

Stat 21 Spring 2022 Syllabus

Class and Contact Information

Professor

- Suzanne Thornton, pronouns she/her or they/them.
- You can refer to me as Prof. Suzanne (pronounced “soo-zan” rhymes with “van”) or my nickname Prof. Suzy or as Prof. Thornton.

E-mail

sthornt1@swarthmore.edu

Office Hours

- W - 2:30 - 3:30pm in SCI 136
- Th - 4:00 - 5:00pm on [Zoom](#)
- F - 2:00 - 3:00pm in SCI 136

Live Class Meeting Times

- M/W/F 9:30–10:20am or 11:30am–12:20pm EST

Course Description

Stat 21 is a second course in applied statistics that extends the methods taught in Stat 11. Topics for this semester include chi-squared models and tests, analysis of variance, multiple linear regression, and model building. Both sections of this class are intended to be identical and will be graded together. Note that no prior programming experience is required for this class although we will be using RStudio (a widely used, open source, statistical analysis software interface) regularly.

Prerequisites

AP Stat, Stat 11, Stat 61, Econ 31, or Stat 1 with permission of instructor

Useful Links

- Zoom Office Hours: <https://swarthmore.zoom.us/my/sthornt1>
- Course material: <https://moodle.swarthmore.edu/>
- RStudio: <http://rstudio.swarthmore.edu/>
- Swat VPN:
<https://kb.swarthmore.edu/display/PS/VPN+and+Off-Campus+Access>

Required Material

- The required textbook is *STAT2: Modeling with Regression and ANOVA*, 2nd Edition by Cannon et al.
- A second recommended, but not required, textbook you may find useful is *Regression and Other Stories* by Gelman.
- A laptop or computer with reliable internet access.
- Reliable access to RStudio.

Course Format

This class is structured to encourage statistical literacy which encompasses not only individual comprehension but, importantly, *the ability to communicate statistical analyses*. You are expected to keep up with weekly assignments, some of which are graded for correctness and some of which are completion based, and weekly reading assignments. In class, you will work with a group of 3-4 of your peers. Groups may switch halfway through the semester depending on whether the course stays in-person or goes virtual. Final projects are to be completed with your group, so if you have any problems with your group, please let me know as soon as possible so I can make minor group adjustments early on.

Inclusive Course Expectations

We all come to class with different backgrounds and experiences and this diversity of thought and perspective can enrich our learning environment. Respect for one another's identities and contributions to class discussions is expected of your professor, your peers, and yourself. This commitment will enable us to maintain a supportive learning environment where everyone feels comfortable participating and where we will all grow in our quest for knowledge and understanding.

Grading Policy

Your overall course grade will be determined by the following components.

- **Homework** (33% of overall grade) - There will be 10 total assignments but your two lowest grades will be dropped. Each assignment is worth 4.13% of your course grade.
- **Participation** (14% of overall grade) - Grade will be determined by completion of weekly reflection prompts worth 7% of your course grade and weekly reading quizzes also worth 7% of your course grade.
- **Tests** (33% of overall grade) - There are two in-class midterm tests worth 10% of your course grade each and there is one test during finals week worth 13% of your course grade.
- **Final Project** (20% of overall grade) - There are four components to your final project: a proposal, a poster, a paper, and peer review feedback. Each component is worth 5% of your course grade.

How to get full credit on homework and test questions...

Because communication of technical concepts is such an integral part of being able to actually use statistical methods effectively, I want you to practice the language of statistics both on HW and tests. Here's an example of a question and full credit solution to show you what I mean....

Example) A gambler at a casino decided to play a certain card game. The casino claims that the probability any gambler will win money at the game is

0.45. This particular gambler plays the game 10 times and wins money only twice. Is there statistical evidence that the casino's claim is incorrect?

Answer: With a p-value of approximately 0.2 (note the sample size here is too small for this calculation to be reliable but I'm just using it as an example here), at any typical significance level, say $\alpha = 0.1$ or smaller, the data suggests that we reject the null hypothesis in favor of the alternative. That is, this data provides statistically convincing evidence that the real probability of winning this card game is not the same as the reported probability of 0.45.

An answer that simply states, "At a p-value of 0.2 we reject the null in favor of the alternative" is not sufficient for full credit because it does not interpret the statistical analysis within the context of this particular problem. (What is the null? What's the alternative? What significance level are we using? ect.) A good rule of thumb is to make sure your answer is understandable without anyone having seen the problem setting or question or R output.

