STAT 101-002: Data Analysis and Statistical Inference
Summer 2020
Zoom Sessions MTWRF 12:30 PM-1:45 PM (all times on syllabus in Eastern)
Lab Sessions TR 9:30 AM-10:45 AM OR 5:00 PM-6:15 PM

Instructor: Jacob Smith (jacob.f.smith@duke.edu)
Tentative Office Hours on Zoom: M 4:30-5:30 PM, W 2-4 PM, Thursday 11AM-12 PM
I welcome you to come to office hours to discuss assignments, but also if you would like to discuss your experience as a college student at Duke, something in the news that interests you, or anything else you would like to talk about.

TA: Daniel Deng (di.deng@duke.edu)
Tentative Office Hours on Zoom: M 6-7PM, TH 7-8:30 PM, F 6-7:30 PM

TA: Meredith Brown (meredith.brown@duke.edu)
Tentative Office Hours on Zoom: T 2-4 PM, W 10-AM 12PM

Course Description: Introduction to statistics as a science of understanding and analyzing data. Themes include data collection, exploratory analysis, inference, and modeling. Focus on principles underlying quantitative research in social sciences, humanities, and public policy. Research projects teach the process of scientific discovery and synthesis and critical evaluation of research and statistical arguments. Readings give perspective on why in 1950, S. Wilks said, "Statistical thinking will one day be as necessary a qualification for efficient citizenship as the ability to read and write."

As a quantitative social scientist, I am particularly excited to show you how I use data to answer questions on a variety of topics in political science and public policy. We will also discuss how social scientists and humanists in other fields use data in their research.

Course Goals and Objectives: This course introduces students to the discipline of statistics as a science of understanding and analyzing data. Throughout the semester, students will learn how to make effective use of data in the face of uncertainty: how to collect data, how to analyze data, and how to use data to make inferences and conclusions about real world phenomena.

The course goals are as follows:
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.

8. Complete a research project demonstrating mastery of statistical data analysis from exploratory analysis to inference to modeling.

Structure of course: This course will use an online flipped classroom format. Before each class session, there will be some readings and video lectures (see "Required Texts" below) to read and watch that focus on core statistical concepts or applications to social science/humanities research. Live Zoom sessions each day at 12:30 PM will focus on working through problems together and in groups in breakout rooms, answering questions, and discussing practical applications of the statistical concepts for that day. I will not take attendance at Zoom sessions and I will provide a recording if you cannot attend. You should also enroll in a lab session. These sessions, led by Daniel Di and Meredith Brown, will provide guidance on how to use the statistical software environment *R*. As with the main session, I encourage you to attend if possible, but I will make a recording available if you cannot attend. This will be a fast-paced course condensed into a short time-frame, so it is important to keep up with course material. However, I understand that challenges may arise during the semester, so I urge you to reach out to me if you have any concerns.

Course grades and assignments:
- **Problem Sets:** 15% of final grade. *You will complete graded problem sets on an approximately weekly basis over the course of the semester. I will also suggest ungraded practice problems that will help practice the skills you will use on graded assignments. You are welcome to work with others on the problem sets, but must turn in separate assignments that are in your own words. There will be five problem sets; if you complete all five problem sets, then you will have the opportunity to complete a bonus problem set the last week of the semester where you can earn up to 10 bonus points on your lowest problem set.*
- **Labs:** 15% of final grade. *You will complete a graded assignment in RStudio/RMarkdown after nearly every lab session (8 labs total). You are welcome to work with others on the labs, but must turn in separate assignments that are in your own words. I will drop the lowest lab grade from your final average in this category.*
- **Midterm 1:** 10% of final grade. *Our first midterm exam will be on Tuesday July 14; you should select the two-hour block between 12 am and 11:59 pm Eastern time on this day that is best for you to complete this exam.*
- **Midterm 2:** 10% of final grade. *Our second midterm exam will be on Tuesday July 28; you should select the two-hour block between 12 am and 11:59 pm Eastern time on this day that is best for you to complete this exam.*
- **Final Exam:** 20% of final grade. *Our final exam will tentatively be on Saturday August 8; you should select the three-hour block between 12 am and 11:59 pm Eastern time on this day that is best for you to complete this exam. You will be allowed to use notes on exams, but not get the help of any other person. More specific instructions will be available before the exam.*
- **Project:** 20% of final grade. *You will complete a project where you use real data to examine a topic of interest. As part of this project, you will participate in two workshops with peers in the class where you exchange drafts in advance and give each other feedback. Consistently exchanging papers after the set time for that paper will reflect*

negatively on final participation grades. I will post more specific directions for the project soon.

