DELAWARE TECHNICAL & COMMUNITYCOLLEGE
COLLEGEWIDE COURSE SYLLABUS

Campus:	Terry
Department:	Mathematics
Course Number and Title:	MAT 012 - Review of Math Fundamentals
Instructor Name:	**Telephone:** **E-mail:**
Prerequisites:	MAT 005 or required math score on College Placement Test
Corequisites:	None
Course Hours and Credits:	4:0:4
Course Description:	A review of arithmetic, math in daily living, basic geometry, English/metric conversions, scientific notation, simple algebraic expressions, and simple algebraic equations.
Required Text:	Slater, J., & Tobey J. (2005). Basic College Mathematics, (5th ed.). Prentice Hall Publishing Co.
Materials:	Scientific Calculator (follow on course MAT 120, 150, 155 or 201) Graphing Calculator (follow on course MAT 130, 153, 181 or 251)
Method of Instruction:	Lecture
Manuals:	Student Booklet, Review for Final Exam
Disclaimer:	None

CORE COURSE PERFORMANCE OBJECTIVES

The student will be able to:

1. Recognize place value, perform the four operations of arithmetic and solve applied problems using whole numbers. (CCC 2, 7)
2. Demonstrate the knowledge of the definition of fractions and mixed numbers. (CCC 1)
3. Perform the four operations of arithmetic and solve applied problems using fractions and mixed numbers. (CCC 2, 7)
4. Recognize place value, perform the four operations of arithmetic and solve applied problems using decimals. (CCC 2, 7)
5. Write ratios, calculate rates and proportions, and use these to solve applied problems. (CCC 2, 7)
6. Demonstrate equivalent percent notations and solve percent problems. (CCC 2, 7)
7. Compute, analyze and interpret statistical data. (CCC 2, 5, 7)
8. Calculate conversions between the English system and the metric system and use these to solve applied problems. (CCC 2, 5, 7)
9. Compute perimeter, area, and volume of geometric figures. (CCC 2, 7)
10. Perform the four operations of arithmetic and use order of operations to simplify mathematical expressions involving integers. (CCC 2, 7)
11. Solve applied problems using simple algebraic equations. (CCC 2, 7)
12. Perform calculations involving scientific notation. (CCC 7)

MEASURABLE PERFORMANCE OBJECTIVES

1. **Recognize place value, perform the four operations of arithmetic and solve applied problems using whole numbers. (CCC 2, 7)**

    1.1 Given whole number exponents, write numbers in exponent form and find the value of exponent expressions.

    1.2 Given arithmetic expressions involving whole numbers, more than one operation, exponents, whole numbers and parentheses, simplify the expressions using the rules for order of operations correctly.

    1.3 Given a number round to the indicated place.

    1.4 Use the Principle of Estimation to find an estimate of the answer for a calculation.

    1.5 Given applied problems, solve them using one or more operations.

2. **Demonstrate the knowledge of the definition of fractions and mixed numbers. (CCC 1)**

2.1 Given fractional notation, identify the numerator and denominator; use a fraction to represent the data from applied situations; division including the numbers 1 and 0.

2.2 Given any fractional number, simplify the number correctly.

2.3 Given a pair of fractions, test for equality and use = or ≠ to show the results.

3**. Perform the four operations of arithmetic and solve applied problems using fractions and mixed numbers. (CCC 2, 7)**

3.1 Given a mixed numeral, convert from mixed numeral to equivalent improper fractional notation.

3.2 Given an improper fraction, convert from fractional notation or a quotient to an equivalent mixed numeral.

3.3 Given two fractions, a fraction and a whole number, a mixed number, or applied problems concerned with fractions, multiply the numbers correctly.

3.4 Given two fractions, a fraction and a whole number, a mixed number, or applied problems concerned with fractions, divide the numbers correctly.

3.5 Given fractions find the least common dominator and/or “build up the fraction”.

3.6 Given fractions whose denominators are different, add or subtract and simplify the fractions correctly.

3.7 Given problems or applications involving addition and subtraction with mixed numerals, perform the operations correctly and simplify.

3.8 Given applications involving fractions, solve the problems correctly.

4 **Recognize place value, perform the four operations of arithmetic and solve applied problems using decimals. (CCC 2, 7)**

4.1 Given a number or money value in decimal notation, write the correct word name. **Do <u>not</u> use the word *point*.**

4.2 Given a fractional number whose denominator is a power of ten, convert to equivalent decimal notation.

4.3 Given a number written in decimal notation, convert to equivalent fractional notation.

4.4 Given a pair of numbers written in decimal notation, correctly tell which is larger and be able to place 3 or more decimals in order.

4.5 Given a number written in decimal notation having a sufficient number of decimal places, correctly round the given number to the indicated place.

4.6 Given two or more decimal numbers, add the numbers correctly.

4.7 Given two decimal numbers, subtract the numbers correctly.

4.8 Given word problems involving addition and subtraction with decimals, solve the problems correctly.

4.9 Given a decimal number or applications involving decimals, multiply by a decimal, a whole number or a power of 10.

4.10 Given a decimal number or applications involving decimals, divide by a whole number or a decimal.

4.11 Given fractional notation convert the fraction to equivalent decimal notation.

4.12 Given arithmetic expressions involving decimal notation, more than one operation, and parentheses, simplify the expressions using the rules for order of operations correctly.

