

Lassen Community College Course Outline

MATH-40 Elementary Statistics

3.0 Units

I. Catalog Description

The use of probability techniques, hypothesis testing, and predictive techniques to facilitate decision-making. Topics include descriptive statistics; probability and sampling distributions; statistical inference; correlation and linear regression; analysis of variance; chi-square and t-tests; and application of technology for statistical analysis including the interpretation of the relevance of the statistical findings. Applications using data from a broad range of disciplines. This course has been approved for online, hybrid and correspondence delivery.

Prerequisite(s): Math 60 Intermediate Algebra or equivalent multiple measures

Prerequisite Skills are:

1. Solve rational equations and inequalities. Simplify rational expressions.
2. Simplify expressions using order of operations.
3. Determine the equation of a straight line and calculate the dependent variable's value given the independent variable's value.
4. Solve radical equations and inequalities. Simplify radical expressions.
5. Transform nonlinear functions into linear functions.
6. Manipulate and solve exponential functions.
7. Formulate strategies and choose the necessary information to solve applied problems.

Transfers to both UC/CSU

General Education Area: D2

CSU GE Area: B4

IGETC GE Area: 2A

C-ID MATH 110

51 Hours Lecture, 102 Hours Expected Outside Class Work, 153 Total Student Learning Hours

Scheduled: Fall, Spring

II. Coding Information

Repeatability: Not Repeatable, Take 1 Time

Grading Option: Graded or Pass/No Pass

Credit Type: Credit - Degree Applicable

TOP Code: 170100

III. Course Objectives

A. Course Student Learning Outcomes

Upon completion of the course, students will be able to:

1. Calculate and interpret measures of center and measurements of dispersion for given data.
2. Find probabilities for applications involving normal random variables.
3. Construct and interpret a confidence interval; formulate decisions on hypotheses based on data/information provided.

B. Course Objectives

Upon completion of the course, students will be able to:

1. Interpret data displayed in tables and graphically.
2. Apply concepts of sample space and probability.
3. Calculate measures of central tendency and variation for a given data set.
4. Identify the standard methods of obtaining data and identify advantages and disadvantages of each.
5. Calculate the mean and variance of a discrete distribution.
6. Calculate probabilities using normal and student's t-distributions.
7. Distinguish the difference between sample and population distributions and analyze the role played by the Central Limit Theorem.
8. Construct and interpret confidence intervals.
9. Determine and interpret levels of statistical significance including p-values.
10. Interpret the output of a technology-based statistical analysis.
11. Identify the basic concept of hypothesis testing including Type I and II errors.
12. Formulate hypothesis tests involving samples from one and two populations.
13. Select the appropriate technique for testing a hypothesis and interpret the result.
14. Use regression lines and ANOVA for estimation and inference, and interpret the associated statistics.
15. 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.

IV. Course Content

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

V. Assignments

A. Appropriate Readings

Students will be required to read and study the assigned chapters in the textbook. Supplemental readings are generally not assigned, but may be assigned.

B. Writing Assignments

1. Prepare for class and review material and concepts presented in class.

2. Complete homework assignments, including applications of representative symbol systems and/or work problems.
3. Understand and apply the theories and techniques taught in class.

C. Expected Outside Assignments

Students expected to spend a minimum of 2 hours outside of class in practice and preparation for each hour of class. Assignments may include: reading the text, application of formulas and theorems, practice problems from the text, and assignments in the math lab.

D. Specific Assignments that Demonstrate Critical Thinking

Students will be required to interpret mathematical principles and techniques to solve a variety of problems, including those that demand the application of principles in a number of different context. Multiple measures of student performance including in-class, out-of-class work, multiple exams, and final exam.

VI. Methods of Evaluation

Traditional Classroom Delivery Evaluation

The student's grade will be based on homework assignments, multiple exams, collaborative Group Work, an optional research paper and a comprehensive final.

Correspondence Delivery Evaluation

Same as face to face with the exception the exclusion of participation in classroom activities. Students will be expected to complete assignments and activities equivalent to in-class assignments and activities. Written correspondence and a minimum of six opportunities for feedback will be utilized to maintain effective communication between instructor and student.

Online Delivery Evaluation

A variety of methods will be used, such as: research papers, asynchronous and synchronous discussions (chat/forum), online quizzes and exams, postings to online website, and email communications.

Hybrid Delivery Evaluation

All quizzes may be taken online and exams will be administered during the in-person class time. Students will be expected to complete online assignments and activities equivalent to in class assignments and activities for the online portion of the course. Electronic communication, both synchronous and asynchronous (chat/forum) will be evaluated for participation and to maintain effective communication between instructor and students.

Web-enhanced course Delivery Evaluation

Additional information and resources may be made available to students online. , and students may be required to do research and complete and/or submit assignments online. Quizzes may be administered online, but exams and summative assessments must be administered face-to-face.

VII. Methods of Delivery

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

Traditional Classroom Delivery Correspondence Delivery

Hybrid Delivery

Online Delivery

Traditional Classroom Course Delivery

Lecture, questions and answers, demonstrations and discussion.

Correspondence Course Delivery

Assigned readings, instructor-generated handouts, lecture materials, exercises and assignments equal to face to face instructional delivery. Written correspondence and a minimum of six opportunities for feedback will be utilized to maintain effective communication between instructor and student.

Online Course Delivery

Student will access course materials over the Internet. These will include a syllabus, homework assignments and tests. Instruction shall include video lectures, animations, and guided tutorials. Password protected asynchronous discussion, and synchronous messaging is also provided to allow for collaboration.

Hybrid Course Delivery

A combination of traditional classroom and online instruction will be utilized. Each semester-a minimum of 17 hours will be taught face-to face by the instructor and the remaining hours will be instructed online through the technology platform adopted by the District. Traditional class instruction will consist of exercises/assignments, lectures, visual aids, and practice exercises. Online delivery will consist of exercises/assignments, lecture posts, discussions, adding extra resources and other media sources as appropriate.

VIII. Representative Texts and Supplies**All Delivery Modalities**

Required:

Triola, Mario F., *Elementary Statistics, 13th edition*, 2018, Pearson. This textbook may be purchased in a cloth/paper bound version, ISBN: 978-0-134-462-455 or in a loose-leaf version, ISBN: 978-0-134-463-063, or as an eText version, ISBN 978-0-137-324-750 all without MyLab Statistics

When a Math 40 section requires the use of MyLab Statistics, the eText and MyLab may be purchased separately or as a bundle, ISBN 978-0-135-959-732 (18 week eText and MyLab access) or ISBN 978-0-134-464-404 (24 month eText and MyLab access).

Optional:

Alan Bass, *Math Study Skills*, 1st edition, 2008, Pearson Education, ISBN: 9780321513076

IX. Discipline/s Assignment

Mathematics

X. Course Status

Current Status: Active

Original Approval Date: 6/18/1990

Revised By: Noelle Eckley

Curriculum/Academic Standards Committee Revision Date: 03/07/2023