COURSE DISCIPLINE :   MATH

COURSE NUMBER :   130

COURSE TITLE (FULL) :   Elementary & Intermediate Algebra for Statistics

COURSE TITLE (SHORT) :   Elem & Inter Algebra for Stat

CALIFORNIA STATE UNIVERSITY SYSTEM C-ID :

CATALOG DESCRIPTION

MATH 130 is a one-semester course leading to transfer-level Statistics (Math 136), Finite Mathematics (Math 133), Liberal Arts Mathematics (Math 135), and Math for Elementary Teachers I (Math 138). Topics include curve plotting, linear equations and inequalities, radicals, functions and inverse functions, systems of linear equations, exponential and logarithmic functions, factoring, rational expressions, roots and radicals, quadratic equations, descriptive statistics, graphical and numerical statistics for quantitative and categorical data, modeling bivariate data with linear functions, introductory set theory, and introductory probability.

CATALOG NOTES

Note: This course is designed for non-STEM students who are not majoring in science, technology, engineering, mathematics, or business. This course may not be taken for credit by students who have completed MATH 131. A maximum of 6 units will be granted for MATH 130 AND 141, 146, 119, 219A, 219B, or 219C, OR a maximum of 8 units will be granted for MATH 130 AND 101, 120, 220A, or 220B.

Total Lecture Units:5.00

Total Laboratory Units: 1.00

Total Course Units: 6.00

Total Lecture Hours:90.00

Total Laboratory Hours: 54.00

Total Laboratory Hours To Be Arranged: 0.00

Total Contact Hours: 144.00

Prerequisite: Satisfactory completion of MATH 144, MATH 145, or 2 units of MATH 245.

ENTRY STANDARDS

	Subject	Number	Title	Description	Include
1				add, subtract, multiply, and divide real numbers;	Yes
2				solve linear equations and inequalities;	Yes
3				solve absolute value equations and inequalities;	Yes
4				simplify exponential expressions;	Yes
5				add, subtract, multiply, and divide polynomials;	Yes
6				graph linear equations and inequalities;	Yes
7				find the equation of a line;	Yes
8				solve linea r systems;	Yes
9				use algebra to solve applied problems;	Yes
10				use function notation.	Yes

EXIT STANDARDS

1   factor polynomials;
2   solve rational equations;
3   graph quadratic functions;
4   solve equations with radicals;
5   solve absolute value equations and inequalities;
6   solve linear equations and inequalities;
7   find the equation of a line and interpret the slope and intercept;
8   solve a system of linear equations using elimination, and graphing;
9   solve applied problems;
10 find the inverse of a function;
11 solve logarithmic and exponential equations;
12 find the nth term of arithmetic and geometric sequences;
13 graph functions (linear, exponential, logarithmic);
14 compute basic statistics for a variable, including mean, median, mode, quartiles , range, variance and standard deviation;
15 describe the distribution of a quantitative variable in terms of its shape, center and spread, using graphical techniques;
16 apply addition and multiplication rules of probability in problem solving including computing expected value;
17 identify probability models and compute their areas .

STUDENT LEARNING OUTCOMES

1   simplify various algebraic expressions;
2   solve equations and inequalities;
3   graph various sets of data, functions, and relations;
4   use mathematical models to solve application problems;
5   apply formulas, use rules and factor polynomials.

COURSE CONTENT WITH INSTRUCTIONAL HOURS

	Description	Lecture	Lab	Total Hours
1	Factoring • The greatest common factor • Factoring by grouping • Factoring trinomials • The difference of two squares • Solving equations by factoring • Applications • Factoring cubes	10	0	10

2	Rational Expressions • Reducing rational expressions to lowest terms • Multiplication and division of rational expressions • Addition and subtraction of rational expressions • Equations involving rational expressions • Applications • Complex fractions • Proportions and variation	8	0	8
3	Roots and Radicals • Definitions and common roots • Properties of radicals • Simplified formfor radicals • Addition and subtraction of radical expressions • Multiplication and division of radicals	6	0	6
4	Quadratic Equations • Solving using the square root method • Solving by completing the square • The quadratic formula • Complex numbers • Complex solutions to quadratic equations • Graphing parabolas • Distance formula and graphing circles	6	0	6

5	Descriptive Statistics • Basic Statistics • Simple random samples and sampling bias • Measures of center: mean, median, and mode • Measures of spread: standard deviation, variance, interquartile range, and range • Graphs of one variable • Histograms • Stem plots • Box plots • Bar Chart • Pie Chart • Graphs of two variables • Linear equations and inequalities with one and two variables, including absolute values • The rectangular coordinate system • Scatterplots • The slope of a line • Equations of lines • Summation notation • Regression Lines • Correlation	22	0	22
6	Systems of Equations • Solutions by graphing • Solutions by elimination • Applications (i.e. Supply & demand equilibrium and breakeven price & quantity)	7	0	7

7	Exponential and Logarithmic Functions • One-to-one functions • Inverse functions • Exponential functions • Logarithmic functions • Common and natural logarithms • Transforming data • Simple vs. compound interest	11	0	11
8	Basic Set Theory and Probability • Set Theory • The real number system • Subsets • Complements • Unions and intersections • Counting techniques, permutations, and combinations • Probability Rules • Addition and multiplication rules • Conditional probability, dependent and independent events • 2-Way Tables • Expected Value and the Pythagorean Theorem of Statistics • Probability Models • General discrete probability models • Normal and uniform distributions	20	0	20
9	Laboratory content • Simplify radical and rational expressions • Factor polynomials • Graph lines, quadratic functions, exponential functions, and logarithms • Apply mathematical models • Analyze data sets • Construct box-plots, histograms, and stem-plots	0	54	54
				144

OUT OF CLASS ASSIGNMENTS

1 homework (e.g. problems sets related to course content) ;

2 project(s) using datasets and technology culminating in a written report (e .g. analyze data provided involving price and quantity of soda and construct a scatter plot and linear regression model using Excel) .

METHODS OF EVALUATION

1 quizzes;

2 seven to nine examinations;

3 one comprehensive final examination.

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
Elementary Algebra	Required	Cengage	5	print	Alan Tussy	1-111-56766-8	2013
Intermediate Algebra	Required	Cengage Learning	5	print	Alan Tussy	1-111-56767-0	2013
Collaborative Statistics	Required	College Open Textbooks Present		digital	Susan Dean		2011