COLLEGE OF THE DESERT

Course Outline of Record

1. Course Code: MATH-054
2. a. Long Course Title: Beginning Algebra
    b. Short Course Title: BEGINNING ALGEBRA
3. a. Catalog Course Description:

    This course is an introduction to the real number system and to the use of variable expressions and equations in problem solving. Topics include properties of the real numbers, square roots, arithmetic of variable expressions including polynomials and algebraic fractions, solving linear equations and inequalities in one variable, factoring, and an introduction to the Cartesian coordinate system and the equations and graphs of linear equations in two variables. Also, the proper use of math notation is emphasized along with an introduction to Pythagorean Theorem and basic geometric formulas, some dimensional analysis with modeling applications is included.

    b. Class Schedule Course Description:

    This introductory algebra course focuses on the arithmetic of variable expressions and the solving of single variable equations, including basic applications involving these. There is also an introduction to the Cartesian coordinate system and the graphing of linear equations in two variables.

    c. Semester Cycle (*if applicable*): N/A
    d. Name of Approved Program(s):
       - BASIC MATH Certificate of Completion
4. Total Units: 4.00   Total Semester Hrs: 108.00

   Lecture Units: 3   Semester Lecture Hrs: 54.00

   Lab Units: 1   Semester Lab Hrs: 54.00

   Class Size Maximum: 35   Allow Audit: No

   Repeatability No Repeats Allowed

   Justification 0
5. Prerequisite or Corequisite Courses or Advisories:

   Course with requisite(s) and/or advisory is required to complete Content Review Matrix (CCForm1-A)

   Prerequisite: MATH 060

   Advisory: ENG 061
6. Textbooks, Required Reading or Software: *(List in APA or MLA format.)*
    a. Lial M., Hornsby J., McGinnis T (2016). *Beginning Algebra* (12/e). Pearson. ISBN: 9780321969330

    College Level: Yes

    Flesch-Kincaid reading level: *N/A*
7. Entrance Skills: *Before entering the course students must be able:*

   a.

   Compute using the four basic operations of addition, subtraction, multiplication, and division on the rational numbers in both fraction and decimal form.

   - MATH 060: a. Compute using the four basic operations of addition, subtraction, multiplication, and division on the rational numbers in both fraction and decimal form.

   b.

   Apply the basic operations to solve application problems that involve whole numbers, integers, and rational numbers.

   - MATH 060: b. Apply the basic operations to solve application problems that involve whole numbers, integers, and rational numbers.

   c.

Apply the order of operations to simplify expressions involving several operations using rational numbers.
- MATH 060: c. Apply the order of operations to simplify expressions involving several operations using rational numbers.

d.
Use rounding and estimation to solve problems involving rational numbers.
- MATH 060: d. Use rounding and estimation to solve problems involving rational numbers.

e.
Employ decimal notation and place value to compare, order, and round numbers.
- MATH 060: e. Employ decimal notation and place value to compare, order, and round numbers.

f.
Use the concept of ratio to determine the solution to a proportion problem.
- MATH 060: f. Use the concept of ratio to determine the solution to a proportion problem.

g.
Apply methods of conversion between percents, decimals, and fractions.
- MATH 060: g. Apply methods of conversion between percents, decimals, and fractions.

h.
Determine the solution to equations involving percents by deductive reasoning.
- MATH 060: h. Determine the solution to equations involving percents by deductive reasoning.

i.
Recognize and convert between units of measurements in the American and metric systems.
- MATH 060: i. Recognize and convert between units of measurements in the American and metric systems.

j.
Use unit measure appropriately in applications.
- MATH 060: j. Use unit measure appropriately in applications.

k.
Use concepts and formulas from geometry.
- MATH 060: k. Use concepts and formulas from geometry.

l.
Compute square roots and use the Pythagorean Theorem to solve simple right triangles.
- MATH 060: l. Compute square roots and use the Pythagorean Theorem to solve simple right triangles.

m.
Locate rational numbers on the real number line.
- MATH 060: m. Locate rational numbers on the real number line.

n.
Understand the concept of a variable and how a variable can be used to represent an unknown quantity.
- MATH 060: n. Understand the concept of a variable and how a variable can be used to represent an unknown quantity.

o.
Distinguish between various subsets of the rational numbers including natural numbers, whole numbers, and integers.
- MATH 060: o. Distinguish between various subsets of the rational numbers including natural numbers, whole numbers, and integers.

   p.
Apply the commutative, associative, distributive, inverse and identity properties to simplify algebraic expressions.
- MATH 060: p. Apply the commutative, associative, distributive, inverse and identity properties to simplify algebraic expressions.

   q.
Use the properties of natural number exponents to simplify algebraic expressions.
- MATH 060: q. Use the properties of natural number exponents to simplify algebraic expressions.

   r.
Evaluate an algebraic expression via substitution of rational numbers and determine if a given value is a solution to an algebraic equation.
- MATH 060: r. Evaluate an algebraic expression via substitution of rational numbers and determine if a given value is a solution to an algebraic equation.

   s.
Explain the concepts of terms, factors, variable and coefficient.
- MATH 060: s. Explain the concepts of terms, factors, variable and coefficient.

