

University of Houston-Downtown

Course Prefix, Number, and Title: STAT 1312 Statistical Literacy

Credits/Lecture/Lab Hours: 3/3/0

Foundational Component Area: Mathematics

Prerequisites: A grade of C or better in MATH 1300 or a TSI score of 350 or higher.

Co-requisites: ENG 1301

Course Description: STAT 1312 is designed for students requiring one college-level mathematics course. This course cannot be applied toward any degree in the Department of Mathematics and Statistics or the Department of Computer Science and Engineering Technology.

TCCNS Number: N/A

Demonstration of Core Objectives within the Course:

Assigned Core Objective	Learning Outcome Students will be able to:	Instructional strategy or content used to achieve the outcome*	Method by which students' mastery of this outcome will be evaluated
Critical Thinking Communication Empirical & Quantitative Reasoning	Describe and communicate mathematical information verbally, numerically, graphically, and symbolically.	<p>Content: Summary statistics of data; types of graphs for data; and types of patterns and trends in data.</p> <p>Instructional Strategies: Students will calculate and interpret measures of central tendency and of variation; will use statistical software to convert data into graphs such as pie and bar graphs, histograms and scatter plots.</p>	HW assignments; In-class group activities; Semester exams.
Critical Thinking Empirical & Quantitative Reasoning	Use appropriate mathematical techniques to model situations from a variety of settings, including real-world applications in generalized mathematical forms.	<p>Content: Statistical inference procedures.</p> <p>Instructional Strategy: Students will use statistical software to construct confidence intervals and hypothesis tests of population parameters in application settings.</p>	HW assignments; In-class group activities; Semester exams.
Critical Thinking	Interpret mathematical models, such as formulas,	<p>Content: Criteria for "good" and "bad" graphs in statistics;</p>	HW assignments; In-class group activities;

Empirical & Quantitative Reasoning	graphs, tables, and schematics, and draw inferences from them.	making inferences and predictions from data. Instructional Strategies: Students will use statistical software to construct graphs and explain why a graph is not a “good” graph; will describe what a valid inference is.	Semester exams.
Critical Thinking Empirical & Quantitative Reasoning	Discern relationships and patterns in quantitative data to arrive at informed conclusions.	Content: Relationships between randomness and chance and developing valid experimental designs and inferences from data. Instructional Strategies: Students will use statistical software to simulate random selection to verify inferences based on rules of chance	HW assignments; In-class group activities; Semester exams.
Critical Thinking Empirical & Quantitative Reasoning	Utilize appropriate technology to enhance mathematical thinking and understanding, to solve mathematical problems, and to judge the reasonableness of the results.	Content: Statistical software will be used for data analysis and to run statistical tests. Instructional Strategy: Students will use statistical software to organize and run statistical tests to make valid inferences about a population based on data from a sample.	HW assignments; In-class group activities; Semester exams.

Additional Course Outcomes:

- Describe the utility and limitations of data and statistical methods for solving real-world problems.
- Describe methods of data collection and explain potential pitfalls, biases, and ethical issues.
- Demonstrate facility with the terminology, notation, and numerical methods generally found in an introductory statistics course, such as graphical summaries, measures of central tendency and dispersion and use these to compare data sets.
- Demonstrate a basic understanding of probability and how it relates to statistics, particularly the ideas of randomness and statistical significance.
- Demonstrate facility with basic inferential statistical methods, including confidence intervals and hypothesis tests, and understand when a particular method is appropriate, and the ability to interpret results in the context of a stated problem.

- Demonstrate facility to use appropriate technology such as statistical software and/or calculators.
- Formulate and communicate solutions to statistical problems in clear, grammatically correct, precise English.

Course Outline:

- **Unit I – Producing Data** (10 hours)
 - Topics or techniques to be covered include: Where Do Data Come From; Samples, Good and Bad; What Do Samples Tell Us; Sample Surveys in the Real World; Experiments, Good and Bad; Experiments in the Real World.
- **Unit II – Organizing Data** (10 hours)
 - Topics or techniques to be covered include: Graphs, Good and Bad; Displaying Distributions with Graphs; Describing Distributions with Numbers; Normal Distributions; Describing Relationships: Scatterplots; Describing Relationships: Regression.
- **Unit III – Chance** (10 hours)
 - Topics or techniques to be covered include: Thinking About Chance; Probability Models; What is a Confidence Interval.
- **Unit IV – Inference** (4 hours)
 - Topics or techniques to be covered include: What is a Test of Significance; Use and Abuse of Statistical Inference

Grading/Course Content which Demonstrates Student Achievement of Core Objectives:

The grading scale is as follows: 100-90% = A; 89-80% = B; 79-70% = C; 69-60% = D; 59-0% = F.

Summary of Course Exams, Quizzes, Assignments and Final	
Three in-class tests (11%/exam)	33% of final grade
Paper	11% of final grade
Homework	12% of final grade
Peer-Interview Activity Post-Interview Quiz	11% of final grade
Final	33% of final grade