



Course Syllabus – Last Updated: 27 February 2019

# Statistics for Information Science

## INST 314

Section 105  
Spring 2019

*This syllabus has a heading outline for navigation ease.*

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 MS Excel and R for basic data manipulation and analysis;
- Critically evaluate data analyses and develop strategies for making better decisions.

### Class Meets

Tu/Th 3:30-4:45 ESJ 1202

### The Instructional Team

**Mr. Shawn Janzen**

[sjanzen@umd.edu](mailto:sjanzen@umd.edu)

(pronouns: he/him/his)

**Office:** 1109K Patuxent (PTX)

### Office Hours:

Mondays 12:30 – 1:30 pm,

Tuesdays 5:00 – 7:00 pm,

and by appointment

### Teaching Assistants

**TA Office: See table on p.2**

Nikki Sigalo

[nsigalo@umd.edu](mailto:nsigalo@umd.edu)

Monalisa Swami

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Krishna Nambi

[knambi@terpmail.umd.edu](mailto:knambi@terpmail.umd.edu)

### Academic Peer Mentors (AMPs)

**TA Office: See table on p.2**

Christina Lingfu

[clingfu@terpmail.umd.edu](mailto:clingfu@terpmail.umd.edu)

Peter Lim

[plim7@terpmail.umd.edu](mailto:plim7@terpmail.umd.edu)

Brian Yang

[yang.brian97@gmail.com](mailto:yang.brian97@gmail.com)

Lana Dove

[lanavdove@gmail.com](mailto:lanavdove@gmail.com)

### Course Prerequisite

STAT 100 or equivalent

## Office Hours

Monday	Tuesday	Wednesday	Thursday	Friday
				Mona 10:00-12:00 HBK 0215B
Janzen 12:30-13:30 PTX 1109K		Krishna 12 – 2:00 HBK 0215B	Brian 1:00-3:00 HBK 0215B	
Nikki 6:00-7:00 HBK 4115	Janzen 5:00-7:00 HBK 0215B		Lana 6:30-7:30 HBK 0215A	

## Course Communications

### Email



To ensure that I receive your message, please write me directly: [sjanzen@umd.edu](mailto:sjanzen@umd.edu). Likewise, email others on the instructional team directly. To and CC as needed.

**Do not use ELMS email. Do not rely solely on the assignment comment box.**

It is essential that we all conduct ourselves as professionals, so please visit [ter.ps/email](http://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! 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.

### Discussion Board

This class makes heavy use of the Discussion Board (DB) on ELMS to address all questions about assignments, lectures, how to use R and Excel, and similar topics. **DO NOT email questions to me or others on the instructional team that can be answered on the DB.** If you do, we will reply to post your question to the DB, and you will lose valuable time.

Posting to the DB 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 the DB to see if someone else has already asked your question. The instructional team regularly monitors the DB to respond in a timely manner—ideally within a couple of hours during the day and early evening.

**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 so that others can replicate your work.** Either copy/paste your code into the DB post, 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 the DB because of shyness or concerns that you might feel like you are asking a ‘stupid question.’ My experience teaching this class 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 the DB for fear that others will copy it. This is normal, but I encourage posting code to the DB. 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. 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

	Email	Discussion Board	Individual Appointments	ELMS Class Announcements	Absence Form
Class or office hour cancellation or reschedule (from me to you)				✓	
Absent from class					✓
Assignment questions		✓			
Need in-depth help		✓	✓		
Exam review			✓		
General performance review			✓		
Identify / Resolve classmate conflicts	✓		✓		
Just want to chat			✓		

## Course Materials & Resources

### Computer

You must bring a charged laptop to class every day. Tablet and similar devices are not acceptable as they cannot fully run R and the Respondus Lockdown Browser. Alternatively, you may partner with a willing classmate to share computer use in class. If you need a computer to study and complete your assignments, LeFrak Hall has computer labs with R installed (and other stats software). You must use your own computer for in-class exams. If your computer is not working, the UMD libraries may have computers available to borrow (<https://www.lib.umd.edu/tlc/equipment-availability>).

## Websites



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

All relevant, required course content will be stored or linked from ELMS, including class videos.



**DataCamp:** <http://www.datacamp.com>

DataCamp is a third-party skills training company and website. The subscription costs to access DataCamp materials is free for students while part of INST 314. I will send you an invitation to join our DataCamp classroom to complete various assignments. Some assignments are required, others will provide extra credit. See the extra credit section below for more details. If you already have a DataCamp account, you may use that account for this class, but you must inform me which email address you use for that account. If you do not have a DataCamp account, you will be required to create one.

