



COURSE OUTLINE: MATH 90+

D Credit – Degree Applicable

COURSE ID - 010379

Created: February 2019

COURSE DISCIPLINE : MATH

COURSE NUMBER : 90+

COURSE TITLE (FULL) : Intermediate Algebra for BSTEM with Support

COURSE TITLE (SHORT) : Inter Alg for BSTEM with Support

CATALOG DESCRIPTION

MATH 90+ is a one-semester Intermediate Algebra course with a built-in support lab component intended to prepare students for algebra-intensive transfer courses (i.e. Precalculus, Business Calculus, or College Algebra). Topics include fundamental laws, curve plotting, linear equations, fractional exponents, quadratic equations and inequalities, radical and rational expressions and equations, factoring, functions and inverse functions, algebra of functions, graphs of functions, systems of linear and nonlinear equations and inequalities, and exponential and logarithmic functions. MATH 90+ is intended for students who plan to major in BSTEM (business, science, technology, engineering and math). Note: This course may not be taken for credit by students who have completed MATH 101, 118, 120, 220A, 220B or 220S. A maximum of 6 units will be granted for MATH 90 and any of the following courses: MATH 119, 219A, 219B, 219C, 146, 246A, or 246B. A maximum of 8 units will be granted for MATH 90 and either of the following: MATH 130 or 131.

Total Lecture Units:6.00

Total Laboratory Units: 0.50

Total Course Units: 6.50

Total Lecture Hours:108.00

Total Laboratory Hours: 45.00

Total Laboratory Hours To Be Arranged: 0.00

Total Contact Hours: 153.00

Prerequisite: Placement is based on an academic background or satisfactory completion of MATH 15.



ENTRY STANDARDS

	Subject	Number	Title	Description	Include
1				add, subtract, multiply, and divide real numbers;	Yes
2				convert between percents, decimals and fractions;	Yes
3				solve introductory linear equations and inequalities;	Yes
4				simplify introductory exponential expressions;	Yes
5				add, subtract, multiply and divide polynomials;	Yes
6				graph introductory linear equations and inequalities;	Yes
7				find the equation of a line;	Yes
8				solve linear systems using 3 different methods;	Yes
9				use algebra to solve applied problems;	Yes
10				factor polynomials;	Yes
11				demonstrate knowledge of test-taking strategies and study skills.	Yes

EXIT STANDARDS

- 1 Solve absolute value equations and inequalities;
- 2 solve linear equations and compound inequalities;
- 3 perform operations with polynomials;
- 4 simplify complex fractions;
- 5 perform operations with radical expressions;
- 6 simplify expressions with rational exponents;
- 7 solve rational equations;
- 8 solve equations with radicals;
- 9 find the equation of a line parallel or perpendicular to a given line;
- 10 solve a system of linear equations using elimination, substitution;
- 11 solve systems of linear inequalities;
- 12 find the composition of two functions;
- 13 solve applied problems;
- 14 solve quadratic equations with real and complex solutions;
- 15 find the inverse of a function;
- 16 use the properties of logarithms to simplify and expand expressions;
- 17 solve logarithmic and exponential equations;
- 18 graph functions (linear, quadratic, exponential, logarithmic);
- 19 graph parabolas and circles centered at any point.



STUDENT LEARNING OUTCOMES

- 1 simplify linear, polynomial, rational, and radical expressions;
- 2 identify different types of equations and inequalities, select the appropriate strategy and solve the equation or inequality, and check the reasonableness of the solution;
- 3 identify, formulate, and analyze mathematical functions numerically, graphically, and symbolically at the intermediate algebra level and have the ability to transition between these representations;
- 4 formulate mathematical models for a variety of real-world phenomena and communicate mathematical solutions clearly and effectively;
- 5 incorporate academic strategies and mindset in planning and self-assessment of mathematical success.

