

COURSE SYLLABUS

YEAR COURSE OFFERED: 2017

SEMESTER COURSE OFFERED: Fall 2017

DEPARTMENT: MATH

COURSE NUMBER: 3339

NAME OF COURSE: Statistics for the Sciences

NAME OF INSTRUCTOR: Rebecca George <https://www.math.uh.edu/~bekki>

The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

Course Description

- Graphical and descriptive methods in statistics, probability, random variables and distributions, sampling, estimation, hypothesis testing, regression, analysis of variance, exploratory and diagnostics, statistical computing.
- Credits: 3 hours
- Prerequisite: MATH 1432

Learning Objectives

The student will be able to:

- Demonstrate the ability to understand basic theory of probability and statistics.
- Understand fundamentals of probability, distribution theory and sampling models.
- Interpret statistical data.
- Understand statistical inference and interpretation.
- Apply statistical concepts to actual scientific data using some sort of computer software.

Instructor Information

- Instructor: Rebecca George
- Office: 206 PGH
- Office/conference Hours: M 11:00 am - 12:30 pm & Tu 3:00 – 4:00 pm
For other times make an appointment at least 24 hours in advance
- Email: bekki@math.uh.edu

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Major Assignments/Exams

ASSESSMENTS

Poppers	10%
Online Quizzes	15%
Homework	15%
Exams (2 exams)	30% (15% each)
Final Exam	30%

Note: The percentage grade on the final exam can be used to replace your lowest test score.

GRADING SCALE

90% and above - A

at least 80% and below 90% - B

at least 70% and below 80% - C

at least 60% and below 70% - D

below 60% - F

INSTRUCTIONS FOR POPPERS

- For each lecture starting on the third week of classes (September 5th) you will be asked a series of problems that will have to do with the lecture.
- This requires a buying a poppers package from the bookstore. Make sure that the package is for section 3339 -03 (21155).
- You are required to fill in your id number, popper number and blacken the correct circles. Make sure that your id number and popper number are correct before turning in the popper at the end of the lecture. If these are not filled out correctly or if the darken circles are too light you will not get credit for that day's lecture even if you attended.
- The total number of questions for the course will be counted, 80% of the total number of questions will be the 100%. For example, if there are 5 questions each class for 24 classes, which is 120 questions. Your grade will be calculated out of $120(.8) = 96$ points.

INSTRUCTIONS FOR QUIZZES

- The quizzes are located in the CASA CourseWare course website under the "Online Assignments" tab.
- The quizzes will close Fridays on the due dates given at 11:59 pm starting on September 1st.
- One of the lowest quizzes will be dropped.
- You have 20 times to take each quiz.
- There is a 90 minute time limit for each quiz.
- The following table shows what sections each quiz covers.
- All of the quizzes are open starting the first day of classes.

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Quiz	Topics Covered	Textbook Sections	Date Closed
Quiz 1	Counting Techniques and Introduction to Probability	3.1 – 3.3	9/1
Quiz 2	Probability Rules, Independence and Bayes Rule	3.4 – 3.6	9/8
Quiz 3	Distributions and Descriptive Statistics	2.1 – 2.2	9/15
Quiz 4	Bivariate Descriptive Statistics	2.3 & 8.1 – 8.2	9/22
Quiz 5	Discrete Distributions, Binomial	4.1 – 4.5	9/29
Quiz 6	Poisson, Hypergeometric, and Joint Distributions	4.6 – 4.8	10/6
Quiz 7	Continuous Distributions, Uniform, Gamma and	5.1 – 5.4	10/13
Quiz 8	Normal Distributions and Sampling Distributions	5.5 & 6.1 – 6.5	10/20
Quiz 9	Confidence interval for one sample mean	7.1 – 7.3	10/27
Quiz	Hypothesis tests for one sample mean	7.7 – 7.9	11/3
Quiz	Inference for one sample proportion and variance	7.4, 7.6 & 7.10	11/10
Quiz	Inference for two means and ANOVA	9.1 – 9.3	11/17
Quiz 13	Inference for two proportions, Chi-square test	10.2 – 10.3	11/26 (Monday)
Quiz 14	Inference for regression parameters	8.3 – 8.4	12/1

INSTRUCTIONS FOR HOMEWORK

- There are weekly assignments due every Wednesday starting on September 6th.
- Each homework assignment is worth 15 points.
- You will submit the homework in the CASA CourseWare website. See [Instructions to upload homework in CASA](#) for how to upload the homework.
- Two of the lowest homework scores will be dropped.

