

ARAPAHOE COMMUNITY COLLEGE SYLLABUS

Course Number: MAT 135

Title: Introduction to Statistics

Credits: 3

Instructor:

Phone:

E-mail:

Office Location (if applicable):

Office Hours (if applicable):

Online Student Evaluation Process:

E-mail Policy

Important Dates:

Last day to drop with refund (include date):

Last day to withdraw without refund (include date):

Catalog Description:

Includes data presentation and summarization, introduction to probability concepts and distributions, statistical inference, estimation, hypothesis testing, comparison of populations, correlation and regression. Most of chapters 1 through 11 will be covered.

This course is one of the **Statewide Guaranteed Transfer** courses. GT-MA1

Prerequisites: MAT 106, Survey of Algebra, MAT 099 Intermediate Algebra or equivalent.

Co-requisite: None

Text: *Elementary Statistics, A Brief Version*, 4th edition, Bluman.

Required Course Material: Text and TI-83 graphing calculator.

Optional Course Material: MathZone, Student Study Guide, videotapes are available in the Math Support Room.

Grading Criteria:

Makeup Policy:

Attendance Policy:

Arapahoe Community College provides accommodations to qualified students with disabilities. To request accommodation, contact Disability Services in M2710 or call (303) 797-5937 v/tty.

Student Success Center for all ACC students: Peer and professional tutoring in Room M2720 now includes student tutors, math support, and the Writing Center in one location to provide academic assistance for all your classes.

ACC math instructors provide help with concepts, homework, online resources and graphing calculator workshops. Students may watch course related videos and DVDs in the library. For information, contact the Student Success Center at 303-797-5669 or email Mathhelp@arapahoe.edu

Academic Honesty Statement

Arapahoe Community College is committed to academic honesty and scholarly integrity. The College can best function and accomplish its mission in an atmosphere of the highest ethical standards. All members of the College community are expected and encouraged to contribute to such an environment by observing all accepted principles of academic honesty. Academic dishonesty includes but is not limited to: plagiarism, cheating, fabrication, grade tampering, misuse of computers and other electronic technology, and facilitating academic dishonesty. Those found in violation may also be subject to potential disciplinary sanctions under the Arapahoe Community College Code of Conduct

ACC Safety

The safety and security of all our students, faculty, staff and visitors is of the utmost importance to the Campus Police Department. We rely on each of you to be an additional set of ears and eyes to help maintain campus safety. Please be diligent in your efforts to report suspicious or unusual behavior or circumstances to the Campus Police Department. Trust your instincts when something doesn't look, seem or feel right and tell someone. The Campus Police can be reached at 303-797-5800 or in M2600 on the second floor behind Information Central. Additional safety information can be found on the website at: <http://www.arapahoe.edu/studentsvcs/campuspolice/index.html>

Contact Information for Learning Support Services

Library	M2500 303-797-5090
Technical Support	797-5700 x3199
Writing Center	M2855 303-797-5830
Advising/Counseling	M2010 303-797-5651
Instructional Testing Center	M2280 303-797-5993
Bookstore	M1200 303-797-5676
Computer Lab	M1650 303-797-5907
Tutorial Services	M2710 303.797.5669
Career Center	M2025 303-797-5805
eLearning	303-797-5700 x6700

Online Course Evaluations: As this course nears completion, you will have the opportunity to complete a confidential evaluation of the class online. Login instructions will be sent to your 'student.cccs.edu' e-mail address. Your feedback is important, and ensures that ACC continues to offer quality instruction that meets your needs. Please take time to complete the survey – I appreciate your feedback.

E-mail Communication: Effective 1/20/09 electronic correspondence from ACC employees will go to your student email account *only*. When you activate your account you can forward emails to an e-mail account that you already have. To activate your student e-mail account, go to <http://www.arapahoe.edu> and click on the "Activate Student E-mail" link. Questions? Please call 303-797-5621

COURSE CONTENT:

Chapters and topics in current text:

1 The Nature of Probability and Statistics

- 1.1 Introduction
- 1.2 Descriptive and Inferential Statistics
- 1.3 Variables and Types of Data
- 1.4 Data Collection and Sampling Techniques
- 1.5 Observational and Experimental Studies
- 1.6 Uses and Misuses of Statistics
- 1.7 Computers and Calculators
- 1.8 Summary

2 Frequency Distributions and Graphs

- 2.1 Introduction
- 2.2 Organizing Data
- 2.3 Histograms, Frequency Polygons, and Ogives
- 2.4 Other Types of Graphs
- 2.5 Paired Data and Scatter Plots
- 2.6 Summary

3 Data Description

- 3.1 Introduction
- 3.2 Measures of Central Tendency
- 3.3 Measures of Variation
- 3.4 Measures of Position
- 3.5 Exploratory Data Analysis
- 3.6 Summary