- o **Proposal:** 5% of final grade. *A proposal for your paper is due by 11:59 PM Eastern on Tuesday July 21; we will have a workshop in lieu of class on Monday July 20 and you should exchange drafts of your proposal with your group by noon Eastern Time on Sunday July 19.*
- o **Final Draft:** 15% of final grade. *The final draft of your project is due by 11:59 PM Eastern on Thursday August 6; we will have a workshop in lieu of class on Wednesday August 5 and you should exchange drafts of your proposal with your group by noon Eastern Time on Tuesday August 4.*
- **Participation:** 10% of final grade.
  - o *Students can earn participation in several ways in this course. If you are able to attend the Zoom sessions, engagement in discussions can count positively towards class participation. Additionally, I will post a "question of the week" on Piazza at the start of each week. If there is something in the reading that especially excites you, or if you see something in the news that relates directly to a topic we discuss it class, you are welcome to email me or post a new topic on Piazza. When calculating participation grades, I will holistically consider each of these things. I will provide a participation update when I return the first exam, but you are welcome to ask me about where you stand on participation at any point during the semester.*

Required Texts:
- OpenIntro Statistics (4th Edition, 2019), by Diez, David, Mine Çetinkaya-Rundel, and Christopher Barr. (ISBN: 1943450072).
  - o The textbook is available for free online here. A paper copy is also available from Amazon here.
- Other readings are available on Sakai or online. Please let me know if a link to an online resource does not work.

Statistical Software:

This course will make use of the programming language *R* through the integrated development environment (IDE) *RStudio*. I have reserved Docker containers here through OIT where you can access the software. You are also welcome to download *R* and *RStudio* for your own computer for free.

Statistics 101 Course Policies

Attendance: I will not take attendance at live sessions, but you should watch recordings of any sessions that you miss. I encourage you attend, but you will not be penalized if you cannot.

Submission of Assignments: You will submit all written assignments through either Sakai or *Gradescope*. You will submit labs and the assignments for the project on Sakai, while you should complete the exams and problem sets through *Gradescope*.

Contact Policy and Office Hours: Students are encouraged to attend office hours or contact me via email with any questions about the course. I am also available by appointment if one is unable to meet during the times listed on the syllabus.

Please feel free to contact me over email as well. I will respond promptly and will do my best to respond the same day to emails; however, I may not always be able to provide an immediate response to a late evening email sent the day before an assignment is due.

TAs will also hold office hours and are available over email.

Diversity and Mutual Respect: It is my intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that the students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity and in alignment with Duke's Commitment to Diversity and Inclusion. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally, or for other students or student groups.

Furthermore, I would like to create a learning environment for my students that supports a diversity of thoughts, perspectives and experiences, and honors your identities. To help accomplish this:

- If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with me. If you prefer to speak with someone outside of the course, your academic dean is an excellent resource.
- I (like many people) am still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable, please talk to me about it.

Late Work: Unless I have approved a deadline extension in advance, all assignments are due according to the deadlines specified, including date and time. Late penalties begin 1 minute after an assignment is due. If an assignment is due at 5 pm Wednesday, the late penalty from 5:01 pm Wednesday through 5 pm Thursday is 5 percentage points (e.g. , a 100 would become a 95, an 90 would become a 85). An assignment submitted between 5:01 pm Thursday to 5 pm Friday would lose 10 percentage points.

A late lab or problem set will not be accepted more than 48 hours without a valid excuse such as a serious illness. All work is due by the final exam unless an extension is previously approved by the instructor. Students should contact the instructor as soon as possible if they will not be able to complete work on time. While I cannot approve extensions in many cases, I understand that these are turbulent times and I do not want that to affect negatively your performance in the class.

It is very important that students exchange drafts on time for group workshops. Consistently exchanging drafts after the set time for that assignment will reflect negatively on final participation grades.

Integrity: Duke University is a community dedicated to scholarship, leadership, and service and to the principles of honesty, fairness, respect, and accountability. Citizens of this community commit to reflect upon and uphold these principles in all academic and non-academic endeavors, and to protect and promote a culture of integrity. Cheating on exams and quizzes, plagiarism on homework assignments and projects, lying about an illness or absence and other forms of academic dishonesty are a breach of trust with classmates and faculty, violate the Duke Community Standard, and will not be tolerated. Such incidences will result in a 0 grade for all parties involved as well as being reported to the Office of Student Conduct. Additionally, there may be penalties to your final class grade. Please review Duke's Academic Dishonesty policies.

