Naugatuck Valley Community College
STEM Division
Science, Technology, Engineering and Mathematics

Common Course Syllabus
Principles of Statistics MAT*H167

COURSE TITLE: Principles of Statistics, MAT*H167

COURSE DESCRIPTION: This technology-based course begins with an introduction to data analysis including techniques in the presentation of data and in the determination of statistical measures for central tendency and variation. The topics of linear correlation and regression are explored in the analysis of bivariate data. The basics of probability are presented prior to a thorough examination of discrete and continuous probability distributions. Emphasis is placed on the binomial and normal distributions. Estimation and hypothesis testing for population means is introduced. As time permits, statistical inference techniques for proportion, variance and the difference of means will be presented.

NUMBER OF CREDITS: 3 credit hours

PREREQUISITE: Grade of "C" or better in MAT*H137 (Intermediate Algebra) or an appropriate score on a college placement exam.

COURSE OBJECTIVES:
1. Introduce students to the most important topics in the field of modern statistics.
2. Provide students with a solid foundation in descriptive statistics and an introduction to statistical inference.
3. Exhibit numerous applications of statistics in business, education, government, industry, medicine, technology, etc.
4. Engage students in communicating, writing and using accurate statistical language to analyze and interpret results.
5. Promote understanding of concepts through appropriate use of technology.

LEARNING OUTCOMES: At the end of this course the student will be able to do the following:

A. Descriptive Statistics —
 1. Know the basic terminology used in the interpretation of statistics.
 2. Graphically represent data in a variety of formats - bar graphs, dot plots, frequency distribution histogram.
 3. Calculate and distinguish the measures of central tendency – mean, median, mode and midrange – for both grouped and ungrouped data.
 4. Calculate and distinguish the measures of variation - range, standard deviation and variance - for both grouped and ungrouped data.
 5. Calculate and interpret the values determined for quartiles, percentiles and standard score.
 6. Use the mean and standard deviation for a set of data to determine information about the proportion of data from applying Chebyshev's Theorem and/or the Empirical Rule for normal distributions.

7. Draw a scattergram for bivariate data and determine and interpret the value of the linear correlation coefficient for that data.
8. Determine the linear relationship for bivariate data through a regression analysis and determine the line of best fit for that data.

B. Probability —
1. Distinguish between empirical and theoretical probability and be able to represent all of the outcomes in either case.
2. Determine a simple probability using the relative frequency definition applied to the entire set of outcomes.
3. Apply the basic rules of probability to determine the probabilities for compound events especially in the case where the set of all possible outcomes is presented in a tabular format.
4. Recognize a probability distribution when presented in a tabular or algebraic fashion and be able to calculate the mean and standard deviation as well as be able to draw a histogram for such a probability distribution.
5. Recognize a binomial probability experiment and be able to calculate the probability in any situation of this type.
6. Determine a probability for the standard normal distribution.
7. Determine a standard score when a specific probability is given for the standard normal distribution.
8. Apply the standard normal distribution to determine probabilities and/or specific values for any normal distribution.

C. Sampling Distributions —
1. Apply the concept of a sampling distribution with emphasis on the sampling distribution of sample means and the conclusions drawn for it by the Central Limit Theorem.
2. Use the conclusions of the Central Limit Theorem to determine probabilities involving the sample mean.

D. Statistical Inference —
1. Determine and interpret a confidence interval estimate for the population mean when the population standard deviation is known.
2. Determine the sample size to estimate the population mean (standard deviation known) within a certain level of accuracy.
3. Demonstrate the steps involved and the conclusion reached in a test of a statistical hypothesis.
4. Complete a test of hypothesis relative to a population mean (standard deviation known) and state a meaningful conclusion for that testing.
5. Determine a probability for the student t distribution.
6. Use the student t distribution to determine and interpret a confidence interval estimate for the population mean when the population standard deviation is unknown.
7. Use the student t distribution to complete a test of hypothesis for the population mean when the population standard deviation is unknown.

GRADING SYSTEM: For the purpose of computing numerical credit point averages, grades are evaluated as follows for each semester hour of credit. Grades on exams, papers, and quizzes, will be based on this grading system.

Numeric Grade	Acceptable Letter Grade Range to be used by the instructor	Description
90 –100	A– to A	Excellent
80 – 89	B–, B, B+	Above Average
70 – 79	C–, C, C+	Average
60 – 69	D–, D, D+	Below Average
Below 60	F	Failing

CLASS CANCELLATION PROCEDURE: *If the instructor is late, the class is expected to wait 15 minutes before leaving or until informed of a cancellation by a college official. Information on weather related closings/late openings concerning Naugatuck Valley Community College can be obtained through local radio and television stations, or via the college website (http://www.nvcc.commnet.edu).* **NOTE:** *An alternative assignment may be given if classes are canceled due to weather.*

ACADEMIC HONESTY STATEMENT: *At NVCC we expect the highest standards of academic honesty. Academic dishonesty is prohibited in accordance with the Board of Trustee's Proscribed Conduct Policy in Section 5.2.1 of the BOT Policy Manual. This policy prohibits cheating on examinations, unauthorized collaboration on assignments, unauthorized access to examinations or course materials, plagiarism, and other proscribed activities. Plagiarism is defined as the use of another's idea(s) or phrase(s) and representing that/those idea(s) as your own, either intentionally or unintentionally. Anyone who is caught cheating on exams, plagiarizing another's work or published material will fail the course regardless of progress made in the course.*

CHILDREN ON CAMPUS: *With permission of the instructor only – Children must be attended at all times by a responsible adult. The student must notify the instructor or supervisor prior to the beginning of the class or activity that a child is present. Instructors and/or supervisors are authorized to ask the student or program participants to leave should the presence of a child be disruptive.*

CELL PHONE/PAGER USE POLICY: *Students are hereby notified that cellular phones and beepers are allowed in class only if they are turned off or turned to a silent mode. Under no circumstances are telephones to be answered in class. Students who ignore this policy may be asked to leave class. When there are extenuating circumstances that require that a student be available by phone or beeper, the student should speak to the instructor prior to class, so that together they can arrive at an agreement concerning the device.*

STUDENTS WITH SPECIAL NEEDS: *Students who may require accommodations on the basis of a learning disability are encouraged to contact the Coordinator of Learning Disabilities. Students who may require accommodations on the basis of all other disabilities should contact the Coordinator of Disability Services. After providing documentation and completing the disability disclosure process, students are then encouraged to meet with their instructor(s) to discuss the accommodations approved by the appropriate Coordinator and to complete the Accommodations Agreement form. Accommodations are not retroactive, students are therefore encouraged to meet with their instructor(s) at the beginning of each semester. Instructors, in conjunction with appropriate college personnel, will provide assistance and/or accommodations only to those students who have completed the disability disclosure and accommodations process.*