## Software

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

Required:



- You must install and use R. R programming language and software is free and available online (<https://www.r-project.org/>).



- You may want to use R Studio, which will be used predominately through the class; R studio is an integrated development environment for R. (<http://web.cs.ucla.edu/~gulzar/rstudio/>).

I have posted links to R Studio tutorials on Elms/Canvas.



- Microsoft Excel is preferred, but you may also use Google Sheets or Open Office Calc. Course instruction materials will use Excel. Differences in how to perform work may differ using Sheets or Calc. Microsoft Excel is available for PC and Macintosh through the university's TERPware website (<https://terpware.umd.edu>). Google Sheets is available freely through Google Drive as part of your UMD student Google account (<http://drive.google.com>). Open Office Calc is a free software spreadsheet application available online (<https://www.openoffice.org/product/calc.html>).

Recommended (see extra credit EC 1):

- Python, Minitab, SPSS, Stata, SAS. Python is free and available online. The other recommended software is not free, but most (if not all) have reduced student or short-term pricing available on their websites. You may also find cheaper versions through the university's TERPware website (<https://terpware.umd.edu>). The computer labs in LeFrak Hall may also have several of these software platforms installed.

## Course Videos

These pre-recorded lectures provide the core "lecture content" of the course. They are available through ELMS.

## 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. You do not need to purchase a textbook. The

required textbooks are available as free pdf files. Any reading topics outside of the textbook will be posted on Elms/Canvas.

#### Required:

- Diez, D., Barr, C., and Çetinkaya-Rundel, M. (2015), *OpenIntro Statistics*, 3<sup>rd</sup> 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. (2017), *Statistics (The Easier Way) With R*, 2<sup>nd</sup> ed., Lapis Lucera. ISBN-13: 978-0-9969160-5-9.
  - This was a previous term's textbook. I highly recommend it for statistics using R.
  - The author offers a free e-book version with proof of purchase of the physical book copy.
- See Appendix A for other recommended books.

#### Clickers



You will need a “clicker” (a.k.a. response card). The university will provide you with a Turning Account license. Visit [clickers.umd.edu](http://clickers.umd.edu) for details. You may purchase the physical clicker at the UMD Book Center or online. Older, used models will still work and are certainly less expensive.

Though not technically required, it would be a good idea to have two spare CR2032 batteries. You may also use the Clickers mobile app, but you may only use your phone with the app during class review.

#### Course Design

**This is a “flipped” class. It is not a traditional lecture class.** This means that you are expected to watch the video lectures and read materials posted to Canvas **before each class session**. There will be learning check questions embedded into the video lectures that you must complete in ELMS **before each class session**. In class, we will review the lesson concepts. There will be graded clicker questions as part of that review. These questions are designed to help me to understand areas where you are having difficulty. In class, you will not be passive recipients of information, but instead will be actively engaged participants in teamwork, discussions, and hands-on demonstrations.

This course may require more of you than some of your other courses. The University of Maryland guidelines state that for every hour you spend in class per week you should expect to spend an average of 2-3 hours on coursework outside of class. For a three-credit course: If you have any questions about why the course is taught the way it is, I would be happy to discuss it with you.

3 Credits in	Expect
16 weeks	5-7 hrs per week
6 weeks	15-20 hrs per week
3 weeks	30-45 hrs per week

## Expectations

**Before class** you are expected to be prepared by:

- Watching the assigned videos
- Reading the assigned texts
- Completing the video challenge questions
- Performing other activities, as assigned

**During class** you will be assigned a variety of activities including, but not limited to:

- Completing the in-class review questions
- Completing in-class lab-style activities
- Participating in discussions
- Performing other activities, as assigned

In-class review questions and lab-style activities are graded every class period.



## My Teaching Philosophy & Style

I think it is important that you understand how I view my role as a teacher and what my goals are for you as my student. This is my distilled teaching philosophy: *Part of my job is to teach, and if you are not learning when you are trying to learn, then I'm failing in my obligations and I'm failing you.*

This means that if you are putting in the work, then I will be there for you to help you across the finish line. I never leave a willing student behind. I designed or adopted every part of this course to help you build the necessary skills to excel and be successful in the workplace and in life. I may come across as intense in my lecture, but that is just my passion for the subject. I aim to be approachable to discuss any topics, for this course, others, or anything else on your mind.

