STAT C1000: INTRODUCTION TO STATISTICS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Fall 2025
Units:	5
Hours:	5 lecture per week (60 total per quarter)
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.
Advisory:	Demonstrated proficiency in English by placement via multiple measures OR through an equivalent placement process OR completion of ESLL 125 & ESLL 249; UC will grant transfer credit for a maximum of one course from the following: MATH 17, PSYC 7, SOC 7, or STAT C1000 - students are strongly encouraged to meet with a counselor for appropriate course selection; not open to students with credit in MATH 10.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Area 2: Mathematical Concepts & Quantitative Reasoning
Transferable:	CSU/UC
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable
Formerly:	MATH 10

Student Learning Outcomes

- Students will demonstrate the ability to compute descriptive statistics, calculate confidence intervals, and carry out tests of hypotheses.
- Students will develop conceptual understanding of descriptive and inferential statistics. They will demonstrate and communicate this understanding in a variety of ways, such as: reasoning with definitions and theorems, connecting concepts, and connecting multiple representations, as appropriate.
- Students will formulate conclusions about a population based on analysis of sample data.

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. Students are also introduced to collection and presentation of data, measures of central tendency and dispersion, and illustrations taken from the fields of business, economics, medicine, engineering, education, psychology, sociology, social sciences, life science, and health science.

Course Objectives

At the conclusion of this course, the student should be able to:

1. Assess how data were collected and recognize how data collection affects what conclusions can be drawn from the data.
2. Identify appropriate graphs and summary statistics for variables and relationships between them and correctly interpret information from graphs and summary statistics.
3. Describe and apply probability concepts and distributions.
4. Demonstrate an understanding of, and ability to use, basic ideas of statistical processes, including hypothesis tests and confidence interval estimation.
5. Identify appropriate statistical techniques and use technology-based statistical analysis to describe, interpret, and communicate results.
6. Evaluate ethical issues in statistical practice.

In more detail, the student will be able to:

1. Distinguish between quantitative and qualitative data; levels/scales of measurement; sample and population; descriptive statistics and inferential statistics and their implications.
2. Identify the standard methods of obtaining data and identify advantages and disadvantages of each.
3. Read a graph and conclude what information the graph is conveying about the data.
4. Calculate measures of central tendency, dispersion, and relative standing and use these measures to solve application problems.
5. Compute basic probabilities and apply concepts of sample space.
6. Define discrete probability distributions; calculate the mean, variance, and standard deviation of a discrete distribution; and use such distributions to solve application problems.
7. Define continuous probability distributions; calculate probabilities using the normal and student t-distributions; and use such distributions to solve application problems.
8. Define sampling distributions, state the central limit theorem, and use sampling distributions and the central limit theorem to solve application problems.
9. Use confidence intervals to estimate population parameters, or the difference between two population parameters, using the appropriate formula and then interpret the result.
10. Determine the sample size required to estimate a population parameter.
11. Design, set up, and evaluate the results of hypothesis tests; determine and interpret levels of statistical significance, including p-values in hypothesis tests; and identify type I and type II errors.
12. Compare and contrast the use of confidence intervals and hypothesis tests to make inferences about population parameters.
13. Solve application problems utilizing techniques of regression and correlation.
14. Use analysis of variance to make inferences about more than two population means.
15. Solve application problems using categorical data analysis.

16. Demonstrate statistical understanding of inference by participating in a cooperative project.
17. Demonstrate proficiency in the use of the computer as a tool for doing statistics.
18. Apply statistical methods to situations in a culturally diverse society, including applications from business, economics, medicine, engineering, education, psychology, sociology, social sciences, life science, and health science.
19. Discuss mathematical problems and write solutions in accurate mathematical language and notation.
20. Interpret mathematical solutions.

Course Content

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

Lab Content

Not applicable.

Special Facilities and/or Equipment

1. Graphing calculator
2. Access to Microsoft Excel software
3. When taught on Foothill Global Access: ongoing access to a computer with email software and email address

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Examples of potential methods of evaluation used to observe or measure students' achievement of course outcomes and objectives could include but are not limited to quizzes, exams, laboratory work, field journals, projects, research demonstrations, etc. Methods of evaluation are at the discretion of local faculty.
Students may also be asked to complete computer lab assignments and a proctored comprehensive final examination. The final exam must be taken in person at the Los Altos Hills campus or at another approved facility administered by a proctor deemed acceptable by the instructor.

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture
Discussion
Cooperative learning exercises

Representative Text(s) and Other Materials

Introduction to Modern Statistics 2e, C#etinkaya-Runde, M., Hardin, J., OpenIntro, 2024 ($0- 25): https://www.openintro.org/book/ims/

Statistics: Learning From Data 3e, Peck, R., Case, C., Cengage, 2024 ($57-250): https://www.cengage.com/c/new-edition/9780357758298/

Introductory Statistics: Exploring the World Through Data 4e, Gould, R., Wong, R., Ryan, C., Pearson, 2025 ($65-80): https://www.pearson.com/en-us/subject-catalog/p/introductory-statistics/P200000011641/9780138242145

Introductory Statistics 2e, Illowsky, B., Dean, S., OpenStax, 2023 ($0): https://openstax.org/details/books/introductory-statistics-2e

Introductory Statistics: Analyzing Data with Purpose, The Dana Center Mathematics Pathways, Charles A. Dana Center, University of Texas at Austin, 2021 ($0): https://www.utdanacenter.org/products/introductory-statistics

Martinez, Seelbach. Statistics: An Animated Journey, 2nd ed. 2024.

Navidi, W., and B. Monk. Elementary Statistics, 4th ed. 2022.

When taught on Foothill Global Access: lectures, handouts, and assignments are delivered via email and/or the internet.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

1. Homework problems covering subject matter from text and related material ranging from 30-60 problems per week. Students will need to employ critical thinking in order to complete assignments.
2. Five hours per week of lecture covering subject matter from text and related material. Reading and study of the textbook, related materials, and notes.
3. Student projects covering subject matter from textbook and related materials. Projects will require students to discuss mathematical problems, write solutions in accurate mathematical language and notation, and interpret mathematical solutions. Projects may require the use of Excel.
4. Worksheets: Problems and activities covering the subject matter. Such problems and activities will require students to think critically. Such worksheets may be completed both inside and/or outside of class.

Discipline(s)

Mathematics