Providence Extension Program (PEP): Statistics Honors with Mrs. Norris

Syllabus

This course will give each student a strong foundation in advanced mathematical and analytical concepts as applied to real world problem-solving. It focuses on critical thinking; statistical literacy, methods, and interpretation; and the use of probability in decision-making. It will also help each student to develop better note-taking and test-taking skills.

This course introduces the student to statistics in a way that it is accessible to everyone, even those who do not love math! Statistics affects all aspects of our lives. In the school environment, it is used in testing, grades, class rank, etc. In the world outside of campus, it is used in medicine, business, the arts, actually any discipline; we are only limited by our own imagination in discovering new uses for statistics!

During the year we will cover statistical methods, focusing on the suitability of the method and the meaning of the result. Statistical methods and measurements are developed in the context of applications.

Text & Supplies

Understandable Statistics - Concepts & Methods (Brase & Brase, 10th Ed.)

David & Goliath by Malcolm Gladwell

Statistics/Graphing Calculator TI-84 Plus (preferably C Silver Edition)

Notebook & Graph Paper, Pencils, Pens, Colored Pencils/Markers, Highlighters

Student Information Form

Grading

A = 90-100 (4.5 (1/2 point Honors boost)), B = 80-89 (3.5), and so forth for each letter grade C and D. Any grade at or below 59 is failing and receives an F.

Tests, Quizzes and Projects comprise 70% of quarterly grades and are allocated differently from quarter-to-quarter. Please check the PEP GradeBook. Homework 20%, Class Participation* 10%

* one excused absence per quarter

Success in this class will require multiple exposures to each concept, usually three. Prior to each class, students are expected to look over the sections to be covered (exposure #1). Then I will teach the concepts in class and we will work some examples **(exposure #2)**. Finally, students will do homework assignments on the concepts taught **(exposure #3)**. By the time students are tested on the subject matter, they are well prepared to demonstrate mastery of the skills taught.**Success in this class will also require appropriate application of the concepts taught through Projects assigned.**

Homework Policy

All Homework must be completed in pencil (or colored pencils as warranted).   Homework will almost always be odd-numbered problems and are to be checked by the students. Homework grades will be based on completion. However, late Homework will receive a 60%, if turned in at the next class. Homework will not be accepted after that one day "grace", and the student will receive a zero.   If your student misses class on the day the assignment is due, please contact me directly that day. Homework will then be due the next day the student is in class.

Tests

Tests may be delivered via e-mail. **Once parents have printed out the materials, they should immediately delete the e-mail.** Tests will have a guided time limit; so, parents please keep track of the time when you administer them. Tests should be returned in sealed envelopes with the parents' signature **across the seal** and the time needed to take the test noted. ****Tests will not be accepted, if they are not presented to me as noted above.****

Lesson Plans

Lesson plans for each week will be posted/uploaded to My Weebly Site (www.pepmrsnorris.weebly.com). They will outline Homework assignments and due dates and upcoming Test and Project due dates. My goal is for these Lesson Plans to follow the Syllabus outlined below. However, changes may be made throughout the year, based on student progress. Wherever they may conflict, the Lesson Plans will prevail.

Semester One

Chapter One   Introduction to Statistics

(Random Samples, & Experimental Design)

Chapter Two   Organizing Data Pictorially

(Frequency Distributions, Histograms, Bar/Circle/Time Series Graphs,
Stem & Leaf, etc.)

Chapter Three   Averages & Variation

(Measures of Central Tendency - Mean/Median/Mode, Measures of Variation,
Percentiles, Box & Whisker Plots)

Chapter Four   Introduction to Probability

(Compound Events, Trees, Counting Techniques)

Chapter Five   Binomial Probability Distribution, etc.

(Random Variables, Probability Distributions, Binomial
Probabilities/Distributions, Geometric & Poisson Probability Distributions)

Chapter Six   Normal Curves & Sampling Distributions

(Graphs of Normal Probability Distributions, Standard Units & Areas Under the
Standard Normal Distribution, Areas Under Any Normal Curves, Sampling
Distributions, Central Limit Theorem, Normal Approximation to Binomial
Distribution and to Proportion Distributions)

<u>**Semester Two**</u>

Chapter Seven   Estimation

(Estimating the Mean When Standard Deviation Is Known/Unknown, Estimating Proportions - margin of error, confidence intervals)

Chapter Eight   Hypothesis Testing

(Introduction to Statistical Tests, Type I & Type II Errors, Testing the Mean When the Standard Deviation is Known & Unknown, Testing the Proportion, Critical Regions, Tests Involving Paired Differences in Dependent Samples, Testing the Difference Between Means in Independent Samples when the Standard Deviations are Known & Unknown, & Testing the Difference of Proportions)

Chapter Nine   Correlation & Regression

(Scatter Diagrams & Linear Correlation, Linear Regression & the Coefficient of Determination, Inferences for Correlation & Regression, Multiple Regression)

Chapter Ten   Chi Square

(Chi Square - Tests of Independence & Homogeneity, Goodness of Fit, Testing & Estimating a Single Variance or Standard Deviation)

<u>Optional</u>

Chapter Ten   F Distributions, etc.

