COURSE INFORMATION FORM

DISCIPLINE: Mathematics
COURSE TITLE: Math 92 – Elements of Algebra II

CR.HR. 3  LECT HR. 3  LAB HR. CLIN/INTERN HR.  CLOCK HR. 

CATALOG DESCRIPTION
Continued review of all basic mathematical operations. Review fractions, decimals, proportions and percentages. Elementary geometry (Perimeter, area and volume). Continued review of all operations and properties of real numbers with special attention given to work with signed numbers. Solutions of linear equations and inequalities in one variable, using and manipulation formulas. Properties of exponential numbers, definition and basic operations with polynomials and solution of polynomial equations by factoring. Basic operations and simplification of rational expressions. Graphing linear equations in two variables. Increased application of functions and their graphs, systems of linear equations, application problems, inequalities, absolute value equations. Increased use of rational exponents, radicals, quadratic functions and equations, ratios and proportions. Self-paced course based on initial diagnostic.

PREREQUISITES
Math 91

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)
Upon completion of this course, the student will be able to:

1. Continue to identify and use the terminology of arithmetic, percentages, ratios, and geometry
2. Perform arithmetic computations of integers, fractions, and decimals
3. Estimate the results of arithmetic computations
4. Compute percentages and ratios
5. Increase application of arithmetic, percentages, ratios, proportions and geometry to solutions of real life problems
6. Draw appropriate diagrams to aid in solving arithmetic and geometric problems
7. Continue to make calculations by substituting values into algebraic expressions
8. Increase simplification and performance of addition, subtraction, multiplication, and division on polynomial and rational expressions
9. Factor polynomial expressions and solve quadratic equations using factoring
10. Create and interpret linear graphs
11. Determine the slope of a line from a graph or an equation and interpret slope
12. Solve linear applications
13. Construct and solve equations derived from applied situations
14. Identify and use algebraic terminology, expressions and function notation
15. Solve rational, radical, linear, absolute value and quadratic equations
16. Solve linear and absolute value inequalities
17. Solve linear equations and systems of linear equations
18. Identify and apply geometric and algebraic formulas
19. Use algebra to analyze reasonable estimates and answers

Revised 10/29/14
20. Graph linear and quadratic functions
21. Determine the equation of a line
22. Interpret the graph of a function

GENERAL EDUCATION OUTCOMES (ESO)
Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>ESO</th>
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<tr>
<td>Information Literacy – The student will be able to access and apply information from multiple sources, evaluating the accuracy and credibility of each, with appropriate documentation. The student should be able to: Interpret and apply quantitative and/or qualitative information embedded in text, real-life situation, tables, or graphs to analyze complex situations and/or solve quantitative or qualitative problems. (1-22)</td>
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PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes may be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

1. Homework exercises (1-22)
2. Journal of vocabulary and processes (1-22)
3. Tests on skills and processes (1-22)
4. Projects that involve collecting and analyzing data (1-22)
5. Reports on mathematical findings (1-22)
6. Papers (1-22)
7. Portfolios (1-22)
8. Computer labs (1-22)
9. Collaborative assignments on problem solving and discovery exercises. (1-22)
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Whole Numbers
   A. Arithmetic operations
   B. Rounding and estimating
   C. Graphing
   D. Exponents
   E. Order of operations
   F. Applications of whole number arithmetic

II. Fractions
   A. Simplify fractions
   B. Converting between fractions and mixed numbers
   C. Arithmetic operations on fractions and mixed numbers
   D. Applications of fractions and mixed numbers

III. Decimals
   A. Converting between fractions and decimals
   B. Arithmetic operations of decimals
   C. Applications of decimals

IV. Ratios and proportions
   A. Ratios and applications
   B. Rates and applications
   C. Proportions and applications

V. Percents
   A. Converting between fractions, decimals, and percents
   B. Simple percent applications

VI. Measurement and units
   A. Convert between various customary US units
   B. Convert between various metric units
   C. Convert between US and metric units
   D. Arithmetic operations and applications with units

VII. Rational Numbers
   A. Graphing integers
   B. Arithmetic operations on integers
C. Absolute value notation
D. Scientific notation

VIII. Geometry
A. Perimeter
B. Area
C. Volume
D. Square roots
E. Pythagorean Theorem*
F. Applications

IX. Algebra
A. Evaluating variable expressions
B. Simplifying variable expressions
C. Solving and checking linear equations
D. Applications of linear equations*

X. Elementary statistics
A. Graphs and charts
B. Mean, median, mode

XI. Pre-algebra and introduction to algebraic expressions
A. Sets of real numbers and the real number line
B. Order of operations
C. Addition, subtraction, multiplication, and division of real numbers
D. Properties of real numbers and simplifying expressions
   1. Associative
   2. Commutative
   3. Distributive

XII. Solving linear equations and inequalities
A. Addition, subtraction, multiplication, and division properties of equality
B. Solving and checking linear equations
   1. Clearing fractions and decimals
   2. Linear equations with variables on both sides of the equation
C. Solving literal equations with variables
D. Application problems modeled by linear equations
   1. Percent
   2. Geometry
E. Application problems modeled by linear inequalities

XIII. Graphing linear equations in two variables
A. Introducing the Cartesian coordinate system
B. Graphing linear equations in two variables
   1. Setting up and completing a table of values for a linear equation of two variables
   2. Using x- and y-intercepts
3. Horizontal and vertical lines
4. Define slope of a line and interpret slope as a rate
5. Write equation of a line using slope-intercept form
6. Write equation of a line using point-slope form

C. Applications and modeling of linear equations

XIV. Polynomials and properties of exponents
A. Properties of exponents
   1. Simplify exponential expressions
   2. Multiply and divide common bases
   3. Definition of zero exponent and integer exponent
   4. Power rule
   5. Scientific notation
B. Definition of a polynomial
C. Addition, subtraction, multiplication, and division of polynomials

XV. Factoring polynomials
A. Greatest common factor
B. Factor by grouping
C. Trinomials
D. Special factorizations
   1. Difference of Squares
   2. Sum of cubes
   3. Difference of cubes
   4. Perfect square trinomial
E. Solve quadratic and higher degree equations by factoring

XVI. Rational Expressions
A. Simplify and reduce rational expressions
B. Domain restrictions of rational expressions
C. Multiplication and division of rational expressions
D. Common Denominators
E. Addition and subtraction of rational expressions

XVII. Functions and Graphs
A. Definition of function
B. Notation
C. Domain and range
D. Graphs

XVIII. Systems of equations
A. Solving equations in two variables
   1. Graphically
   2. Substitution
   3. Elimination
B. Solving systems of equations in three variables  
C. Solving applications: systems of equations  

XIX. Inequalities and problem solving  
A. Interval Notation  
B. Intersections, unions, and compound inequalities  
C. Absolute-value equations and inequalities  
D. Linear inequalities in two variables*  
E. Polynomials and rational inequalities  

XX. Rational exponents  
A. Radical expressions and functions  
B. Rational numbers as exponents  
C. Simplifying  
D. Operations with radical expressions  
E. Solving radical equations  
F. Application  
G. Complex numbers*  

XXI. Quadratic functions and equations  
A. Quadratic equations  
   1. Completing the square  
   2. Quadratic formula  
B. Applications  
C. The discriminant*  
D. Variation and problem solving*  
E. Quadratic functions and their graphs  
F. Optimization*