## Our Class Contract

As members of a learning community, we need to have a mutual understanding of what is expected from each of us, and what we have the right to expect from others.

### I, as the instructor, agree to...

- ✓ Create and maintain a classroom environment that fosters student engagement and active learning.
- ✓ Establish clear standards, assess your learning & skills in a fair and honest way, and give you helpful feedback.
- ✓ Respond to your questions in a timely manner.

### You, as a student, agree to...

- ✓ Take personal responsibility for your learning.
- ✓ Actively engage the material and our class meetings.
- ✓ Actively monitor email and ELMS announcements.
- ✓ Ask questions.

## We, as members of this learning community, agree to...

- ✓ Abide by the course and campus policies.
- ✓ Be respectful and encouraging.
- ✓ Give each other our undivided attention. No phones, laptop, or tablets are permitted during class meetings except during activities.
- ✓ Be professionals. That means arriving on time, being prepared, and preventing foreseeable problems.



## Suggestion Box



I am always looking for ways to improve this course. Your feedback is valued, and I encourage you to share your thoughts. I will send out two brief feedback forms during the semester and the university requests a formal course evaluation at the end of the course. However, at any time, you may submit your opinions, idea, criticisms, or other thoughts. I will check the suggestion box periodically and consider your submissions. Suggestion Box form: <http://ter.ps/inst314box>

## Course Activities

### Labs

Each major topic module will have an accompanying lab activity. These lab assignments are designed to teach you more about how R works within the context of the topics being taught in class. You will need your laptop to complete the lab assignments. You will work on the labs in class with your classmates and complete any unfinished work at home. Completed labs will be submitted via Elms/Canvas due by 10:00 pm on the scheduled due date. Since labs are submitted online via ELMS, they will be unaffected by campus closures or changes in the classroom schedule.

There will be two additional labs you must complete on your own in DataCamp – Introduction to R and Introduction to Data. Their due dates will differ from the regular labs and are completed out of class.

You must complete at least 50% of the lab for it to be marked complete. Most of the time, lab answer keys will be shared within 1 week after it is marked due (allowing for penalized late submissions); they may be shared sooner as exams approach to help with studies. Labs contribute toward your final grade, but they will not be formally graded, although you may receive some feedback. You will be responsible for checking your lab work against the answer key. If you have any questions, please come to office hours or post them to the DB. **Labs are one of the most important class exercises to prepare you for the exams and learn R!**

### Learning Checks

There are three types of learning checks: knowledge challenges, prep quizzes, and in-class reviews. They triangulate graded course content in-and-out of the classroom and will aggregate their scores together toward the final grade. The goal is to have prep quizzes and in-class review activities that correspond with each regular class day (approximately regular 23 class days). I will reduce the number of learning check activities based on events out of class controls, e.g. university closures due to inclement weather.

## Prep Quizzes

Each learning module will have a series of prep quiz questions that correspond to the video lectures and readings. The questions will be assigned progressively as we move through the content. You must complete the assigned quiz questions individually using ELMS before the start of class. These quizzes are graded and you will receive the solutions by the time class starts. Since prep quizzes are submitted online via ELMS, they will be unaffected by campus closures or changes in the classroom schedule.

## In-Class Reviews

Each regular class day will include a review of the readings and video lectures. As a part of that review, you will have clicker questions embedded into the review slides. These review questions will be graded and stored in ELMS as part of your final grade.

## Knowledge Challenges

There will be a total of 8 knowledge challenges. These assignments are meant to assess your mastery of the topics and techniques covered in class. These will consist of one multi-part, text-book style problem that cover materials from the corresponding class videos, readings, quizzes, in-class reviews, and labs. Knowledge Challenge assignments will be submitted via ELMS by 10:00 pm on the day it is scheduled due. Since knowledge checks are submitted online via ELMS, they will be unaffected by campus closures or changes in the classroom schedule.

## Projects

There will be a total of 4 projects. These are your opportunity to apply concepts learned in class to real problems and data sets from ideas and hypotheses you develop and test. These assignments will be memo-style narrative reports with statistical analysis. Each project will have a graded declaration section, where students will post to the DB initial information about their project. The first and second projects are collaborative, team-based assignments, while the third and fourth projects are individual assignments. Projects will be submitted via ELMS by 10:00 pm on the day it is scheduled due. Project 4 will be a “Final Class Project” and graded with greater scrutiny than previous projects. Since projects are submitted online via ELMS, they will be unaffected by campus closures or changes in the classroom schedule.

