INFERENCE

Date	Class	General Topic	Materials & Readings	Handouts	PC
10/17 (Tu)	14	Intro to RStudio	R Markdown Cheatsheet ↗ (https://raw.githubusercontent.com/rstudio/cheatsheets/main/rmarkdown.pdf)	No handout	PC (https://canvas.harvard.edu/courses/125663/335)
10/19 (Th)	15	Expected value	MMC: 3.4	Handout ↗ (https://drive.google.com/file/d/10C91S8SIQxe-el3m-VxVDrmNRnED2StK/view?usp=sharing)	No I
10/24 (Tu)	16	Decision analysis			
10/26 (Th)	17	Confidence intervals - I			
10/31 (Tu)	18	Confidence intervals - II			

11/2 (Th)	19	Statistical significance			
11/7 (Tu)	20	Limits of statistical significance			
11/9 (Th)	21	Sampling and survey design			
11/14 (Tu)	22	Application: Oregon health study			
11/16 (Th)	23	Regression			

WRAP-UP

Date	Class	General Topic	Materials & Readings	Handouts	PCE	PS
11/21 (Tu)	24	Looking back and looking ahead				
11/22 (Wed)	Due Date	Final Exercise Drafts Due				
11/28 (Tu)	25	Final Exercise Presentations				
11/30 (Th)	26	Final Exercise Presentations				
12/1 (Fri)	Due Date	Final Exercise Due				
12/8	Due Date	FINAL EXAM (Time 9:00 AM - 12:00 PM; Location TBA)				