Southeastern Louisiana University
COURSE PROFILE

COURSE NAME:	**MATH 151: College Algebra Fundamentals** **MATH 161: College Algebra**
PRIMARY ONLINE CONTENT SOURCE	***College Algebra 10e, MyMathLab*** Sullivan
COURSE/UNIT CREDIT:	**3 Carnegie Units**

CHAPTERS FOR MATH 161 COLLEGE ALGEBRA

1 – Equations and Inequalities	**5 - Polynomial and Rational Functions**
2 - Graphs	**6 - Exponential and Logarithmic Functions and Equations**
3 – Functions and Their Graphs	**8 - Systems of Equations and Inequalities**
4 – Linear and Quadratic Functions	

SECTION NAMES (HOMEWORK EXERCISES) AND LEARNING OBJECTIVES

CHAPTER 1: Equations and Inequalities
1.1 Linear Equations (17, 21, 25, 29-55 odd, 59, 61, 65, 71, 73, 77, 79, 81, 85-91 odd, 95) Solve linear equations. Solve equations that lead to linear equations. Solve problems that can be modeled by linear equations.
1.2 Quadratic Equations (11-35 odd, 43-53 odd, 59-65 odd, 79-85 odd, 89, 91, 95, 101) Factor a second-degree trinomial of the form $x^2 + Bx + C$. Factor a second-degree polynomial: $x^2 + Bx + C$, where A is not equal 1. Factor using the best strategy. Solve quadratic equations by factoring. Solve a quadratic equation by the square root method. Solve a quadratic equation using the quadratic formula.
1.4 Radical Equations; Equations Quadratic in Form; Factorable Equations (9-25 odd, 35-57 odd, 61-65 odd, 69-85 odd) Understand the meaning of $a^{1/n}$. Understand the meaning of $a^{-m/n}$. Solve radical equations. Solve equations quadratic in form. Solve equations by factoring. Factor out the GCF of a polynomial's terms. Factor polynomials by grouping.
1.5 Solving Inequalities (13, 15, 27-39 odd, 61, 63, 67, 71, 73, 83, 103) Use interval notation. Solve inequalities. Solve combined inequalities. Solve applications involving inequalities.

CHAPTER 2: Graphs

2.3 Lines (1-4, 7, 8, 13, 15, 19, 21-29 odd, 39-59 odd, 63-71 odd, 75, 81, 95, 117, 123)

Concepts and Vocabulary
Calculate and interpret the slope of a line.
Identify the graph of a line with a given slope.
Use a point and the slope of a line to graph a line or find additional points.
Find the equation of a line given two points.
Find equations of parallel or perpendicular lines.
Write the equation of a line given a point and the slope.
Identify the slope and y-intercept of a line from its equation, and graph the line.
Find the intercepts of a line given its equation, and graph the line.
Solve applications involving lines and linear equations.

CHAPTER 3: Functions and Their Graphs

3.1 Functions (19, 21, 23, 31-37 odd, 41, 43, 51-59 odd, 63, 67, 73, 79, 83)

Determine whether a relation represents a function.
Find the value of a function.
Find the domain of a function defined by an equation.
Form the sum, difference, product, and quotient of two functions.
Find the difference quotient of a function.

3.2 The Graph of A Function (11-21 odd, 25, 27, 29, 33, 43, 45)

Obtain information from or about the graph of a function.
Identify the graph of a function.
Solve applications involving graphs of functions.

3.3 Properties of Functions (7, 10, 11-45 odd)

Concepts and Vocabulary
Use a graph to determine where a function is increasing, decreasing, or constant.
Use a graph to locate maxima and minima.
Use a graph to determine if a function is even or odd.
Identify even and odd functions from the equation.

3.4 Library of Functions; Piecewise-defined Functions (1-26)

Concepts and Vocabulary
Graph the functions listed in the library of functions.
Graph piecewise-defined functions.
Graph, write, or evaluate piecewise-defined functions.
Solve applications involving piecewise-defined functions.

3.5 Graphing Techniques: Transformations (1, 2, 5- 23 odd, 27, 29, 35, 39-59 odd)

Concepts and Vocabulary
Graph functions using multiple transformations.
Graph functions using compressions and stretches.
Graph functions using vertical and horizontal shifts.
Graph functions using reflections about the x-axis and the y-axis.

CHAPTER 4: Linear and Quadratic Functions

4.1 Properties of Linear Functions and Linear Models (2, 4, 7-13, 15-27 odd, 31-37 odd, 41, 45, 47)

Concepts and Vocabulary
Graph linear functions and determine their characteristics.
Use average rate of change to identify linear functions.
Solve linear equations and inequalities based on graphs.
Solve applications involving linear functions and linear models.

4.3 Quadratic Functions and Their Properties (1-9, 12, 13, 17-41 odd, 45-61 odd, 67, 71, 85, 87)
Concepts and Vocabulary
Graph a quadratic function using transformations.
Graph a quadratic function using its vertex, axis of symmetry, and intercepts.
Graph and analyze quadratic functions.
Find a quadratic function given its vertex and one other point.
Find the maximum or minimum value of a quadratic function.
Solve applications involving quadratic functions.

