ROWAN UNIVERSITY
Department of
Mathematics

Syllabus
STAT 02.260 - Statistics I

CATALOG DESCRIPTION:

STAT 02.260 - Statistics I - 3 s.h.

Prerequisites: Equivalent of College Algebra

Students learn to use various graphical displays and measures of location and variability to describe data. The course considers elementary probability and sampling distributions, and uses the normal and t-distributions in estimation and hypotheses testing. It includes descriptive techniques for simple linear regression and correlation. Use of a graphing calculator is required; computer software may be used. Students are expected to have completed an equivalent of College Algebra.

OBJECTIVES:

The objectives of this course are to familiarize students with basic statistical terminology and tools for describing datasets. Students will also obtain a knowledge of basic concepts in data description, hypothesis testing, statistical inference and obtain a firm basis for further statistical study. Students will be exposed to the importance of the basic assumptions underlying all statistical calculations

Course Objectives
- The objectives of this course are to familiarize students with basic statistical terminology.
- Students will also obtain a knowledge of basic concepts in data description and descriptive statistics based tools for presenting and describing data sets.
- Students will also obtain a knowledge of basic inferential statistical concepts in hypothesis testing, statistical inference and obtain a firm basis for further statistical study.
- Students will be exposed to the importance of the basic assumptions underlying all statistical calculations.

Rowan Core (General Education)
Starting in Fall 2018, first-year undergraduate students at Rowan University must complete the new general education requirements, known as Rowan Core. (Continuing students and new transfer students will follow the existing general education requirements.) Students in Rowan Core must complete course requirements in six literacies: Artistic, Communicative, Global, Humanistic, Quantitative and Scientific. This course belongs to the Quantitative Literacy. All students in this course will be assessed on the following Rowan Core Learning Outcomes for this literacy:
- 3. Students can describe the differences between continuous (e.g. measurable) and discrete (e.g. countable) quantities and how this affects how they can be analyzed.
- 1. Students can define basic statistical and regression vocabulary and also qualitatively describe the meanings relative to a set of given data (e.g. mean vs. median, what does the standard deviation represent; correlation coefficients, and model parameter.
- 6. Students can perform basic analyses on both discrete and continuous data.

- 4. Students can perform basic statistical and regression analyses on data and also qualitatively describe the meaning of the results (e.g. how they change as new data are added, limits of regression models and how they can infer correlation and/or causality.

CONTENT:

1. Introduction

1.1 Brief discussion on the usefulness and relevance of statistics

1.2 Graphical Techniques - bar graphs, pie charts, stemplots, histograms, boxplots, scatterplots.

1.3 Descriptive Statistics - mean, median, standard deviation, interquartile range and five-number summary

2. Basic Probability

2.1 Probability - experiments, sample spaces, events, probability of event, set notation, independent and dependent events, intersections and unions, probability calculations

2.2 Variable description - discrete & continuous random variables

2.3 Expected value for discrete random variables

2.4 Probability distributions for continuous random variables - normal and t distributions

2.5 Bivariate descriptive statistics including Interpreting scatterplots and the Pearson coefficient of correlation

2.6 Simple Linear Regression

2.7 Coefficient of determination

3. Sampling and Sampling Distributions

3.1 Importance of appropriate sampling

3.2 Concept of (simple) random sample, sampling distribution of the mean, the Central Limit Theorem

4. Estimation

4.1 Point and interval estimation

4.2 Confidence intervals for a single population mean (based off the t-distributions)

4.3 Confidence internals for a single population proportion

4.4 Sample size estimation

5. Hypothesis Testing

5.1 Hypothesis testing methodology

5.2 Hypothesis testing for a single population mean and a single population proportion

POSSIBLE TEXTS:

*Peck, Olsen and Devore; Introduction to Statistics and Data Analysis with CD Rom, 5th edition, Thomson

Brooks/Cole, 2017. (Present text for any face to face based sections of Stat 1 that are NOT honors sections)

Robin H. Lock, Patti Frazer Lock, Kari Lock Morgan, Eric F. Lock, Dennis F. Lock, 2e, Statistics :Unlocking the Power of Data, Wiley , 2017.

McClave, James T. and Terry Sincich; Statistics, 13th edition. Pearson/Prentice Hall, Upper Saddle River, N.J., 2017.

Moore, David S., and George P. McCabe; Introduction to the Practice of Statistics, 9th edition. W.H. Freeman, New York. 2017.

Weiss, Niel A., Introductory Statistics 10th Ed., Pearson/Addison Wesley, Boston. 2016.