MATH 3070-01: Applied Statistics I  
Fall 2020 Syllabus

Time and Location: Monday, Wednesday, Friday 9:40-10:30 am MDT, online through Zoom

Course Type: Interactive Video Conferencing (IVC – Synchronous Online)

Instructor: Sean Groathouse  
he/him/his pronouns  
preferred name/address: Sean

Email: sean@math.utah.edu

Office Hours: Online through Zoom,  
Mondays 10:30-11:30 am MDT  
Fridays 8:40-9:35 am MDT  
before and after class most days,  
or by appointment.

Course Web Page: I will post all course information and announcements on Canvas: 
https://utah.instructure.com/courses/634152

Prerequisites: C or better in MATH 1220 or MATH 1250 or MATH 1270 or MATH 1311 or MATH 1320 or MATH 1321 or an AP Calculus BC score of at least 4.

Corequisite: Students must be enrolled in an accompanying lab section in order to receive credit for this course. The lab will focus on statistical computing using R. Students must pass the lab component in order to pass the course. Please check the syllabus for your lab section for more information.


Course Description: This course will cover descriptive statistics, basic probability theory, discrete and continuous distributions, joint distributions, point estimation, and confidence intervals and hypothesis testing for one or two samples.

Expected Learning Outcomes: At the end of the course, students will be able to:

- Utilize descriptive statistics, and interpret measures of location and variability.
- Apply the basic properties of probability, and work with conditional probabilities.
- Work with discrete and continuous random variables.
- Be fluent in several standard discrete and continuous probability distributions.
- Work with joint distributions.
- Understand the foundations of point estimation.
- Calculate and interpret confidence intervals based on one or two samples.
- Perform and interpret hypothesis tests based on one or two samples.
Grading: Grades will have the following weights and scale:

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<thead>
<tr>
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<th>Weight</th>
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<tbody>
<tr>
<td>Homework</td>
<td>20%</td>
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<tr>
<td>Labs</td>
<td>20%</td>
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<tr>
<td>Midterm 1</td>
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<td>Midterm 2</td>
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<tr>
<td>Final Exam</td>
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<table>
<thead>
<tr>
<th>Grade</th>
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<tbody>
<tr>
<td>A</td>
<td>[93, 100]</td>
<td>B-</td>
<td>[80, 83]</td>
<td>C+</td>
<td>[67, 70]</td>
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<tr>
<td>A-</td>
<td>[90, 93]</td>
<td>C</td>
<td>[77, 80]</td>
<td>D+</td>
<td>[63, 67]</td>
</tr>
<tr>
<td>B+</td>
<td>[87, 90]</td>
<td>C-</td>
<td>[73, 77]</td>
<td>D</td>
<td>[60, 63]</td>
</tr>
<tr>
<td>B</td>
<td>[83, 87]</td>
<td>C</td>
<td>[70, 73]</td>
<td>E</td>
<td>[0, 60]</td>
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Although I’m not philosophically opposed to curving grades, I find it’s usually not necessary. If I do need to curve the grades, I will explain any modifications to this scale on Canvas.

**Homework:** We will have approximately 11 homework assignments throughout the semester. Homework will be posted through Canvas. To submit the homework, you will be asked to upload either pictures or a scan of your work as a file upload through the Canvas assignment page. The homework assignments will usually be due on Tuesdays by 11:59pm MDT. I understand that sometimes homework cannot be completed on time due to circumstances beyond your control. While I generally will not accept late homework, I will drop the lowest homework score for each student.

**Labs:** Students must also be enrolled in a lab section of Math 3070. The labs introduce students to the statistical software package R, which you can download for free from the internet. Students must pass the lab component in order to pass the course.

**Midterm Exams:** We will have two midterm exams, on October 2 and November 13. A midterm will typically include material covered in class through the previous week. The midterm exams will be given online through Canvas. You may use your notes and the textbook during the exam. You may not work with any other person, or access any websites or online resources during the exam. Any violations to the exam rules may lead to receiving a 0 on the exam, or a 0 in the course. It is required that I report any violations to the department and College of Science, which may result in additional disciplinary procedures.

**Final Exam:** We will have a comprehensive final exam on December 11. The final exam will have more emphasis on the material covered after Midterm 2. The exam will be given online through Canvas, and will have a similar format to the midterms. The same exam rules apply to the final as to the midterms.

**Class Format**

Our class is listed as IVC, meaning that we will meet live during class time but entirely online. We will meet through Zoom. The link and password will be posted on Canvas. If you do not have access to Canvas, please email me, and I will send you the information. Zoom is free to use, but it will require a sufficiently fast internet connection in order to participate in the live classes. Attendance is not required or graded, but attending live will allow for more interactivity and discussions.

During class time, I will use my laptop as a whiteboard while sharing my screen. We will cover concepts, work through examples together, and have time for individual and group work in breakout rooms. Our class meetings will be recorded and uploaded to Canvas, so if you miss a class you can watch it later. I will also post on Canvas a pdf version of the notes that we write during class.

During class, I ask that you please mute your microphone, unless you are speaking. This is not meant to discourage participation; when you have questions or contributions please bring them up! Rather, this is meant to help minimize background noise and audio feedback that can result from several people having their microphones on at the same time.
Additional Covid-19 Specific Information:

Should another stay-at-home order go into place, the structure of this course should not be affected. However I can imagine that for some students, a stay-at-home order may come with additional burdens. If you are in this case, please let me know, and I will work with you individually to come up with solutions.

