

COURSE PROFICIENCY OUTLINE

STATISTICS – 1326

Honors

5 Credits

Purpose

This course will introduce the student to the methods used in applied statistics, both descriptive and inferential. The course will also make use of the concepts of probability. The student will gain insight into the preparation of statistical reports and will be better able to interpret the figures and meaning of statistics. The course will make extensive use of the computer, but will not require programming knowledge.

I. Student Outcomes 4.4, 4.5

The goal of this course is to give the student a working knowledge of how statistics are used in our society. The student will learn to prepare statistical reports, describe the data collected, and make intelligent inferences about data that might be collected later. The student will learn the importance of hypothesis testing and the many different ways to analyze data.

II. Content 4.4, 4.5

- A. Introduction to Statistics
 - 1. Overview and background
 - 2. Use and abuse of statistics
 - 3. The nature of data
- B. Descriptive Statistics
 - 1. Frequency tables
 - 2. Pictures of data
 - 3. Central tendency
 - 4. Dispersion statistics
 - 5. Measures of position
- C. Probability
 - 1. Basic definitions of probability
 - 2. Addition rule
 - 3. Multiplication rule
 - 4. Complements and odds
 - 5. Permutations and combinations rules
- D. Probability Distributions
 - 1. Random variables
 - 2. Mean, variance, standard deviation and expectation
 - 3. Binomial experiments
 - 4. Mean and standard deviation for the binomial distribution
 - 5. Distribution shapes
- E. Normal Probability Distributions
 - 1. The standard normal distributions
 - 2. The nonstandard normal distributions
 - 3. Normal as approximation to binomial
 - 4. The central limit theorem
- F. Testing Hypotheses
 - 1. General procedures
 - 2. P-Values
 - 3. T Test
 - 4. Tests of Proportions
 - 5. Tests of variances with chi-square distribution

- G. Estimates and Sample Sizes
 - 1. Estimates and sample sizes of means
 - 2. Estimates and sample sizes of proportions
 - 3. Estimates and sample sizes of variances
- H. Tests Comparing Two Parameters
 - 1. Tests comparing two variances
 - 2. Tests comparing two means
 - 3. Tests comparing two proportions
- I. Correlation and Regression
 - 1. Linear correlation
 - 2. Regression line
 - 3. Multiple regression
- J. Chi-Square and Analysis of Variance
 - 1. Multinomial experiments
 - 2. Contingency tables
 - 3. Analysis of variance
- K. Design, Sampling and Report Writing
 - 1. Designing the experiment
 - 2. Sampling, collecting and analyzing data
 - 3. Writing the report
- L. Careers
 - 1. Related careers will be discussed

III. Materials

- A. Text: Elementary Statistics 8th Edition; Mario Triola, Addison & Wesley
- B. Notebook and pencil must be provided by the student.
- C. Calculators will be provided when necessary.

IV. Evaluation

- A. The student will be expected to complete classwork, homework, keep a notebook and take tests and quizzes. These will be checked and reviewed by the teacher.
- B. The student will be expected to demonstrate an acceptable level of proficiency in the objectives and content of this course.
- C. The student will be expected to demonstrate at all times appropriate classroom behavior such as self-control, respect for others, respect for property and a mature attitude.
- D. The student will be expected to adhere to the school rules and regulations for behavior and the district policy for attendance.
- E. Students will be required to successfully pass the High School Proficiency Assessment as mandated in the graduation law (N.J.S.A. 6:8-4.2).
- F. Students who fail the HSPA examination will be placed in a Basic Skills Math class as required by N.J.S.A.6:8-4.2. There will be no exceptions to this requirement.
- G. The student will be expected to take a comprehensive final exam covering the entire school year's work. This exam will count at 1/5 of the final grade.
- H. The final grade represents the teacher's professional judgment of the student's performance and all of the aforementioned activities and/or requirements are included in the evaluative process.