Degree Applicable                                     Glendale Community College
Course ID 010166                                                        April 2015

COURSE OUTLINE

**Mathematics 131**
**Intermediate Algebra for Statistics**

## I.       Catalog Statement

Mathematics 131 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, descriptive statistics, graphical and
numerical statistics for quantitative and categorical data, modeling bivariate data with
linear functions, introductory set theory, and introductory probability.

Total Lecture Units:  5.0
Total Laboratory Units:  0.0
**Total Course Units:  5.0**

Total Lecture Hours: 80.0
Total Laboratory Hours: 0.0
        Total Laboratory Hours To Be Arranged**:** 0.0
**Total Faculty Contact Hours:  80.0**

Prerequisite:  Placement is based on a composite of test scores and academic background
or satisfactory completion of MATH 141, MATH 146, or MATH 246B.

Note:  This course is designed for non-STEM students who are not majoring in science,
technology, engineering, mathematics, or business. A maximum of 5 units will be granted
for MATH 131 and 119 or 219, OR a maximum of 7 units will be granted for MATH 131
and 101, 120 or 220. No more than 7 units total will be granted.

## II.      Course Entry Expectations

Prior to enrolling in the course, the student should be able to:
*   add, subtract, multiply and divide real numbers;
*   solve linear equations and inequalities;
*   solve absolute value equations and inequalities;
*   simplify exponential expressions;
*   add, subtract, multiply and divide polynomials;
*   graph linear equations and inequalities;
*   find the equation of the line passing through 2 points;

- solve linear systems using 3 different methods;
- use algebra to solve applied problems;
- use function notation;
- factor polynomials;
- add, subtract, multiply and divide algebraic fractions;
- solve rational equations;
- use algebra to solve applied problems;
- use the properties of radicals to simplify radicals;
- add, subtract, multiply and divide radicals;
- solve radical equations;
- solve quadratic equations by factoring, completing the square, and using the quadratic formula;
- graph quadratic functions and circles;
- use the distance formula to find the distance between two points.

## III.    Course Exit Standards

Upon successful completion of the required coursework, the student will be able to:
- solve absolute value equations and inequalities;
- solve linear equations and inequalities;
- solve equations with radicals;
- find the equation of a line and interpret the slope and intercept;
- solve a system of linear equations using elimination, and graphing;
- solve applied problems;
- find the inverse of a function;
- solve logarithmic and exponential equations;
- find the nth term of arithmetic and geometric sequences;
- graph functions (linear, exponential, logarithmic);
- apply the Binomial Theorem;
- compute basic statistics for a variable, including mean, median, mode, quartiles, range, variance and standard deviation;
- describe the distribution of a quantitative variable in terms of its shape, center and spread, using graphical techniques;
- apply addition and multiplication rules of probability in problem solving including computing expected value;
- identify probability models and compute their areas.

## IV.    Course Content                                    Total Faculty Contact Hours = 80.0

A.  Descriptive Statistics for one variable **(15 hours)**
    1. Basic Statistics
        a. Simple random samples and sampling bias
        b. Measures of center: mean, median, and mode

      c.  Measures of spread: standard deviation, variance, interquartile range, and range

   2.  Graphs of one variable
      a.  Histograms
      b.  Stem plots
      c.  Box plots
      d.  Bar Chart
      e.  Pie Chart

B. Descriptive Statistics for two variables **(10 hours)**
   1.  Graphs of two variables and linear regression
      a.  Linear equations and inequalities with one and two variables, including absolute values
      b.  The rectangular coordinate system
      c.  Scatterplots
      d.  The slope of a line
      e.  Equations of lines
      f.  Summation notation
      g.  Regression Lines
      h.  Correlation
   2.  Geometric and arithmetic series
   3.  Binomial Theorem

C. Systems of Equations **(10 hours)**
   1.  Solutions by graphing
   2.  Solutions by elimination
   3.  Solutions of three equations in three variables
   4.  Applications
      a.  Supply and demand equilibrium
      b.  Breakeven price and quantity

D. Exponential Functions **(8 hours)**
   1.  Functions including exponents and radicals and scientific notation
   2.  Exponential functions

E. Logarithmic Functions **(8 hours)**
   1.  One-to-one functions
   2.  Inverse functions
   3.  Common and natural logarithms
   4.  Transforming data

F. Applications of Exponential and Logarithmic Functions **(4 hours)**
   1.  Simple vs. compound interest
   2.  Loan payments
   3.  Annuities
   4.  Growth/decline patterns

G. Basic Set Theory **(10 hours)**
   1.  The real number system
   2.  Subsets
   3.  Complements
   4.  Unions and intersections

     5. Counting techniques, permutations, and combinations
  H. Probability (**15 hours**)
    1. Probability Rules
      a. Addition and multiplication rules
      b. Conditional probability, dependent and independent events
      c. 2-Way Tables
      d. Expected Value
    2. Probability Models
      a. General probability density functions
      b. Binomial and Normal
      c. Cumulative distribution functions

## V.   Methods of Instruction

The following methods of instruction may be used in the course:
- lecture/discussion;
- small group work/discussion;
- online presentation (e.g. online videos);
- computer software and/or graphing calculator demonstrations.

## VI.   Out of Class Assignments

The following out of class assignments may be used in the course:
- homework (e.g. problem sets related to course content);
- project(s) using datasets and technology culminating in a written report.

## VII.   Methods of Evaluation

The following methods of evaluation may be used in the course:
- quizzes;
- five to eight regularly scheduled examinations;
- one two-and-one half hour comprehensive final examination;

## VIII.   Textbook(s)

McKeague, Charles. *Intermediate Algebra Custom Edition for GCC*. 9th Ed. Mason:
    Cengage, 2011. Print.
11th Grade Textbook Reading Level.  ISBN #1-111-75205-2

Dean , Susan and  Barbara Illowsky,. *Collaborative Statistics*.  Houston: College Open
    Text Books Present, 2011. Digital file.
11th Grade Textbook Reading Level.

## IX.   Student Learning Outcomes

Upon successful completion of the required coursework, the student will be able to:

- solve equations and inequalities;
- simplify various algebraic expressions;
- graph various sets of data and functions;
- use mathematical models to solve application problems);
- apply formulas and rules.