

**NEOSHO COUNTY COMMUNITY COLLEGE
MASTER COURSE SYLLABUS**

COURSE IDENTIFICATION

Course Code/Number: MATH 143

Course Title: Elementary Statistics

KRSN: MAT1020
(Kansas Regents Shared Number)

Please visit the Kansas Board of Regents website for more information.

Division: Applied Science (AS) Liberal Arts (LA) Workforce Development (WD)
 Health Care (HC) Lifetime Learning (LL) Nursing Developmental

Credit Hour(s): Three (3)

Effective Date: Summer 2016

Assessment Goal Per Outcome: 70%

COURSE DESCRIPTION

This is a standard introductory course in elementary statistics with College Algebra as a prerequisite. The content includes descriptive and inferential statistics and the study of probability. Calculation techniques for descriptive statistics, normal distributions, confidence intervals, sample size, hypothesis testing, and correlation will be presented. The application problems make this course appropriate for students who may need to describe a population or research a problem in a class such as psychology, sociology, business, computer science, biology, education, technology, liberal arts, social science, nursing, and allied health care, economics, ecology, and agriculture. Each student will be required to have a graphing calculator; a TI-83 or TI-83 Plus is recommended.

MINIMUM REQUIREMENTS/PREREQUISITES AND/OR COREQUISITES

MATH 113 or its equivalent. This requirement may be satisfied by a College-Level Examination Program (CLEP) College Algebra test score of 50.

TEXTS

The official list of textbooks and materials for this course is found on [myNeosho..](http://www.neosho.edu/ProspectiveStudents/Registration/CourseSyllabi.aspx)

<http://www.neosho.edu/ProspectiveStudents/Registration/CourseSyllabi.aspx>

GENERAL EDUCATION OUTCOMES

1. Practice Responsible Citizenship through:
 - identifying rights and responsibilities of citizenship,
 - identifying how human values and perceptions affect and are affected by social diversity,
 - identifying and interpreting artistic expression.
2. Live a healthy lifestyle (physical, intellectual, social) through:
 - listing factors associated with a healthy lifestyle and lifetime fitness,
 - identifying the importance of lifetime learning,
 - demonstrating self-discipline, respect for others, and the ability to work collaboratively as a team.
3. Communicate effectively through:
 - developing effective written communication skills,
 - developing effective oral communication and listening skills.
4. Think analytically through:
 - utilizing quantitative information in problem solving,
 - utilizing the principles of systematic inquiry,
 - utilizing various information resources including technology for research and data collection.

COURSE OUTCOMES/COMPETENCIES (as Required)

The following outcomes and competencies, excepting those denoted with an asterisk, comprise the official list of outcomes and competencies submitted by the Kansas Core Outcomes Group and approved by the Kansas Board of Regents. Certain outcomes and material above and beyond the state outcomes have been added. This material is denoted with an asterisk in the list below. All students will be assessed according to these outcomes and competencies.

1. **Create graphical and numerical descriptions of quantitative and qualitative data**
2. ***Calculate empirical and classical probabilities including compound and conditional probabilities.***
3. **Calculate probabilities and percentiles related to a general normal distribution *and also probabilities related to a discrete distribution.***
4. **Distinguish differences in data analysis and interpretation between observational data and data from designed experiments.**
5. **Calculate and interpret a confidence interval for a single parameter, using both large and small samples.**

6. Perform and interpret a test of hypotheses for a single parameter, using both large and small samples.
7. Perform and interpret statistical inference on the difference of two parameters.
8. Fit and interpret a simple linear regression model, including correlation and scatterplots.

MINIMUM COURSE CONTENT

- I. Introduction to Statistics
 - A. Descriptive and Inferential statistics.
 - B. Types of Data
 - i. Qualitative
 - ii. Quantitative (discrete and continuous)
 - iii. Level of measurement
 - C. Analysis of Design of Statistical studies
 - i. Types of statistical studies
 - ii. Sampling techniques
 - iii. Misuse and abuse of statistics

- II. Describing, Exploring, and Comparing Data
 - A. Frequency Distributions
 - B. Visualizing Data
 - i. Histograms
 - ii. Frequency polygons
 - C. Measures of Center
 - i. Mean
 - ii. Median
 - iii. Mode
 - D. Measures of Variation
 - i. Range
 - ii. Standard Deviation
 - iii. Variance
 - iv. Chebyshev's Theorem
 - E. Measures of Relative Standing
 - i. Z-scores
 - ii. Quartiles
 - iii. Percentiles
 - F. Exploratory Data Analysis
 - i. Five number summary and boxplots
 - ii. Outlier check.

- III. Probability
 - A. Fundamentals
 - i. Sample space
 - ii. Classical probability
 - iii. Empirical probability
 - iv. Complements
 - B. Addition Rule

- C. Multiplication Rule
 - i. Conditional probability

- VI. Discrete Probability Distributions
 - A. Random variables and Their Probability Distributions
 - B. Mean of a probability distribution (expected value of a random variable).

- V. Normal Probability Distributions
 - A. Standard Normal Distribution
 - B. Applications of Normal Distribution
 - C. Sampling Distributions
 - D. The Central Limit Theorem

- VI. Confidence Intervals
 - A. Estimate a Population Proportion.
 - B. Estimate a Population Mean: σ Known
 - C. Estimating a Population Mean: σ Not Known
 - D. Calculate minimum sample size

- VII. Hypothesis Tests
 - A. Basics of Hypothesis Testing
 - i. Critical and P-value methods
 - B. Testing a Claim About a Proportion or a Difference of Two Proportions
 - C. Testing a Claim About a Mean or a Difference of Two Means (Known or Unknown Standard Deviations.)

