KAP Statistics
Gilmour Academy

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Primary Textbook: *The Practice of Statistics, 2e*, Yates, Moore and Starnes,
Technology: TI 83+ or TI 84+Graphing Calculator and Minitab
Kenyon Supervising Instructor: Brad Hartlaub, P.D.

Course Content:
Exploring Univariate Data:
    Explore, display, and interpret categorical and numerical data observing patterns and departures from patterns
- Displays include histograms, pie charts, dotplots, stemplots, boxplots; cumulative frequency charts and plots, and normal probability plots
- Interpretation utilizing measures of center, spread, linear transformations, assessing normality, and comparing distributions

Exploring Bivariate Data:
    Utilize regression and correlation to describe, summarize, and make predictions regarding bivariate data
- Scatter plots, correlation, least squares regression, and linear transformations
- Visual and numerical summaries for two-way tables

Planning and Designing Studies And Experiments:
    Design, conduct, and analyze studies, surveys and experiments, incorporating a variety of data collection methods and identifying sources of error, bias, blocking and confounding variables
- Simple comparative experiments and block designs
- Use of randomization, eliminating bias, control and experimental groups, placebo effect, replication, etc.
- Sampling Methods: Census, observational study, simple random sample, stratified sample, cluster samples, systematic samples, biases, and sampling variability
- Use of simulation

Probability:
    Acquire a basic knowledge of probability, probability distributions, and simulations
- Basic probability models, random variables, expected values and variances of random variables, general probability rules, linear combinations of random variables
- Discrete Distributions - Binomial, Geometric, and Uniform
- Continuous Distributions – Chi-square, Normal, t, and Uniform

Sampling Distributions:
    Recognize, understand, utilize, and interpret sampling distributions
- Sample Proportions – means, standard deviations, normal approximations
- Sample Means – mean, standard deviations, Central Limit Theorem, use of normal distributions

Statistical Inference:
    Apply the principles of statistical inference to draw conclusions, utilizing confidence intervals, hypothesis testing, and goodness-of-fit tests
- Confidence intervals for measures of center, a proportion, differences in means from two samples (dependent and independent), differences in proportions from two samples, and linear regression models
- Hypothesis tests for measures of center, a proportion, differences in means from two samples (dependent and independent), differences in proportions from two samples, and linear regression models
- Goodness-of-fit tests and chi-square tests for association and equality of proportions

Expectations:

Students are expected to _come to class prepared_. You should have textbooks, pencils, notebooks, and completed homework each day of class.

Participating in class and _asking and answering questions_ are a vital part of the learning process. I expect you to actively participate. There is no "dumb" or "bad" question.

All students are _encouraged to seek extra help_. If at any time you have questions that you do not feel comfortable asking in class, are having difficulty understanding the concepts, or have been absent, please arrange to see me outside of class for additional help. Do not ignore questions or uncertainties.

Homework:
Homework will be checked at the start of the class when the assignment is due. It will be collected periodically. All work must be shown in order to receive full credit.

Investigations and Projects:
There are a variety of investigations and projects throughout the year. The points assigned will vary based on the amount of time and effort needed to complete them.

AP Problems:
There will be approximately 2 AP problems assigned every chapter. It is important that you complete these as thoroughly as possible. Some will be done individually, some in pairs.

In-Class Activities:
There will be a variety of activities completed in class, either independently or in groups.

Tests:
There will be approximately one test given per chapter. Each test will cover the objectives of that chapter, but may also contain important past material. Tests will be announced well in advance. The will be a 1st semester exam in January. The final exam will be the Advanced Placement test.

Grades:
Your grade will be determined on total points. Below is an example of how the semester points may be distributed Semester 1.

Category	Points
Tests (6 or 7, 30-40 points each)	230
Homework (5-10 points per chapter)	55
Projects (3 projects)	75
AP Problems (10-14 problems)	60
Semester Exam	80

If you earn a C or better in this course, you will receive college credit from Kenyon College.

Absences:
Attendance is very important in this course.
If you know, in advance, that you will be absent from class for any reason, you should notify me prior to the absence so that you do not fall behind in the work. If you are unexpectedly absent, please see me immediately upon return to obtain assignments and arrange for make-up work.
A large number of absences in this course will hamper your success.