Math 2311: Introduction to Probability and Statistics
Course Syllabus

Section number: This information applies to all sections
Delivery format: face-to-face lecture or online
Prerequisites: MATH 1310: College Algebra or MATH 1311: Elementary Mathematical Modeling or a passing score on the test for placement out of College Algebra.

Textbook: Available in electronic form (PDF) through CASA for all enrolled students.

The information contained in this class outline is an abbreviated description of the course. Additional important information is contained on your instructor's personal webpage. You are responsible for knowing all of this information.

Upon successful completion of this course, students will be familiar with basic rules of probability and will be able to use them in modeling uncertainty in obtaining and recording data. They will be able to utilize graphical and numerical summaries of data in understanding data generating processes. They will understand the logic of statistical inference and will be able to apply common inferential procedures. Students will be exposed to the computational aspects of statistics through the use of calculators, spreadsheet programs or special purpose data analysis packages.

Subject to modifications by individual instructors, the semester grade will be calculated by the following formula:

Daily Quizzes (Poppers): 10%
Homework: 10%
Online Quizzes: 10%
Tests 1 – 3: 45% (15% each)
Final Exam: 25%

Text: Introduction to Probability and Statistics by the University of Houston Department of Mathematics. The learning materials for Math 2311, including the textbook, are available online at the CourseWare site at www.casa.uh.edu. Students are required to purchase an access code at the Book Store to access the learning materials. Students are required to have a calculator. A graphing calculator is not necessary.

Course Content:

Exploring Univariate Data

1.1 Types of data
1.2 Mean and Median
1.3 Standard Deviation and Variance
1.4 Range, IQR and Finding Outliers
1.5 Graphs and Describing Distributions

Introduction to Probability

2.1 Counting Techniques, Combinations and Permutations
2.2 Sets and Venn Diagrams
2.3 Basic Probability Models
2.4 General Probability Rules

Discrete Distributions

3.1 Random Variables
3.2 Binomial Distributions
3.3 Geometric Distributions

Continuous Distributions

4.1 Density Curves
4.2 The Normal Distribution
4.3 Standard Normal Calculations
4.4 Sampling Distribution of $\overline{x}$ and $\hat{p}$

Bivariate Data

5.1 Scatter Plots
5.2 Correlation
5.3 The Least Squares Regression Line
5.4 Residuals
5.5 Non-Linear Models
5.6 Relations in Categorical Data

Samples and Experiments

6.1 Sampling
6.2 Designing Experiments
6.3 Simulating Experiments

Estimation

7.1 Margins of Error and Estimates
7.2 Confidence Interval for a Proportion
7.3 Confidence Interval for the Difference of Two Proportions
7.4 Confidence Interval for a Mean
7.5 Confidence Interval for the Difference of Two Means

Tests of Significance

8.1 Inference for the Mean of a Population
8.2 Sample Proportions
8.3 Inference for a Population Proportion
8.4 Comparing Two Means
8.5 Comparing Two Proportions
8.6 Goodness of Fit Test
8.7 Two-way Tables

Inference for Regression (Optional)

9.1 Confidence Intervals
9.2 Test for Slope of Regression Lines

Whenever possible, and in accordance with 504/ADA guidelines, the University of Houston will attempt to provide reasonable academic accommodations to students who request and require them. Please call 713-743-5400 for more assistance.