Grades: Grading standards are high, but fair. I take grading seriously and am happy to discuss why you received a grade on any assignment during office hours or an appointment at a mutually workable time. Regrade requests must be made within two class days of when the assignment is returned, and must be submitted in writing or using the regrade request in *Gradescope*. These will be honored if points were tallied incorrectly, or if you believe your answer is correct but it was marked wrong. No regrade will be made to alter the number of points deducted for a mistake. There will be no grade changes after the final exam. If I curve grades upwards, this will be done at the end of the semester. However, there is **no guarantee** of a curve.

Letter grades map onto the following scale, which I will use in calculating your final grade for the course (Generally, I will round grades in between these ranges up to the nearest whole number):

A+ (97–100), A (93–96), A- (90–92)
B+ (87–89), B (83–86), B- (80–82)
C+ (77–79), C (73–76), C- (70–72)
D+ (67–69), D (63–66), D- (60–62)
F (0-59)

Statistics 101 Support & Resources

Emergency Notification: In an emergency, there are several ways that the University will contact you. Two are detailed below. Campus emergency procedures are described here: http://emergency.duke.edu.

Text Messaging: An alert message may be sent to the mobile devices of Duke community members who register for a new text messaging system. Sign up for Duke Alert text messages or learn more about text messaging at Duke.

LiveSafe Mobile App: Notifications may be sent through the LiveSafe Mobile app to notify members of the Duke community of emergency situations. The free mobile app, available through the Apple App Store and Android App Store, offers real-time, two-way communication between Duke community members and the Duke University Police Department.

Voting Resources: If you are eligible to vote, I encourage you to participate in this year's election. Based on a 1979 Supreme Court decision, college students may vote at *either* their college or their previous home address (but not both). In some cases, you may live in a state with an election taking place during this course; if you would like to talk about anything related to that (or November's) election, feel free to talk to me about it in office hours.

Course Accessibility: Students who may need special accommodations in this class are encouraged to contact the Student Disability Access Office (http://www.access.duke.edu/students/index.php) as soon as possible to ensure that I can implement such accommodations in a timely fashion. I also encourage you to speak to me individually if you have trouble with this process, as I am glad to help with the process if I can.

Counseling and Psychological Services (CAPS): Each of you will face some level of challenge during your time at Duke – whether it be a challenge like procrastination, or a more profound challenge that impairs your ability to function. The CAPS staff includes psychologists, clinical social workers, and psychiatrists experienced in working with college-age adults. Information about their services and workshops is available here: http://studentaffairs.duke.edu/caps/about-us.

The Academic Resource Center: The ARC provides academic support and programming for all Duke undergraduates. Their services include one-on-one consultations and peer tutoring, and they work alongside the Student Disability Access Office to serve students with diagnosed learning disabilities. Their programs include opportunities for students to study together in structured groups ("learning communities"), as well as workshops offered throughout the semester. Further information and resources are available on their website. http://duke.edu/arc/index.php.

The Center for Sexual and Gender Diversity: This center provides education, advocacy, support, mentoring, academic engagement, and space for lesbian, gay, bisexual, pansexual, transgender, transsexual, intersex, questioning, queer and allied students, staff, and faculty at Duke. The Center for Sexual and Gender Diversity also serves and supports Duke alumni/ae and the greater LGBTQ community. Further information and resources are available on their website. https://studentaffairs.duke.edu/csgd.

This syllabus has been adapted from previous Statistics 101, Statistics 210 and Writing 101 syllabi. Particularly, I would like to recognize Kelly Moran, Victoria Ellison, Maria Tackett, Márcia Rego, and Denise Comer. The syllabus may be added or modified during the semester and students will be notified in advance of any such change taking effect.

Schedule of Readings and Assignments

Monday June 29: Data Collection & Observational Studies

Watch:
- The Introduction video. (~3 mins.)
- The Data Basics video. (~5 mins.)

- The [Observational Studies & Experiments video](#).(~5 mins.)

Read:
- OIS Chapter 1, Sections 1.1, 1.2, and start of 1.3 (pp. 9-23; stop after reading section 1.3.2).
- Smith, Jacob. 2016. "Cherie Berry put her picture in every North Carolina elevator. Here's how that affected her reelection." *Washington Post Monkey Cage Blog*. https://www.washingtonpost.com/news/monkey-cage/wp/2016/04/14/cherie-berry-put-her-picture-in-every-north-carolina-elevator-heres-how-that-affected-her-reelection/ (Available on Sakai).

