# AP Statistics Syllabus

Teacher: Mr. Husar
School Year: 2017-2018
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**Synopsis:** AP Statistics is one of the two AP math offerings that our high school has for its students. The class is NOT a substitute for Calculus, but rather a different real world discipline in mathematics. The class is a very high-paced course in which students learn how to gather and analyze data, draw appropriate conclusions, and communicate the results using everyday and statistical language in the context of the problem.

**Pre-Requisites:** Enrolling students must have met the pre-requisites for this class which includes:

- The student MUST have completed Advanced Algebra with at least a "C" or better grade
- ***The student MUST own and bring a TI-83, TI-84, or TI-nspire calculator to class every day.***
- Students must be highly motivated to improve their math knowledge
- Students should anticipate taking the AP Statistics exam in May 2018.

**Course Materials:**

- Primary Textbook: Bock, Vellerman, and DeVeaux. Stats: Modeling the world, Third Edition. Boston, MA: Pearson Education (2007). ISBN 0-13-187621-X.
- Graphing Calculator Exercises and projects (see specific activities in the Course Outline)
- Other resource materials: newspapers, journals, and the World Wide Web will be utilized to gather data to use to design tasks, analysis conjectures, and draw conclusions from the data)
- Selected AP Statistics Exam free response questions will be utilized
- Computer resources such as Excel and computer generated outputs among others will be utilized as a means to collect data for later analysis
- Graphing Calculator: A graphing calculator like a TI-84 will be utilized daily and is ***required.***

**Course Performance Objectives**

1. Students will explore and understand data
2. Students will explore relationships between variables
3. Students will gather data using a variety of techniques
4. Students will explore the world of randomness and probability
5. Students will connect data at hand to the world at large
6. Students will learn about inferences using means
7. Students will make inferences when variables are related

**Course Performance Indicators**

- Assignments/Projects (20%)
  - Everyday students will be participating in meaningful mathematical learning. Each day, students can expect to complete a daily homework assignment based on that days learning. It could be problems from the textbook, a worksheet based on the learning, or some other meaningful task. Students are expected to be actively engaged in math during class every day.
  - Students will be participating in class projects and reports designed to raise students abilities in expressing data in meaningful and making clear connections between the math and the world around them.
  - Student projects are assigned as major assignments during the second semester. Students must complete all stages in the AP project design in stages at least once during the 2nd semester:
    - A) Plan the sampling procedure & clearly define the measurement strategy
    - B) Anticipate confounding variables in the case of experiments and issues of bias in an observational study
    - C) Suggest their statistical analysis at the planning stage
    - D) Conduct their analysis
    - E) Interpret their results in context
    - F) Present the results in a written report. A short Q&A class presentation is also required.

- Assessments (80%)
    - Chapter Quizzes (Usually between 20-50 points)
        - After each chapter of learning students may take a chapter quiz. This is a test of learning and will be graded based on accuracy. No notes will be allowed, except for a teacher-created reference sheet and the AP reference sheets. Students will be assessed for accuracy and the problem-solving method that was utilized. Pop quizzes may also be used.
    - End of Unit Tests (Usually 50-100 points)
        - Once the unit has been completed, an end of unit test may be assigned. Prior to the test, students will complete a review designed to assist students to prepare for the exam. As with the quiz, no notes will be allowed, except for a teacher-created reference sheet and the AP reference sheets. Once again, students will be assessed for accuracy and the problem-solving method that was utilized. Written evidence will be emphasized.

