

**NEOSHO COUNTY COMMUNITY COLLEGE
MASTER COURSE SYLLABUS**

COURSE IDENTIFICATION

Course Code/Number: MATH 133

Course Title: Quantitative Reasoning

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 2017

Assessment Goal Per Outcome: 70%

COURSE DESCRIPTION

Designed for the students NOT planning to major in a field that requires advanced mathematical skills. Prepares students for the mathematics encountered in other college courses that use quantitative reasoning. Emphasis on developing critical thinking and quantitative reasoning skills needed to understand major issues in society.

MINIMUM REQUIREMENTS/PREREQUISITES AND/OR COREQUISITES

For specific placement requirements for this class, please refer to the Mandatory Placement Policy for MATH 113 in the College Catalog.

TEXTS

The official list of textbooks and materials for this course is found on *myNeosho*.

<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 student will strive to achieve, and be able to demonstrate an understanding of the following competencies/outcomes:

1. Apply critical and logical thinking skills to various applications
2. Apply estimation and an understanding of numbers to various applications
3. Apply generalizations, principles, theories, or rules to the real world
4. Use statistics for decision making
5. Demonstrate basic concepts of probability and risk
6. Apply mathematical tools to financial applications
7. Apply mathematics to the study of social issues
8. Apply mathematics to applications across many different disciplines

MINIMUM COURSE CONTENT

The following topics must be included in this course. Additional topics may also be included.

I. LOGIC AND PROBLEM SOLVING.

1. Thinking Critically.
 - Recognizing Fallacies.
 - Propositions and Truth Values.
 - Sets and Venn Diagrams.
 - Analyzing Arguments.
 - Critical Thinking in Everyday Life.
2. Approaches to Problem Solving.
 - The Problem-Solving Power of Units.
 - Standardized Units: More Problem-Solving Power.
 - Problem-Solving Guidelines and Hints.

II. QUANTITATIVE INFORMATION IN EVERYDAY LIFE.

3. Numbers in the Real World.
 - Uses and Abuses of Percentages.
 - Putting Numbers in Perspective.

Dealing with Uncertainty.

Index Numbers: The CPI and Beyond.

How Numbers Deceive: Polygraphs, Mammograms, and More.

4. Financial Management.

Taking Control of Your Finances

The Power of Compounding.

Savings Plans and Investments.

Loan Payments, Credit Cards, and Mortgages.

Income Taxes.

Understanding the Federal Budget.

III. PROBABILITY AND STATISTICS.

5. Statistical Reasoning.

Fundamentals of Statistics.

Should You Believe a Statistical Study?

Statistical Tables and Graphs.

Graphs in the Media.

Correlation and Causality.

6. Putting Statistics to Work.

Characterizing a Data Distribution.

Measures of Variation.

The Normal Distribution.

Statistical Inference.

7. Probability: Living with the Odds.

Fundamentals of Probability.

A Brief Review: The Multiplication Principle.

Combining Probabilities.

The Law of Large Numbers.

Assessing Risk.

Counting and Probability.

IV. MODELING.

8. Exponential Astonishment.

Growth: Linear Versus Exponential.

Doubling Time and Half-Life.

Real Population Growth.

Logarithmic Scales: Earthquakes, Sounds, and Acids.

9. Modeling Our World.

Functions: The Building Blocks of Mathematical Models.

Linear Modeling.

Exponential Modeling.

10. Modeling with Geometry.

Fundamentals of Geometry.

Problem Solving with Geometry.

Fractal Geometry.

V. FURTHER APPLICATIONS.

11. Mathematics and the Arts.

Mathematics and Music.

- Perspective and Symmetry.
- Proportion and the Golden Ration.
- 12. Mathematics and Politics.
 - Voting: Does the Majority Always Rule?
 - Theory of Voting.
 - Apportionment: The House of Representatives and Beyond.
- 13. Mathematics and Business.
 - Network Analysis.
 - The Traveling Salesman Problem.
 - Scheduling Problems}

STUDENT REQUIREMENTS AND METHOD OF EVALUATION

INSTRUCTIONAL 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