## Exams

There will be two midterms and a cumulative final exam. These exams provide an opportunity for you to test your understanding of the concepts, techniques, and problems associated with statistical reasoning. To learn and understand the material fully it is important to review and revisit it multiple times. The cumulative final is optional. The two highest exam scores will be used for your final grade. If you do not take the final exam, your midterm exams will be used for your final class grade.

The two midterm and final exams are take-home and will be completed in ELMS. They will test a combination of theory and general knowledge with practical questions. They have an open note/book/Internet format, but you must complete it individually. The exams will be timed, but you will be able to choose when you start the exam from anytime within the scheduled timeframe. You must be prepared work in multiple windows on your computer and to copy/paste content from those windows into ELMS. Since exams are held online, they will be unaffected by campus closures, changes in the classroom schedule, or any activities that keep you from attending class. Absences will only be counted as excused if your excusal documentation covers you for the

entire scheduled timeframe and specifically notes that you will not be able to perform class activities remotely.

### Professionalism

In this class you are learning more than just analytical skills; you are also preparing to be good employees. I will treat you as junior professionals and I expect you to behave accordingly. If you are often late to class, leave early from class, talk in class or behave unprofessionally in any way in class or out of class (online communication), expect that we may discuss this behavior. If you do not improve, you may forfeit some to all the professionalism grade based on the extent of the behavior. If this seems subjective, it is, but you will find the real world operates on much the same standard. I will hold everyone to the same expectations.

### Grades

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. '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.

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

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

Grade Allocation	#	Category Weight
Labs	13	5%
Learning Checks		25%
Prep Quizzes	23	
In-Class Reviews	*	
Knowledge Challenges	8	
Projects	4	34%
Exams		34%
Midterm 1	1	
Midterm 2	1	
Cumulative Final	Opt.	
Professionalism	1	2%
<b>Total</b>		<b>100%</b>
Optional Extra Credit	*	5%
<b>Total with Extra Credit</b>		<b>105%</b>

*\* Number of In-Class Reviews depend on number of class days, expect daily minus exam and exam review days*

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 options. Please come and talk to me early if you think that there might be a problem.

### Extra Credit

I believe that there is only so much we can do in the classroom and that much of your learning will be reinforced through applied activities outside of class. I am also interested in helping you develop additional

skills and experiences beyond the scope of this class that may help position yourself better for future employment. There are 5 different types of extra credit. You are not obligated to complete any of it. You may mix and match any of the extra credit activities to earn a maximum of 5% toward your final grade. **All extra credit activity must be received no later than Thursday, May 9<sup>th</sup>, except project 4 which is due May 14<sup>th</sup>.**

### **EC 1: Learning other statistical software**

While this course focuses on R as the software of choice, it is not the only one for statistical analysis. Knowing more than one software for statistical analysis may make you a more qualified job/intern candidate and valuable data team member.

When a knowledge challenge or project requires the use of R, you must use R to obtain credit for your work; however, you may also submit the same work also performed using SAS, Stata, SPSS, Minitab, or Python (or Jupyter). Script/Syntax and output files for the bonus software must be submitted with the knowledge challenge or project before the assignment deadline to receive extra credit. No extra credit for this method will be given for late assignments. Each knowledge check with this method will earn you 0.25% extra credit toward your final grade, and each project will earn you 0.5%. If you complete this method for all 7 knowledge checks and 4 projects (no code for KC1), the maximum extra credit for this method is 3.75% toward your final grade.

Most statistical software is not free; however, you may have free access to this software on select campus computers (see labs in Lefrak Hall <https://oacs.umd.edu/facilities/oacs-computer-labs>). If you wish to have your own copy of these software, trial, student, and other versions may be available. See the Office of Academic Computing Services for more information (<https://oacs.umd.edu/services/statistical-software-sas-spss-statttransfer-stata>).

Although no class time will be dedicated toward software other than R or Excel, there are many free resources online to help you learn. I will also be happy to help answer any questions about using them during office hours.

### **EC 2: Review statistics in practice**

As well as learning statistical theory and applying the techniques, you are encouraged to attend events where statistics play an integral role. The statistics used in the event must be more than simple descriptive statistics, such as averages and proportions; there must be some form of detailed analysis that uses statistics to test a hypothesis, conduct exploratory research, and/or predict one or more activities.