Assignment	Topics Covered	Textbook Sections	Due Date
Homework 1	Probability	3.1 – 3.6	September 6
Homework 2	Distributions and Descriptive Statistics	2.1 & 2.2	September 13
Homework 3	Bivariate Descriptive Statistics	2.3 & 8.1 – 8.2	September 20
Homework 4	Discrete Distributions, Binomial	4.1 – 4.5	September 27
Homework 5	Poisson, Hypergeometric & Joint Distributions	4.6 – 4.8	October 4
Homework 6	Continuous Random Variables, Exponential & Gamma Distributions	5.1 – 5.3	October 11
Homework 7	Normal and Sampling Distributions	5.5 & 6.1 – 6.5	October 18
Homework 8	Introduction to inference, confidence interval for one sample mean	7.1 – 7.3	October 25
Homework 9	Introduction to hypothesis tests, hypothesis tests for one sample mean	7.7 – 7.9	November 1
Homework 10	Confidence interval for one sample proportion and variance	7.4, 7.6 & 7.10	November 8
Homework 11	Two sample T-test, matched paired and ANOVA tests	9.1 – 9.3	November 15

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Homework 12	Two sample test for proportions, Chi-square tests	10.2 -10.3	November 21 (Tuesday)
Homework 13	Inference for regression parameters	8.3 – 8.4	December 1 (Friday)

LATE ASSIGNMENT, MAKE-UP AND INCOMPLETE POLICIES

- This course is a cumulative course. You as a student need to keep up with the reading, homework assignments and exams. Thus late work or make-ups will not be accepted.
- The following is calculated for the final grade:
 - Two of the lowest homework assignments are dropped.
 - One of the lowest online quizzes are dropped.
 - 80% of the total number of popper questions will be the 100%.
 - Two of the weekly discussion board points will be dropped.
 - The final exam score can replace the lowest exam score out of three.
- Incomplete policy: A notation of "incomplete" may be given in lieu of a final grade to a student who has carried a subject successfully until the end of a semester but who, because of illness or other unusual and substantiated cause beyond the student's control, has been unable to take or complete the final examination or to complete some limited amount of term work.

Exam Information

MIDTERM EXAMS

Test 1: Textbook Sections Covered: Chapter 1 – 4.5, 8.1 & 8.2 - September 28 – 30

Test 2: Textbook Sections Covered: 4.6 – 7.10 - November 9 - 11

- The test will be given in CASA located on the second floor of Garrison or in CBB, see the exam scheduler for details.
- You can access the scheduler for these exams by logging into Courseware.
- The exams given in CASA will consist of both multiple choice and written questions.
- The multiple choice questions will be machine graded.
- The written questions (free response) will be graded by the instructors and teaching assistants.
- The scheduler will be available approximately 2 weeks prior to the start of the exam cycle. Exam dates are listed above.

FINAL EXAM

- A comprehensive final exam will be given in CASA.
- You can access the scheduler for this exam by logging into Courseware.
- Dates: **December 8 - 10**

Required Reading

- Course webpage: <https://www.math.uh.edu/~bekki>
- The textbook, online quizzes, and additional help materials will be made available by logging into CourseWare at <http://www.casa.uh.edu>. The first portion of these materials are freely available for the first two weeks of class. All students must purchase a Course Access Code and enter it on CourseWare by the beginning of the third week (September 3rd) of class to continue accessing the course learning materials. A Course Access Code must be purchased for \$55 from the University Bookstore.

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List of discussion/lecture topics

This table is tentative and may need to be updated during the semester. Updates will be announced in lecture and posted on the course website.