Please read syllabus and fill out Qualtrics Survey before the first day of class.

Tuesday June 30: Sampling

Watch:
- The [Sampling and sources of bias video](#) (~8 mins.)
- The [Experimental design video](#) (~3 mins.)
- The [Random Sample Assignment video](#) (~4 mins.)

Read:
- OIS Chapter 1, Sections 1.3 & 1.4 (pp. 22-38).
- Cassino, Dan. 2016. "How Today's Political Polling Works." *Harvard Business Review.* https://hbr.org/2016/08/how-todays-political-polling-works (Available on Sakai).

Wednesday July 1: Exploratory Data Analysis

Watch:
- The [Visualizing Numerical Data video](#) (10 mins.)
- The [Measures of Center video](#) (4 mins.)
- The [Measures of Spread video](#) (6 mins.)
- The [Robust Statistics video](#) (1 min.)
- The [Transforming Data video](#) (3 mins.)

Read:
- OIS Chapter 2, Section 2.1 (pp. 41-61).
- Ha, Robbie, Peilin La, and Alejandro Ortega. (Faculty Lead Astrid Giugni, Project Manager Jessica Hines, Ph.D.) 2017. *Visualizing Suffering: Tracking Photojournalism and the Syrian Refugee Crisis.* [Watch the Room 351 Video](#) and [Read the Executive Summary](#).

Lab 1 Due- Submit .R File on Sakai by 11:59 pm.

Thursday July 2: More EDA- Intro to Statistical Inference & Lab 2

Watch:

- View the [Exploring Categorical Variables video](#) (8 mins.)
- View the [Introduction to Inference video](#) (12 mins.)

Read:
- OIS Chapter 2, Sections 2.2 & 2.3 (pp. 61-76).
- Bunyasi, Tehama Lopez and Candis Watts Smith. 2019. *Stay Woke: A People's Guide to Making All Black Lives Matter.* Chapter 1, pages 29-40. (Available on Sakai, please read sections labeled, "Education," "Employment," and "Income and Wealth.")

Problem Set 1 Due- Submit on Gradescope by 11:59 PM.

Monday July 6: Probability and Conditional Probability

Watch:
- The [Introduction video](#) (5 mins.)
- The [Disjoint Events + General Addition Rule video](#) (9 mins.)
- The [Independence video](#) (9 mins.)
- The [Probability Examples video](#) (9 mins.)
- The [Disjoint vs. Independent video](#) (2 mins.)

Read:
- OIS Chapter 3, Section 3.1 (pp. 81-94).

Lab 2 due- Submit Word file with .Rmd output on Sakai by 11:59 pm

Tuesday July 7: Bayes Theorem/Bayesian Inference & Lab 3

Watch:
- The [Conditional Probability video](#) (12 min.)
- The [Probability Trees video](#) (10 min.)
- The [Bayesian Inference video](#) (14 min.)
- The [Examples of Bayesian Inference video](#) (7 min.)

Read:
- OIS Chapter 3, Section 3.2 (pp. 95-112)
- Lee, Mike and Benedict King. *The Conversation.* "Bayes' Theorem: the maths tool we probably use every day, but what is it?" (Available online at https://theconversation.com/bayes-theorem-the-maths-tool-we-probably-use-every-day-but-what-is-it-76140.)

Wednesday July 8: Normal and Binomial Distributions

Watch:
- The [Normal Distribution video](#) (17 mins.)
- The [Evaluating the Normal Distribution video](#) (2 mins.)

- The [Working with the Normal Distribution video](#) (5 mins.)
- The [Binomial Distribution video](#) (17 mins.)
- The [Normal Approximation to Binomial video](#) (14 mins.)
- The [Working with the Binomial Distribution video](#) (9 mins.)

Read:
- OIS Chapter, Section 4.1 and start section 4.3 (pp. 133-143 & 149-157).

Lab 3 due- Submit Word file with .Rmd output on Sakai by 11:59 pm

Thursday July 9: Variability in estimates and CLT & Lab 4

Watch:
- The [Introduction video](#) (4 mins.)
- The [Sampling Variability and CLT video](#) (20 mins.)
- The [CLT (for the mean) examples video](#) (10 mins.)

Read:
- OIS Chapter 5, Section 5.1 (pp. 170-180).

Problem Set 2 Due- Submit Word File or PDF on Sakai by 11:59 PM.