8. Course Content and Scope:

Lecture:

1. Development of the real number system: integers, rational and irrational numbers.
2. Properties of real numbers and operations: commutative, associative, distributive, identity, inverse.
3. The concept of a variable.
4. Use of variables to create algebraic expressions modeling an application problem.
5. Arithmetic of algebraic expressions; the use of the commutative, associative, distributive, identity, and inverse properties, the use of the order of operations, and the use of integer exponents and the rules of exponents.
6. Simplifying algebraic expressions, including algebraic fractions.
7. Converting numbers to and from scientific notation and standard notation.
8. Solving linear equations in one variable: addition, subtraction, multiplication, and division properties of equality
9. Creating equations that model real world situations given in application (word) problems.
10. Solving linear inequalities in one variable: addition, subtraction, multiplication, and division properties of inequality.
11. Graphing of solutions of linear equations in one using the real number line.
12. Creating inequalities that model real world situations described in word problems.
13. Polynomial arithmetic, including expanding and combining polynomials expressions using the distributive property.
14. Factoring out the greatest common factor from a polynomial expression.
15. Factoring simple quadratic polynomials.
16. Solving rational equations that reduce to linear equations.
17. Interpreting roots and radicals and solving simple radical equations.
18. Solving linear equations in two variables and graphing the solution sets using the Cartesian coordinate system.
19. The slope formula of a line and the different standard forms for the equation of a line in two dimensions.

Lab: *(if the "Lab Hours" is greater than zero this is required)*

1. Participate in discussion of lectured material through question and answer format to improve understanding of new concepts.
2. Participate in skill lab by working on either paper or web based worksheets to practice skills learned in lectures.

3. Receive academic assistant from instructor, ISAs and tutors on individual basis.

9. Course Student Learning Outcomes:
1. Demonstrate number sense, which is characterized by the ability to judge relative sizes of numbers, perform computations with numbers in different representations, represent sets of numbers using diagrams, and assess the reasonableness of results.
2.
Define and use variables to model change and patterns in a variety of applications.

3. Use the information obtained in application problems to estimate a reasonable solution, identify and execute methods of solution that involve algebraic computations, and evaluate the reasonableness of results.
4. Apply algebraic principles and deductive reasoning to solve basic equations and inequalities.

10. Course Objectives: *Upon completion of this course, students will be able to:*
a. Identify, recognize and classify real numbers, as integers, rationals, or irrationals and locate their approximate positions on the real number line.
b. Understand the concepts of variables and how variables can be used to represent an unknown quantity or a range of quantities.
c. Use variables to create algebraic expressions that model quantities in an application problem.
d. Apply the commutative, associative, distributive, identity, and inverse properties to simplify algebraic expressions involving polynomial, rational and radical expressions - perform arithmetic operations with algebraic expressions using the order of operations.
e. Use the properties of integer exponents to simplify algebraic expressions, including expressions involving scientific notation.
f. Analyze the concept of an algebraic equation and demonstrate the meaning of a solution to the equation, including integer, non-integer rational, decimal and radical solutions.
g. Employ variables to create algebraic equations or inequalities that model an application problem.
h. Solve equations and inequalities that model application problems and interpret these solutions.
i. Use properties of equality to solve linear equations in one variable and describe the solution using set notation.
j. Convert between the geometric (Cartesian) and algebraic representations of a linear relation in two variables. Make use of point-slope and slope intercept forms.
k. Solve linear systems of two equations in two variables both algebraically and graphically.
l. Use the properties of inequality to solve linear inequalities in one variable and describe the solution set in set notation and graphically.
m. Add, subtract, multiply and divide polynomials.
n. Factor the greatest common divisor from a polynomial expression and factor quadratic binomials and trinomials with integer coefficients.
o. Solve quadratic equations in one variable by factoring and applying the zero product property.
p. Demonstrate use of the method of completing the square to solve quadratic equations of the form where p and q are integers.
q. Add, subtract, multiply, divide and simplify rational expressions.
r. Solve rational equations that simplify to linear or quadratic equations.
s. Interpret square roots and solve square root equations.
t. Interpret the meaning of the slope of a line as a constant rate of change.
u. Apply learned principles and skills to novel situations in addition to situations that mimic those on the homework and those shown in class.
v. Use mathematical language to communicate ideas, especially in writing.
w. Deduce right triangle side lengths using the Pythagorean Theorem and square roots.
x. Use basic formulas from geometry to find perimeter, area and volume of basic figures.
y. Use proportionality to discover side lengths of similar triangles.
z. Use dimensional analysis appropriately in applications.

