
COURSE SYLLABUS
Math 338-03: Statistics Applied to Natural Sciences (4 units)
Course Numbers: 18146
Spring 2020

Instructor: Dr. HeeJeong Lim
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Class Hour: TR 8:30 - 9:45 am (Classroom: MH 491)
Lab Hour: TR 10:00 - 10:50 am (Lab: MH 452)

Office Hour: 8:00-8:30 am & 11:00-11:30 am & 2:00-2:30 pm. Also by appointment.

Prerequisite: Math 130 or 150B or consent of instructor

Textbook: Introduction To The Practice of Statistics by Moore, McCabe and Craig.
9th Edition. W. H. Freeman and Company. ISBN-13: 9781319137533

Required in the Course

- **Calculator:** scientific calculator (TI83 or higher recommended) **Note:** For the tests, cell phones or PDA calculators of any sort are forbidden.
- **Titanium:** The course will use the campus TITANium site for informational purposes. All handouts/solutions and grades will be posted on the Titanium
- **Lecture Notes**: Lecture notes are available from the Titanium
- **Software:** We will use the statistical software **R/RStudio**.
  - R can be downloaded for free from http://cran.us.r-project.org/.
  - RStudio can be downloaded for free from https://www.rstudio.com/

Course Description:

The basics are covered: what to look for when you plot data, what makes a good scientific study, how to interpret your results, what you can and cannot say based on your study design, is that claim of “clinically proven to enhance weight loss” correct. Students will gain an understanding of statistical principles and their use. Students will also gain experience in collecting data and learn how to summarize data using graphical and numerical techniques, apply basic probability rules and perform standard statistical analyses for one and two variables

Course Topics: Descriptive Statistics; Statistical Measures; Scatter Plots; Correlation and Regression; Sampling Schemes, Probability and probability Models; Mean and Variance; The Normal and Binomial Distributions; Some Other Distributions; Sampling Distributions; Confidence Intervals; Tests of hypotheses, Comparing Two Means; Two-Way Tables (Contingency Tables), Multiple Linear Regression, ANOVA

Course Evaluation:

Lab & Project	Exam 1	Exam 2	Exam 3	Final Exam
20%	50%			30%
Every Lab	Tue, Feb 25	Tue, Apr 7	Thu, Apr 30	Tur, May 14 9:00–10:50 am

Your final letter grade will be determined from your course percentage as shown below. There shall be NO extra credits nor border-line consideration.

A+	98% - 100%		B+	88% - 89.9%		C+	77% - 79.9%
A	93% - 97.9%		B	83% - 87.9%		C	68% - 76.9%
A-	90% - 92.9%		B-	80% - 82.9%		D	58% - 67.9%

Note: A grade of "C" (2.0) or better is required to meet the GE requirement.

1. Lab Assignments

- Lab assignments are given in almost all lab sessions. If you are not present in the lab on the day the lab is assigned, a zero will be given for the lab assignment.
- Once you finish the lab work, you can submit it and leave early. Otherwise, you must stay in the lab to finish it.
- One make-up lab assignment will be given for the semester and you should ask it by the end of the day.

2. Projects

- There are several projects (data exploration & statistical analysis) using R/RStudio (statistical software). .
- For the projects, your work must be all typed (no handwriting) and you must submit it online (Titanium).

3. Three Midterm Exams and a Comprehensive Final Exam

- Each exam will contain some free response and some multiple choice problems.
- For free response questions, you must show your work or provide enough explanation to receive any partial credit. I will give a zero if you don't show your work or don't explain. Grading is only based on what you show me.

Math Department ADD/DROP Dates

- Feb 4 (Tue)**:** Last day for students to ADD with a permit. All permits expire at midnight on February 4
- Feb 4 (Tue): Last day for students to DROP without a grade of "W". Students drop using Titan Online
- Feb 17 (Mon): Last day the Math Department will be flexible on the approval of non-medical withdrawal requests. Beginning Tuesday, February 18, students must have a serious and compelling reason for non-medical withdrawal request and must provide supporting documentation for their reason
- Apr 17 (Fri): Last day to withdraw with a truly and compelling reason that is clearly beyond the student's control. Students must document their reason.

Disability Support Services (DSS)

During the first week of classes, inform me of any disabilities or special needs that you have that may require special arrangements related to attending class sessions, carrying out writing assignments or service learning component, or taking examinations. Students with disabilities may receive assistance and support services through the Disability Support Service Office, UH-101, 657-278-3117, www.fullerton.edu/disabledservices

General Instruction

- Per the policy on Initial Class Meeting in the University catalog, the Instructor may drop a student if the student is absent without notifying the instructor or departmental office within 24 hours after any meeting missed during the first week.
- Disruptive behaviors shall be avoided in the class. You may be asked to leave the class if your behavior is disrupting the class.
- The student is responsible for any announcement or information provided or announced by the instructor in the class or on Titanium.
- The instructor reserves the right to change or amend the syllabus of the course, after announcing it in the class.

