MATH 115 – INTERMEDIATE ALGEBRA | 4 CREDITS

SYLLABUS

CATALOG DESCRIPTION

Instructs students in the knowledge of algebra involving nonlinear content including expressions, equations, functions and inequalities. This course emphasizes simplifying and solving methods for polynomial, quadratic, rational, absolute value, radical, exponential, and logarithmic expressions and equations.

Prerequisites: ACCUPLACER score of 61 – 103 or Grade of "C" or better in Math 096

Semester Offered: Fall, Spring and Summer

Common Student Learning Outcomes

Upon successful completion of San Juan College programs and degrees, the student will demonstrate competency in…

BROAD AND SPECIALIZED LEARNING

Students will actively and independently acquire, apply, and adapt skills and knowledge with an awareness of global contexts.

CRITICAL THINKING

Students will think analytically and creatively to explore ideas, make connections, draw conclusions and solve problems.

CULTURAL AND CIVIC ENGAGEMENT

Students will act purposefully, reflectively, and ethically in diverse and complex environments.

EFFECTIVE COMMUNICATION

Students will exchange ideas and information with clarity in multiple contexts.

INFORMATION LITERACY

Students will be able to recognize when information is needed and have the ability to locate, evaluate, and use it effectively.

INTEGRATING TECHNOLOGIES

Students will demonstrate fluency in the application and use of technologies in multiple contexts.

Student work from this class may be randomly selected and used anonymously for assessment of course, program, and/or institutional learning outcomes. For more information, please refer to the Dean of the appropriate School.

General Learning Outcomes

Upon successful completion of the course, the student will be able to…

1. Rational expressions and equations
2. Functions and their graphs.
3. Inequalities and absolute value equations.
4. Radical expressions, equations, and complex numbers
5. Quadratic functions and equations
6. Exponential and logarithmic functions.

Specific Learning Outcomes

Upon successful completion of the course, the student will be able to…

1.1 Find the domain of a rational function.
1.2 Simplify rational expressions.
1.3 Evaluate rational functions.
1.4 Multiply and divide rational expressions.
1.5 Add and subtract rational expressions.
1.6 Solve rational equations including proportions.
1.7 Solve applications involving rational equations.
1.8 Simplify complex fractions.

2.1 Graph linear equations.
2.2 Find linear functions based on various types of given information.
2.3 Evaluate and graph nonlinear functions, including piecewise functions.
2.4 Sketch graphs of functions using transformations.
2.5 Find equations of direct, inverse, joint, and combined variation.

3.1 Find the union and intersection of two sets.
3.2 Solve compound inequalities. Describe their solutions sets graphically and using interval notation.
3.3 Solve linear absolute value equations and inequalities.
3.4 Graph linear inequalities in two variables, including systems of linear inequalities.

4.1 Simplify radical expressions.
4.2 Evaluate radical functions.
4.3 Find the domain of a radical function.
4.4 Graph radical functions.
4.5 Convert radical expressions to rational exponent expressions and vice versa.
4.6 Perform algebraic operations on expressions written as radicals or as rational exponents.
4.7 Find the distance and midpoint between two points.
4.8 Add, subtract, and multiply radical expressions.
4.9 Rationalize denominators and numerators of radical expressions.
4.10 Solve radical equations.
4.11 Solve applications involving radical equations, including the Pythagorean Theorem.
4.12 Simplify expressions with square roots of negative numbers by rewriting as complex numbers.
4.13 Simplify expressions with powers of i.
4.14 Add, subtract, multiply, and divide complex numbers.

5.1 Solve quadratic equations by using an appropriate method including: factoring, principle of square roots, completing the square, and the quadratic formula.
5.2 Solve equations reducible to a quadratic equation.
5.3 Solve polynomial inequalities.
5.4 Graph a quadratic function including the vertex, and all intercepts.
5.5 Solve applications involving quadratic equations, including optimization problems.

6.1 Add, subtract, multiply, and divide functions, specifying any restrictions on the domain.
6.2 Find and evaluate composite functions.

6.3 Determine if a function is one-to-one from a set of ordered pairs and graphically.
6.4 Find the inverse of a one-to-one function.
6.5 Graph a function and its inverse on the same set of axes.
6.6 Graph and evaluate exponential and logarithmic functions.
6.7 Convert a logarithmic expression to an exponential expression and vice versa.
6.8 Use the properties of logarithms to expand or condense logarithmic expressions.
6.9 Know the common and natural base logarithms and use the change-of-base formula to evaluate logarithmic expressions.
6.10 Solve exponential and logarithmic equations and applications.

Other Requirements:

A Scientific Calculator is required for the course. We highly recommend the student use a TI-30IIX Texas Instruments scientific calculator. No type of graphing calculator or symbolic manipulator will be allowed on examinations, department finals and where the instructor finds fit.