

NEWPORT-MESA UNIFIED SCHOOL DISTRICT
Course Description

STATISTICS
Elective – 1 year (1AB)

Content covered in this course is described in the Course of Study. Based upon student needs, teachers select appropriate materials from the Instructional Materials List. Teaching strategies will include direct instruction, cooperative learning, group projects, individual projects, individual projects, graphing calculators and the internet.

Overview:

Statistics will introduce students to the study of probability, interpretation of data, and fundamental statistical problem solving. Mastery of this academic content will provide students with a solid foundation in probability and facility in processing statistical information.

Course of Study Objectives:

1.0 The student will know the definition of the notion of *independent events* and can use the rules for addition, multiplication, and complementation to solve for probabilities of particular events in finite sample spaces.

1.1 SUGGESTED STUDENT ACTIVITIES:

- Flipping coins and rolling number cubes in groups
- Calculating probabilities
- Textbook problems

1.2 INSTRUCTIONAL MATERIALS USED:

- Approved textbook
- Worksheets & Online Sites
- Graphing Calculator

1.3 SUGGESTED TEACHER ACTIVITIES:

- Direct instruction
- Group organization and management for activities
- Demonstrations with Manipulatives such as Urns and Marbles
- Venn Diagrams

2.0 The student will know the definition of *conditional probability* and use it to solve for probabilities in finite sample spaces.

2.1 SUGGESTED STUDENT ACTIVITIES:

- The student will understand the definitions and differences of conditional and unconditional probabilities.
- The student will be able to apply the formula for conditional probability.

2.2 INSTRUCTIONAL MATERIALS USED:

- Approved textbook
- Worksheets & Online Sites
- Graphing Calculator

2.3 SUGGESTED TEACHER ACTIVITIES:

- Direct instruction
- Group organization and management for activities
- History of Terminology and Symbols
- Venn Diagrams

3.0 The student will demonstrate an understanding of the notion of *discrete random variables* by using them to solve for the probabilities of outcomes, such as the probability of the occurrence of five heads in 14 coin tosses.

3.1 SUGGESTED STUDENT ACTIVITIES:

- Chart of probability trees
- Textbook problems

- 3.2 INSTRUCTIONAL MATERIALS USED:
- Approved textbook
 - Worksheets & Online Sites
 - Graphing Calculator
- 3.3 SUGGESTED TEACHER ACTIVITIES:
- Direct instruction
 - Group organization and management for activities
 - Demonstrations with Manipulatives such as Urns and Marbles
 - Probability Trees for Outcomes
- 4.0 **The student is familiar with the standard distributions (normal, binomial, and exponential) and can use them to solve for events in problems in which the distribution belongs to those families.**
- 4.1 SUGGESTED STUDENT ACTIVITIES:
- Textbook exercises
 - Online examples of distributions
 - Software simulations
 - Additional distributions visualized for completeness (e.g. uniform)
- 4.2 INSTRUCTIONAL MATERIALS USED:
- Approved textbook
 - Worksheets & Online Sites
 - Graphing Calculator & Spreadsheet & Specialist Statistical Software
- 4.3 SUGGESTED TEACHER ACTIVITIES:
- Direct instruction
 - Group organization and management for activities
 - Software & Computer demonstrations
- 5.0 **The student will determine the mean and the standard deviation of a normally distributed random variable.**
- 5.1 SUGGESTED STUDENT ACTIVITIES:
- Textbook problems
 - Drawing of 68%, 95%, 99% for standard deviation
- 5.2 INSTRUCTIONAL MATERIALS USED:
- Approved Textbook
 - Worksheets & Online Sites
 - Graphing calculator
- 5.3 SUGGESTED TEACHER ACTIVITIES:
- Direct instruction
 - Group organization and management for activities
- 6.0 **The student will know the definitions of the *mean*, *median*, and *mode* of a distribution of data and can compute each in particular situations.**
- 6.1 SUGGESTED STUDENT ACTIVITIES:
- Textbook problems
 - Visual display of the three measures of central tendency.
- 6.2 INSTRUCTIONAL MATERIALS USED:
- Textbook
 - Worksheets & Online Sites
 - Graphing calculator
- 6.3 SUGGESTED TEACHER ACTIVITIES:
- Direct instruction
 - Group organization and management for activities
 - Manipulatives showing distinction such as the use of a weighing scale

7.0 The student will compute the variance and the standard deviation of a distribution of data.**7.1 SUGGESTED STUDENT ACTIVITIES:**

- The student will solve problems directly.
- The student will read and solve word problems.

7.2 INSTRUCTIONAL MATERIALS USED:

- Approved textbook
- Worksheets & Online Sites.
- Graphing Calculator

7.3 SUGGESTED TEACHER ACTIVITIES:

- Direct instruction
- Group organization and management for activities.

8.0 The student will organize and describe distributions of data by using a number of different methods, including frequency tables, histograms, standard line and bar graphs, stem-and-leaf displays, scatter plots, and box-and-whisker plots.**8.1 SUGGESTED STUDENT ACTIVITIES:**

- The student will draw graphs manually in groups.
- The student will use software to display graphs.

8.2 INSTRUCTIONAL MATERIALS USED:

- Approved textbook
- Worksheets & Online Sites
- Graphing Calculator & Spreadsheet & Statistical Software

8.3 SUGGESTED TEACHER ACTIVITIES:

- Direct Instruction
- Group organization and management for activities.
- Multiple examples for visual learners

9.0 The student will become confident in using mathematical technology tools including graphing calculators, Java applets, and spreadsheets (Technology Standards).**9.1 SUGGESTED STUDENT ACTIVITIES:**

- Programming calculators with lists and the display of graphs.
- Making charts and mathematical models in spreadsheets.
- Observing changes in distributions in statistics software.
- Using advanced statistical software to explore practitioner usage.

9.2 INSTRUCTIONAL MATERIALS USED:

- Approved textbook
- Worksheets & Online Sites
- Graphing Calculator & Spreadsheet
- Data Acquisition System

9.3 SUGGESTED TEACHER ACTIVITIES:

- Direct instruction
- Group organization and management for activities
- Video demonstrations of software usage & tutorials

10.0 The student will learn CALP words and everyday science applications (Universal Access).**10.1 SUGGESTED STUDENT ACTIVITIES:**

- Frayer Cards on Subtle Math Words (e.g. confidence interval)
- Simulated lab reports that use real data on topics like school attendance
- Designating words as "Mortar" or Brick."

10.2 INSTRUCTIONAL MATERIALS USED:

- Approved textbook
- Overhead projector
- Presentation Software

10.3 SUGGESTED TEACHER ACTIVITIES:

- Direct instruction
- Group organization and management for activities

INSTRUCTIONAL MATERIALS:

Textbooks –

Statistics Through Applications (2005) Yates, Daniel S. et al. W.H. Freeman and Company, New York

Supplementary Materials -

Graphing Calculator (e.g. TI-84)

Spreadsheet (e.g. Excel)

Statistics Software (e.g. Fathom, Minitab)

Presentation Software (e.g. PowerPoint, eZedia)

Data Collection (e.g. Vernier sensors)

All of the California standards (2000, revised edition) for probability and statistics are incorporated within the course.

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