11. Methods of Instruction: *(Integration: Elements should validate parallel course outline elements)*
a. Discussion

    b. Laboratory

    c. Lecture

Other Methods:

Teamwork

12. Assignments: *(List samples of specific activities/assignments students are expected to complete both in and outside of class.)*

    In Class Hours: 108.00

    Outside Class Hours: 108.00

    a. In-class Assignments

        1. Attend classroom lectures and take notes.
        2. Attend and participate in lab.
        3. Participate in discussion groups to review, analyze, diagnose, and evaluate various methods of solution used on homework.
        4. Complete examinations involving problems that require the application of studied principles and skills to new situations as well as problems that mimic those done on homework and in class.

    b. Out-of-class Assignments

        1. Read the textbook and any supplementary materials.
        2. Complete daily assigned homework and assigned pre-tests.
        3. Participate in discussion groups to review, analyze, diagnose, and evaluate various methods of solution used on homework.

13. Methods of Evaluating Student Progress: *The student will demonstrate proficiency by:*
   - Written homework
   - Mid-term and final evaluations
   - Student participation/contribution

14. Methods of Evaluating: Additional Assessment Information:

15. Need/Purpose/Rationale -- *All courses must meet one or more CCC missions.*

    PO-GE C4.b - Language & Rationality (Communication & Analytical Thinking)

      Gather, assess, and interpret relevant information.

      Apply logical and critical thinking to solve problems; explain conclusions; and evaluate, support, or critique the thinking of others.

    IO - Scientific Inquiry

      Analyze quantitative and qualitative information to make decisions, judgments, and pose questions.

    IO - Global Citizenship - Scientific & Technological Literacy

      Utilize quantitative expression in a variety of contexts. These would include units of measurement, visual representations, and scales and distributions.

      Synthesize, interpret, and infer, utilizing information, data, and experience to solve problems, innovate, and explore solutions.

16. Comparable Transfer Course

University System	Campus	Course Number	Course Title	Catalog Year

17. Special Materials and/or Equipment Required of Students:

18. Materials Fees: ☐ Required Material?

Material or Item	Cost Per Unit	Total Cost

19. Provide Reasons for the Substantial Modifications or New Course:

   SLO update

20.   a. Cross-Listed Course *(Enter Course Code)*: *N/A*
         b. Replacement Course *(Enter original Course Code)*: *N/A*

21. Grading Method *(choose one)*: Letter Grade Only

22. MIS Course Data Elements
         a. Course Control Number [CB00]: CCC000082785
         b. T.O.P. Code [CB03]: 170100.00 - Mathematics, General
         c. Credit Status [CB04]: C - Credit - Not Degree Applicable
         d. Course Transfer Status [CB05]: C = Non-Transferable
         e. Basic Skills Status [CB08]: 1B = Course is a basic skills course
         f. Vocational Status [CB09]: Not Occupational
         g. Course Classification [CB11]: Y - Credit Course
         h. Special Class Status [CB13]: N - Not Special
         i. Course CAN Code [CB14]: *N/A*
         j. Course Prior to College Level [CB21]: B = 2 Levels Below
         k. Course Noncredit Category [CB22]: Y - Not Applicable
         l. Funding Agency Category [CB23]: Y = Not Applicable
         m. Program Status [CB24]: 2 = Stand-alone
      Name of Approved Program *(if program-applicable)*: BASIC MATH
      Attach listings of Degree and/or Certificate Programs showing this course as a required or a restricted elective.)

23. Enrollment - Estimate Enrollment
   First Year: 1000
   Third Year: 1000

24. Resources - Faculty - Discipline and Other Qualifications:
         a. Sufficient Faculty Resources: Yes
         b. If No, list number of FTE needed to offer this course: *N/A*
25. Additional Equipment and/or Supplies Needed and Source of Funding.
   N/A
26. Additional Construction or Modification of Existing Classroom Space Needed. *(Explain:)*
   N/A
27. FOR NEW OR SUBSTANTIALLY MODIFIED COURSES
   Library and/or Learning Resources Present in the Collection are Sufficient to Meet the Need of the Students Enrolled in the Course: Yes

28. Originator Sally Kalpakoff   Origination Date 10/20/17