

# INST 314: Statistics for Information Science

Adrienne Bradford (she/her)

Spring 2020 - Sections 0201, 0202, 0203

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Office Hours: TU/TH 2-5pm or by appointment

Office: 1218G LeFrak Hall

Web: [elms.umd.edu](http://elms.umd.edu)

Lecture: M/W 1-1:50pm

Lecture Room: SYM 0200

## DISCUSSIONS:

0201 : F 1-1:50PM in ATL 2330

0202 : F 2-2:50PM in HBK 0123

TA: Mona Swami (she/her)

TA Office Hours: M: 3-5pm; W: 3-4pm

TA email: [mswami@umd.edu](mailto:mswami@umd.edu)

TA Office: TBA

0203 : F 3-3:50 in ATL 2330

TA: Shreeya Kotasthane (she/her)

TA Office Hours: F: 4-6pm

TA email: [skotasth@umd.edu](mailto:skotasth@umd.edu)

TA Office: TBA

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## Course Description

Advances in hardware and software technologies have led to a rapid increase in the amount of data collected, with no end in sight. Decision making in the coming decades will depend, to an ever greater extent, on extracting meaning and knowledge from all that data. In this class we focus on one branch of statistics, inferential statistics, to help us reason about data. By gathering datasets, formulating proper statistical analyses and executing these analyses, information professionals play a significant role in bridging the gap between raw data and decision making. This course will introduce basic concepts in data analytics including study design, measure construction, data exploration, hypothesis testing, and statistical analysis. The course also provides an overview of commonly used data manipulation and analytic tools. Through homework assignments, projects, and in-class activities, you will practice working with these techniques and develop statistical reasoning skills.

## Learning Objectives

After completing this course, you will be able to:

- Select and evaluate various types of data to use in decision making;
- Use prescriptive and descriptive analyses to reach defensible, data-driven conclusions;
- Select and apply appropriate statistical methods;
- Use R for basic data manipulation and analysis;
- Critically evaluate data analyses and develop strategies for making better decisions.

## Course Materials & Resources

### Computer

You must bring a charged laptop to discussion as they will be run as in-class coding labs. Tablet and similar devices are not acceptable as they cannot fully run R. Alternatively, you may partner with a willing classmate to share computer use in class.

**Computer problems and software problems are never an excuse for turning in assignments late.** There are many (free) resources available on campus. The instructor is aware of the following, although there may be more available:

- Engineering IT Services [<https://eit.umd.edu/labs>]: including 24/7 computer labs in Glenn L. Martin Hall that are available to ALL students, not just ENGR students.
- UMD Libraries [<https://www.lib.umd.edu/services/library-computer>]: both workstations and laptop rental available. 24/7 access at McKeldin starts 2/9/2020. PC workstations in McKeldin may have R installed.
- OACS Computer Labs [<https://oacs.umd.edu/facilities/oacs-computer-labs>]: these labs have R/RStudio installed, located in the basement of LeFrak. Not 24/7.

If computer labs do not have R/RStudio installed, you can use RStudio Cloud (see below).

### Website

ELMS-Canvas: <http://elms.umd.edu>

All relevant, required course content will be stored in or linked from ELMS.

### Software

The following software is necessary for you to successfully complete the course activities.

- You must install and use R. R programming language and software is free and available online (<https://www.r-project.org/>).
  - Once you install R, you may wish to install packages that will be used in the in-class labs prior to the labs in which they will be used. You can begin with the tidyverse, using the command `install.packages("tidyverse")`. The tidyverse is a collection of packages that may take 10-15 minutes to install, wait until the command prompt returns before performing other actions in R.
- I strongly encourage you to use RStudio, which I will predominately use during the class. RStudio is an integrated development environment for R and the open source desktop version is free to download and use. (<https://www.rstudio.com/products/rstudio/download/#download>). You must download and install R prior to installing and using RStudio.

An alternative to installing the software on your own computer is to use the free version of RStudio Cloud (<https://rstudio.cloud/>). This is also a good option for if you ever run into computer problems and still need to be able to complete an assignment on a computer that does not have R installed. It is also a good option if you run into software issues on your computer with R/RStudio and/or R packages needed to complete your assignment.

## Readings

Completing the required reading for the class is essential to understanding the core statistical concepts. In order to learn, you must review the material multiple times. Any required readings outside of these textbooks will be posted on ELMS/Canvas.