Friday July 10-Confidence Intervals

Watch:

- The [Confidence Interval (for a mean) video](#) (11 mins.)
- View the [Accuracy vs. Precision video](#) (7 mins.)
- View the [Required Sample Size for a ME video](#) (4 mins.)
- View the [CI (for a mean) examples video](#) (5 mins.)

Read:

- OIS Chapter 5, Section 5.2 (pp. 181-188)
- Mercer, Andrew. 2016. "5 key things to know about the margin of error in election polls." Pew Research Center. Available at https://www.pewresearch.org/fact-tank/2016/09/08/understanding-the-margin-of-error-in-election-polls/.

Lab 4 due- Submit Word file with .Rmd output on Sakai by 11:59 pm

Monday July 13-Midterm 1 Review

I will be available in the Zoom Room during the normal class time to answer questions.

No additional reading- study for exam.

Tuesday July 14-Midterm 1

Midterm available on Gradescope from 12 am to 11:59 pm. Complete in a two hour window.

No lab today.

Wednesday July 15- Hypothesis Tests

Watch:
- The [Another Introduction to Inference video](#) (4 mins.)
- The [Hypothesis Testing (for a mean) video](#) (14 mins.)
- The [HT (for the mean) examples video](#) (9 mins.)

Read:
- OIS Chapter 5, Section 5.3 (pp. 189-201).
- Denworth, Lydia. 2019. "The Significant Problem of P-Values." *Scientific American.* (Available on Sakai.)

Thursday July 16-Inference for a Single Proportions & Lab 5

Watch:
- The [Introduction to Inference for Categorical Variables video](#) (3 mins.)
- The [Sampling Variability and CLT for Proportions video](#) (15 mins.)
- The [Confidence Interval for a Proportion video](#) (9 mins.)
- The [Hypothesis Test for a Proportion video](#) (9 mins.)

Read:
- OIS Chapter 6, Section 6.1 (pp. 208-216).

Problem Set 3 Due- Submit Word File or PDF on Sakai by 11:59 PM.

Friday July 17-Inference for Comparing Two Proportions

Watch:
- The [Estimating the Difference Between Two Proportions video](#) (17 mins.)
- The [Hypothesis Test for Comparing Two Proportions video](#) (13 mins.)
- The [Small Sample Proportions video](#) (10 mins.)
- The [Examples video](#) (4 mins.)
- The [Comparing Two Small Sample Proportions video](#) (5 mins.)

Read:
- OIS, Chapter 6, Section 6.2 (pp. 217-228).

Lab 5 due at 11:59 pm- Submit Word file with .Rmd output on Sakai.

Monday July 20- Project Proposal Workshop in Groups
Exchange proposal with group by noon on Sunday July 19. Turn in revised draft by 11:59 pm on Tuesday.

Tuesday July 21: Inference with t-distribution & Lab 6

Watch:
- The Introduction to Inference for Numerical Variables video (4 mins.)
- The t-distribution video (7 mins.)
- The Inference for a mean video (9 mins.)

Read:
- OIS Chapter 7, Sections 7.1 and 7.2 (pp. 251-266).
- Clarke, Andrew. 2010. *The Blue Dog Coalition: Impact of a Single Issue Caucus from the 104th to 110th Congress.* Read Chapter 1, pp. 1-12. (Available on Sakai, pages labeled at bottom right of page.)

Project Proposal Due at 11:59 PM- Submit Word file or PDF on Sakai.

Wednesday July 22-Inference for comparing two means + Power

Watch:
- The Inference for comparing two independent means video (8 mins.)
- The Inference for comparing two paired means video (9 mins.)
- The Power video (11 mins.)

Read:
- OIS, Chapter 7, Sections 7.4 & 7.5 (pp. 267-284).
- Clarke, Andrew. 2010. *The Blue Dog Coalition: Impact of a Single Issue Caucus from the 104th to 110th Congress.* Read Chapter 3, pp. 39-60, section labeled "The Source of Preference." (Available on Sakai, pages labeled at bottom right of page.)

Lab 6 due- Submit Word file with .Rmd output on Sakai by 11:59 pm

Thursday July 23: Chi-Square Test

Watch:
- The Chi-Square GOF Test video (14 mins.)
- The Chi-Square Independence Test video (11 mins.)

Read:
- OIS Chapter 6, Section 6.3 (pp. 229-239).
- Clarke, Andrew. 2010. *The Blue Dog Coalition: Impact of a Single Issue Caucus from the 104th to 110th Congress.* Read Chapter 3, pages 61-75, section labeled

"Representation on Prestige Committees." (Available on Sakai, pages labeled at bottom right of page.)

Problem Set 4 Due- Submit Word File or PDF on Sakai by 11:59 PM.

Friday July 24: ANOVA & Bootstrapping

Watch:
- The [Comparing more than two means video](#) (6 mins.)
- The [ANOVA video](#) (9 mins.)
- The [Conditions for ANOVA video](#) (2 mins.)
- The [Multiple comparisons video](#) (6 mins.)
- The [Bootstrapping video](#) (8 mins.)

Read:
- OIS, Chapter 7, Section 7.5 (pp. 285-298).
- DelPonte, Alessandro, Andrew W. Delton, Rueben Kline, and Nicholas A. Seltzer. 2017. "Passing it Along: Experiments on Creating the Negative Externalities of Climate Change." *Journal of Politics* 79(4): 1444-1448.

Lab 7 due- Submit Word file with .Rmd output on Sakai by 11:59 pm

Monday July 27-Midterm 2 Review

No additional reading- study for exam.

Tuesday July 28- Midterm 2- No Lab

Wednesday July 29-Intro to Bivariate Regression

Watch:
- The [Introduction video](#) (~1 min.)
- The [Correlation video](#) (~9 mins.)
- The [Residuals video](#) (~2 mins.)
- The [Least Squares Line video](#) (~12 mins.)
- The [Conditions for Linear Regression video](#) (~10 mins.)

Read:
- OIS Chapter 8, Sections 8.1 and start of 8.2 (pp. 305-321).

Thursday July 30-Outliers and Inference for Bivariate Regression & Lab Session 7

Watch:
- The [Prediction and Extrapolation video](#) (~4 mins.)
- The [R^2 Video](#) (~4 mins.)

- The [Regression for Categorical Explanatory Variables Video](#) (6 mins.)
- The [Outliers in Regression](#) Video (~7 mins.)
- The [Inference in Linear Regression](#) Video (~12 mins.)

Read:
- OIS, Chapter 8, Finish Section 8.2 and Sections 8.3 and 8.4 (pp. 322-337).

Problem Set 5 Due- Submit Word File or PDF on Sakai by 11:59 PM.

Friday July 31-Multiple Regression I- Inference

Watch:
- The [Inference for Multiple Linear Regression](#) Video (~12 mins.)

Read:
- OIS, Chapter 9, Section 9.1 (pp. 343-352).
- Abramowitz, Alan. 2016. "Will Time for Change Mean Time For Trump?" *PS: Political Science and Politics* 49(4): 659-660. (Available on Sakai.)
- Clarke, Andrew. 2010. *The Blue Dog Coalition: Impact of a Single Issue Caucus from the 104th to 110th Congress.* Read Chapter 3, pages 76-80, section labeled "Blue Dog Association with Fiscal Conservatism" (Available on Sakai, pages labeled at bottom right of page.)

Lab 8 due- Submit Word file with .Rmd output on Sakai by 11:59 pm

Monday August 3: Multiple Regression II- Model Selection and Diagnostics & Case Study

Watch:
- The [Model Selection](#) Video (~11 mins.)
- The [Diagnostics for Multiple Linear Regression](#) Video (~8 mins.)

Read:
- OIS Chapter 9, Sections 9.2 & 9.3 (pp. 353-362).
- Smith, Jacob and Jonathan Spiegler. "Explaining Gun Deaths: Gun Control, Mental Illness, and Policymaking in the American States." *Policy Studies Journal* 48(1): 235-256.

Tuesday August 4: Multiple Regression Case Study and Other Types of Regression & Lab Session 8

Read:
- Benjamin, Andrea, Ray Block Jr., Jared Clemons, Chryl Laird, and Julian Wamble. 2020. "Set in Stone? Predicting Confederate Monument Removal." *PS: Political Science and Politics* 53(2): 659-660. 237-242.
- Clarke, Andrew J. 2020. "Party Sub-Brands and American Party Factions." *American Journal of Political Science.* Available as an Early View article. (Available on Sakai.)

Bonus Mini-Problem Set Due- Submit Word File or PDF on Sakai by 11:59 PM.

Wednesday August 5-Project Workshop

Exchange Projects with Group Members by noon on August 4.

Revised version due to me by 11:59 pm on Thursday August 6.

Thursday August 6- Review Session for Final- No Lab

Final Exam will tentatively be Saturday August 8th in a three hour window of your choice. We will discuss this when we get closer to the time.