Fall 2008 Math SLOs

MATH 811 (Basic Math)

By completing MATH 811 course students will be able to:
- Correctly choose and apply the four basic arithmetic operations with whole numbers, decimals, fractions and signed numbers to estimate and solve application problems that are part of their daily lives. (Number Sense)
- Apply "Proportional Reasoning" to solve related problems including ratios, rates, proportion, percent and conversions of units.
- Compute the area and perimeter of geometric figures.
- Use the services available to improve study skills, test taking skills, problem solving skills and attitude toward learning mathematics

MATH 110 (Elementary Algebra)

Upon completion of the course:
- Through real world applications, students will be able to create, manipulate (apply?), and interpret (results obtained from?) mathematical models of relationships defined by either a constant rate of change or a constant relative rate of change.
- Students will recognize, apply, and interpret multiple representations (graphic, symbolic, numerical/data, verbal/applied) of linear functions and their applications.
- Students will develop skills and attitudes for effectively solving problems at an introductory algebra level.
- (Proposed) Through understanding and errorless application of algebraic properties, students will be able to correctly simplify (linear?) expressions and solve (linear?) equations as appropriate.

MATH 120 (Intermediate Algebra)

Upon completion of the course:
- Through real world applications, students will be able to create, manipulate, and interpret mathematical models of relationships involving linear, exponential, polynomial, radical, and rational functions.
- Students will recognize, apply, and interpret multiple representations (graphic, symbolic, numerical/data, verbal/applied) of functions and their applications.
- Students will develop skills and attitudes for effectively solving problems at an intermediate algebra level.

MATH 130 (Trig)

Upon completion of the course:
- Through real world applications, students will be able to create, manipulate, and interpret mathematical models of periodic relationships.
- Students will recognize, apply, and interpret multiple representations (graphic, symbolic, numerical/data, verbal/applied) of periodic functions and their applications.
- Students will recognize, apply, and interpret proportional reasoning in the context of right triangles and circles by analyzing a variety of problems, then applying the trigonometric definitions, choosing appropriate ideas, and applying these ideas to the solution of the problems.
- Students will develop skills and attitudes for effectively solving problems at a transfer math course level.

MATH 150 (Math for Elementary School Teachers)

Upon completion of the course:
- Students will be able to apply a variety of strategies to solve multi–step problems; including making a table, chart or list, drawing pictures, making a model, using patterns, working backward, guessing and checking, and comparing with previous experience.
- Students will communicate mathematical thoughts, ideas, and solutions clearly and concisely to others in the oral and written forms.
- Students will be able to describe the nature of a problem and the problem–solving process

MATH 200 (Stat)

Upon completion of this course the student will be able to:
- Organize, analyze, and utilize appropriate methods to draw conclusions based on sample data by using tables, graphs, measures of central tendency, and measures of dispersion.
- Have sufficient command of the concepts and terminology of probability and statistics.
- Collect data, interpret and communicate the results using statistical analyses such as confidence intervals, hypothesis tests, and regression analysis.
- Successfully apply statistics to ones selected major at a transfer institution

MATH 222 (Pre Calc)

At the end of the semester students will be able to:
* Apply Algebraic concepts to equation and problem solving.

* Apply modeling techniques to solve real world problems.

* Apply graphing methods to be able to synthesize graphical concepts to check algebraic solutions, as well as, to find solutions where algebraic ones are not possible.

* Apply their functional awareness to be successful in Calculus

MATH 241 (Applied Calc)

Upon completion of the course:
* Students will be able to solve real world applications using the concepts of an average or instantaneous rate of change.
* Students will recognize, apply, and interpret multiple representations (graphic, symbolic, numerical/data, verbal/applied) of the derivative and its applications.
* Students will develop skills and attitudes for effectively solving problems at an applied calculus level.

MATH 251 (Calc 1)

* Students will be able to explain and apply the techniques of differential calculus to construct derivatives graphically, numerically and analytically.

* Students will be able to translate problems from the physical, life and social sciences into workable mathematical form, suitable for graphical, numerical, analytical or verbal solutions.

* Students will be able to use technology where appropriate, in particular, the use of a graphing calculator to
    a. produce the graph of any function in an arbitrary viewing window
    b. estimate the value of a numerical derivative of a function at a point and
    c. estimate the value of a definite integral to a given degree of accuracy

MATH 252 (Calc 2)

- Students will be able to explain and apply the techniques of integral calculus to construct anti-derivatives graphically, numerically and analytically.

- Students will be able to translate problems from the physical, life and social sciences into workable mathematical form, suitable for graphical, numerical, analytical or verbal solutions.

- Students will be able to use technology where appropriate, in particular, the use of a graphing calculator to
    - produce the graph of any function in an arbitrary viewing window
    - estimate the value of a numerical derivative of a function at a point and
    - estimate the value of a definite integral to a given degree of accuracy

- Students will be able to solve differential equations with an emphasis on qualitative solutions, modeling and interpretation.

- Students will be able to analyze the convergence or divergence of sequences and series of constants with a variety of techniques.

MATH 253 (Calc 3)

- Students will be able to explain and apply the techniques of multivariable calculus to solve problems graphically, numerically and analytically.

- Students will be able to translate problems from the physical, life and social sciences into   workable mathematical form, suitable for graphical, numerical, analytical or verbal solutions.

- Students will be able to calculate derivatives and integrals, using vectors and other tools fundamental to multivariable calculus.

- Students will be able to solve multivariable problems graphically and analytically, by examining level sets, partial derivatives, finding extrema, etc.

MATH 270 (Linear Algebra)

Upon completion of the course:
- Students will be able to formulate linear systems as mathematical models.
- Students will be able to represent any linear system with a suitable matrix equation.
- Students will be able to compute the general solution to any linear system.
- Students will recognize inherent geometric and analytical properties of a given matrix.

MATH 275 (Differential Equations)

Upon completion of the course:
- Through real world applications, students will be able to create, manipulate, solve, and interpret mathematical models describing various physical phenomena using scalar or vector differential equations.
- Students will be able to apply analytical, numerical, and qualitative methods to achieve solutions to a wide class of differential equations.
- Students will develop skills for effectively solving problems at an introductory level of differential equations study.