Stat 100 Online Syllabus: Spring 2021

Course Info
Statistics 100 (Stat 100), 3 credit hours
Meets the Quantitative Reasoning I general education requirement

Instructor Contact Information
Lead Instructor: Karle Flanagan
Email:stat100@illinois.edu

Course Webpage
go.illinois.edu/stat100
You can also google "stat 100" :)

Course Materials

1. **Required Workbook:** Stat 100 Incomplete Lecture Notes Workbook by Ellen Fireman, Karle Flanagan, and John Marden. Either the Fall 2020 edition or Spring 2021 edition will work (they are exactly the same!)

   - Available at the Illini Union Bookstore for $35. You can pick it up in person or buy it online.

   - This notebook is the only thing you are required to purchase for Stat 100!

   - You will use this notebook every week when you watch the videos.

2. **Required Calculator:** Any calculator is accepted. I recommend **this one!**

Class Times for Spring 2021
Online Section ONL: No assigned meeting times. Watch lecture videos on Compass.

Office Hours
Stat 100 Office Hours will be offered each week Monday-Friday from 2-5pm via zoom. Feel free to stop by anytime for help. Karle and the Stat 100 CAs will be there to answer any questions you may have about the course, assignments, or anything you need. If you are unavailable during these times and want to meet, send us an email at stat100@illinois.edu and we will set up a time!

Technical Issues
If you experience a glitch in Lon Capa/Compass, first, try logging out and logging back in. If this doesn't work, send an email to our tech doc, Dr. Yuk Tung Liu ytliu@illinois.edu describing the problem. Please make sure to include a screenshot of the error in your e-mail. You can also stop by office hours and get help in person!

Homework Schedule
Homework (HW) is due every Tuesday and Thursday at 11:59pm (see calendar) on Lon-Capa. You can ask questions on the Lon Capa discussion boards, our course Piazza page, or stop by office hours any time to get homework help!

We do NOT accept late homework, but we do drop your 3 lowest HW scores. This means you can miss 3 HW assignments without any penalty!

There are many ways to get help so don't hesitate to ask! Also, please do not ask for an extension. To be fair to everyone, extension requests will not be granted since you can miss 3 assignments without penalty. If something happens where you will miss more than 3 HW assignments, please contact Karle right away and we will work something out!

Exam Schedule
There will be 3 evening exams and a cumulative final. The dates/times are listed below:
- Exam 1= Thursday February 18th from 6-7:30pm
- Exam 2= Thursday March 18th from 6-7:30pm
- Exam 3= Thursday April 15th from 6-7:30pm
- Final= Monday May 10th from 1:30-4:30pm

For Exams 1-3, there will be a main conflict at 4:30pm on exam days and an international conflict at 11pm on exam days! You will be able to sign up for these on Lon Capa the week before.

Grade for Required Work

3 Exams: 60% (each worth 20%)

Homework: 15%

Final Exam: 25%

Overall Grade is Translated into a Letter Grade as follows:

A+	97-100	A	93-96.99	A-	90-92.99
B+	87-89.99	B	83-86.99	B-	80-82.99
C+	77-79.99	C	73-76.99	C-	70-72.99
D+	67-69.99	D	63-66.99	D-	60-62.99
		F	< 60		

Bonus Work
Everyone may earn between 0 and 100 Bonus Points. Every bonus point earned helps your overall grade, but even if you do no bonus work, you can still get 100% for the course. In other words, bonus points can only help you. Bonus points are extra credit. Here's how you can get them:

1) Lon Capa Pre-Lecture Videos (46 bonus points)
   Each class there will be a short pre-lecture video posted on Lon Capa followed by a few questions. The pre-lectures are designed to give you a preview of the basic concepts you'll see in the actual lectures. There are 23 prelectures and each is worth 2 bonus points.

2) Lon Capa Surveys (25 bonus points)
There will be 5 surveys due on the first Friday of each month (see the course calendar). Each survey is worth 5 bonus points. The surveys are all anonymous. Lon Capa just records whether or not you submitted a survey, not who submitted which answer. You must answer every question on the survey to get the 5 points.
3) Research Opportunities (28 bonus points)
There will be a few research opportunities to participate in throughout the semester. The details will be posted on our course Compass page! These opportunities are completely optional but give those who want to a chance to participate in a real study.
4) The Pre-Lecture and Survey bonus points add to 99! Everyone will get 1 bonus point automatically for free ;)

How do these bonus points get calculated into your grade?

At the end of the semester, take your total bonus points and divide them by 20. This will be how many percentage points get added to your grade! For example, if you have all 100 bonus points, you'd take 100 and divide it by 20 to get 5. So, if you have an 80% (B-) in the class, the bonus will bring you up to an 85% (B).

Couse Outline

- **Study Design**: observational studies vs. randomized experiments, why randomized controls are key, confounders in observational studies, Simpson's Paradox, intent to treat analysis, etc.
- **Descriptive Statistics**: mean, median, SD, histograms, box plots, normal curve, etc.
- **Linear Regression**: correlation coefficient, simple linear regression, the RMSE, etc.
- **Probability**: chance, multiplication rule, addition rule, conditional probability, Bayes rule, etc.
- **Statistics for Random Variables**: expected value and standard error of chance processes, probability histograms and the Central Limit Theorem, developing simple chance models box models that more complicated sampling processes can be translated into, the Law of Averages, etc.
- **Sampling and Statistical Inference**: using sample means and percents to estimate population means and proportions, attaching margins of errors to our estimates by computing confidence intervals, why randomized sampling is key, etc.
- **Significance Tests**: one sample and two sample z-tests, t-tests, and chi-square tests for goodness of fit and independence, the focus is on understanding how these tests depend on chance models.
- **Limits of Significance Tests**: understanding what the p-value means and under what circumstances it is valid (for example, hypotheses must be stated before looking at the data, the total number of experiments before significant results were found must be reported, etc.)

LON-CAPA Site
http://www.lon-capa.uiuc.edu
All homework and bonus work is submitted and graded immediately on Lon Capa.

Compass Site
https://compass2g.illinois.edu
We're using Compass 2g to post announcements, lecture videos, and display grades. Exams will also be taken on Compass.

Academic Integrity
If you cheat on an exam or attempt to cheat on an exam in this class you're very likely to get caught and the consequences will be **SEVERE**. See the **University Student Code of Conduct**.

You are not allowed to work with other people on exams and you are not allowed to use cheating websites like Chegg. We have multiple versions of all exams that may look identical at first glance but are not. Bottom line is, please don't cheat. It's not worth risking your entire college career and you will get caught. If you are caught, you will get a 0 on the exam and be reported to the university.

DRES Accommodations
I am happy to offer accommodations for disabilities verified through DRES (http://www.disability.illinois.edu/). Please email me a copy of your letter during Week 1. Since all of our exams will be online, I will provide the extra time accommodation for any student who needs it and sends me their DRES letter. If you have any other questions or need any other accommodations, don't hesitate to reach out :)