

Applied Statistics I

Math 3070-001, Summer 2019

Class meets: 05/13/2019 to 07/05/2019

Time: MoTuThFr / 08:30AM-10:00AM

Holidays: Monday, May 27 (Memorial Day) & Thursday, July 4 (Independence Day)

Place: LCB 222

Instructor: Sung Chan Choi, JWB 121

Email: choi@math.utah.edu

Office Hours: M, T, H 10 AM-10:55AM LCB 222, or appointment

Tutoring, Computer Lab, and Printing:

Free tutoring and free printing are available in the T. Benny Bushing Mathematics Center, located between LCB and JWB. The regular hours is M-Th 8:00am - 8:00pm, Fri 8:00am - 6:00pm.

See <http://www.math.utah.edu/ugrad/mathcenter.html> .

Text: Jay L. Devore, Probability and Statistics for Engineering and the Sciences, Ninth Edition, Cengage Learning, 2016. (Required)

Course Description:

MATH 3070 teaches the fundamentals of probability theory and principles of data analysis (including visualization and interpretation of data, data collection, statistical model building, roles of parameters, estimation theory and hypothesis testing). The general methodology is illustrated and supplemented by several data examples from engineering, chemistry, social and life sciences. Students are encouraged to participate in the classroom discussions.

The course comes with a computer lab. R statistical software is used to teach the students how theoretical considerations apply to real data. Students are introduced to statistical software, learn how to combine several R packages, test statistical software, and perform simulations including Monte Carlo and data driven simulations.

The data sets include changes in river flows, quality control, comparing traffic flow observations from several years and/or different locations, the role of gender in university admission and some financial data sets.

The students learn to get the data from several sources, including the Internet. Assignments include the study of a data set. The data analysis and computing skills learned by students in this course are highly valued in the modern world.

The data analysis assignments are written as reports, explaining the data, the question which should be answered by the data analysis, the methodology used and the conclusion. Thus, the students practice how to write scientific reports, where the first part should be understandable for even non-experts. Graphical interpretation of the data is almost always included. The students present their findings in the classroom.

Tentative Course Outline:

In this course, we will cover chapters 1 through 9 of Devore's book. This will cover:

1. Descriptive statistics and basic visualization
2. Probability Theory
3. Discrete random variables and probability distributions
4. Continuous random variables and probability distributions
5. Joint probability distributions and random samples
6. Point estimation
7. Statistical intervals based on a single sample
8. Tests of hypotheses based on a single sample
9. Inferences based on two samples

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

Requirement Designation: This is a lecture course in statistics. Students must be enrolled in the accompanying lab section in order to receive credit for this course. The lab will focus on statistical computing using R.

Grade Distribution:

R Lab	15%
Homework	10%
Quizzes	20%
Midterm Exam 1	15%
Midterm Exam 2	15%
Final Exam	25%

Grading Scale:

≥ 93	A	73 - 76	C
90 - 92	A-	70 - 72	C-
87 - 89	B+	67 - 69	D+
83 - 86	B	63 - 66	D
80 - 82	B-	60 - 62	D-
77 - 79	C+	≤ 59	E

Course Policies:

- **General**

- Exams are closed book, closed notes.
- You will need a calculator for this class. I do not have any preference regarding which calculator would be most useful, so you're welcome to choose for yourself. I will allow calculators on exams. No cell phone calculators will be allowed.
- **No makeup exams will be given** except in the case of a documented emergency.

- **Weekly Homework**

- I will collect homework during the first class of each week. All of the homework assigned the previous week is due at that time.
- All homework must be written in a neat and organized form and **stapled** together. If you do **not staple** together or do **not write homework number and your name**, **5 points will be taken off**. A non-stapled or non-organized homework will hinder our from grading because the class size is big.
- I will choose 5 problems from weekly homework assigned then they will be graded for correctness. Each selected problem will be worth 5 points. To get 5 points for correctness, you **MUST** show all your work! If you turn in just the answers, with no work shown, you will get a 0 point for **correctness**.
- So total score will be worth the sum of completeness and correctness. For example, if you have 24 points for completeness and 23 points for correctness then your total score will be 47.
- **Late homework will NOT be accepted**. But **2 lowest scores** will be dropped at the end of this semester.

- **Daily Quizzes**

- Quiz will be given daily with one or two problems on the topic of the previous class in class.
- 5-7 minutes will be given.
- You will need a calculator for this class. I do not have any preference regarding which calculator would be most useful, so you're welcome to choose for yourself. I will allow calculators on exams. No cell phone calculators will be allowed.
- **No makeup** quiz will be given. But **3 lowest scores** will be dropped at the end of this semester.

- **Midterms**

- There will be two in-class midterm exams.
- **6/3(M) and 6/24(M)** in the regular classroom
- You will need a calculator for this class. I do not have any preference regarding which calculator would be most useful, so you're welcome to choose for yourself. I will allow calculators on exams. No cell phone calculators will be allowed.
- **No makeup exams will be given** except in the case of a documented emergency. Please contact the instructor ASAP, or at least two classes ahead of time so that the instructor and student can make arrangements to make up the test. I reserve the right to make makeup exams more difficult than the scheduled exam.

- **Final**

- The comprehensive final exam will be on **July 5(F), from 8 am to 10 am**.
- LCB 222

- **Other Policies**

- There will be no retakes of exams . . . ever. Your score is what you get.
- You may take an alternate exam if you submit a documented verification about it to me first and explain the extenuating circumstances that make it necessary. Needing to work, babysitting your siblings, oversleeping, or needing more time to study do not pass as acceptable reasons.
- I will demand respectful behavior in my classroom. Examples of disrespect include reading a newspaper or magazine in class, social chatting with your friend in class, text-messaging your buddies during class or cuddling with your girl/boyfriend in class.
- There will be no cursing nor negative ranting (for example, "math sucks") on any written work turned in. The penalty for such things on your written work will be a zero score on that assignment or test!
- You need to have a valid email address registered with Campus Information System.
- You need to check CANVAS everyday.
- 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. You 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, collusion, fraud, theft, etc. Students should read the Code carefully and know you are responsible for the content. According to Faculty Rules and Regulations, it is the faculty 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>
- I reserve the right to change my policies stated in this syllabus at some point in the semester. If I do make a change to a policy, I will announce it in class and send the change in email.

Other Important Dates:

You may add, drop (delete), elect CR/NC, and audit workshops, miscellaneous, and short term classes according to the Deadlines for Courses with Irregular Start & End Dates policy chart.

See <https://registrar.utah.edu/academic-calendars/summer2019.php>

ADA:

The American with Disabilities Act requires that reasonable accommodations be proved for students with physical, cognitive, systemic learning, and psychiatric disabilities. The student needs to have such a disability approved by the Disability Service Office (162 UNION, 581-5020) in order to have the accommodations provided. The instructor need to be informed about such a disability and approved accommodations at the beginning of the semester.