Academic Integrity

Students who violate university standards of academic integrity are subject to disciplinary sanctions, including failure in the course and suspension from the university. (see http://hhd.fullerton.edu/MSW/documents/StudentHandbook.pdf).

Examples of actions that constitute academic dishonesty include, but are not limited to:

- **Unacceptable examination behavior** – communicating with fellow students, copying material from another student's exam or allowing another student to copy from an exam, possessing or using unauthorized materials, or any behavior that defeats the intent of an exam

- **Unauthorized collaboration** on a project, homework or other assignment
- **Plagiarism** – taking the work of another and offering it as one's own without giving credit to that source, whether that material is paraphrased or copied in verbatim or near-verbatim form
- **Documentary falsification** including forgery, altering of campus documents or records, tampering with grading procedures, fabricating lab assignments, or altering medical excuses

Learning Goals for the General Education Category:

This course achieves all of the general education learning goals of category III A.1 of the Mathematics Department. This course achieves all of the general education learning goals in this category.

- To understand and appreciate the varied ways in which mathematics is used in problem-solving
- To understand and appreciate the varied applications of mathematics to real-world problems
- To perform appropriate numerical calculations, with knowledge of the underlying mathematics, and draw conclusions from the results
- To demonstrate knowledge of fundamental mathematical concepts, symbols, and principles
- To solve problems that requires mathematical analysis and quantitative reasoning
- To summarize and present mathematical information with graphs and other forms that enhance comprehension
- To utilize inductive and deductive mathematical reasoning skills in finding solutions, and be able to explain how these skills were used
- To explain the overall process and the particular steps by which a mathematical problem is solved
- To demonstrate a sense of mastery and confidence in the ability to solve problems that requires mathematical concepts and quantitative reasoning

Two broad goals of the course are to provide students an appreciation of the very important role of the field of statistics in empirical research, and to teach students to use some useful statistical methods in empirical research. Particular goals of the course are

- To learn basic techniques for exploring and describing data sets
- To understand and appreciate the importance of how data are produced and the difference between experimental and non-experimental studies
- To learn basic inferential methods, understand why they work, and appreciate their basic theoretical properties
- To learn use of a statistical software, such as R (Rstudio)

Emergency Evacuation: In the event of an emergency such as earthquake or fire:

- Take all your personal belongings and leave the classroom. Use the stairways located at the east, west, or center of the building.
- Do not use the elevator. They may not be working once the alarm sounds.
- Go to the lawn area towards Nutwood Avenue. Stay with class members for further instruction.
- For additional information on exits, fire alarms and telephones, **Building Evacuation Maps** are located near each elevator.
- Anyone who may have difficulty evacuating the building, please see the instructor.

Tentative Schedule

Week	Date (Tue)	Section(s)		Date (Thu)	Section(s)
1	Jan 21	Introduction		Jan 23	1.1, 1.2
2	Jan 28	1.2, 1.3		Jan 30	1.3, 1.4
3	Feb 4	1.4		Feb 6	2.1, 2.2, 2.3, 2.4
4	Feb 11	2.4, 2.6, 4.2		Feb 13	4.5
5	Feb 18	Catch-up		Feb 20	4.5, Review
6	Feb 25	**Exam 1**		Feb 27	4.3
7	Mar 3	4.3, 4.4		Mar 5	4.4, 5.1
8	Mar 10	5.2, 5.3		Mar 12	6.1, 6.2
9	Mar 17	6.2, 6.3		Mar 19	6.3, 6.4
10	Mar 24	6.4, 7.1		Mar 26	7.1, Review
11	Mar 31	**Spring Break!!**		Apr 2	**Spring Break!!**
12	Apr 7	**Exam 2**		Apr 9	7.2
13	Apr 14	7.2		Apr 16	7.2, 8.1
14	Apr 21	8.1, 8.2		Apr 23	8.2, 9.1
15	Apr 28	9.2, Review		Apr 30	**Exam 3**
16	May 5	Chapters 10, 11		May 7	Chapters 10, 11
Final Exam: MH 491, 9:00 – 10:50 am, May 14 (Thur)					

Note: Please be advised that the schedule is tentative and may be subject to change for the best interest of all students in the class. Changes will be announced in class.