***Course Anticipated Outline {Subject to change}***

A word on technology- Technology will be incorporated throughout the text, including the use of graphing calculators. Each chapter in the text speaks to the usage of calculators to give the students instruction and practice with the statistical capabilities of the calculator.

| Unit | Approx Time | Topics to be discussed<br>{More mini-projects may be added} | Projected Bookwork<br>{Book- Bock, Velleman, DeVeaux} |
|---|---|---|---|
| I | 4 weeks | Exploring and understanding data<br>• Introduction<br>• Data<br>• Displaying and describing categorical data<br>• Asgn 1.1: Students will be analyzing computer outputs and constructing data displays from them. Students will the describe the distributions using sample means, sample standard dev, and the use of z-scores to interpret specific data pts within the set.<br>• Displaying Quantitative Data<br>• Describing distributions numerically<br>• The Standard Deviation as a ruler and the normal model<br>• Mini-Project #1.2: M&M Experiment. Students will produce data from a package of M&M's, predict outcomes for a larger sample size, use a data display of the choosing, and conjecture what the actual mixture is. | • Chap 2: 3-5, 7<br>• Chap 3: 5, 7-9, 11, 14<br>• Chap 4: 4-7, 10, 12, 18, 20, 30<br>• Chap 5: 3-5, 7, 8, 11, 13, 17-19<br>• Chap 6: 1, 3-5, 8, 18, 20-22, 24, 28, 29, 33, 34<br>• Review: 3-18 (x3), 21- 39 (x3) |
| II | 6 weeks | Exploring relationships between variables<br>• Scatterplots * Associations<br>• Correlation * Linear Regression<br>• Re-expressing data<br>• Mini-Project #2.1: Height vs. Shoe experiment: Students will gather data, construct a scatter plot, perform a correlation and regression analysis, and report the findings. Students will conduct major portions of the experiment using a TI-83/TI-84 {Using stat lists, stat plots, 1-var stat calcs, and LinReg} | • Chap 7: 1-15, 18-36 (x3)<br>• Chap 8: 1-10<br>• Chap 9: 1-5, 11-19, 21, 22<br>• Chap 10: 1, 3, 4, 8-12, 23, 25, 27-29<br>• Review: 1-12, 15-33 |

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|---|---|---|---|
| III | 3 weeks | Gathering Data<br>• Randomness and simulations<br>• Sample surveys (bias, sampling methods)<br>• Experiments (Blocking, blinding, placebos)<br>• Observational studies<br><br>• Mini Project #3.1: Random number table experiment. Students will make a conjecture of the outcomes of a random task given certain parameters. Students will gather data using the RandInt function on the TI-83/TI-84 to determine the success/failure of a particular experiment. Students will analyze their conjecture in light of the results of the experiment | • Chap 11: 1-9, 11-14<br>• Chap 12: 1-21<br>• Chap 13: 1-6, 9-11, 17, 21, 23, 28, 30, 31, 36, 39<br><br>• Review: 1-4, 22-29 |
| IV | 5.5 wks | Randomness and Probability<br>• Probability basics (law of large numbers, independence, sample space, compliment)<br>• Probability rules (Venn diagrams, addition and multiplication rules, conditional prob., disjoint events, tree diagrams)<br>• Random variables (discrete vs continuous, expected value, variance<br>• Probability Models (Geometric and Binomial) | • Chap 14: 1-6, 9-24<br>• Chap 15: 1-14<br>• Chap 16: 1-3, 5, 9, 11, 18, 19, 23, 24, 26, 27, 29, 31, 33, 34-37<br>• Chap 17: 1-3, 6-13, 19, 21, 22, 24 |
| V | 4 weeks | From the data at hand to the world at large<br>• Sampling distribution models<br>• Confidence intervals for proportions<br>• Testing hypothesis about proportions<br>• Comparing two proportions<br><br>• Mini-Project #5.1: TBD | • Chap 18: 1-19, 21-36 (x3), 22-24 (x3)<br>• Chap 19: 1-3, 5, 9, 11-15, 23-25, 33-35<br>• Chap 20: 1-5, 9-13<br>• Chap 21: 1-3, 7-9, 11-17<br>• Chap 22: 1, 3, 11, 15 |
| VI | 4 weeks | Learning about the world<br>• Inferences about means<br>• Comparing means<br>• Paired samples and blocks | • Chap 23: 1-5, 10, 11, 15, 16, 19, 26, 33, 35<br>• Chap 24: 1-3, 5, 7, 9, 10, 12, 16<br>• Chap 25: 5-8, 13, 14, 17 |
| VII | 2 weeks | Inference when variables are related<br>• Comparing counts (Goodness of fit, independence, and homogeneity)<br>• Inferences for regression<br><br>• 2nd Semester final project. Students must complete the requirements for a final report (see page 1) on a topic to be determined. Students must utilize research reported in newspapers, news magazines, or research journals (online format is acceptable). The use of appropriate statistical language, methods, and interpretations will be assessed. | • Chap 26: 1-6, 10-13, 15-17<br>• Chap 27: 1-7, 26, 29 |