- VIII. Correlation and Regression
 - A. Scatterplots
 - B. Correlation Coefficient
 - C. Fitting and Interpreting a Simple Linear Regression Model

STUDENT REQUIREMENTS AND METHOD OF EVALUATION

INSTRUCTION METHODS

The text will serve as a guideline for the course with most of the material taken from the text and delivered in an informal lecture/discussion presentation. A TI-83 or other model of a graphing calculator, an overhead projector, chalkboard, videos or other forms of technology may be used for demonstrations. Problem assignments will be made for each section that is covered and the student should be ready to discuss the problems in the next class session. Normally the first part of a class will be used to discuss the previous assignments. The student is encouraged to visit the instructor for individual help outside of class; seek help immediately when you don't understand some concept.

STUDENT REQUIREMENTS

See the syllabus supplement for a specific course section for details of student requirements and method of evaluation.

GRADING SCALE

- A: 90-100
- B: 80-89
- C: 70-79
- D: 60-69
- F: below 60%

See the syllabus supplement for a specific course section for details of grading scale.

ASSESSMENT OF STUDENT GAIN

The purpose of assessing student learning at Neosho County Community College is to ensure the educational purposes of the institution are met and appropriate changes are made in program development and classroom instruction to allow for student success. The instructor(s) of this course will determine the methods of assessment most appropriate and complete an assessment report at the end of the course.

Attendance Policy

1. NCCC values interactive learning which promotes student engagement in the learning process. To be actively engaged, the student must be present in the learning environment.
2. Unless students are participating in a school activity or are excused by the instructor, they are expected to attend class. If a student's absences exceed one-eighth of the total course duration, (which equates to one hundred (100) minutes per credit hour in a face-to-face class) the instructor has the right, but is not required, to withdraw a student from the course. Once the student has been dropped for excessive absences, the registrar's office will send a letter to the student, stating that he or she has been dropped. A student may petition the chief academic officer for reinstatement by submitting a letter stating valid reasons for the absences within one week of the registrar's notification. If the student is reinstated into the class, the instructor and the registrar will be notified. Please refer to the Student Handbook/Academic Policies for more information
3. Absences that occur due to students participating in official college activities are excused except in those cases where outside bodies, such as the State Board of Nursing, have requirements for minimum class minutes for each student. Students who are excused will be given reasonable opportunity to make up any missed work or receive substitute assignments from the instructor and should not be penalized for the absence. Proper procedure should be followed in notifying faculty in advance of the student's planned participation in the event. Ultimately it is the student's responsibility to notify the instructor in advance of the planned absence.

ACADEMIC INTEGRITY

NCCC expects every student to demonstrate ethical behavior with regard to academic pursuits. Academic integrity in coursework is a specific requirement. Definitions, examples, and possible consequences for violations of Academic Integrity, as well as the appeals process, can be found in the College Catalog, Student Handbook, and/or Code of Student Conduct and Discipline.

ELECTRONIC DEVICE POLICY

Student cell phones and other personal electronic devices not being used for class activities must not be accessed during class times unless the instructor chooses to waive this policy.

NOTE

Information and statements in this document are subject to change at the discretion of NCCC. Students will be notified of changes and where to find the most current approved documents.

ACCOMMODATIONS

If you are a student with a disability who may need accommodation(s), in compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990, please notify the Dean of Student Services in the Student Services Office, Sanders Hall, 620-432-0304, on the Chanute Campus, or the Dean for the Ottawa and Online Campuses, 785-248-2798, on the Ottawa Campus as soon as possible. You will need to bring your documentation for review in order to determine reasonable accommodations, and then we can assist you in arranging any necessary accommodations.

NON-DISCRIMINATION POLICY

The following link provides information related to the non-discrimination policy of NCCC, including persons with disabilities. Students are urged to review this policy.

<http://www.neosho.edu/Departments/NonDiscrimination.aspx>

SEXUAL MISCONDUCT POLICY (TITLE IX)

At NCCC, it is the responsibility of an instructor to help create a safe learning environment in the classroom, including both physical and virtual classrooms. All instructors are considered mandatory reporters at NCCC, therefore any information regarding sexual misconduct that is shared by a student in one-on-one meetings with the instructor must be reported to appropriate personnel at the College.

Instructors will keep the information private to the greatest extent possible, but it is not confidential. Generally, climate surveys, classroom writing assignments or discussions, human subjects research, or events such as Take Back the Night events do not provide notice that must be reported to the Coordinator by employees, unless the reporting party clearly indicates that they wish a report to be made.

The following link provides information related to the sexual misconduct policy of NCCC, including resources, reporting options, and student rights. Students are urged to review this policy.

<http://www.neosho.edu/TitleIX.aspx>

COURSE NOTES

CLASSROOM ENVIRONMENT

Students are encouraged to participate freely in classroom discussions, including offering personal insights and asking questions relevant to the subject at hand. However, intentionally non-relevant comments and questions, and personal conversations are disruptive and are not appropriate in coursework while class is in session. These behaviors interfere with the learning process and therefore will not be tolerated. You are expected to conduct yourselves at all times as mature adults actively engaged in the pursuit of higher learning.