Course Goals: Math 114 – Pre-Calculus A & B – 5 credits

In each category, students will be able to demonstrate:

114 – A (3 credits)

Algebraic Skills & Introductory Function concepts
- The ability to simplify rational, exponential, and radical algebraic expressions.
- The ability to solve rational, exponential, and radical equations.
- Handling function notation in combination with algebraic operations (such as, evaluation & simplification of difference quotients)
- Assessing domain, range, and attributes such as one-to-one and onto
- Computation of composition of function as well as 'decomposition'; that is, decomposing a function into a component functions
- Determination of invertibility and computation of rule of inverse function

Linear Functions
- The ability to graph linear functions.
- The ability to find the equation for a linear function given two points or one point and the slope.
- The ability to solve applied problems using linear functions and interpret the slope and intercepts in terms of real-world phenomena.
- The ability to find the equations of price-supply and price-demand linear functions given data points and to interpret findings based on these (interpretation of slope in real world terms, determination of equilibrium point, and discussion of stability of equilibrium).

Quadratic Functions
- The ability to graph quadratic functions and locate the vertex.
- The ability to find the equation of a quadratic function given three points or the vertex and one point.
- The ability to solve applied problems using quadratic functions and interpret the vertex as a maximum or minimum value of the function.
- The ability to find the equations of revenue and profit functions given price-demand linear functions and to interpret findings based on these (determination of maximum revenue and profit, break-even points, intervals of profit and loss).

Polynomial Functions
- The ability to graph, including intercepts.
- Solve inequalities involving polynomial functions.

Rational Functions
- The ability to graph, including intercepts and asymptotes (both vertical & non-vertical).
- Solve inequalities involving rational functions.

Exponential Functions
- The ability to graph exponential functions.
- The ability to find the equation of an exponential function given two points.
- The ability to solve exponential equations using logarithms.
- The ability to solve applied problems using exponential functions including problems of exponential growth and decay.
- The ability to solve applied problems using logarithmic functions.

114 – B (2 credits)

Periodic Functions
- The ability to graph the standard periodic functions (sine, cosine, tangent)
- The ability to find the equation of periodic functions and inverse periodic functions given sufficient information such as period, amplitude, points, etc.
- The ability to solve applied problems using periodic and inverse periodic functions.

Trigonometry
- Knowledge of the sine, cosine, and tangent of the standard angles (30°, 45°, etc.) given in either degrees or radians.
- Familiarity with the double angle formulas, the half angle formulas, and the addition and subtraction formulas for the trigonometric functions.
- The ability to use the trigonometric functions to solve applied problems (e.g. triangle problems and vector problems).
- The ability to derive trigonometric identities.

Approved – October 5, 2009
Business Applications added – May 2015