Exam 2 Topics

Chapter 5 – Exploring Data Distributions
- Know the difference between an individual and a variable.
- Determine the distribution of a variable by finding the values a variable can have and how often they occur.
- Construct a histogram for a data set either with a given class size or without (8 to 12 classes typically look good) and appropriately label axes.
- Describe types of distributions for a histogram by looking at the shape and spread of the distribution.
- Know what it means for a data set to be symmetric or skewed.
- Understand the difference between left- and right-skewed data.
- Construct a stemplot for a data set.
- Calculate the mean, median, mode, quartiles, IQR and range of a set of data.
- Construct a boxplot from a data set’s five-number summary.
- Construct an appropriate data set that matches given summary statistics.
- Determine if a data set has an outlier.
- Know how an outlier affects the mean, median, and mode of a data set, if at all.
- Calculate the standard deviation of a small data set.
- Given the mean and standard deviation of a normally distributed data set, compute the first and third quartiles, apply the 68–95–99.7 rule and sketch the normal curve.
- Know how to compute z-scores and what the z-scores mean.

Chapter 6 – Exploring Data Relationships
- In a data set, determine the response variable and the explanatory variable.
- Draw a scatterplot for a small data set consisting of pairs of numbers. Determine whether the data is linearly or non-linearly associated (or if there is no apparent association). For linear associations, determine whether the association is positive or negative and how strongly they are associated (the correlation).
- From a scatterplot, draw an estimated regression line and determine if there are outliers.
- Use a regression line to estimate values of the variables.
- Understand the difference between interpolation and extrapolation and know when extrapolation may not be valid.
- Understand that correlation and regression describe relationships that need further interpretation, because association does not imply causation and outliers have an effect on these relationships.

Chapter 7 – Data For Decisions
- Identify the population and the sample in a given sampling or experimental situation.
- Know the different types of bias that can occur when sampling a population and analyze a sampling example to detect sources of bias.
- Determine a numbering scheme and use it with a table of random digits to select a random sample of a given size from a population.
- Recognize when two variables are confounded in an experiment.
- Know the difference between the experimental group and the control group in an experiment.
- Describe the placebo effect and why double blindness is desirable in an experiment.
- Understand what is meant by statistically significant.
- Know the difference between an observational study and an experiment.
- Know the difference in a prospective and retrospective study.
- Define statistical inference and the difference between a parameter and a statistic.
- Compute the sample proportion when both the sample size and number of favorable responses are given.
- Using an appropriate formula, calculate the standard deviation of a given sampling distribution.
- Explain the difference between the population mean and the sample mean.
- Given a sample proportion and sample size, list the range for a 95% and 99.7% confidence interval for the population proportion.
- Calculate differing margins of error for increasing sample sizes or how the sample size needs to increase to achieve a certain margin of error.