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Test Policy

For the two midterm tests in this class, you will have the opportunity to submit test corrections for half credit. These must be completed by the announced deadlines.

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After grading everything, I will round your overall course grades to the nearest whole number and letter grades will be assigned based on the following:

A+	[96, 100]	C+	[75, 79]
A	[93, 95]	C	[70, 74]
A-	[90, 92]	D+	[65, 69]
B+	[86, 89]	D	[60, 64]
B	[83, 85]	F	< 60
B-	[80, 82]		

I may make (positive) adjustments to test grades, however no such adjustments will be made until at least the last week of class.

Late Policy

In general, I do not accept any late work. This includes not only homework assignments but also weekly reflection prompts and reading quizzes. Coding in RStudio can be quite frustrating and time consuming at first so please take this into account when planning when to complete the coding portions of your homework assignments so that this does not prevent you from completing the assignment on time. The same policy applies to course tests and your final project. If something happens during the semester that drastically impacts your ability to keep up with the course material, please reach out to me as soon as possible so that I can help come up with a reasonable solution which may include receiving an INC grade for the course until a later date.

Religious observance or travel plans

If you have a conflict between a religious holiday or travel plans and due dates for course material, you must contact me by the end of February to make appropriate arrangements. After February, no additional arrangements will be granted.

Time management expectations

I have designed the course calendar carefully to enable you to be able to rest during school holidays. However, whether or not you find yourself working on holidays ultimately comes down to your ability to manage your own time. Your professor does not reply to emails on the weekends or during school holidays so please keep this in mind as you plan your work for each week.

Additional Resources

Getting Stats Help

There are several resources available to you if you need assistance in this class. The first resource you have is my *office hours*. These are times set

aside specifically for you so that I can offer you more individualized feedback on any questions you may have. Please use them!

Additionally, the Math/Stats department offers the following types of academic support for this course: (click [here](#) for virtual meeting info)

- [Stat Clinics](#)

Stat Clinics are drop-in study sessions run by friendly and knowledgeable upperclassmen every Monday and Tuesday nights from 7-10 pm in SCI 149, starting the second week of classes. Clinics are a wonderful opportunity to study, do homework, meet/work with classmates, and ask questions about statistics. Because clinics are drop-in, you are welcome to come and go as you please. To make the most of your time, be sure to first try problems on your own, or bring questions you have from your text or class. Having your textbook, lecture notes, and online resources handy is essential because these are helpful resources for both you and the Clinician working with you. There will likely be other students (possibly from other courses) with their own questions for the Clinician, please be open to working on other problems, working with classmates, or doing other coursework while you wait your turn.

- [Stat 21 Muses](#)

Stat 21 Muses are course-specific upperclassmen who hold Study Sessions twice a week: Wednesday and Thursday nights 8-10pm in SCI 158. The Muses holding these sessions will also attend class from time to time to provide support to your instructor and to become familiar with the course material and format. These study sessions are another great opportunity to study, do homework, meet and work with classmates. These sessions are also drop-in and you are welcome to come and go as you please. Again, to make the most of your time at Muse study sessions be sure to first try the problems on your own, or bring questions you have from your text or class. Be well prepared and bring your textbook, lecture notes and online resources to these sessions and do not expect to get individual attention the entire time

you are there. *If you need help specifically with assignments using RStudio for your specific course, the Muses will be better able to assist you than Clinicians. However, if you have general conceptual questions about statistics, either Muses or Clinicians can assist you.*

- In rare cases, if you find that you are still needing statistics help after consistently utilizing as many of the resources mentioned above as you can, you may [request tutoring](#) at no cost.

If you have questions about any of these departmental resources, please visit or contact Laura Dandridge (ldandri1@swarthmore.edu), the Academic Support Coordinator for the Math/Stat Department.

Accessibility Accommodations

If you need formal accommodations for a physical or mental disability or a chronic medical condition, please contact Student Disability Services via e-mail at studentdisabilityservices@swarthmore.edu. As appropriate, the office will issue students with documented disabilities or medical conditions a formal accommodations letter. *Since accommodations require early planning and are not retroactive, please contact Student Disability Services as soon as possible.* For details about the accommodations process, visit the [website](#).

There are freely available [mental health resources](#) through Swarthmore that I encourage you to look into. [It's really difficult to do math with an anxious mind!](#) I have personally experienced the positive impact mental health care has on my own ability to do math and statistics; *there is no shame at all in seeking assistance with this and the potential rewards are great.*