If I happen to get sick, I will arrange an alternative instructor. Should one of you happen to get sick please let me know, and we will work out an arrangement for future homework assignments and exams. A reminder that all students, faculty, and staff who are given a positive COVID diagnosis must self-report at coronavirus.utah.edu

Fall break was originally scheduled to run from October 4-11 but has since been cancelled. From September 27 through October 11, all classes will be delivered online. All classes will also be online the week after Thanksgiving break, from November 30 through the last day of classes on December 3. Since our course is entirely online, the format and schedule for this course will remain the same during these periods.

Class Policies

- Since our class is operating through Canvas, it is crucial that you either check Canvas regularly or have Canvas notifications forwarded to an email that you do check.

- Please make sure you do your best throughout the semester, knowing the grading scheme and what’s expected of you, and talk to me if you need further study strategies. I am happy to brainstorm ideas to help you maximize your study strategies and improve your mathematical understanding. No extra credit will be provided at the end of the course, so please talk with me early on about any concerns with your grade, so we have time to address them.

- If you have crisis-level extenuating circumstances which affect your class performance, and you need guidance/advice/flexibility, please communicate with me as soon as possible so I can help you in some manner, which I’m truly happy to do. The longer you wait to communicate with me, the less I can do to help.

- If you want to appeal the grading of a homework assignment or exam, I ask that you please bring it to me within one week of it being returned. This policy helps me maintain consistency in grading and helps make sure I can address any grading issues before the final grades are submitted. I’m always happy to look over any classwork with you, answer any questions you have, and fix any grading issues when appropriate.

- It is possible during the semester that I may need to modify this syllabus to help meet the learning goals of our class. If I do need to make any changes, I will announce them on Canvas.

Other Policies and Resources

**Math Tutoring Center:** Please do not hesitate to come to office hours or contact me with any questions you have or to discuss anything about the course. Additionally, the T. Benny Rushing Mathematics Tutoring Center offers free online tutoring. The website can be found here: https://www.math.utah.edu/undergrad/mathcenter.php

**Private Tutoring:** The Learning Center has additional tutoring available for our class. Their website can be found here: https://learningcenter.utah.edu/
The math department also maintains a list of private tutors.
Student Names and Personal Pronouns: Class rosters are provided to the instructor with the students’ legal name as well as preferred first name (if previously entered by you in the Student Profile section of your CIS account). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise me of any name or pronoun changes (and update CIS), so I can help create a learning environment in which you, your name, and your pronoun will be respected. If you need assistance getting your preferred name on your U-ID card, please visit the LGBT Resource Center Room 409 in the Olpin Union Building, or email bpeacock@sa.utah.edu to schedule a time to drop by. The LGBT Resource Center hours are M-F 8am-5pm, and 8am-6pm on Tuesdays.

Veterans Center: If you are a student veteran, the University of Utah has a Veterans Support Center located in Room 161 in the Olpin Union Building. Hours: M-F 8:00am – 5:00pm. Please visit their website for more information about what support they offer, a list of ongoing events and links to outside resources: http://veteranscenter.utah.edu/. Please also let me know if you need any additional support in this class for any reason.

Center for Student Wellness: Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., may interfere with a student’s ability to succeed and thrive at the University of Utah. For helpful resources, contact the Center for Student Wellness: https://wellness.utah.edu/

ADA Statement: The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, (801) 581-5020. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

Addressing Sexual Misconduct: Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veterans status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

Faculty and Student Responsibilities: All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know that they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty’s responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee. See http://regulations.utah.edu/academics/6-400.php
Safety Statement: The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

Important Dates: We will meet for class every Monday, Wednesday, and Friday except for these days:

Monday, September 7 (Labor Day holiday)
Friday, November 27 (Thanksgiving Break)

Last day to add, drop, or elect Credit/No Credit . . . . . . . Friday, September 4
Midterm 1 ................................................................. Friday, October 2
Last day to withdraw ........................................... Friday, October 16
Midterm 2 ................................................................. Friday, November 13
Last day to reverse Credit/No Credit ............... Friday, November 27
Final Exam ................................................................. Friday, December 11

Tentative Schedule:

Week 1 (8/24–8/28) Chapter 1 Descriptive Statistics, start Chapter 2
Week 2 (8/31–9/4) Chapter 2 Probability
Week 3 (9/9–9/11) Chapter 3 Discrete Random Variables
Week 4 (9/14–9/18) Chapter 3 Discrete Random Variables
Week 5 (9/21–9/25) Chapter 4 Continuous Random Variables
Week 6 (9/28–10/2) Chapter 4 Continuous Random Variables, Midterm 1
Week 7 (10/5–10/9) Chapter 5 Joint Probability Distributions
Week 8 (10/12–10/16) Chapter 5 Joint Probability Distributions
Week 9 (10/19–10/23) Chapter 6 Point Estimation
Week 10 (10/26–10/30) Chapter 7 Statistical Intervals
Week 11 (11/2–11/6) Chapter 8 Hypothesis Test Based on One Sample
Week 12 (11/9–11/13) Chapter 8 Hypothesis Test Based on One Sample, Midterm 2
Week 13 (11/16–11/20) Chapter 9 Inference Based on Two Samples
Week 14 (11/23–11/25) Chapter 9 Inference Based on Two Samples
Week 15 (11/30–12/2) Catch-up/Review
Week 16 (12/7–12/11) Final Exam

Note: This is an approximate schedule, and I may need to adjust the pace for the learning needs of our class.