Week	Dates	Textbook Sections	Topics
Week 1	August 21 – 26	Chapter 1, 3.1 & 3.2	Sample, Population, Types of Variables, Types of Experiments, Introduction to Probability, Sample Spaces, Counting Rules
Week 2	August 27 – September 2	3.3 – 3.6	Probability Rules, Independence, Bayes' Theorem
Week 3	September 3 – 9	2.1 & 2.2	Univariate Descriptive Statistics (Central Tendency, Spread, Percentiles and Quantiles, Histograms, Boxplots, Stem-and-Leaf)
Week 4	September 10 – 16	2.3, 8.1 & 8.2	Bivariate Descriptive Statistics (Scatterplot, Covariance, Correlation, Least Squares Regression)
Week 5	September 17 – 23	4.1 – 4.5	Discrete Probability Distributions, Bernoulli, Binomial
Test 1	September 28 – 30	Chapter 1 – 4.5, 8.1 & 8.2	
Week 6	September 24 – 30	4.6 – 4.8	Poisson and Hypergeometric, Joint Probability Distributions
Week 7	October 1 – 7	5.1 – 5.4	Continuous Distributions, Uniform, Exponential, Gamma Distributions
Week 8	October 8 – 14	5.5, 6.1 – 6.5	Normal Distributions, Sampling Distributions
Week 9	October 15 – 21	7.1 – 7.3	Introduction to Inference, Confidence intervals for one sample mean
Week 10	October 22 – 28	7.7 – 7.9	Introduction to Hypothesis testing, hypothesis for one sample mean
Week 11	October 29 – November 4	7.4, 7.6, & 7.10	Confidence interval and hypothesis tests for one sample proportion, Confidence Interval for variance.
Test 2	November 9 – 11	4.6 – 7.10	
Week 12	November 5 – 11	9.1 – 9.3	Inference for matched pairs, two sample mean, ANOVA
Week 13	November 12 – 18	Notes, 10.2 & 10.3	Inference for two sample proportions, Chi-square goodness of fit, Chi-square test for independence
Week 14	November 19 – December 2	8.3 & 8.4	Inference for Regression Parameters
Final	December 8 – 10	Cumulative	

Computer Requirement

- Knowledge of a statistical package is an indispensable part of the modern statistics. The class presentations, some homework assignments, and the exams are computer based.
- The statistical package R-studio is used in this class for exploring statistical concepts and demonstrating statistical analysis of actual data useful for business decisions. No previous knowledge of this software is assumed.
- This software is a free package that you can download on to your personal computer. This will be available to you for your exams in CASA.

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- You first need to download R: <http://cran.cnr.berkeley.edu/>
- Then you can download Rstudio: <https://www.rstudio.com/>

CSD/Academic Accommodation

- **Academic Adjustments/Auxiliary Aids:** The University of Houston System complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, pertaining to the provision of reasonable academic adjustments/auxiliary aids for students who have a disability. In accordance with Section 504 and ADA guidelines, University of Houston strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you believe that you have a disability requiring an academic adjustments/auxiliary aid, please visit The [Center for Students with DisABILITIES \(CSD\)](#) website at <http://www.uh.edu/csd/> for more information.
- **Accommodation Forms:** Students seeking academic adjustments/auxiliary aids must, in a timely manner (usually at the beginning of the semester), provide their instructor with a current [Student Accommodation Form \(SAF\)](#) from the CSD office before an approved accommodation can be implemented.

Details of this policy, and the corresponding responsibilities of the student are outlined in [The Student Academic Adjustments/Auxiliary Aids Policy \(01.D.09\)](#) document under [*STEP 4: Student Submission (5.4.1 & 5.4.2), Page 6*]. For more information please visit the Center for Students with Disabilities [FAQs](#) page.

Additionally, if a student is requesting a (CSD approved) testing accommodation, then the student will also complete a Request for Individualized Testing Accommodations (RITA) paper form to arrange for tests to be administered at the CSD office. CSD suggests that the student meet with their instructor during office hours and/or make an appointment to complete the RITA form to ensure confidentiality.

- Note: RITA forms must be completed at least 48 hours in advance of the original test date. Please consult your [counselor](#) ahead of time to ensure that your tests are scheduled in a timely manner. Please keep in mind that if you run over the agreed upon time limit for your exam, you will be penalized in proportion to the amount of extra time taken.

UH CAPS Statement

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the "Let's Talk" program, a drop-in consultation service at convenient locations and hours around campus. http://www.uh.edu/caps/outreach/lets_talk.html