Piedmont Technical College

Course Information Sheet

Course Title: Probability and Statistics
Course Prefix/Number: MAT 120

COURSE-SPECIFIC GRADE CALCULATION
Advanced notification of any changes will be provided to the student.

Four categories of grades will be used to compute your final average.

- Discussion Board/Class Participation – 10%
- Homework – 25%
- Tests – 50%
- Excel Projects – 15%

EXPLANATION OF SPECIFIC PROCTORED EXAM INFORMATION
For online classes, the Unit 2 Test and Unit 4 Test will be proctored. The student can use scratch paper and a scientific or graphing calculator. The calculator must not be a part of another device (for example, an app on a smartphone). You may bring one (1) page of notes (front side only). Scratch paper should be turned in at the end of the exam.

LAB/CLASSROOM SAFETY STATEMENT
Piedmont Technical College Laboratory Safety Statement: Lab Safety Statement (www.ptc.edu/courseinfo/safety.pdf)

Classroom Safety Statement:
N/A

COURSE CONTENT OUTLINE
Advanced notification of any changes will be provided to the student.

Modules/Units

Module/Unit 1

Competencies:

DESCRIPTIVE STATISTICS
The student will:

- Distinguish between data types and levels of measurements of data and identify sampling methods.
- Identify misleading and deceptive uses of statistics.
- Construct Pareto charts and time-series graphs.
- Apply appropriate technology to compute descriptive statistics and construct graphs for a set of data.
- Calculate and interpret measures of central tendency and variation for a set of data.
- Calculate weighted mean.

**Module/Unit 2**

Competencies:

**MEASURES OF POSITION, PROBABILITY, AND COUNTING**

The student will:

- Calculate and interpret measures of position.
- Calculate and interpret empirical and classical probabilities for an event by using summarized data and sample spaces.
- Find the probabilities of compound events using the addition and multiplication rules.
- Find the total number of outcomes in a sequence of events using the fundamental counting rule.
- Find the number of ways that r objects can be selected from n objects using the permutation rule.
- Find the number of ways that r objects can be selected from n objects, without regard to order, using the combination rule.

**Module/Unit 3**

Competencies:

**DISCRETE PROBABILITY DISTRIBUTIONS, BINOMIAL DISTRIBUTIONS, AND STANDARD NORMAL DISTRIBUTIONS**
The student will:

- Calculate and interpret the mean, variance, and standard deviation and construct a graph for a discrete random variable given its distribution.
- Determine the expectation of an event.
- After identifying an experiment as binomial, calculate and interpret probabilities for a binomial experiment by tables and the probability formula.
- Calculate the mean, variance, and standard deviation for a binomial random variable and apply these processes to determine whether the outcome of a binomial experiment would be considered unusual.
- Calculate and interpret probabilities using standard and nonstandard normal distribution.
- Given a percentage, calculate the corresponding nonstandard score for a normal distribution.
- Calculate and interpret probabilities for the mean using the Central Limit Theorem.

**Module/Unit 4**

Competencies:

HYPOTHESIS TESTING FOR ONE MEAN AND ONE PROPORTION, CONFIDENCE INTERVALS

The student will:

- Test hypotheses for a population mean using the z-Test and t-Test.
- Construct and interpret confidence intervals for a population mean by using the standard normal and t-distributions.
- Calculate the minimum sample size necessary to estimate a population mean given a specific confidence and margin of error.

**Module/Unit 5**

Competencies:

CORRELATION AND REGRESSION

*May 16, 2017*
The student will:

- Given a set of bivariate data, determine the relationship between the variables by using a scatter plot, the correlation coefficient, and the least-squares regression line.