STAT 211-T01
Elementary Statistical Inference
Fall 2017

Catalog Data: (3-0) Credit 3. Statistical inference, selecting appropriate statistical methods for data sets, interpreting results from commonly used statistical tests, evaluating reported statistical analysis in medical and health care literature, statistical calculations. Prerequisites: MATH 123 or MATH 126

Objective: Upon completion of this course the student will have a basic knowledge of statistics and be able to use various types of statistical process to describe a sample, to estimate the parameters of a population based on the statistics of a sample, and to determine whether or not already given estimations should be rejected.

Goals: Upon successful completion of the course the student should be able to:

1) Differentiate between Descriptive and Inferential Statistics
2) Identify the different types of data.
3) Graphically represent the different types of data.
4) Use statistical terms to summarize data
5) Use counting techniques to find the probability of simple and compound events.
6) Find the mean and standard deviation of discrete probability distribution
7) Understand and be able to use the Central Limit Theorem.
8) Use the different types of distributions appropriately.
9) Find the confidence interval of a mean, proportion, and standard deviation.
10) Select and use the appropriate hypothesis test for a given study.
11) Determine when data correlate and find an appropriate regression line.
12) Use the Chi-square test and Analysis of variance.

This course satisfies GEF Area 3 and GEC Objective 2A and GEC Objective 4

Instructor: Susan Barton, Ph.D., Professor of Mathematics
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Office/Phone: Engineering Lab Building 101F / 304-442-3297
Office Hours:
M 8:00 – 8:50 and 2:00 – 2:50
T 8:00 – 9:20 and, 11:00 - 11:50
W 8:00 – 8:50 and 2:00 – 2:50
R 8:00 – 9:20 and 11:00 – 11:50
F 8:00 – 8:50

Class: MWF 1:00 – 1:50 Elab 205
Method: This is a lecture based course meeting 3 times a week. Quizzes and supporting documents are at https://ecampus.wvu.edu
Policy: NO cell phones are to be used in the classroom during class, this includes texting.
Tutoring: You may stop by my office any time, office hours are just the times I promise to be there. You may also make an appointment. **Additional help:** (The Math Lab (Room LRC 323D) is open from 8am to 4:30pm for quiet study). A schedule will be posted before the second week of class detailing the hours that tutoring is available. Free tutoring is also available through the Student Success Center (LRC 222) and Student Support Services (Benedum Center 130).

Textbook: Bluman, Allan G., *A Brief Version: Elementary Statistics, a step by step approach,* Sixth edition, 2013, McGraw-Hill Higher Education, New York.

Chapters Covered:

Ch 1 - The Nature of Probability and Statistics
Ch 2 - Frequency Distributions and Graphs
Ch 3 - Data Description
Ch 4 - Probability and Counting Rules
Ch 5 - Discrete Probability Distributions
Ch 6 - Normal Distribution
Ch 7 - Confidence Interval and Sample Size
Ch 8 - Hypothesis Testing
Ch 9 - Testing the Difference between Two Means, Two Variances, or Proportions
Ch 10 - Correlation and Regression
Ch 11 - Chi-square Tests and Analysis of Variance (if time permits)

Topics:

1. Nature of Probability and Statistics
   a) Variables and types of data
   b) Sampling
2. Frequency Distribution and Graphs
   a) Categorical, Grouped, and ungrouped Distributions
   b) Graphs and charts of data
3. Data Description
   a) Measures of central tendency
   b) Dispersion
   c) Exploratory data analysis
4. Counting Techniques
   a) Multiplication Rule
   b) Permutation
5. Probability
   a) Sample space
   b) Addition and multiplication Rules
   c) Conditional Probability
6. Probability Distributions
   a) Normal distribution
7. Confidence Intervals and Sample Size
   a) Confidence interval for the mean
   b) Confidence Intervals and sample size of proportions
   c) Confidence Intervals for variances ad standard deviation
8. Hypothesis Testing
   a) z test for a mean
   b) t test for a mean
   c) z test for proportion
   d) chi-square test for a variance or standard deviation
9. Testing the Difference
   a) Testing the difference between two means having large samples
   b) Testing the difference between two variances
   c) Testing the difference between two means with small independent samples
   d) Testing the difference between two means with small dependent samples

10. Correlation and Regression
11. Analysis of variance - One-way analysis

Grading and Assessment:

Quizzes/Homework: There will be 9 quizzes and 2 homework assignments for 20 points apiece. I will drop the lowest grade. This thus counts for 200 points (about 28.6% of your course grade). The quizzes will be given in the eCampus. Quiz due dates are on the calendar below. Note the due date is one day earlier than the date listed in eCampus. The eCampus date includes a 24 hour grace period to handle any computer/internet problems that arise. https://ecampus.wvu.edu

Exams: Three in class hourly tests, each worth 100 points (about 14.3%) of the course grade.

Final Exam: A comprehensive final exam worth 200 points (about 28.6%) of the course grade will be given. Note: The final exam is open book (although not open notes).

NOTE: Only excused absences will enable a student to make up exams. This means that you must have an excuse for the day of the missed exam and every subsequent day until you have made it up. In general quizzes and homework may not be made-up

Course Grade: Grades are assigned according to the following scale:

A – 90 - 100%	(630 – 700 points)
B – 80 -	(560 – 630 points)
C – 70 -	(490 – 559 points)
D – 60 -	(420 – 489 points)
F - below 60%	

Borderline grades may be improved based on performance and grade distribution of the whole class.

Calculator Usage: Minimally you will need a calculator that does square roots. If you choose to buy a graphing calculator, I recommend the TI-83 or 84 since instructions on its use are in the book. Phones may not be used as calculators on exams

Computer Usage: Quizzes are given online. If you are unable to take online quizzes please see me as soon as possible and we will arrange a time for you to take a quiz on paper.

Reference: None **Laboratory Projects:** None

Disclaimer: The professor reserves the right to make any necessary adjustments to this syllabus.

Academic Integrity:

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University Academic Catalog at http://catalog.wvu.edu/undergraduate/coursecreditstermsclassification/#academicintegritytext.
Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see me before the assignment is due to discuss the matter.

Tentative Syllabus

Monday	Wednesday	Friday
	16 1.1- 1.4	18 1.5-1.8
21 2.1 (Quiz 1 due)	23 2.2	25 2.3 (2.4 done later)
28 3.1 (Quiz 2 due)	30 3.2	Sept 1 3.3
4 	6 3.4	8 Review (Quiz 3 due)
11 EXAM 1	13 4.1	15 4.2
18 4.3	20 5.1 (Quiz 4 due)	22 5.2
25 6.1/(Quiz 5 due)	27 6.1/6.2	29 6.2/6.3
Oct 2 6.3	4 Review (Quiz 6 due)	6 EXAM 2
9 7.1	11 7.2	13 7.3
16 7.4	18 8.1	20 Quiz 7 due/more 8.1
23 8.2	25 8.3	27 8.6
30 Review/Quiz 8 due	Nov 1 EXAM 3	3 9.1
6 9.1	8 9.2	10 9.3
13 9.5	15 2.5/10.1	17 10.1/10.2 (Quiz 9 due)
20 	22 	24 
27 10.2	29 11.1	Dec 1 11.2
4 Review	Prep Day for Finals	

Final Exam: Friday Dec 8, 1:00 – 2:50