STAT 1000H: INTRODUCTION TO STATISTICS - HONORS

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2025
Credits:	4
Total Contact Hours:	72
Lecture Hours :	72
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	144
Total Student Learning Hours:	216
Prerequisite:	Placement as determined by the college's multiple measures assessment process or completion of a course taught at or above the level of intermediate algebra.
District General Education:	A3. Mathematics
Transferable to CSU:	Yes
Transferable to UC:	Yes - Approved
Grading Method:	Standard Letter

Catalog Course Description

This course is an introduction to statistical thinking and processes, including methods and concepts for discovery and decision-making using data. Topics include descriptive statistics; probability and sampling distributions; statistical inference; correlation and linear regression; analysis of variance, chi-squared, and t-tests; and application of technology for statistical analysis including the interpretation of the relevance of the statistical findings. Students apply methods and processes to applications using data from a broad range of disciplines. This is an honors course. Moreover, this class will include the normal curve, z-test for one and two samples, other types of probability rules, counting rules, hypothesis testing for proportions, and statistical inference for proportions. Furthermore, this class discusses experimental design (the role of confounding variables in observational studies, the role of random assignment, the strengths and weaknesses of observational studies and controlled experiments, etc.). Student must be eligible for the Citrus College Honors Program or obtain a recommendation from an Honors instructor. Formerly MATH 165H. 72 lecture hours.

Course Objectives

- Assess how data were collected and recognize how data collection affects what conclusions can be drawn from the data.
- Identify appropriate graphs and summary statistics for variables and relationships between them and correctly interpret information from graphs and summary statistics.
- Describe and apply probability concepts and distributions.
- Demonstrate an understanding of, and ability to use, basic ideas of statistical processes, including hypothesis tests and confidence interval estimation.
- Identify appropriate statistical techniques and use technology-based statistical analysis to describe, interpret, and communicate results.
- Evaluate ethical issues in statistical practice.
- Distinguish the difference between sample and population distributions and analyze the role played by the Central Limit Theorem.
- Use regression lines and ANOVA for estimation and inference, and interpret the associated statistics
- Use appropriate statistical techniques to analyze and interpret applications based on data from at least four of the following disciplines: business, economics, social science, psychology, political science, administration of justice, life science, physical science, health science, information technology, and education
- Apply various counting rules to find the sample space and probability.

Major Course Content

Part 1:

1. Introduction to statistical thinking and processes
2. Technology-based statistical analysis
3. Applications using data from four or more of the following disciplines: administration of justice, business, economics, education, health science, information technology, life science, physical science, political science, psychology, and social science
4. Units (subjects/cases) and variables in a data set, including multivariable data sets
5. Categorical and quantitative variables
6. Sampling methods, concerns, and limitations, including bias and random variability
7. Observational studies and experiments
8. Data summaries, visualizations, and descriptive statistics
9. Probability concepts
10. Probability distributions (e.g., binomial, normal)
11. Sampling distributions and the Central Limit Theorem
12. Estimation and confidence intervals
13. Hypothesis testing, including t-tests for one and two populations, Chi-squared test(s), and ANOVA; and interpretations of results
14. Regression, including correlation and linear regression equations

Part 2:

1. Discrete Distributions: random variables and expected value;
2. Counting Rules and other probability rules
3. Discussion of normal distribution and computation of probabilities
4. Hypothesis Testing and inference, including z-tests for one and two populations for the mean and proportion

Examples of Required Writing Assignments

For any written assignment, students will need to first sample data, organize the data into a frequency table, and then summarize the results by generating graphs. The students will then need to form a hypothesis involving the data, and then run a series of statistical tests to determine if the results are significant or not. Finally, the student will write out his her findings and incorporate all the statistical work as justification for any conclusions he or she comes up with.

Examples of Outside Assignments

Outside assignments include completing all homework assigned from the textbook; research projects involving the collecting, organizing, and presentation of data for a specific statistical topic; and completion of any computer project using a spread sheet software for understanding how to apply features of the software to solve problems in statistics.

Instruction Type(s)

Lecture, Online Education Lecture

IGETC Area 2: Mathematical Concepts and Quantitative Reasoning

Yes