Columbia University
Calculus-Based Introduction to Statistics
Statistics UN1201 section 001
517 Hamilton, Mon/Wed 8:40-9:55am

Instructor: Joyce Robbins   Fall 2017
Email: jtr13@columbia.edu   Office hours: Wed., 11:30am-1:00pm
Tel: 212-853-1391   603 Watson Hall: 612 W. 115th St.

Course description

This introductory course is designed for students who desire a strong grounding in statistical concepts, and has a greater degree of mathematical rigor than STAT W1101. Topics include: graphical and numerical summaries of data; the normal distribution, probability, random variables, and sampling distributions; estimation and hypothesis testing for means and proportions; comparing two populations; two-way contingency tables; introduction to linear regression. This course serves as the pre-requisite for ECON W3412.

Resources and readings

Required text:

Devore, Jay L. 2016. *Probability and Statistics for Engineering and the Sciences*. 9th edition.
ISBN:9781305251809

Grading procedures

Grades will be determined as follows:

Homework	180 points (9 x 20 points)
Class problem	20 points (will be explained in class)
Test #1	200 points
Test #2	200 points
Final	400 points

Grading scale

(Final averages will be determined by dividing total points by 100 and rounding to the nearest integer. Do not rely on any averages that appear in CourseWorks since they may not be accurate for various reasons.)

98 or more	A+	77 - 79	C+
93 - 97	A	73 - 76	C
90 - 92	A-	70 - 72	C-
87 - 89	B+	60 - 69	D
83 - 86	B	59 and below	F
80 - 82	B-		

Class policies

Homework

Unless otherwise indicated, assignments must be submitted on CourseWorks as a **single pdf file** -- TurboScan or similar phone apps can be used for this purpose.

Homework will be due most Mondays, beginning on Sept. 18 (see schedule below).

Homework must be submitted by 11:59pm on the due date for full credit. Late assignments will only be accepted for the **first 24 hours after the assignment is due, and 4 points will be deducted. After this 24 hour period, CourseWorks will no longer accept homework submissions**.

If you submit more than one assignment, the last one will be counted.

Be sure that homework is clearly labeled and legible.

You are encouraged to discuss homework problems with your classmates, but all work submitted must be your own. If multiple students turn in identical solutions, all of them will receive a zero.

Academic Integrity: Plagiarism or any other breach of academic integrity will not be tolerated and will result in disciplinary action. For more information please refer to the *The Columbia University Undergraduate Guide to Academic Integrity*:

> http://www.college.columbia.edu/academics/academicintegrity

Tests: Tests, including the final, are cumulative, with a greater emphasis on newer material. Allowable materials include pens, pencils, erasers, a hand-held calculator, and a single (two-sided) 8.5" x 11" sheet of original handwritten notes for the first two tests, and two sheets (each two-sided) for the final. *Make-up tests will only be administered in cases of documented emergencies.*

Getting help
There are numerous opportunities to get assistance with the class material:

1. Ask questions during class.

2. Ask questions after class (I will stay after every class if students have questions.)

3. Attend a Statistics Help Room session where Statistics Ph.D. answer questions for students in introductory level statistics classes. Hours and locations are posted here: http://stat.columbia.edu/help-room/

4. Discuss the material with classmates in person or on Piazza. Instructions on how to join will be provided on CourseWorks.

Class schedule

Week	Date	Topics	Textbook
1	Wed 9/6	Graphical summaries of data	1.1-1.2
2	Mon 9/11 Wed 9/13	Numerical summaries of data Probability	1.3-1.4 2.1-2.3, 2.5
3	Mon 9/18* Wed 9/20	Discrete random variables Expected values	3.1-3.2 3.3
4	Mon 9/25* Wed 9/27	Binomial and related distributions Continuous random variables	3.4-3.6 4.1-4.2
5	Mon 10/2* Wed 10/4	Normal and other continuous distributions The sampling distribution of a mean	4.3-4.5 5.3-5.5
6	Mon 10/9 Wed 10/11	**Test #1** Point estimation	 6.1-6.2
7	Mon 10/16* Wed 10/18	Confidence intervals Confidence intervals for means and proportions	7.1 7.2-7.3
8	Mon 10/23* Wed 10/25	Hypothesis testing Hypothesis tests for means	8.1 8.2-8.3
9	Mon 10/30* Wed 11/1	Hypothesis tests for proportions Comparing two means	8.4-8.5 9.1-9.3
10	Mon 11/6 Wed 11/8	**No classes (Columbia-wide)** **Test #2**	
11	Mon 11/13 Wed 11/15	Comparing two proportions Conditional probability	9.4 2.4-2.5
12	Mon 11/20* Wed 11/22	Joint probability distribution **No classes (Columbia-wide)** (*Thanksgiving*)	5.1-5.2
13	Mon 11/27* Wed 11/29	Inference in two-way tables Correlation	14.3 5.2, 12.5
14	Mon 12/4* Wed 12/6	The simple linear regression model Regression with transformed variables	12.1-12.2 13.1, 13.2
15	Mon 12/11	Review	

* = homework due