

COURSE SYLLABUS – MATH 2311

YEAR COURSE OFFERED: 2018

SEMESTER COURSE OFFERED: Fall Session

DEPARTMENT: MATH

COURSE NUMBER: 2311

NAME OF COURSE: Introduction to Probability and Statistics

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

- Description: Probability, correct probabilistic reasoning, distributions, graphical and descriptive methods, sampling estimation, hypotheses and statistical inference.
- Prerequisite: A satisfactory score on a placement examination. May not apply to course or GPA requirements for a major or minor in natural sciences and mathematics. Students with prior credit for MATH 3338 or 3339 may not enroll in or receive credit for MATH 2311.
- Textbook: Available in electronic form (PDF) through CASA for all enrolled students.

Learning Objectives

The student will be able to:

- Demonstrate the ability to compute basic descriptive statistics.
- Interpret statistical data.
- Understand statistical inference and interpretation.
- Apply statistical concepts to actual data.

Major Assignments/Exams

ASSESSMENTS

Poppers	5%
Online Quizzes	10%
Homework	15%
Exams (3 exams)	45% (15% each)
Final Exam	25%

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

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GRADING SCALE

93% and above - A
at least 90% and below 93% - A-
at least 87% and below 90% - B+
at least 83% and below 87% - B
at least 80% and below 83% - B-
at least 77% and below 80% - C+

at least 73% and below 77% - C
at least 70% and below 73% - C-
at least 67% and below 70% - D+
at least 63% and below 67% - D
at least 60% and below 63% - D-
below 60% - F

INSTRUCTIONS FOR POPPERS

- For each lecture, starting on the third week of classes 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 your section.
- 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, 85% 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 $120(.85) = 102$ points.

INSTRUCTIONS FOR QUIZZES

- All of the quizzes are open and will close every Saturday at 11:59 pm starting on September 1st.
- The quizzes have to accessed through CASA using the Online Assignments tab at the top of the course page.
- 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.
- These are linked to copies of one version of each quiz.

Quiz	Sections Covered	Topics Covered	Date Closed
Quiz 1	1.1-1.5	Descriptive Statistics and Graphs	September 1
Quiz 2	2.1-2.4	Counting Techniques, Sets and Probabilities	September 8
Quiz 3	2.4-3.1	Discrete Random Variables	September 15
Quiz 4	3.2-3.3	Binomial and Geometric Distributions	September 22
Quiz 5	4.1-4.3	Continuous Random Variables and Normal Distribution	September 29
Quiz 6	4.3-4.4	Standard Normal and Sampling Distributions	October 6
Quiz 7	5.1-5.3	Scatterplots, Correlation, Regression	October 13
Quiz 8	5.4-5.6	Residuals, Non-Linear Models, and Relations in Categorical data	October 20
Quiz 9	6.1-6.3	Samples and Experiments	October 27
Quiz 10	7.1-7.3	Estimation and Confidence Intervals for Proportions	November 3
Quiz 11	7.4-7.5	Confidence Intervals for Means	November 10
Quiz 12	8.1-8.2	Hypothesis tests for one sample mean or proportion	November 17

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Quiz 13	8.3-8.5	Hypothesis test for two or more samples and Chi-square Goodness of Fit test	November 26 (Monday)
Quiz 14	8.6 & mixed hyp test	Chi-square test for Independence and Review	December 1

INSTRUCTIONS FOR HOMEWORK

- There are assignments due every Wednesday at 11:59 pm starting on September 5th.
- The weekly homework will be worth 15 points.
- The homework will be submitted in the CASA CourseWare website under the Assignments tab. See [Instructions to upload homework in CASA](#) for how to upload the homework.
- Two of the lowest homework scores will be dropped.
- The following table gives the due dates and the sections covered for each homework assignments.
- Working with other students on the assignments is highly recommended. However, each student's homework must present their original work. Otherwise this will affect your grade.

Assignment	Sections	Topic Covered	Due Date
Homework 1	1.1 – 1.5	Descriptive Statistics	September 5
Homework 2	2.1 – 2.4	Introduction to Probability	September 12
Homework 3	3.1 – 3.3	Discrete Random Variables, Binomial and Geometric Distributions	September 19
Homework 4	4.1 – 4.4	Continuous Random Variables, Normal Distribution, Sampling Distributions	October 3
Homework 5	5.1 – 5.3	Scatterplots, Correlation, and Regression	October 10
Homework 6	5.4 – 5.6	Residuals, Non-linear Models, and Relations in Categorical data	October 17
Homework 7	6.1 – 6.3	Sampling and Experiments	October 24
Homework 8	7.1 – 7.3	Estimation and Confidence Intervals for Proportions	November 7
Homework 9	7.4 – 7.5	Confidence Intervals for Means	November 14
Homework 10	8.1 – 8.6	Hypothesis Tests for means and proportions, Chi-square tests	November 28

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.
 - 85% of the total number of popper questions will be the 100%.
 - 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.