(F Distributions - Testing 2 Variances; One-Way ANOVA; and 2-Way ANOVA**)**

Chapter Eleven   Nonparametric Statistics

(Sign Test for Matched Pairs, Rank-Sum Test, Spearman Rank Correlation, Runs Test for Randomness)

Additional Topics: Bayes' Theorem & Hypergeometric Probability Distribution

Projects: Quarter I   Read <u>David & Goliath</u> by Malcolm Gladwell.
Write Paper Based on Teacher Prompt.

Quarter II - Statistical Studies and Analysis of Individually Chosen Topic
(See Student Information Sheet Below and Project Document on Weebly)

3rd Quarter – Hypothesis Testing & Analysis of:
a Specific Measurable Characteristic of a Species at the Jacksonville Zoo

Student Information for Statistics

Name _____ Grade Level _____
Previous Math Class _____

What are your interests, hobbies, sports, etc. that you think would make an interesting project for Statistics?

What events in the world would you like us to watch closely and investigate statistically during the course of this upcoming year?

What are you curious about that we might look into using statistical methods?

What relationships between two variables are you curious about and would like to explore statistically? (See Project #2 - Part 3 before you answer this question)

Thank you !!

Mrs. Norris

Quarter One

Week 1	**T** ORIENTATION	**Th** Chapter 1: Sections 1.1 & 1.2

Week 2 **T** Chapter 1: Section 3 **Th** <u>Chapter Review</u>

*Chapter Test at Home

Week 3 **T** Chapter 2: Section 1 **Th** Sections 2.2 & 2.3

Week 4 **T LABOR DAY – no classes** **Th** <u>Chapter Review</u>

*Chapter Test at Home

Week 5 **T** Chapter 3: Sections 3.1 & 3.2 **Th** Sections 3.2 & 3.3

(pages 80-99) (pages 100 - 116)

Week 6 **T** <u>Chapter Review</u> **Th** ***D & G Quizzes (Chap. 4–6 and 7-9)**
  *Chap. Test @ Home – due in 1 wk. **Class Discussion**
  *David & Goliath Quiz (Intro. - Chap. 3)

Week 7 **T** Chapter 4: Section 1 **Th** Section 4.2

Week 8 **T** Sections 4.2 & 4.3 **Th** CATCH UP DAY

Week 8.5 **T** ***<u>Project #1 Due</u>*** **Th** FALL BREAK – no classes

Quarter Two

Week 1 **T** <u>Chapter Review</u>
  *Chapter Test at Home **Th** Chapter 5: Section 1

Week 2 **T** Section 5.2 **Th** Section 5.3

Week 3 **T** Section 5.4 **Th** <u>Chapter Review</u>
  *Chapter Test at Home

Week 4 **T** Chapter 6: Section 1 **Th** Section 6.2

Week 5 **T** Chapter 6: Section 3 **Th** Section 6.4

THANKSGIVING BREAK

Week 6 **T** Section 6.5 **Th** Section 6.6

Week 7 **T** **Chapter 6 Review** **Th Semester Review**

Week 8 **T** **SEMESTER EXAM - IN CLASS** **Th SEMESTER EXAM - IN CLASS**
  <u>Project #2 Due</u>

CHRISTMAS BREAK

Quarter Three

Week 1	**T** Chapter 7: Section 1	**Th** Section 7.2
Week 2	**T** Section 7.3	**Th** Section 7.4 (Part 1)
Week 3	**T** Section 7.4 (Part 2)	**Th** **Review for Chapter 7 TEST** *** Chapter Test at Home**
Week 4	**T** Chapter 8: Section 1	**Th/F** Section 8.1 (con't)
Week 5	**T** Section 8.2	**Th** Section 8.3
Week 6	**T** Section 8.4	**Th/F** Sec. 8.5 (Part 1)), **Zoo Field Trip**
Week 7	**T** Section 8.5 (Part 2)	**Th** Catch-up Day
Week 8	**T** <u>**CHAPTER TEST - IN CLASS**</u> <u>**(Part 1: 8.1 - 8.3)**</u>	**Th** <u>**CHAPTER TEST - IN CLASS**</u> <u>**(Part 2: 8.4 - 8.5)**</u> <u>***Project #3 Due***</u>

SPRING BREAK

Quarter Four

Week 1	**T** Chapter 9: Section 1	**Th** Section 9.2
Week 2	**T** Section 9.3	**Th** Section 9.4
Week 3	**T** <u>Chapter Review</u> ***Chapter Test at Home (due in 1 Week)**	**Th** Chapter 10: Section 1
Week 4	**T** Section 10.2	**Th** Section 10.3
Week 5	**T** <u>Chapter Review</u> ***Chapter Test at Home**	**Th** **Special Topics from Chap. 10**
Week 6	**T** **Special Topics Chap. 10 & 11**	**Th** **Special Topics from Chap.11**
Week 7	**T** **Senior Theses**	**Th** **Senior Theses**
Week 8	**T** **SEMESTER REVIEW**	**Th** **SEMESTER REVIEW**

SEMESTER EXAM