Student Conduct Expectations

1. Students will participate in all classroom activities.
2. Students will complete all assigned work to the best of his/her ability, showing all work neatly.
3. Students will take responsibility for their individual learning and behavior.
4. Students will attend class daily, arriving punctually and mentally and physically prepared to learn.
5. Students will respect the orderly learning environment of the classroom.
6. Students will respect the physical environment of the classroom.
7. Students will respect others space, heritage, and unique talents/abilities.
8. Students will refrain from inappropriate discussions involving drugs, alcohol, and other destructive illegal behaviors. Our school is a drug, alcohol, and tobacco free campus and therefore talk of such is not permitted.

Classroom Management Goals and Plan

It is my mission as a teacher to present the best possible learning environment for my students. I will make every effort to individually help every student succeed. I expect the same courtesy and respect in return from my students. Students who find themselves unable to conduct their actions in an acceptable manner as outlined in the "student expectation" section above are subject to consequences ranging from detention to expulsion

## ***Assessing student learning***

Our school's math department policy calls for math grades to be done in a weighted fashion. In AP Statistics: 80% of the grade is based on assessments, and 20% of the grade is based on homework and in-class assignments.

Once the mean grade is computed, grades are earned at the following levels, as established district-wide:

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|---|---|---|---|---|
| A+ is not a option on transcripts | | A = 92.51-100 (4.0) | | A- = 89.51-92.50 (3.7) |
| B+ = 86.51-89.51(3.3) | | B = 82.51-86.50 (3.0) | | B- = 79.51-82.50 (2.7) |
| C+ = 76.51-79.50 (2.3) | | C = 72.51-76.50 (2.0) | | C- = 69.51-72.50 (1.7) |
| D+ = 65.51-69.50 (1.3) | | D = 59.50-65.50 (1.0) | | D- is not an option on transcripts |
| F= 0-59.50 (0.0) | | | | |

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Additional classroom policies

- **Grade Improvement Retests**: In AP Statistics, students may retest 1 time per chapter on chapter quizzes. Students may also retest once per unit on unit tests. Retests are allowed providing the following procedure is completed:
  - Students must correct the mistakes on the original quiz/test prior to a retake
  - Students may have to demonstrate knowledge on each missed problem on a separate assignment prior to the retest
  - All homework from the material that the student wishes to do a retake on must be completed and earn at least 70%
  - The retake grade replaces the original grade to determine the final score but a retake score can never exceed a maximum of 89% (Unless the grade was 90% or above the 1st time)
  - Grade improvement retakes must be completed within two weeks of receiving the test or retest back.
  - No grade improvement retakes will be administered within 5 school days before the end of the 1st semester and within 10 school days before the end of the 2nd semester due to time constraints

* **Absent Test Policy**-
  * Tests missed due to absences MUST be made up within one week, per department policy
    * If the absence was *excused*, the make-up will occur with no penalty if the make-up occurs within 1 week.
  * If the absence was *unexcused*, the make-up will occur immediately upon return, however the maximum possible score will be 79% on that and all subsequent retests.

