MATH 165H: INTRODUCTORY STATISTICS - HONORS

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2024
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:	Intermediate algebra or higher or direct placement based on multiple measures; ENGL 101 or ENGL 101E or ENGL 101H or higher or direct placement based on multiple measures; also, student must be eligible for the Citrus College Honors Program or obtain a recommendation from an Honors instructor.
District General Education:	A3. Mathematics
Transferable to CSU:	Yes
Transferable to UC:	Yes - Approved
Grading Method:	Standard Letter

Catalog Course Description

Introductory course to statistics and probability, descriptive analysis, and presentation of data, hypothesis testing, statistical inference, normal curve, chi-square, and applications in diverse disciplines. Students are expected to work and participate at an honors level which includes strong critical thinking skills, thorough analysis of mathematical readings, presentation, and leadership skills demonstrated through class participation/presentation and service learning in the community. 72 lecture hours.

Course Objectives

- Interpret data displayed in tables and graphically.
- Apply concepts of sample space and probability.
- Calculate measures of central tendency and variation for a given data set.
- Identify the standard methods of obtaining data and identify advantages and disadvantages of each.
- Calculate the mean and variance of a discrete distribution.
- Calculate probabilities using normal and t-distributions.
- Distinguish the difference between sample and population distributions and analyze the role played by the Central Limit Theorem.
- Construct and interpret confidence intervals.
- Determine and interpret levels of statistical significance including p-values.
- Interpret the output of a technology-based statistical analysis.
- Identify the basic concept of hypothesis testing including Type I and II errors.
- Formulate hypothesis tests involving samples from one and two populations.
- Select the appropriate technique for testing a hypothesis and interpret the result.
- 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.

Major Course Content

1. Summarizing data graphically and numerically;
2. Descriptive statistics: measurement, measures of central tendency, and variation;
3. Sample spaces and probability;
4. Random variables and expected value;
5. Sampling and sampling distributions;
6. Discrete distributions – Binomial;
7. Continuous distributions – Normal;
8. The Central Limit Theorem;
9. Estimation and confidence intervals;
10. Hypothesis Testing and inference, including t-tests for one and two populations, and Chi-square test;
11. Correlation, regression lines, and analysis of variance (ANOVA);
12. Applications using 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; and Technology based statistical analysis.

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