To obtain extra credit related to events, you must provide proof of attendance at both the beginning and ending of the event, e.g. selfie photos capturing you and the event/speakers with timestamps. You must also provide a summary of the event, no more than ½ to 1-page in length, describing the event, its purpose, and how statistics were used in the event, presentations, etc. Go into detail about what data was used, if there were any interesting aspects of the data (e.g. how it was collected, privacy or missing data concerns), how the data was processed for the event, and so on. You must also include a discussion about what statistical methods were used; it is alright if you are unfamiliar with the specific techniques, but obtain the names of the techniques and discuss how/why they were used. Detail what results were found and what, if any, implications the results may carry (e.g. affect policy decisions, develop new applications).

Gaining sufficient information may require you to ask the event speaker(s) or other attendees more familiar with the statistical methods used. You are encouraged to participate and ask questions before, during, and after the event. Bonus: this can help you develop a professional network.

Your completed summary report must be written in a Word document and submitted into ELMS in the Extra Credit assignment section using the file name convention:

EC\_LastName\_FirstName\_EventName.docx

You may perform this type of extra credit twice—once for an event that occurs on campus and once for an event that occurs off-campus. An on-campus example is an iSchool faculty or guest research presentation; an off-campus example is a data or policy seminar. Each event report extra credit is worth 1.0% towards your final grade; so, a total of 2.0% extra credit is possible with this method.

### **EC 3: Online training modules for R**

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 for most of the class modules. 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, pending any materials 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. I have internal reports that allow me to parse out how much you completed. *Another great learning tool for R is a package called Swirl. This was the previous extra credit learning tool, but will not provide any extra credit for your class as it was replaced by DataCamp. I encourage you to explore the Swirl lessons if you have the time. Check with me for which lessons will be most relevant to our class.*

### **EC 4: It Takes a Village**

Within the first week, you will be grouped into teams. You will work with your teammates on many activities such as labs and the first two projects. Working in teams can be extremely helpful—those that feel strong with the content will learn it better by helping those struggling, and those struggling will benefit from their peer's help. Teams can also check in with each other to ensure everyone is attending class and that assignments are completed on time.

Individual activity will contribute or deduct points that will be aggregated at a team level. I will post team point updates for the class regularly. I may disclose how points were earned or lost, but I will not provide names of the students responsible for the earned or lost points. Teams are encouraged to communicate internally to see where they gained or lost points. I will try to make all teams have an equal number of students, but if a team has an 'off-number', then I will weight that team's contributions accordingly to that all teams have a relatively fair earning potential.

As we move through the term, I will announce point thresholds for extra credit (and potentially other course benefits—this aspect is TBD). The thresholds are not competitive—all teams that surpass each point threshold will receive the corresponding benefits for those team members.

Team points may be earned and lost by any of the following\*:

- Attending class: +1 point per student for each day of class attendance
- Participating in class by replying to live questions during lecture: +2 points per participating student (*may be earned once per student per class*).
- Responding to another student’s question on the discussion board: +2 points if from the same team, + 5 points if from another team (*may be earned once per discussion board section, e.g. Knowledge Challenge 2 is one section*).
- Missing a Prep Quiz: -5 points per student per prep quiz
- Missing a Midterm exam\*: -10 points per student per exam
- Failing to submit a Knowledge Challenge or Project on time\*: -5 points per student per assignment per day it is late (capped at 4 days or -20 points per student per assignment).

\* *Deadlines take into consideration any excused absences.*

### EC 5: iSchool Support

In the spirit of supporting the iSchool and other UMD events, I may occasionally announce via ELMS additional opportunities for extra credit and how much those opportunities are worth.

### Academic Integrity Matrix

Activity	 OPEN NOTES	 USE BOOK	 SEARCH ONLINE	 ASK FRIENDS	 WORK IN GROUPS
Prep Quizzes	✓	✓	✓		
In-Class Reviews	Paper notes				
Labs	✓	✓	✓	✓	✓
Knowledge Challenges	✓	✓	✓		
Projects 1 & 2	✓	✓	✓	✓	✓
Projects 3 & 4	✓	✓	✓	✓	
Exams: In-Class Portion	One-page				
Exams: Take-Home Portion	✓	✓	✓		
Extra Credit	✓	✓	✓	✓	✓

### Course Policies

## Electronic Device Policy

No phones, "smart" wearables, or tablet devices are permitted during our class meetings, except when required for DSS accommodations or to allow for the Clicker app during class review. Laptops must be turned on but closed until it is time for in class activities and exams.