4.13 Given applied problems involving operations with decimals, solve the problems correctly.

5. **Write ratios, calculate rates and proportions, and use these to solve applied problems. (CCC 2, 7)**

5.1 Given a statement comparing two values, express the comparison as a ratio.

5.2 Given two pairs of numbers, determine whether the pairs are proportional.

5.3 Given a proportion in which three of the four terms are known, find the value of the unknown term.

5.4 Given a word problem involving proportions, solve the problem correctly using proportions.

6. **Demonstrate equivalent percent notations and solve percent problems. (CCC 2, 7)**

6.1 Given percent notation, convert to equivalent decimal notation.

6.2 Given decimal notation, convert to equivalent percent notation.

6.3 Given percent notation, convert to equivalent fractional notation.

6.4 Given fractional notation, convert to equivalent percent notation.

6.5 Given a problem involving percent, solve the problem correctly using the formula: **Amount = Percent Number x Base**

6.6 Given a problem involving percent, solve the problem correctly using proportions:

$$\frac{\textbf{Amount}}{\textbf{Base}} = \frac{\textbf{Number}}{\textbf{100}}$$

6.7 Given applied problems involving percent, solve the problems correctly.

7. **Compute, analyze and interpret statistical data. (CCC 2, 5, 7)**

7.1 Given data in either table or graphical form, read and interpret the data correctly.

7.2 Given a set of data, construct a frequency distribution and a histogram.

7.3 Given a set of numbers or information concerning the numbers, correctly find the average (mean) for the data given.

7.4 Given a set of numbers, correctly find the median and mode (or modes) for the data given.

7.5 Given the theoretical definition of probability, determine the probability of various outcomes.

7.6 Given multiple possibilities, determine compound probabilities by considering the sample space only.

7.7 Given various situations, determine the odds in favor of and the odds against a particular occurrence. You will also learn to determine the difference between odds and probability.

8. **Calculate conversions between the English system and the metric system and use these to solve applied problems. (CCC 2, 5, 7)**

8.1 Using a conversion table, convert from one American unit to another correctly in equations and applications.

8.2 Given linear measures in the metric system, **memorize basic metric prefixes** and convert from one metric unit of length to another correctly.

8.3 Using your knowledge of metric prefixes, convert between metric units of volume and weight and add quantities after converting to a convenient unit.

8.4 Using your knowledge of metric prefixes and a conversion table, convert between American and metric units.

8.5 Given the formulas,

$$F = \frac{9}{5}C + 32 \qquad C = \frac{5}{9}(F - 32)$$

convert from one unit of temperature measurement to an equivalent unit of temperature measurement.

9. **Compute perimeter, area, and volume of geometric figures. (CCC 2, 7)**

9.1 Given the measures of the necessary sides and **your knowledge of the appropriate formulas**, find the perimeter/area of a polygon correctly.

9.2 Understanding angles in a quadrilateral or triangle and using **your knowledge of the appropriate formulas** find the perimeter and area of a triangle.

9.3 Simplify square roots without a calculator or table and using a calculator or Table I.

10. **Perform the four operations of arithmetic and use order of operations to simplify mathematical expressions involving integers. (CCC** 2, 7)

10.1 Given a real number, determine the absolute value of that real number.

10.2 Given two or more integers, add the numbers correctly.

10.3 Given an integer, find the opposite (additive inverse) of the integer and then use it to subtract the numbers.

10.4 Given any two or more real numbers, multiply the numbers correctly.

10.5 Given any two real numbers, divide the numbers correctly.

10.6 Given arithmetical expressions involving real numbers, more than one operation, and parentheses, simplify the expressions using the rules for order of operations correctly.

11. **Solve applied problems using simple algebraic equations. (CCC 2, 7)**

11.1 Given a simple algebraic expression rewrite and combine like terms.

11.2 Given a simple algebraic expression, apply the Distributive Property correctly.

11.3 Given an equation in one unknown, solve the equation correctly using the addition principle.

11.4 Given an equation in one unknown, solve the equation correctly using the Multiplication Principle and/or Division Principle.

11.5 Given an equation in one unknown, solve the equation correctly using both the addition and multiplication and/or division principles.

11.6 Given an English statement translate it into an equation. (Do not solve the equation.)

12. **Perform calculations involving scientific notation. (CCC 7)**

12.1 Given numbers written in standard decimal notation, convert to equivalent scientific notation.

12.2 Given numbers written in scientific notation, convert to equivalent standard decimal notation.

EVALUATION CRITERIA

Students will demonstrate proficiency on all Measurable Performance Objectives at least to the 75% level. The final grade will be determined using the College Grading System:

92 - 100	AE
83 - 91	BE
75 - 82	CE
0 - 74	RE

Students should refer to the Student Handbook for information on Academic Standing Policy, Academic Honesty Policy, Students Rights and Responsibilities and other policies relevant to their academic progress.

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