COURSE OUTLINE: MATH 90
D Credit – Degree Applicable
COURSE ID - 010378
Created: February 2019

COURSE DISCIPLINE: MATH

COURSE NUMBER : 90

COURSE TITLE (FULL) : Intermediate Algebra for BSTEM

COURSE TITLE (SHORT) : Inter Alg for STEM

CATALOG DESCRIPTION

MATH 90 is a one-semester Intermediate Algebra course 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: 0.00

Total Course Units: 6.00

Total Lecture Hours:108.00

Total Laboratory Hours: 0.00

Total Laboratory Hours To Be Arranged: 0.00

Total Contact Hours: 108.00

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

ENTRY STANDARDS

	Subject	Number	Title	Description	Include
1	MATH	15	Foundations of Algebra	Add, subtract, multiply, and divide real numbers;	Yes
2	MATH	15	Foundations of Algebra	convert between percents, decimals and fractions;	Yes
3	MATH	15	Foundations of Algebra	solve introductory linear equations and inequalities;	Yes
4	MATH	15	Foundations of Algebra	simplify introductory exponential expressions;	Yes
5	MATH	15	Foundations of Algebra	add, subtract, multiply and divide polynomials;	Yes
6	MATH	15	Foundations of Algebra	graph introductory linear equations and inequalities;	Yes
7	MATH	15	Foundations of Algebra	find the equation of a line;	Yes
8	MATH	15	Foundations of Algebra	solve linear systems using graphing, substitution and elimination methods;	Yes
9	MATH	15	Foundations of Algebra	use algebra to solve applied problems;	Yes
10	MATH	15	Foundations of Algebra	factor polynomials;	Yes
11	MATH	15	Foundations of Algebra	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 solve quadratic equations with real and complex solutions;
13 find the composition of two functions;
14 solve applied problems;
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.

COURSE CONTENT WITH INSTRUCTIONAL HOURS

	Description	Lecture	Lab	Total Hours
1	The Real Number System • 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 • 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 • 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	Systems of Equations and Inequalities • 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	Exponents, Polynomials, and Factoring • 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	Rational Expressions • 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	Rational Exponents and Radicals • 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	Quadratic Equations • Completing the square • Quadratic formula • The discriminant and its applications • Equations quadratic in form • Non-linear inequalities of one variable	9	0	9

9	Exponential and Logarithmic Functions • 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	The Conic Sections • Parabolas • Circles	4	0	4
11	Metacognition and Affective Domain • Study plans • Mindset (growth, resilience, hardiness and grit) • Reading and cognitive techniques • Study and test taking skills	16	0	16
				108

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).

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

- [x] Lecture
- [ ] Laboratory
- [ ] Studio
- [x] Discussion

- [x] Multimedia
- [ ] Tutorial
- [ ] Independent Study
- [x] Collaboratory Learning
- [ ] Demonstration
- [ ] Field Activities (Trips)
- [ ] Guest Speakers
- [x] Presentations

TEXTBOOKS

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