**NO PHONES ALLOWED!**



I understand and have considered arguments for having devices in the classroom. However, in my experience (and based on the research evidence), the reality is that they present an irresistible distraction and detract from the cooperative learning environment. Researchers have found that these distractions interfere with learning and active participation. I expect you to make the responsible and respectful decision to refrain from using your cellphone in class. If you have critical communication to attend to, please excuse yourself and return when you are ready. For more information about the science behind the policy watch: [youtu.be/WwPaw3Fx5Hk](https://youtu.be/WwPaw3Fx5Hk)

## Attendance

Attending class is not mandatory; however, your attendance in class is expected. Missing class is likely to influence on your class performance and grade. Class sessions will involve hands-on activities. You are expected to complete them in class and the activities' files are to be turned in at the end of each session, so that I can identify problem areas.

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. If you are absent: fill out this form:

<http://ter.ps/inst314abs>

## Excused Absences

If you are absent for any reason, you should complete the absent form linked above. Depending the reason for your absence, it may be excused (e.g. religious observance).

- You are given two (2) excused absences for regular class days without question.
- If you miss class on an exam day or any other non-regular class day on the schedule, you will need documentation to excuse your absence.
- Any work from an unexcused absence will be given a score of zero (0).
- Any work from an excused absence must be made up within one (1) week of the original deadline—anything during the last week of class may require a sooner makeup.
- Missed exams without a documented, excused absence cannot be made up and will receive a score of zero (0).

If you have a prolonged sickness/injury or other event that affects your ability to complete assignments, you **MUST** obtain a signed note from a doctor or similar qualified representative **AND** that note **MUST** identify: 1) if you are well enough to attend class or not, 2) if you are well enough to complete assignments in or out of class, and 3) the dates for your excused absence. Upload a copy of the doctor's note to absent form. I reserve the right to contact that doctor's office to only verify the authenticity of your note and its contents.

If you have a death in the family, have a family member with a severe injury or illness, or have a similarly grave situation—come discuss it with me. You will be granted an excused absence for the first instance, but any other instances or if additional time will be considered on a case-by-case basis.

Be aware of how any time lost in class may affect your ability to complete your studies.

### 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 date—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 ELM, 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.

Late Penalty Schedule

Up to 1 day	1 ≤ 2 days	2 ≤ 3 days	3 ≤ 4 days	4 ≤ 7 days	> 7 days
10%	20%	30%	40%	50%	0%

### 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 regarded, 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. 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 Disability Support Services (301-314-7682 or <http://www.counseling.umd.edu/DSS/>). Disability Support Services 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. **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.

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 Cancellations**

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. If I am completely unable to teach class on a given day, and rescheduling is not preferred, I may ask another instructor to assist for the day. In that event, you will be expected to attend class as usual with the guest instructor.

Weather and other events may require campus to close and cancel class. 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.

### Other 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

This schedule is for planning purposes and may change. See Elms for current information and deadlines.

Readings: [O] = Open Intro Stats, [V] = Verzani, (opt) = optional

Assignments: KC = Knowledge Challenge, DC = DataCamp

#	Wk	Day	Date	New Topic	Readings	Videos	Prep Quiz	Lab	KC	Project
1	1	Tue	29-Jan	Intro to 314						
2		Thu	31-Jan	Inference Part 1: Foundations & Sampling	[O] 1.1 to 1.5 [V] Sections 1 & 2 p.1-9 (R intro)	1.1 to 1.6	1	1 start 4 DC start		
3	2	Tue	05-Feb	Basic Data Management in R		2.1 to 2.4	2	1 due 2 start	1	
4		Thu	07-Feb	Descriptive Statistics & Graphics	[O] 1.6 & 1.7, (opt) skim 1.8 & skim Ch 2 (opt) [V] Section 3 & 4	3.1 and 3.2	3a	3 start		
5	3	Tue	12-Feb	Descriptive Statistics & Graphics (con't.)		3.3 and 3.4	3b	2 due		
6		Thu	14-Feb	Inference Part 2: Intro to Hypotheses, Power, and Effect Size	(opt) [V] Section 5 p.42-54 (multivariate data) [O] Ch 3 (distributions)	4.1 to 4.3	4	4: DC due 4a: Intro to R 4b: Intro to Data	2	
7	4	Tue	19-Feb	Chi-Square: Goodness of Fit	[O] 6.3 (opt) [V] Section 12 p.93-97 (GoF)	5.1 to 5.4	5a	3 due 5 start		1 declare
8		Thu	21-Feb	Chi-Square: Test of Independence	[O] 6.4 (opt) [V] Section 12 p.97-99 (ToI)	6.1 to 6.5	5b			
9	5	Tue	26-Feb	Inference Part 3: Normal Distribution, Z-Scores & Confidence Intervals	[O] Ch 4 (inference) (opt) [V] p.59-60 (d, p, & q functions), p.60-	7.1 to 7.8	6	6 start	3	