* **Late finish testing policy**: Tests must be finished on the test due date unless permission was granted to the entire class or other special circumstances exist. If the test is not fully completed on the due date, the test will be graded as is. Students may still access a grade improvement retest.

* **Cheating Policy:** Students involved in cheating or plagiarism will have their assignment/test/project invalidated. Any response substantially copied from online sources (including phone apps) constitutes plagiarism. Students may retest or resubmit a project (except for the final project) 1 time with a maximum possible score of 60%. Students can't improve a test that was initially cheated on with a grade improvement retest. A second instance of cheating on a test will result in a 0 with no make-up opportunity, unless appealed to administration.

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*Late assignment provision*

* Daily Homework: Homework will be accepted until the end of the unit at no penalty. After that a 30% penalty will apply. No homework that is two units late will be accepted, except as it relates to making up tests (work later than 2 units will receive 1 point).
* Chapter Tests and quizzes: See above sections on absent tests, late finish tests and grade improvement retests.
* AP Research Project(s)- The project(s) is due on its announced date. A late project will be accepted at a 20% per day late penalty, except the final project will not be accepted late.

## ***Exit qualification (Final test score)***

- Test will be a AP style test over the entire class and is worth 100-150 points.
- No retakes on the final are allowed
- Students who are caught cheating on the final will receive a 0 on the final with no make-up

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## ***Attendance***

Daily attendance is required by state law and is necessary for successful completion of this course. Attendance will be taken promptly daily when the bell rings. Students are expected to be in their assigned seat when the bell rings.

## ***Discipline Plan for absences:***

- School Policy- A student who accumulates 12 or more absences per semester can be subject to a penalty as imposed by the teacher. The following is this instructors written policy on absences
    - **Unexcused absences**: A student with an unexcused absence on a test day will incur a maximum score of 80% on retests instead of 90%. Students with an unexcused absence may NOT make up that daily homework check.
    - **Excess absences (over 11 total absences per semester)**:
        - Students lose the ability to earn an "A" or "A-" for the semester on the 15th non-school related absence and could have their grade lowered to 89% unless the grade is already below 89%.
        - In addition, each non school-related absence over the 15th may result in an additional 1% penalty per absence. The penalty could be applied weekly. School-related absences do not count. All other absences mahy count, unless otherwise approved by administration.

**REQUIRED MATERIALS- The required materials list is listed on the syllabus signature sheet and my website; please note that a graphing calculator is a requirement of the course.**

| Beg of Sem WS<br>B06 | AP Statistics<br>Student/Parent Syllabus Acknowledgement | Name _____ |
|---|---|---|

Student Portion-

Student Name (Printed) _____

I, _____, have read and understand the basic rules and procedures pertaining to my success in AP Stats. I understand that my continued success is largely dependent on my adherence to the rules set forth by the instructor. I also acknowledge that discipline procedures ranging from detention to expulsion could result from repeated violations of classroom conduct procedures. By signing this agreement, I hereby attest that I understand and will agree to follow the instructor's published classroom rules and also agree to follow any future rules to be added as necessary.

X _____ Date _____

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**REQUIRED MATERIALS**

- **Assigned Book**
- **Pen or writing materials**
- **Paper and Previous Day's Work**
- **Notebook to keep previous work in**
- **Chromebook**
- **A TI-83 or TI-84 calculator (or equiv.) is a requirement of the course and may also be used on the AP exam**

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Parent/Guardian Portion-

Student Name _____

Parent/Guardian Name _____ Contact Phone Num. _____

Parent/Guardian contact e-mail: _____

I, _____, have read and understand the basic rules and procedures pertaining to my student's success in AP Stats. I understand that rules and procedure are a necessary part of maintaining a quality learning environment. I have read the syllabus and will support these provisions with my learner. By signing this agreement, I hereby understand my student's role to follow the instructor's policy during this semester and school year.

X _____ Date _____

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