COURSE CONTENT WITH INSTRUCTIONAL HOURS

	Description	Lecture	Lab	Total Hours
1	The Real Number System <ul style="list-style-type: none"> • Sets and the real number system • Equality and properties of real numbers • Inequalities and graphs of sets of real numbers • Arithmetic of real numbers 	3	0	3
2	Equations and Inequalities <ul style="list-style-type: none"> • Linear equations and their solutions • Applications • Formulas and literal equations • Absolute value equations • Linear inequalities • Inequalities with absolute values 	10	0	10
3	Graphs of Lines, Equations of Lines, and Variation <ul style="list-style-type: none"> • The rectangular coordinate system • The slope of a line • Equations of lines • Graphs of linear inequalities in two variables • Introduction to functions • The algebra of functions, composition of functions • Translations and reflections of functions • Proportion and variation 	10	0	10



4	<p>Systems of Equations and Inequalities</p> <ul style="list-style-type: none"> • Solution by graphing • Solution by substitution • Solution by elimination • Solution of three equations in three variables • Applications • Systems of linear inequalities 	8	0	8
5	<p>Exponents, Polynomials, and Factoring</p> <ul style="list-style-type: none"> • Exponents and scientific notation • Adding and subtracting polynomials • Multiplying polynomials and dividing polynomials • The greatest common factor and factoring by grouping • The difference of two squares; the sum and difference of two cubes • Factoring trinomials • Solving equations by factoring • Applications 	13	0	13
6	<p>Rational Expressions</p> <ul style="list-style-type: none"> • Simplifying rational expressions • Multiplying and dividing rational expressions • Adding and subtracting rational expressions • Complex fractions • Equations containing rational expressions • Applications • Graph rational functions 	13	0	13
7	<p>Rational Exponents and Radicals</p> <ul style="list-style-type: none"> • Rational exponents • Radical expressions • Adding and subtracting radical expressions • Multiplying and dividing radical expressions • Solving equations with radicals • Applications of radicals • Complex numbers 	11	0	11



8	<p>Quadratic Equations</p> <ul style="list-style-type: none"> • Completing the square • Quadratic formula • The discriminant and its applications • Equations quadratic in form • Non-linear inequalities of one variable 	9	0	9
9	<p>Exponential and Logarithmic Functions</p> <ul style="list-style-type: none"> • One-to-one functions • Inverse functions • Exponential functions • Logarithmic functions • Properties of logarithms • Common and natural logarithms • Exponential equations and change of base • Solving logarithmic equations • Applications 	11	0	11
10	<p>The Conic Sections</p> <ul style="list-style-type: none"> • Parabolas • Circles 	4	0	4
11	<p>Metacognition and Affective Domain</p> <ul style="list-style-type: none"> • Study plans • Mindset (growth, resilience, hardiness and grit) • Reading and cognitive techniques • Study and test taking skills 	16	0	16



12	Arithmetic of real numbers	0	45	45
	<ul style="list-style-type: none"> • Fractions 			
	Linear equations			
	<ul style="list-style-type: none"> • Applications 			
	Formulas and literal equations			
	Inequalities with absolute values			
	Equations of lines			
	Introduction to functions			
	Systems of Equations			
	<ul style="list-style-type: none"> • Applications 			
	Exponents and scientific notation			
	Addition and subtraction of polynomials			
Multiplication and division of polynomials				
Factoring				
Solving equations by factoring				
Addition and subtraction of rational expressions				
Proportions/Variations				
Affective domain				
<ul style="list-style-type: none"> • Metacognition and the brain • Skills for success in a math class • Productive persistence and struggle • Time Management 				
				153



COURSE OUTLINE: MATH 90+
D Credit – Degree Applicable
COURSE ID - 010379
Created: February 2019

OUT OF CLASS ASSIGNMENTS

- 1 homework (e.g. problems sets related to course content);
- 2 online assignments (e.g. problems sets related to course content);
- 3 projects (e.g. analyze a real life situation and create a mathematical model).

METHODS OF EVALUATION

- 1 group work;
- 2 quizzes;
- 3 five to eight examinations are required;
- 4 a comprehensive final examination is required.

METHODS OF INSTRUCTION

- Lecture
- Laboratory
- Studio
- Discussion
- Multimedia
- Tutorial
- Independent Study
- Collaboratory Learning
- Demonstration
- Field Activities (Trips)
- Guest Speakers
- Presentations

TEXTBOOKS

Title	Type	Publisher	Edition	Medium	Author	IBSN	Date
Intermediate Algebra	Required	Cengage	5	Print	Tussy, Alan	1-111-56767-0	2013
Division generated materials							