NEOSHO COUNTY COMMUNITY COLLEGE
MASTER COURSE SYLLABUS

COURSE IDENTIFICATION

Course Code/Number: MATH 125

Course Title: College Algebra and Trigonometry

Division: ☒ Applied Science (AS)   ☐ Liberal Arts (LA)   ☐ Workforce Development (WD)

☐ Health Care (HC)   ☐ Lifetime Learning (LL)   ☐ Nursing   ☐ Developmental

Credit Hour(s):   Five (5)

Effective Date: Spring 2017

Assessment Goal Per Outcome: 80%

COURSE DESCRIPTION

This is a combined College Algebra and Trigonometry course designed for students that have successfully completed Algebra I and Algebra II in high school. It will satisfy the general education requirement for College Algebra and will transfer to all Kansas Regents institutions. This class is also for students earning an A or B in Intermediate Algebra MATH 112. Topics covered are: polynomials, rational expression and radicals, equations and inequalities, absolute value, functions and graphs, rational functions, exponential and logarithmic functions, trigonometric functions, identities and graphs, trigonometric equations, complex numbers, conic sections, matrices and systems of equations and inequalities.
At the discretion of the instructor the course may be taught as an integrated course or separated into a three credit hour College Algebra and a two or three credit hour Plane Trigonometry. Students will be expected to have access to, and use a graphing calculator (TI-83 is recommended).

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 *my*Neosho.

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 be able to demonstrate the ability to:

1. Apply algebraic manipulation including: simplifying, exponents, and radicals
2. Recognize functions and notation: algebraic, trigonometric, exponential, logarithmic, graphing, inverse, and composition
3. Apply solution techniques, including graphing for: first and second degree equations and inequalities, systems of first and second degree equations and inequalities, and polynomial, rational, radical, trigonometric, exponential, and logarithmic equations
4. Evaluate the Trigonometric functions and their inverses in degrees and radians and define the Trigonometric functions using the unit circle (circular functions).
5. Solve right triangles and problems using the properties of trigonometric functions.
6. Apply the knowledge of fundamental identities and sum, difference, double-angle, half-angle, and product/sum identities to simplifying trigonometric expressions.
7. Solve Trigonometric equations.
8. Solve triangles using the Law of Sines and Law of Cosines.
9. Find the sum, difference, product and quotient of two complex numbers and perform operations with complex numbers.
10. Translation and solution for application (verbal) problems
11. Use of functions to model, solve, or predict outcomes for real world problems
12. Identify and graph the conic sections using general and standard forms

MINIMUM COURSE CONTENT

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

I.   Graphs
      A.   Rectangular coordinates and graphing utilities
      B.   Graphs of equations
      C.   Solving equations
      D.   Applications
      E.   Solving systems of two variable linear equations
      F.   Solving systems of three variable linear equations
      G.   Solving inequalities
      H.   Solving systems of linear inequalities
II.   Inequalities, Lines, Circles, and Linear Functions
      A.   Lines
      B.   Circles
      C.   Linear functions
      D.   Quadratic functions
      E.   Characteristics of functions
      F.   Graphing of functions
III. Functions
      A.   Operations on functions
      B.   Construction of functions
      C.   Power functions
      D.   Polynomial functions
      E.   Zeros of a polynomial function
            1. Real roots
            2. Complex roots
IV.   Rational, Exponential, and Logarithmic Functions
      A.   Rational functions
      B.   Polynomial and rational inequalities
      C.   Exponential functions
      D.   Logarithmic functions
      E.   Properties of logarithms
      F.   Exponential and logarithmic equations
      G.   Applications
V.   Trigonometric Functions
      A.   Angles and Their Measure
      B.   Right Triangle Trigonometry
      C.   Computing the Values of Trigonometric Functions of Given Angle
      D.   Trigonometric Functions of General Angles
      E.   Properties of the Trigonometric Functions
      F.   Graphs of the Trigonometric Functions
      G.   Sinusoidal Graphs
VI.   Analytic Trigonometric
      A.   Trigonometric Identities
      B.   Sum and Difference Formulas
      C.   Double-Angle and Half-Angle Formulas
      D.   Product-to-Sum and Sum-to-Product Formulas
      E.   The Inverse Trigonometric Functions

      F.   Trigonometric Equations
VII.   Applications of Trigonometric Functions
      A.   Solving Right Triangles
      B.   Law of Sines
      C.   Law of Cosines
      D.   Area of a Triangle
      E.   Simple Harmonic Motion
VIII.   Polar Coordinates and Vectors
      A.   Polar Coordinates
      B.   Polar Equations and Graphs
      C.   The Complex Plane and DeMoivre's Theorem
      D.   Vectors
      E.   Dot Product
IX.   Miscellaneous
      A.   (Optional) Operation with Matrices
      B.   (Optional) Determinants
      C.   (Optional) Conics
      D.   (Optional) Counting Principles
      E.   (Optional) Probability

STUDENT REQUIREMENTS AND METHOD OF EVALUATION

<u>INSTRUCTIONAL METHODS</u>

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.

<u>STUDENT REQUIREMENTS</u>
See the syllabus supplement for a specific course section for details of student requirements and method of evaluation.

<u>GRADING SCALE</u>
    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