Length of course: 16 Weeks

Contact Hours: 4 Contact Hours

Credit Hours: 4 Credit Hours

Lecture Hours: 4 Lecture Hours

Lab Hours: 4 Lab Hours

Weekly Plan: 4 Hours

Catalogue Description:
College Algebra emphasizes the notion of a function as a unifying concept. The following families of functions and their characteristics are examined within this course: polynomial, rational, exponential and logarithmic functions. Additional topics will include solving inequalities and systems of non-linear equations. Writing assignments, as appropriate to the discipline, are part of the course. Applications involving problem-solving skills will be emphasized throughout the course.

Students the Course is Expected to Serve:
This course is intended for students who plan to major in business, mathematics, engineering, and science.

Pre-requisites:
Prerequisite -- MATH 099 With a minimum grade of 'C' or Placement Test -- or Consent of Chair --

Course Objectives:
1. Analyze the graphs of various families of functions.
2. Apply the models and characteristics of various families of functions to scenarios in order solve real-world (contextual) problems.

Student Learning Outcomes:
Upon satisfactory completion of the course, students will be able to:
A. **Polynomial Functions.** Identify the characteristics of a quadratic function (i.e., vertex, axis of symmetry, and direction of concavity).
B. Compute roots/zeros of a polynomial function by factoring techniques.
C. Estimate the roots/zeros of a polynomial function.
D. Solve polynomial inequalities.
E. Solve systems of linear equations using matrices and determinants.
F. Solve systems of linear inequalities.
G. Solve systems of non-linear equations.
H. **Rational Functions.** Simplify rational expressions using the division algorithm.
I. Identify points of discontinuity of a rational function.
J. Identify vertical/horizontal asymptotes and end behavior of rational functions.
K. Solve rational inequalities.
L. **Exponential and Logarithmic Functions.** Define exponential and logarithmic functions.
M. Simplify exponential and logarithmic expressions using their properties.
N. Solve exponential and logarithmic equations.
O. Formulate and apply exponential and logarithmic functions to a contextual situation.

P. It is expected that the following student learning outcomes (Characteristics of Functions) will be embedded, as appropriate, in the study of the family of functions listed above. Identify the domain and range of a function.

Q. Determine intervals on which functions are decreasing/increasing, continuous/non-continuous, or piecewise.

R. Identify functions from multiple sources of information (i.e., verbal descriptions, graphs, equations, and tables of values).

S. Relate the effect of transformations (i.e., translations, rescaling, or reflections) on graphs of functions and their corresponding equations.

T. Perform operations (i.e., addition, subtraction, multiplication and division) on functions, including the composition of functions.

U. Decompose a function into a composition of two or more functions.

V. Formulate and apply a function to a contextual situation.

W. Determine the conditions under which a function has an inverse.

X. Identify the inverse of a function from multiple representations.

Y. Reformulate a given function into various representations (i.e., verbal, graphical, algebraic, or tabular).

Topical Outline:
Suggested Timeframe only

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>1-5</td>
<td>Concept of a Function (Review)</td>
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<tr>
<td></td>
<td>Polynomial Functions</td>
</tr>
<tr>
<td>6-10</td>
<td>Rational Functions</td>
</tr>
<tr>
<td>11-16</td>
<td>Exponential and Logarithmic Functions</td>
</tr>
</tbody>
</table>

Calendar:

Methods of Evaluation:
Total Percentage: 0%
The weight given to exams, quizzes, and other instruments used for evaluation will be determined by the instructor.

Methods of Assessment:
Exams, quizzes, homework and other assessments will be used as appropriate to measure student learning.

Methods of Instruction:
Problem-based and contextual activities, collaborative-learning techniques, and lecture will be used as appropriate.

Recommended Text: