

ASTR 200 Course Outline (subject to change)

Class	Date	Topic	Assignments Due	Reading Due
Lec 1	Mon 1/28	What is data? What is data science? How is it used in Astronomy?	N/A	Syllabus
Lec 2	Wed 1/30	Types of variables Populations and Samples	Perusall annotations	Diez p. 1-26
Lab 1	Thu 1/31	Variables and Arrays	Prelab #1 – Intro to Jupyter Notebooks	
Disc 1	Fri 2/1	Graphical Excellence	Reading Assignment #1	Tufte Ch 1
Lec 3	Mon 2/4	Descriptive Statistics	Lab #1, Perusall annotations	Diez p. 26-43
Lec 4	Wed 2/6	Types of Data Visualizations	Perusall annotations	Diez p. 43-54
Lab 2	Thu 2/7	Functions and Control Flow	Prelab #2 – Intro to Functions	
Disc 2	Fri 2/8	Graphical Integrity	Reading Assignment #2	Tufte Ch 2
Lec 5	Mon 2/11	Linear Regression – correlation and fitting	Lab #2, Perusall annotations	Diez p. 331-344
Lec 6	Wed 2/13	Linear Regression – outliers and error handling	Perusall annotations	Diez p. 345-355
Lab 3	Thu 2/14	Plotting with Matplotlib	Prelab #3 – Intro to Plotting	
	Fri 2/15	DISCUSSION CANCELED (INTERNET OUTAGE)		
Lec 7	Mon 2/18	Statistical Distributions – The Normal Distribution	Lab #3, Perusall annotations	Diez p. 127-140
Lec 8	Wed 2/20	Statistical Distributions – Other	Perusall annotations	Diez p. 141-157
	Thu 2/21	Open Work Time for Project #1		
Disc 3	Fri 2/22	Graphical Deception	Reading Assignment #3	On Moodle: Tufte “Corruption in Evidence Presentations”+ Sagan “The Fine Art of Baloney Detection”
Lec 9	Mon 2/25	Sampling, Estimation and Confidence Intervals	Perusall annotations	Diez p. 168-180

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Lec 10	Wed 2/27	Hypothesis Testing	Perusall annotations	Diez p. 180-194
	Thu 2/28	LAB CANCELLED (POWER OUTAGE)	Prelab #4 – Intro to Advanced Data Structures	
	Fri 3/1	Project #1 Presentations	Project #1 Writeup and Slides	
Lec 11	Mon 3/4	The Central Limit Theorem	Lab #4, Perusall annotations	Diez p. 194-202
	Wed 3/6	Hypothesis Testing Review	Perusall Annotations	TBD
Lab 4/5	Thu 3/7	Advanced Data Structures & Tables	Prelab #5 – Intro to Pandas	
Disc 4	Fri 3/8	Use of Graphics to Make an Argument – The Good and the Bad	Reading Assignment #4	On Moodle: Tufte “Displays of Evidence for Making Decisions”
3/9-3/17 Spring Break				
Lec 12	Mon 3/18	Intro to Probability in Astronomy	Lab #4/5, Perusall annotations	Wall & Jenkins p. 1-19
Lec 13	Wed 3/20	Bayes’ Theorem	Perusall annotations	W&J p. 20-33
Lab 6	Thu 3/21	Functions and techniques for basic hypothesis testing	Prelab #6 – Filtering data and computing confidence intervals	
Disc 5	Fri 3/22	Data-Ink and Chartjunk	Reading Assignment #5	Tufte Ch 4 + 5 (jigsaw)
Lec 14	Mon 3/25	Statistical Distributions in Astronomy	Lab #6, Perusall annotations	W&J p. 33-46
Lec 15	Wed 3/27	Random Numbers and Monte Carlo Simulations	Perusall annotations	W&J p. 46-52
Lab 7	Thu 3/28	Monte Carlo Simulation	Prelab #7 – Random Numbers Project #2 Proposal	
Disc 6	Fri 3/29	Graphical Aesthetics and Design Principles	Reading Assignment #6	On Moodle: Tufte “Principles of Analytical Design” + Tufte Ch 9
Lec 16	Mon 4/1	Types of Error	Lab #7, Perusall annotations	W&J p. 55-62
Lec 17	Wed 4/3	Error Propagation	Perusall annotations	W&J p. 62-69
	Thu 4/4	Open Work Time for Project #2		
Disc 7	Fri 4/5	Graphical Design, Cont’d	Reading Assignment #7	Tufte Ch 6 + 7 (jigsaw)
Lec 18	Mon 4/8	Correlation Metrics in Astronomy	Perusall annotations	W&J p. 71-84

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Lec 19	Wed 4/10	Hypothesis Testing in Astronomy	Perusall annotations	W&J p. 92-96
Lab 8	Thu 4/11	Correlation Testing	None	
	Fri 4/12	Project #2 Presentations	Project #2 Writeup and Slides	
	Mon 4/15	Project #2 Presentations	Lab #8	none
Lec 20	Wed 4/17	Parametric Hypothesis Tests	Perusall annotations	W&J p. 96-106
Lab 9	Thu 4/18	Advanced Hypothesis Testing	Prelab #8	
Disc 8	Fri 4/19	Multidimensional Data	Reading Assignment #8	On Moodle: Tufte "Escaping Flatland"
Lec 21	Mon 4/22	Non-Parametric Hypothesis Tests	Lab #9, Perusall annotations	W&J p. 97-123
Lec 22	Wed 4/24	Maximum Likelihood Modeling	Perusall annotations	W&J 126-133
Lab 10	Thu 4/25	Advanced Model Fitting	Prelab #9 Final Project Proposal	
Disc 9	Fri 4/26	Data Narratives	Reading Assignment #9	On Moodle: Tufte "Narratives of Space and Time"
	Mon 4/29	Least Squares and Minimum Chi-Squared Modeling	Lab #10, Perusall Annotations	W&J 134-142
	Wed 5/1	Slush Class	TBD	TBD
	Thu 5/2	Open Work time for Final Project	"Prelab 10" = Final Project Outline	
Disc 10	Fri 5/3	TBD	TBD	TBD
	Tue 5/7	Makeup Lab for Power Outage		
Tue 5/14 2-5pm		Final Project Presentations	Final Project Writeup and Presentation	