

COURSE PREFIX/NO:	MAT 120
COURSE TITLE:	Probability and Statistics
LEC HRS/WEEK:	3.0
LAB HRS/WEEK:	0.0
CREDIT HOURS/SEMESTER:	3.0

[Distance Learning Attendance/VA Statement](#)
[Textbook Information](#)

COURSE DESCRIPTION

This course includes the following topics: introductory probability and statistics, including organization of data, sample space concepts, random variables, counting problems, binomial and normal distributions, central limit theorem, confidence intervals, and test hypothesis for large and small samples; types I and II errors; linear regression; and correlation.

COURSE COMPETENCIES

Module 1: Descriptive Statistics

- Draw a random sample
- Interpret line, bar, and circle graphs
- Organize data into tables and graphs
- Calculate averages and variations

Module 2: Probability

- Calculate the probabilities of simple and compound events
- Calculate the number of permutations of n things taken r at a time.
- Calculate the number of combinations of n things taken r at a time.
- Calculate the mean and standard deviation of a probability distribution.

Module3: Probability Distributions

- State the characteristics of a binomial experiment.
- Calculate the probability of r success out of n trials.
- State the characteristics of a normal curve.
- Convert raw scores to z scores and vice versa.
- Find the probability that a measurement or sample mean falls within a certain interval.
- Approximate a binomial distribution using a normal curve.
- Interpret data with regard to statistical process control (SPC).

Module 4: Confidence Intervals and Hypothesis Testing

- Construct confidence intervals for a mean based on a large sample.
- Construct confidence intervals for a mean based on a small sample.
- Construct confidence intervals for a population proportion based on a large sample.
- Calculate the sample size when the standard error is predetermined.
- Determine the Type I and Type II errors in hypothesis testing.
- Perform a one-tailed hypothesis test about a population mean using a large sample.
- Perform a two-tailed hypothesis test about a population mean using a large sample.
- Perform a one-tailed hypothesis test about a population mean using a small sample.
- Perform a two-tailed hypothesis test about a population mean using a small sample.
- Perform a one-tailed hypothesis test about a population proportion.

- Perform a two-tailed hypothesis test about a population proportion.
- Calculate the p-value.

Module 5: Linear Regression and Correlation

- Fit data with straight lines, using methods of linear regression.
- Determine the strength of the fit of the linear regression line.
- Estimate and predict results using a linear regression line.

ACADEMIC INTEGRITY

Students are bound by the policies stated in the York Technical College Catalog and Handbook. A student violating these policies will be subject to academic discipline.

MINIMAL STANDARDS

An average of 60% is required for a grade of D for this course. Most colleges require a C for transfer.

EVALUATION STRATEGIES/GRADING

The final course grade will be determined by a student's performance on the five modules. Each module grade may be comprised of objective and/or essay-type questions, homework, individual or group projects, quizzes, etc., as required by the instructor. The modules will be evaluated as follows:

Module 1: 20%
 Module 2: 20%
 Module 3: 20%
 Module 4: 30%
 Module 5: 10%

Grading Scale:

A = 90 – 100
 B = 80 – 89
 C = 70 – 79
 D = 60 – 69
 F = below 60
 Withdrawal before midterm = W

COURSE REQUIREMENTS

See the York Technical College Catalog and Handbook for attendance, withdrawal, and student conduct policies.

ENTRY-LEVEL SKILLS

The student entering this course must be competent to perform basic and intermediate arithmetic and algebraic operations by hand and with a calculator, and must possess good reading skills.

PREREQUISITES – MAT 102, Intermediate Algebra, or equivalent.

CO-REQUISITES – None