4 Probability and Counting Rules

- 4.1 Introduction
- 4.2 Sample Spaces and Probability
- 4.3 The Addition Rules for Probability
- 4.4 The Multiplication Rules and Conditional Probability
- 4.5 Counting Rules
- 4.6 Probability and Counting Rules
- 4.7 Summary

5 Discrete Probability Distributions

- 5.1 Introduction
- 5.2 Probability Distributions
- 5.3 Mean, Variance, Standard Deviation, and Expectation
- 5.4 The Binomial Distribution
- 5.5 Summary

6 The Normal Distribution

- 6.1 Introduction
- 6.2 Properties of the Normal Distribution
- 6.3 The Standard Normal Distribution
- 6.4 Applications of the Normal Distribution
- 6.5 The Central Limit Theorem
- 6.6 The Normal Approximation to the Binomial Distribution
- 6.7 Summary

7 Confidence Intervals and Sample Size

- 7.1 Introduction
- 7.2 Confidence Intervals for the Mean (σ known or $n \geq 30$)
- 7.3 Confidence Intervals for the Mean (σ unknown and $n < 30$)
- 7.4 Confidence Intervals and Sample Size for Proportions
- 7.5 Confidence Intervals for Variances and Standard Deviations
- 7.6 Summary

8 Hypothesis Testing

- 8.1 Introduction
- 8.2 Steps in Hypothesis Testing -- Traditional Method
- 8.3 Z Test for a Mean
- 8.4 T Test for a Mean
- 8.5 Z Test for a Proportion
- 8.6 χ^2 Test for a Variance or Standard Deviation
- 8.7 Confidence Intervals and Hypothesis Testing
- 8.8 Summary

9 Testing the Difference Between Two Means, Two Variances, and Two Proportions

- 9.1: Introduction
- 9.2: Testing the Difference Between Two Means: Large Samples
- 9.3: Testing the Difference Between Two Variances
- 9.4: Testing the Difference Between Two Means: Small Independent Samples
- 9.5: Testing the Difference Between Two Means: Small Dependent Samples
- 9.6: Testing the Difference Between Proportions
- 9.7: Summary

10 Correlation and Regression

- 10.1 Introduction
- 10.2 Correlation
- 10.3 Regression
- 10.4 Coefficient of Determine and Standard Error of the Estimate
- 10.5 Summary

Competencies View:

- I. Have a working knowledge of and distinguish between the two branches of statistics, descriptive statistics and inferential statistics.
- II. Distinguish between qualitative and quantitative data.
- III. Distinguish between the following levels of measurement: nominal, ordinal, interval, and ratio.
- IV. Define a population and a sample.
- V. Define a parameter and a statistic.
- VI. Recognize that Greek letters are used to represent parameters and English letters are used to represent statistics.
- VII. Present various methods of depicting data and the statistical measures utilized in descriptive statistics.
- VIII. Organize data into a grouped frequency table.
- IX. Present data in the form of histograms, stem and leaf diagrams, and/or box and whisker plots.
- X. Interpret histograms, line graphs, bar graphs, pie charts, and stem and leaf diagrams.
- XI. Use formulas to calculate the following measures of central tendency: mean, median, mode, and midrange.
- XII. Use formulas to calculate the following measures of dispersion: range, variance, and standard deviation.
- XIII. Use appropriate procedures to find the following measures of position in a set of data: z-score, percentile, quartile, and decile.
- XIV. Define percentile and use this to interpret percentile ranks.
- XV. Recognize and identify various shapes of data distributions.
- XVI. Utilize the basic definitions to calculate simple probabilities.
- XVII. Utilize the addition rule to calculate probabilities for the occurrence of one event or another event.
- XVIII. Demonstrate an understanding of how events are complementary and calculate the probability that an event does not occur.
- XIX. Use counting principles to determine the number of ways various events can occur.
- XX. Develop the concepts of probability distributions.
- XXI. Distinguish between discrete and continuous random variables.
- XXII. Have a working knowledge of the concept of probability distributions.
- XXIII. Use formulas to calculate the mean, variance, standard deviation, and expected value of a probability distribution.
- XXIV. Calculate probabilities in binomial experiments.
- XXV. Recognize and identify various shapes of probability distributions.
- XXVI. Demonstrate knowledge of the relationship between probability and the area under a probability curve.
- XXVII. Describe the normal distribution and the associated statistics and probabilities.
- XXVIII. Determine probabilities using the standard normal distribution.
- XXIX. Determine z-scores that correspond with observations in non-standard normal distributions.
- XXX. Determine scores that correspond to given probabilities.
- XXXI. Use the normal distribution to approximate probabilities associated with a binomial experiment and know the conditions for which these approximations are appropriate.
- XXXII. Know the meaning of a sampling distribution.
- XXXIII. Develop the concepts of point estimates and interval estimates and present methods for determining sample size.
- XXXIV. Estimate the value of a population mean and determine confidence intervals for a population proportion.