

STATISTICS

MAT 135/BUS 226

Course Objectives:

1. Have a working knowledge of and distinguish between the two branches of statistics, descriptive statistics, inferential statistics.
2. Distinguish between qualitative, quantitative data.
3. Distinguish between the following levels of measurement
 - A. Nominal
 - B. Ordinal
 - C. Interval
 - D. Ratio.
4. Define a population and a sample.
5. Define parameter and statistic.
6. Recognize that Greek letters are used to represent parameters and English letters are used to represent statistics.
7. To present various methods of depicting data and the statistical measures utilized in descriptive statistics.
8. Organize data into a grouped frequency table.
9. Present data in the form of histograms, stem and leaf diagrams, and/or box and whisker plots.
10. Interpret histograms, line graphs, bar graphs, pie charts, stem and leaf diagrams.
11. Use formulas to calculate the following measures of central tendency:
 - A. Mean
 - B. Median
 - C. Mode
 - D. Midrange.
12. Use formulas to calculate the following measures of dispersion:
 - A. Range
 - B. Variance
 - C. Standard deviation.
13. Use appropriate procedures to find the following measures of position in a set of data
 - A. z-score
 - B. Percentile
 - C. Quartile
 - D. Decile.
14. Define percentile and use this to interpret percentile ranks.
15. Recognize and identify various shapes of data distributions.
16. To present and utilize the basic principles of probability and the relationship between probability and statistics.
17. Utilize the addition rule to calculate probabilities for the occurrence of one event or another event.
18. Demonstrate an understanding of how events are complementary and calculate the probability that an event does not occur.
19. Use counting principles to determine the number of ways various events can occur.
20. Develop the concepts of probability distributions.
21. Distinguish between discrete and continuous random variables.
22. Have a working knowledge of the concept of probability distributions.
23. Use formulas to calculate
 - A. Mean
 - B. Variance
 - C. Standard deviation
 - D. Expected value of a probability distribution.
24. Calculate probabilities in binomial experiments.
25. Recognize and identify various shapes of probability distributions.
26. Demonstrate knowledge of the relationship between probability and the area under a probability curve.

27. Describe the normal distribution and the associated statistics and probabilities.
28. Determine probabilities using the standard normal distribution.
29. Determine z-scores that correspond with observations in non-standard normal distributions.
30. Determine scores that correspond to given probabilities.
31. Use the normal distribution to approximate probabilities associated with a binomial experiment and know the conditions for which these approximations are appropriate.
32. Know the meaning of a sampling distribution.
33. Develop the concepts of point estimates and interval estimates and present methods for determining sample size.
34. Estimate the value of a population mean, proportion and variance and determine confidence intervals for a population proportion.
35. Determine the sample size necessary for each of the above estimates given the desired confidence.
36. Present the process of hypothesis testing regarding one population parameter.
37. Determine when it is appropriate to use a z-test versus t-test in testing hypothesis concerning one mean.
38. Perform hypothesis tests concerning one mean.
39. Perform other hypotheses tests as selected by instructor.
40. Describe the basic concepts of correlation and regression.
41. Construct and analyze scatter diagrams.
42. Determine the linear correlation coefficient and use this to decide whether a linear relationship exists between two variables.
43. Establish the equation of a regression line between two variables and sketch the graph.
44. Analyze the variation between predicted and observed values.
45. Demonstrate the ability to select and apply contemporary forms of technology to solve problems or compile information.
46. Write and speak clearly and logically about statistical topics.
47. Read, analyze, and apply to problems written material related to statistics.