					61(z-scores), p. 62 (CLT)					
10		Thu	28-Feb	One-Sample: z & t tests	[O] 5.1, 6.1 (opt) [V] Section 9 p.77-79 (conf int), p.80-81 (prop test), p.81-84 (z & t), p.86-87 (one-sample tests)	8.1 to 8.3	7a	5 due 7 start		1 due
11	6	Tue	05-Mar	One-Sample: z & t tests		8.4 to 8.6	7b	6 due		
12		Thu	07-Mar	Two-Sample: z & t tests	[O] 5.2-5.4, 6.2 (opt) [V] Section 11 p.89-93 (two sample) Vaughn 11.5: Nonparametric (opt) Vaughn 11.3: Wilcoxon	9.1 to 9.4	8a	8 start	4	2 declare
13	7	Tue	12-Mar	Two-Sample: z & t tests		9.5 to 9.7	8b	7 due		
14		Thu	14-Mar	Midterm 1 review <b>Midterm 1 Exam in ELMS (opens 12:01am 14 Mar and closes 11:59pm 15 March)</b>				8 due		
	8	Tue	19-Mar	No class, Spring break						
		Thu	21-Mar	No class, Spring break						
15	9	Tue	26-Mar	One-Way ANOVA	[O] Ch 5.5 (opt) [V] Section 15 p.116-121 (opt) Vaughn 11.4: Krusal-Wallis	TBD	TBD	9 start		2 due
16		Thu	28-Mar	One-Way ANOVA		TBD	TBD			
17	10	Tue	02-Apr	Correlations	[O] 7.1.4 (Opt.) [V] p.34-35	TBD	TBD	10 start	5	
18		Thu	04-Apr	Correlations con't.; Topic Review		TBD	TBD	9 due		
19	11	Tue	09-Apr	Simple Linear Regression	[O] Ch.7 (opt) [V] Section 4 p.32-34 & 36-40, Section 13 (p.100-108) 7 p.102-103	TBD	TBD	11 start	6	
20		Thu	11-Apr	Simple Linear Regression		TBD	TBD	10 due		3 declare
21	12	Tue	16-Apr	Multiple Linear Regression	[O] Ch 8.1 – 8.3 (opt) [V] Section 14 (p.109-116)	TBD	TBD	12 start	7	
22		Thu	18-Apr	Multiple Linear Regression		TBD	TBD	11 due		3 due

23	13	Tue	23-Apr	Flex day (possible guest speaker TBD)		TBD	TBD			
24		Thu	25-Apr	Midterm 2 Review <b>Midterm 2 Exam in ELMS (opens 12:01am 25 Apr and closes 11:59pm 26 Apr)</b>		TBD	TBD			
25	14	Tue	30-Apr	Multiple Linear Regression		TBD	TBD			
26		Thu	02-May	Multiple Linear Regression		TBD	TBD	12 due		
27	15	Tue	07-May	Multiple Linear Regression		TBD	TBD		8	4 declare
28		Thu	09-May	Topic Review; Last Day for Extra Credit						
29	16	Tue	14-May	Final Exam Review						4 due
30	17		TBD	Final Exam						

### UMD Calendar Spring Semester 2019 Dates

First Day of Classes	Mon 28 January	Reading Day	Wed 15 May
Spring Break	Sun 17 March – Sun 24 March	Final Exams	Thu 16 May – Wed 22 May
Last Day of Classes	Tue 14 May	Commencements begin	Wed 22 May

## Appendix A: Recommended Readings

Recommended:

### General statistics

- Radziwill, N.M. (2017), *Statistics (The Easier Way) With R*, 2<sup>nd</sup> ed., Lapis Lucera. ISBN-13: 978-0-9969160-5-9.
  - This was a previous term's textbook. I highly recommend it for statistics using R.
  - The author offers a free e-book version with proof of purchase of the physical book copy.
- 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. It is a textbook used in other sections of 314 and offers videos and other interactive tools.
- Field, A., Miles, J., & Field, Z. (2012), *Discovering Statistics with R*, Sage Publications, Inc. ISBN-13: 978-1446200469
  - This is a large and comprehensive book—a great resource with many examples using R that will take you beyond the scope of INST 314.