CHAPTER 5: Polynomial and Rational Functions

5.1 Polynomial Functions and Models (2, 5-8, 10, 12, 15-17, 19-39 odd, 43, 45, 49, 51, 55-75 odd, 81-85 odd, 93, 115)
Concepts and Vocabulary
Use given zeros to write and analyze polynomial functions.
Identify polynomial functions and their degree.
Graph polynomial functions of degree 4 or 5 using transformations.
Describe the end behavior of the graph of a polynomial function.
Given a graph, identify a polynomial function and construct the polynomial.
Identify the real zeros of a polynomial function and their multiplicity.
Analyze polynomials and create graphs, either by hand or by graphing utility.

5.2 Properties of Rational Functions (1, 3, 5, 11, 12, 15, 17, 19, 23-37 odd, 41, 51)
Concepts and Vocabulary
Find the domain of rational functions.
Given the graph of a rational function, find the domain, range, asymptotes and intercepts.
Graph rational functions using transformations.
Find all asymptotes of a given rational function.

5.3 The Graph of a Rational Function (1, 3, 4, 7, 9, 11, 17- 23 odd, 31, 33, 51)
Concepts and Vocabulary
Analyze the graph of a rational function.

5.4 Polynomial and Rational Inequalities (5-21 odd, 25, 29-37 odd, 45, 49, 51, 59, 67, 69)
Solve polynomial inequalities graphically.
Solve rational inequalities graphically.
Solve polynomial inequalities algebraically.
Solve rational inequalities algebraically.

CHAPTER 6: Exponential and Logarithmic Functions

6.1 Composite Functions (6-8, 13, 15, 23-37 odd, 53)
Concepts and Vocabulary
Evaluate composite functions.
Form composite functions and find their domains.

6.2 One-to-One Functions; Inverse Functions (6-9, 11-13, 17-25 odd, 35, 45, 47, 49, 53, 57, 65, 79, 87)
Concepts and Vocabulary
Determine whether a function is one-to-one.
Find the inverse of a function defined by an equation.
Obtain the graph of the inverse function from the graph of the function.
Determine properties of the inverse of a function.

6.3 Exponential Functions (1, 8, 9, 14, 29-43 odd, 44, 45-51 odd, 55, 65, 67, 69, 75-83 odd, 89, 97, 105, 109, 111)
Concepts and Vocabulary
Identify linear and exponential functions and find their equations.
Graph exponential functions.
Solve exponential equations.
Find the equations of exponential functions.
Solve applications involving exponential functions.

6.4 Logarithmic Functions (4, 8, 10, 11-39 odd, 43, 61, 63, 67, 71, 73, 75, 83, 89, 91, 93, 97-107 odd, 111, 113, 119)
Concepts and Vocabulary
Change exponential statements to logarithmic statements and vice versa.
Evaluate logarithmic expressions.
Determine the domains of logarithmic functions.
Graph logarithmic functions.
Solve logarithmic equations.
Solve applications related to logarithmic functions.

6.5 Properties of Logarithms (1, 3-6, 13, 15, 19, 21, 25, 37-53 odd, 57, 59, 61, 67, 69, 85)
Concepts and Vocabulary
Work with the properties of logarithms.
Write logarithmic expressions as a sum or difference of logarithms.
Write logarithmic expressions as a single logarithm.

6.6 Logarithmic and Exponential Equations (5-23 odd, 21, 23, 29, 31, 39, 43-49 odd, 55-63 odd, 67, 87)
Solve logarithmic equations.
Solve exponential equations.

6.7 Financial Models (7-15 odd, 19, 21, 31, 39-45 odd, 53)
Determine the future value of a lump sum of money.
Determine the present value of a lump sum of money.
Solve applications involving financial models.
Determine the rate of interest or time required to double or triple lump sums of money.

6.8 Exponential Growth and Decay Models; Newton's Law; Logistic Growth and Decay Models (1-11 odd, 19)
Find equations of populations that obey the law of uninhibited growth.
Find equations of populations that obey the law of decay.

CHAPTER 8: Systems of Equations and Inequalities

8.1 Systems of Linear Equations: Substitution and Elimination (9, 11, 13, 19-27 odd, 33, 35, 37, 57, 61, 67)
Determine if given ordered pairs or ordered triples are solutions to systems of equations.
Solve systems of two equations by substitution or elimination; identify inconsistent systems.
Solve applications involving linear systems with two equations.

8.6 Systems of Nonlinear Equations (1, 2, 5, 9, 23, 27, 33, 35, 39, 51, 75-81 odd)
Graph systems of nonlinear equations and solve to find points of intersection.
Solve systems of nonlinear equations using any method.
Use systems of nonlinear equations to determine two numbers or a ratio of two numbers.
Use systems of nonlinear equations to find dimensions of geometric shapes.