### Required:

- Diez, D., Barr, C., and Cetinkaya-Rundel, M. (2015), OpenIntro Statistics, 3rd ed., OpenIntro. <https://www.openintro.org/stat/textbook.php>
  - Also in a color hardcover or black & white paperback for purchase.
- Verzani, J. (2004), Using R for Introductory Statistics, Chapman & Hall/CRC. ISBN/ASIN: 1584884509 ISBN-13: 9781584884507 <https://cran.r-project.org/doc/contrib/Verzani-SimpleR.pdf>

### Recommended:

- Radziwill, N.M. (2019), Statistics (The Easier Way) With R, 3rd ed., Lapis Lucera. ISBN-13: 978-0-9969160-3-5.
  - NOTE: The 3rd edition is the TIDYVERSION. You can buy used versions of the previous editions, however they will not fully integrate the use of the tidyverse.
  - The author offers a free e-book version with proof of purchase of the physical book copy.

### Other Resources:

If you want to learn more about using R for data science within the tidyverse framework, I highly recommend this book:

- Wickham, H. and Grolemund, G. (2017) R for Data Science, O'Reilly Media. ISBN-13: 978-1491910399. <http://r4ds.had.co.nz/index.html>
  - This is a free book available in HTML and a physical copy is available for purchase

For many different reasons, not everyone likes the required textbook in a quantitative methods course. Alternatively, some of you may wish to further explore some of the course topics and how to use statistical software. The following books have been recommended or are used by my colleagues, and they address many of the same course topics from varied writing approaches.

- Online Statistics Education: A Multimedia Course of Study (<http://onlinestatbook.com/>). Project Leader: David M. Lane, Rice University.
  - This is a free, online stats book available via HTML, pdf, and e-pub.
- Imai, K. (2017), Quantitative Social Science: An Introduction, Princeton Press. ISBN-13: 9780691175461
- Salkind, N.J. (2013), Statistics for People Who (Think They) Hate Statistics, 5th ed., Sage Publications, Inc. ISBN-13: 978-1452277714
- Hinton, P. (2004) Statistics Explained: A Guide for Social Science Students, 2nd ed., Routledge. ISBN-13: 978-0415332859

## Course Activities/Assessments

### Participation

Participation will be based on two elements - clicker participation during lecture and attendance at the weekly Friday discussions (coding labs). The grade will be based on percentage of days participated, and will account for 5% of your total course grade. Clicker participation can be done with the physical clicker hardware or the clicker phone app - review clickers.umd.edu for information on clickers. Participation cannot be "made up" except for if you are granted an excused absence.

Activity	Number	Each	Percent
Participation			5%
DataCamp	2	2.5%	5%
Quizzes	10 of 12	1%	10%
Labs/Homework	10	1.5%	15%
Projects	4		35%
	Project 1	5%	
	Projects 2-4	10%	
Midterm	1	15%	15%
Final	1	15%	15%
<b>TOTAL</b>			<b>100%</b>
<i>Extra Credit</i>			5%

### DataCamp

DataCamp is an online resource which guides new coders step by step through learning languages like R or Python. There will be a link for a free signup with your @umd.edu email account for this course on ELMS. The two courses you will need to complete are the Intro to R and the Intro to the Tidyverse - detailed instructions for accessing these courses will be provided. Intro to R will be due on February 9th. Make sure to start early, as the course could take up to 4 hours to complete. Intro to Tidyverse will be due on March 6th. Each will be worth 2.5% of your overall course grade.

### Quizzes

There will be 12 quizzes. The quizzes will be short (5-10 questions) and will serve as knowledge checks. You can refer to your notes and course materials while completing these. You will complete the quizzes in ELMS - they will be released after Wednesday's lecture and be due by 11:59pm Sunday night. The quizzes will cover that week's material. There will not be a quiz every week (such as the week of the midterm) - refer to the syllabus for the dates of the quizzes. Your lowest two quiz grades will be dropped. There will be no makeup quizzes - missed quizzes will count toward your lowest two.

### Labs/Homework

There will be 10 lab assignments throughout the course. Each lab assignment will cover one topic. The labs will serve as both in-class labs and homework assignments. The labs will be comprised of coding notebooks (R notebooks). These notebooks will include commentary and code blocks that take you through examples of the topics covered in the lecture - the lab portion. The homework will be based on the in-class labs/examples and will ask you to conduct analysis with different data (provided) and interpret the resulting output. Homework will be due a week after the material is covered in the Friday Lab/Discussion. Dates listed on the syllabus and are subject to change.

### Projects

You will complete 4 projects throughout the course. For each project you will use a chosen data source to address a research question of interest to you, perform appropriate analyses utilizing

statistical techniques taught in the course, and compose a 2-4 page summary paper describing your data, research question, hypothesis, and findings. You will turn in both the summary paper and the code you wrote to conduct your analysis (either in a .R script or .rmd notebook).

More details on these assignments will be provided on ELMS.

I will provide a list of datasets that are appropriate for the projects. You may choose to use another data source, however those sources will need to be approved by the instructor prior to the first project.

## Exams

The course will include two exams. The midterm will be administered via ELMS on March 25th and will cover the material from the beginning of the course through and including Two Sample z- and t-tests. The final will be administered during the official final exam period - tentatively scheduled for May 15th. I will update you on the date when the university releases the confirmed dates. The final exam will cover the material from one-way ANOVA through the end of the course. The final will also be administered via ELMS, but I will be available in the classroom if you want to take the exam with access to in-person support.

The exam will utilize the Respondus Lockdown Browser. I will provide any resources necessary (such as t tables) in the exam itself.

Students whose class schedule requires them to take more than three final examinations on the same day have the right to reschedule examinations so they have no more than three on a given day. Please contact me as soon as possible following the release of the final examination schedule if you will require alternate scheduling.

## Extra Credit

Only a limited amount of time is spent teaching you how to use R. We use DataCamp to help get you started, but I have assigned additional content to allow you to become more proficient in using R beyond the statistical analyses we will focus on in the course. All work in DataCamp is broken down into courses, chapters, and exercises - each has an associated point value called XP. You will earn 0.1% extra credit for every 1,000 XP you earn by completing these materials until you reach the maximum 5.0%. You may choose which materials to complete or skip, depending on any pre-requisites. DataCamp will show you how much total XP you earned, but that total will include the required class assignments and any work you completed beyond this class (such as in Python). I have internal reports that allow me to parse out how much you completed in R courses.

## Grading

Your grade is determined by your combined performance on course activities and is assigned individually (not curved). The instructional team will post all graded activity to the course ELMS page. Note that Canvas does not always calculate grades properly due to differing weights on items. ‘Final’ grades posted in ELMS may vary substantially before the end of the term. If you are concerned about any part of your grade, please come see me.

If you have questions about anything graded, please check with the member of the instructional team that graded the work for clarification. If you believe the work was not graded correctly, please see the re-grading policy below. See below for the grade policy on late work submissions.

	range
A	93.0-100%
A-	90.0-92.9%
B+	87.0-89.9%
B	83.0-86.9%
B-	80.0-82.9%
C+	77.0-79.9%
C	73.0-76.9%
C-	70.0-72.9%
D+	67.0-69.9%
D	63.0-66.9%
D-	60.0-62.9%
F	0-59.9%

Final letter grades are assigned based on the percentage of total assessment points earned. Grades will be rounded to the nearest 10th of a percent. Final letter grades will be assigned based on the total percent of points earned, using the following rubric.

To be fair to everyone I established clear standards and apply them consistently. Do not ask me at the end of the term to consider you for a higher grade based on your hard work and effort. It would be unethical to make exceptions for some and not others. If you want an extra edge on your grade, complete the extra credit option. Please come and talk to me early if you think that there might be a problem.

## Communication

### Email

My email address is [abradfor@umd.edu](mailto:abradfor@umd.edu) - please note there is **NO d** on the end of my username. Do not hesitate to email me if you have any questions that cannot be answered by reading the syllabus or posting on the discussion board or discord. It is especially important that you are proactive to email me or meet with me early if you are concerned about your progress in the course. Do not send me messages via ELMS or rely on assignment comments for anything other than notes related to your assignment submission.

It is essential that we all conduct ourselves as professionals, so please visit [ter.ps/email](https://ter.ps/email) for some friendly guidance on writing emails. As the title says, **what you write matters**.

### Office Hours

Please visit me during office hours! I enjoy talking to my students. Open hours will be regularly scheduled for anyone to drop in. Regular office hours may have multiple students present. Individual and group office hours are available by request. Email me to schedule an individual appointment for one-on-one discussions. All office hours are safe spaces to discuss anything related to our class, other iSchool & UMD studies, professional development, or anything else that you'd like to discuss. If you are having trouble in the course, please talk to me as soon as possible. If you do poorly or lower than you expected on an exam, assignment, or anything else, it is imperative that you come to office hours so that we can figure out the problem early.

### Coding Hangouts

Prior to each project due date I will hold a coding hangout in the late afternoon/early evening. This will be an additional opportunity to get coding help from myself, the TAs and AMPs. Dates listed in the calendar below.

### Discord

We will use Discord [<https://discord.gg/yESxK2>] to discuss coding questions, errors, assignments, etc... **DO NOT email questions to me or others on the instructional team that can be answered on discord**. If you do, we will reply to post your question to discord, and you will lose valuable time. Discord appropriate questions include all questions about the course that do not pertain to your individual concerns, progress, or grades.

Posting to discord allows 1) a common location to answer questions that many of you might have, and 2) provides an opportunity for your classmates to respond and assist in both of your

learning. Before you post, check discord to see if someone else has already asked your question. The instructional team regularly monitors discord to respond in a timely manner — ideally within a couple of hours during the day and early evening. If you do not receive a response within 12 hours, feel free to ping the instructor (@adrienne).

**To encourage you to start working on your assignments early, do not expect the instructional team to reply to posts about the assignments on the nights they are due.**

When asking about calculations that use R, you must post the lines of code or a screenshot at a minimum. Either copy/paste your code into discord, or attach an R script file containing your code. Include any other relevant lines of code — **including recoding, subsetting**, etc. If this exceeds 10 lines of code, please attach your R script file on the post.

Do not hesitate to post on discord because of shyness or concerns that you might feel like you are asking a ‘stupid question.’ My experience is that many of your fellow students are similarly shy and have the same questions you do. No questions asked are stupid since learning is both of our goals, and the instructional team can only help you if we know your questions. Some of you may be hesitant to post R code on discord for fear that others will copy it. This is normal, but I encourage posting code. It will help others learn to troubleshoot your challenges, and perhaps share different ways that R can be used to obtain the same answer.

## Announcements

I make frequent use of ELMS announcements - including announcements about cancelling and/or rescheduling class or office hours. I advise you to set your ELMS account notifications to receive course announcements by email. “I did not see the announcement.” is not a valid excuse.

## When & How to Contact the Instructional Team

I will post a "flow chart" on how to get help with R issues, coding, and assignments as a separate file. In general, how and when you should communicate with the instructional team is outlined in the table below.

Communication	Email	Discord	IndAppt	OfficeHours
Absent from class (if requesting excused absence)	X			
Assignment questions		X		X
Need in-depth help		X	X	X
Exam grading review			X	
General performance review			X	
Identify or resolve classmate conflicts	X		X	
Just want to chat		X	X	X

## Course Policies

### Electronic Devices

I do not forbid the use of electronic devices in class as long as they do not interfere with the lecture or distract other students. I will caution that there is empirical evidence<sup>1</sup> that non-academic use of electronic devices during lectures is associated lower exam performance. It is of note that the

<sup>1</sup>Arnold L. Glass & Mengxue Kang (2019) Dividing attention in the classroom reduces exam performance, Educational Psychology, 39:3, 395-408, DOI: 10.1080/01443410.2018.1489046

authors found that students who used devices had good comprehension of material during the lecture (and therefore thought they were “getting it”), but had poorer long-term recall of the material.

## Attendance

Attending class is not mandatory; however, your attendance in class is expected. Five percent (5%) of your course grade will be earned through clicker participation in lecture and attendance in lab. If you miss class, it is your responsibility to make the effort to find out what you missed and to make up any in-class work. **DO NOT email me if you are unable to attend class UNLESS you need to request an excused absence.** Any assignments (even the in-class labs) are available on ELMS and can be turned in on ELMS regardless of your attendance in class.

## Excused Absences

Requests for excused absences should be made via email and accompanied by appropriate documentation. Excused absences and/or subsequent makeup exams will only be granted for non-avoidable situations, such as religious observance, illness, death in family, etc. Students with excused absences will not be penalized for missed clicker and/or discussion participation.

If your excused absence only precludes your attendance in class you will still be expected to submit assignments by the due date via ELMS. If you are incapacitated in a way that you cannot work on coursework outside of class, your documentation should explicitly note that.

Your email requesting exam makeup should be sent prior to the exam - as soon as you know. That means that if you know at the beginning of the semester you have a religious observance, scheduled medical procedure, mandatory military obligation, etc. let me know within the first two weeks of the course.

Missed exams with an excused absence must be made up within 2 weeks of the original date. Missed exams without a documented, excused absence cannot be made up and will receive a score of 0.

## Late Work

Timely submission of the completed assignments is essential. The due date of each assignment will be stated clearly in the assignment description. Late assignments will be increasingly penalized for each day it is late. Late work will be accepted up until one week after the original assignment deadline or the last day of class — whichever comes first, after which you will receive a zero (0) score.

Late penalties are automatically applied in ELMS. There may be time delay from when you submit and when it is received in ELMS, plus ELMS counts seconds. **DO NOT WAIT** to submit till the last minute. Try to submit no less than 5 minutes before the due time. “Oops” and “the system lagged” are not valid excuses. It is your responsibility to double and triple check your assignment submission - ensuring that all files were uploaded and the uploaded files are the correct version. There will be no leniency in grading if you fail to submit (but thought you did), submit the wrong files, or do not submit all required files. If you notice after the due date that you failed to submit, you can submit at that time but any appropriate late penalties will apply. **IF** you believe there to be an ELMS "glitch" or "bug" with your assignment submission, it is your responsibility to obtain documentation of such by submitting a ticket with DIT (itsupport@umd.edu) and copying the instructor (abradfor@umd.edu).

**Penalties for Late Submission:**

	Less than 1 day	1 day	2 days	3 days	4 to 7 days	> 7 days
penalty	10%	20%	30%	40%	50%	0% on the assignment

**Extensions for Assignments**

I will not grant extensions for assignments unless you have a prolonged sickness/injury or other situation that affects your ability to complete assignments outside of class. Documentation of prolonged sickness/injury from a doctor or other medical professional is required and should indicate if you are well enough to complete assignments out of class. You are afforded ample time to complete assignments outside of class so that a 1-2 day routine illness should not preclude timely submission. Proactively contact me if a situation arises during the semester so that we can make appropriate arrangements.

**Re-grading**

Fair, accurate, and consistent grading is very important to me. If you receive a grade different than what you believe you should have received, then within one week of receiving the assigned grade, you must submit a written document in which you include the graded work, an explanation of what you believe was improperly graded, and an explanation for why you think it should be given a different score. For any re-grade requests, the entire assignment will be regraded, and your score may go up or down.

**Getting Help**

You are expected to take personal responsibility for your own learning. This includes acknowledging when your performance does not match your goals and doing something about it. If you need help with the course content, please visit me in office hours or email me to set up an individual appointment.

Everyone can benefit from some expert guidance on time management, note taking, and exam preparation, so I encourage you to consider visiting <http://ter.ps/learn> and schedule an appointment with an academic coach.

Sharpen your communication skills (and improve your grade) by visiting <http://ter.ps/writing> and schedule an appointment with the campus Writing Center.

Finally, if you just need someone to talk to, visit <http://www.counseling.umd.edu>.

Everything is free because you have already paid for it, and **everyone needs help...** all you have to do is ask.

**Names/Pronouns and Self Identifications**

The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering equitable classroom environments. I invite you, if you wish, to tell us how you want to be referred to both in terms of your name and your pronouns (he/him, she/her, they/them, etc.). The pronouns someone indicates are not necessarily indicative of their gender identity. Visit [trans.umd.edu](http://trans.umd.edu) to learn more.

Additionally, how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity, is your choice whether to disclose (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not

presumed or imposed. I will do my best to address and refer to all students accordingly, and I ask you to do the same for all your fellow Terps.

### Accommodations

Please come and see me as soon as possible if you think you might need any special accommodations for disabilities. In addition, please contact the Accessibility & Disability (301-314-7682 or <http://www.counseling.umd.edu/ads/>). ADS will work with us to help create appropriate academic accommodations for any qualified students with disabilities. If you experience psychological distress during the semester you can get professional help at the Counseling Center (301-314-7651 or <http://www.counseling.umd.edu/>).

### Academic Dishonesty & Integrity

It is very important that you complete your own assignments, and do not share files (excluding raw data and code posted to the DB), partial work or final work. You may work with your classmates on the lab/homework assignments but each student should submit their own unique file with the answers in their own words.

**I take plagiarism VERY seriously.** It is quite likely that you will use the Internet or class materials to help answer your assignments and exams. I prefer that you summarize or paraphrase source materials rather than copy & paste content. **If you copy and paste content from ANYTHING you did not write yourself, I expect you to put it in quotation marks and clearly cite the source.** I will heavily enforce plagiarism violation penalties. Plagiarism includes using my exact language/sentences from class examples and example papers and simply "plugging in" your results. You need to write the interpretation of your statistical analyses in your own words.

Cheating in any form (copying, falsifying signatures, plagiarism, etc.) will not be tolerated. It will result in a referral to the Office of Student Conduct irrespective of scope and circumstances, as required by university rules and regulations. There are severe consequences of academic misconduct, some of which are permanent and reflected on the student's transcript. If you have any questions regarding the University's policies on scholastic dishonesty, please see <https://www.studentconduct.umd.edu/academic-dishonesty>.

As a student you are responsible for upholding the academic integrity standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://shc.umd.edu/SHC/Default.aspx>.

### Class and Campus Closures

If I am physically unable to teach class on campus on a given day, I may either hold or reschedule class online, using Google Meet or WebEx; you will be notified in advance of this change and emailed the link to access the online class session.

Weather and other events may require campus to close. Campus closures will be posted on the UMD homepage ([www.umd.edu](http://www.umd.edu)) and many of its social media channels. You may also call the weather emergency phone line: 301-405-7669. See <https://umd.edu/weather> for more information. **In the event of a campus closure, expect our class to be held online.** I will contact you with instructions for the online class.

## University Policies

Other policies relevant to undergraduate courses are found here: <http://ugst.umd.edu/courserelatedpolicies.html>. Topics that are addressed in these various policies include academic integrity, student and instructor conduct, accessibility and accommodations, attendance and excused absences, grades and appeals, copyright and intellectual property.

## Course Schedule

NOTE: Schedule is for planning purposes and is subject to change. Current deadlines will be listed in ELMS.

The schedule for the semester is laid out in a calendar format at the end of the syllabus. Please refer to this calendar for Lecture topics, Discussion/Lab topics, exams, and due dates. Assignments and Quizzes are due by 11:59pm on the date they are listed on the calendar - if deadlines change they will be updated in ELMS.

## Readings

The course readings are listed below by topic. Refer to the calendar for when each topic will be covered in lecture. Readings that are not out of one of the three books listed here are available in the "Files" section in ELMS under the "READINGS" category.

[O] = OpenIntro Stats; [V] = Verzani; [R] = Radziwill (recommended, not required); OPT = optional

**Foundations and Sampling:** [O] Chapter 1; [V] Section 1-2; [R] 1.1, 1.3, 3.1-3.2

**R Basics:** [V] Section 3; Datacamp: Intro to R; [R] 1.6; OPT: Paradis Chapters 2, 3, 6

**Descriptive Statistics, Graphs, and Visualizations:** [O] 2.1.4; [V] p. 19-22; [R] 1.4, 1.5, Section 2; OPT: [https://uc-r.github.io/ggplot\\_intro](https://uc-r.github.io/ggplot_intro)

**Hypotheses, Power, Effect Size:** [O] Chapter 3; [R] Sections 3.5 p.200-203(power)

**Chi-Square Goodness of Fit:** [O] 6.3; [V] Section 12; [R] 5.8, 5.9

**Chi-Square Test of Independence:** [O] 6.4; [V] Section 12; [R] p.204&211(power)

**Normal Distributions, z-scores, and Confidence Intervals:** [O] Chapter 4(inference); [V] Sections 9-10, p. 47(CLT); [R] 3.6, 3.7

**One-sample z- & t-tests:** [O] 5.1, 6.1; [V] Sections 9-10; [R] 4.1, 4.4, 4.6, 5.2, 5.6

**Two-sample z- & t-tests:** [O] 5.2-5.4, 6.2; [V] Section 11; Vaughn 11.5(Nonparametric) and 11.3(Wilcoxon); [R] 4.2, 4.3, 4.5, 4.7, 5.3, 5.4, 5.5, 5.7, p.204 -210(power)

**One-way ANOVA:** [O] 5.5; [V] Section 15; Vaughn 11.4(Krusal-Wallis); [R] 5.10, 5.11, p.204 & 212 (power)

**Two-way ANOVA:** [O] 7.5; Vaughn 13.1(Two-Way ANOVA); [R] 5.12

**Correlations:** [O] 7.1.4; [R] 2.9, p.178, p.435-438

**Simple Linear Regression:** [O] Chapter 8; [V] Section 4(Linear Regression starting at p. 24) and Section 13; [R] 4.8, 6.1, 6.3. p.204&213(power)

**Multiple Linear Regression:** [O] Chapter 9; [V] Section 14; [R] 6.2

INST 314 - 020x  
Jan/Feb 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	First Day of Class 27  Lecture Intro to 314	28	Lecture 29  Foundations of Inference	30	Discussion 31  Lab 1: RBasics	1
Due by 11:59pm 2 Discussion Board - Introduction Quiz 1	Lecture 3 Descriptive Statistics and Graphs/Visualizations	4	Lecture 5 Descriptive Statistics and Graphs/Visualizations Intro to Hypotheses	6	Discussion 7 Lab 2: Descriptive Statistics and Graphs/Visualizations  Due by 11:59pm Lab/HW 1	8
Due by 11:59PM 9 DataCamp - Intro to R Quiz 2	Lecture 10 Intro to Hypotheses, Power, and Effect Size	11	Lecture 12 Intro to Chi-Square	13	Discussion 14 Open Lab Due by 11:59pm Lab/HW 2	15
Due by 11:59PM 16 Quiz 3	Lecture 17 Chi-Square Goodness of Fit	18	Lecture 19 Chi-square Test of Independence Coding Hangout 5-8pm - Location TBA	20	Discussion 21 Lab 3: Chi-square Due by 11:59pm Project 1	22
Due by 11:59pm 23 Quiz 4	Lecture 24 Normal Distribution, z-scores, and Confidence Intervals	25	Lecture 26 Normal Distribution, z-scores, and Confidence Intervals	27	Discussion 28 Data cleaning / Tidyverse Due by 11:59pm Lab/HW 3	29

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Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Due by 11:59PM 1 Quiz 5	Lecture 2 One-sample z- & t-tests	3	Lecture 4 One-sample z- & t-tests	5	Discussion 6 Lab 4: One-sample z- & t-tests Due by 11:59pm DataCamp - Intro to the Tidyverse	7
Due by 11:59PM 8 Quiz 6	Lecture 9 Two-sample z- & t-tests Coding Hangout 5-8pm - Location TBA	10	Lecture 11 Two-sample z- & t-tests Due by 11:59pm Project 2	12	Discussion 13 Lab 5: Two-sample z- & t-tests Due by 11:59pm Lab/HW 4	14
Due by 11:59PM 15 Quiz 7	Spring Break 16	Spring Break 17	Spring Break 18	Spring Break 19	Spring Break 20	21
22	Lecture 23 Midterm Review	24	Midterm 25 via ELMS	26	Discussion 27 Open Lab Due by 11:59pm Lab/HW 5	28
29	Lecture 30 One-way ANOVA	31				

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Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			Lecture 1 One-Way ANOVA Coding Hangout 5-8pm - Location TBA	2	Discussion 3 Lab 6: One-Way ANOVA	4
Due by 11:59pm 5 Quiz 8	Lecture 6 Two-Way ANOVA	7	Lecture 8 Two-Way ANOVA	9	Discussion 10 Lab 7: Two-way ANOVA Due by 11:59pm Lab/HW 6	11
Due by 11:59pm 12 Quiz 9	Lecture 13 Correlations Coding Hangout 5-8pm - Location TBA	14	Lecture 15 Correlations Due by 11:59pm Project 3	16	Discussion 17 Lab 8: Correlations Due by 11:59pm Lab/HW 7	18
Due by 11:59pm 19 Quiz 10	Lecture 20 Simple Linear Regression	21	Lecture 22 Simple Linear Regression	23	Discussion 24 Lab 9: Simple Linear Regression Due by 11:59pm Lab/HW 8	25
Due by 11:59pm 26 Quiz 11	Lecture 27 Multiple Linear Regression	28	Lecture 29 Multiple Linear Regression	30	May 1 Discussion Lab 10: Multiple Linear Regression Due by 11:59pm Lab/HW 9	2

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Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Due by 11:59pm Quiz 12	Lecture Multiple Linear Regression Coding Hangout 5-8pm - Location TBA		Lecture Multiple Linear Regression		Discussion Open Lab Due by 11:59pm Lab/HW 10	
	Lecture Final Review Coding Hangout 5-8pm - Location TBA	Last Day of Classess Due by 11:59pm Project 4	Reading Day Drop-in Office Hours   Bradford   1-5pm		Final Exam (tentative) 1:30 - 3:30pm	