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EXAM INFORMATION

MIDTERM EXAMS

Exam 1: Covers chapters 1, 2 and 3; September 20 - 22

Exam 2: Covers chapters 4, 5 and 6; October 25 - 27

Exam 3: Covers chapters 7 and 8; November 29 – December 1

- All sections of Math 2311 take common exams.
- The three exams will be given in CASA located on the second floor of Garrison, CBB or Agnes Hall, 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 either multiple choice or a combinations of multiple choice and free response questions.
- The multiple choice questions will be machine graded.
- The free response questions will be graded by the instructors and teaching assistants for all sections of Math 2311.
- The scheduler will be available approximately 2 weeks prior to the start of the exam cycle. The scheduler is accessed through the Proctor Exams tab at the top of the course page in CASA.
- There are practice exams available. 10% of the score that you receive for the practice test that is online in the CASA CourseWare site under the Online Assignments will be added to your test score as extra credit.

FINAL EXAM

- There a comprehensive final exam. **December 7 - 10**
- You can access the scheduler for this exam by logging into Courseware.
- If your final numerical score for the course is 80.00 or higher as calculated by the official Math Department Grade Calculator and you have completed the teacher evaluation, then you may CHOOSE to be exempt from the final. Your grade will be the grade calculated by the grade calculator at the time of the deadline.
- If you do not have a semester numerical average that is 80.00 or higher by the exemption deadline, then you must take the final (note that there is no rounding of grades for exemptions). Details and instructions will follow later.

Required Reading

- Course webpage: <http://www.math.uh.edu/~cathy/Math2311/MATH%202311.html>
- 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 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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LECTURE SCHEDULE

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

Week	Textbook Sections	Topics
Weeks 1 & 2	Chapter 1	Types of Data, Univariate Descriptive Statistics (Central Tendency, Spread, Percentiles and Quantiles, Histograms, Boxplots, Stem-and-Leaf)
Week 3	Chapter 2	Counting Techniques, Sets, Venn Diagrams, Probability Rules
Week 4	Chapter 3	Discrete Random Variables, Binomial and Geometric Distributions
Test 1	Chapters 1, 2 & 3	
Week 5	4.1 & 4.2	Density Curves and Introduction to Normal Distribution
Week 6	4.3 & 4.4	Normal Distributions and Sampling Distributions
Week 7	5.1 – 5.3	Scatterplots, Correlation, Least-Squares Regression
Week 8	5.4 – 5.6	Residuals, non-linear models, Contingency tables
Week 9	Chapter 6	Samples, Experiments and Simulations
Test 2	Chapters 4, 5 & 6	
Week 10	7.1 & 7.2	Introduction to inference, Confidence intervals for one sample proportion
Week 11	7.3 – 7.5	Confidence Intervals for one sample mean, two sample means, and two sample proportions
Week 12	8.1 & 8.2	Introduction to Hypothesis Test, Hypothesis test for one mean & one proportion
Week 13	8.3 – 8.5	Hypothesis test for two means, two proportions and chi-square goodness of fit test
Test 3	Chapters 7 & 8	
Week 14	8.6 & Review	Chis-square test for two-way table
Final	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.
- You first need to download R: <http://cran.cnr.berkeley.edu/>
- Then you can download Rstudio: <https://www.rstudio.com/>

CSD ACCOMMODATIONS

- **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 an approved current Student Accommodation Form (paper copy or online version, as appropriate) before an approved accommodation can be implemented.

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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.

- **Homework:** Assigned homework is generally due at midnight of the day after the lecture on the material. **Exceptions may be made per the Student Academic Adjustments/Auxiliary Aids Policy for students with approved CSD accommodations (see above).*
- **Rescheduling and Make-ups:** It may be possible to reschedule a test appointment during the testing period (depending on space availability) by using the online scheduler. Do not assume that you will be able to reschedule - check first for availability.

Your final exam score will replace your lowest midterm exam score if the former is higher. The replacement will occur at the end of the semester after the Letter Grade Calculator (LGC) is turned off. A missed test will result in a score of zero. If you miss two or more exams, only one of those scores will be replaced. There will be no make-up tests or "re-tests". **Exceptions may be made per the Student Academic Adjustments/Auxiliary Aids Policy for students with approved CSD accommodations (see above).*

- For more information and policy see: <http://www.uh.edu/nsm/math/undergraduate/courses/math13xx/>

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

OTHER INFORMATION

- Besides asking your instructor, tutoring is available for this course at two places on campus
 - CASA – Garrison 222 see: <http://www.uh.edu/casa/tutoring-center/>
 - LAUNCH – Cougar Village 1 N109 see: <http://ussc.uh.edu/lss/tutoring.aspx>
- For more information about the UH academic honesty policy and procedures see: <http://www.uh.edu/provost/policies/honesty/documents-honesty/academic-honesty-policy.pdf>