### Math & formula focused

- Hinton, P. (2004) *Statistics Explained: A Guide for Social Science Students*, 2<sup>nd</sup> ed., Routledge. ISBN-13: 978-0415332859

- I find this one to be very theory and formula driven with no software exercises.
- Rice, J.A. (2006). *Mathematical Statistics and Data Analysis, 3<sup>rd</sup> ed.* Cengage Learning. ISBN-13: 978-8131519547
  - This book provides more mathematical detail about the techniques we will cover in the class.

### Statistics in software other than R

- Salkind, N.J. (2016), *Statistics for People Who (Think They) Hate Statistics Using Microsoft Excel 2016, 4<sup>th</sup> ed.*, Sage Publications, Inc. ISBN-13: 978-1483374086
  - This is an easy and light-hearted read that hits on many generally used statistical concepts with an analytical focus entirely based in Excel.
- Kremelberg, D. (2011) *Practical Statistics: A Quick and Easy Guide to IBM SPSS, Stata, and Other Statistical Software*, Sage Publications, Inc. ISBN-13: 978-1412974943
  - This is more of a quick review for stats and focuses on how to perform statistical tests using SPSS and Stata software.

### Less stats, more data science

- Grolemund, G. & Wickham, H. (2017), *R for Data Science*, O'Reilly Publishing, Inc. ISBN-13: <http://r4ds.had.co.nz/index.html>
  - This is a free book available in HTML and a physical copy is available for purchase. This book focuses on working with data in R, rather than statistics, but many of the techniques may be useful to prepare your data for statistical analysis.

## Appendix B: Quick Links

General Course	
Instructor email:	<a href="mailto:sjanzen@umd.edu">sjanzen@umd.edu</a>
Course ELMS page:	<a href="http://elms.umd.edu">elms.umd.edu</a>
DataCamp:	<a href="http://www.datacamp.com">http://www.datacamp.com</a>
Diez et al. OpenIntro Stats Book:	<a href="https://www.openintro.org/stat/textbook.php">https://www.openintro.org/stat/textbook.php</a>
Verzani Simple-R Book:	<a href="https://cran.r-project.org/doc/contrib/Verzani-SimpleR.pdf">https://cran.r-project.org/doc/contrib/Verzani-SimpleR.pdf</a>
Software & Hardware	
R:	<a href="https://www.r-project.org">https://www.r-project.org</a>
R Studio:	<a href="http://web.cs.ucla.edu/~gulzar/rstudio/">http://web.cs.ucla.edu/~gulzar/rstudio/</a>
Excel (Terpware):	<a href="http://terpware.umd.edu">terpware.umd.edu</a>
Clickers Setup:	<a href="http://clickers.umd.edu">clickers.umd.edu</a>
Clicker Support:	<a href="mailto:clickers@umd.edu">clickers@umd.edu</a>
IT Helpdesk:	301-405-1500 <a href="http://helpdesk.umd.edu">helpdesk.umd.edu</a>
Borrowing Computers:	<a href="https://www.lib.umd.edu/tlc/equipment-availability">https://www.lib.umd.edu/tlc/equipment-availability</a>
LeFrak Computer Labs:	<a href="https://oacs.umd.edu/facilities/oacs-computer-labs">https://oacs.umd.edu/facilities/oacs-computer-labs</a>
ELMS student guide:	<a href="http://go.umd.edu/student-canvas-help">go.umd.edu/student-canvas-help</a>

## Communications & Policy

Email Guidance:	<a href="http://ter.ps/email">ter.ps/email</a>
Suggestion Form:	<a href="http://ter.ps/inst314box">ter.ps/inst314box</a>
Absent Form:	<a href="http://ter.ps/inst314abs">ter.ps/inst314abs</a>
Writing Center:	<a href="http://ter.ps/writing">ter.ps/writing</a>
Counseling Center:	<a href="http://counseling.umd.edu">counseling.umd.edu</a>
Accommodations:	<a href="http://www.counseling.umd.edu/DSS/">http://www.counseling.umd.edu/DSS/</a>
Weather Closures:	<a href="https://umd.edu/weather">https://umd.edu/weather</a>
Academic Dishonesty:	<a href="https://www.studentconduct.umd.edu/academic-dishonesty">https://www.studentconduct.umd.edu/academic-dishonesty</a>
Academic Integrity:	<a href="http://shc.umd.edu/SHC/Default.aspx">http://shc.umd.edu/SHC/Default.aspx</a>