PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

COLLEGE ALGEBRA
MATH1130

Class Hours: 3.0   **Credit Hours: 3.0**

Laboratory Hours: 0.0   **Revised: Spring 2011**

Catalog Course Description:

This course is designed for students who are not in University Parallel/College Transfer programs of science, mathematics, engineering or computer science. Topics include linear, polynomial, rational, exponential, and logarithmic functions and their graphs and applications; linear and nonlinear regression models.

Entry Level Standards:

Students must be able to read at the college level.

Prerequisites:

High school algebra I and algebra II and ACT math score of at least 19; or Transitional Studies math requirements or equivalent math placement score.

Textbook(s) and Other Course Materials:

Textbook:
Rockswold, Gary. College Algebra with Modeling & Visualization, 4th Edition. Addison-Wesley, Reading, MA, 2010.

References:
Bittinger, Marvin L., Judith A. Beecher, David Ellenbogen, and Judith A. Penna. College Algebra: Graphs and Models., 4th Edition. Addison-Wesley, Reading, MA, 2009.
Blitzer, Robert. College Algebra Essentials, 3rd Edition. Pearson Prentice Hall, Upper Saddle River, NJ, 2010.
Narasimhan, Revathi. College Algebra Building Concepts and Connections. Houghton Mifflin Company, Boston, MA. 2009.
Young, Cynthia. College Algebra, 2nd Edition. John Wiley & Sons, Hoboken, NJ. 2009.

Supplements:
MyMathLab or InteractMath

Technology Requirement:
A non-symbolic graphing calculator is required; the TI-84 Plus is preferred.

I. Week/Unit/Topic Basis:

 Included in the topics listed below are projects which students may be asked to complete individually or in groups. Some instructors may use other projects. The selection, timing and manner of presentation of the projects is to be determined by the instructor.

Week	Topic
1	Numbers, Data, and Problem Solving 1.1; Visualizing and Graphing Data 1.2; Functions and Their Representations 1.3; Types of Functions 1.4
2	Functions and Their Rates of Change 1.5; Linear Functions and Models 2.1; Equations of Lines 2.2
3	Linear Equations 2.3; Linear Inequalities 2.4
4	Chapter 1, 2 Test; Quadratic Functions and Models 3.1
5	Factoring R.4, R.6; Quadratic Equations and Problem Solving 3.2
6	Difference Quotient 1.5; Chapter 3 Test
7	Combining Functions 5.1; Inverse Functions and Their Representations 5.2
8	Review of Exponents; Exponential Functions and Models 5.3
9	Logarithmic Functions and Models 5.4; Properties of Logarithms 5.5
10	Exponential and Logarithmic Equations 5.6
11	Chapter 5 Test; More Nonlinear Functions and Their Graphs 4.1; Polynomial Functions and Models 4.2
12	Real Zeros of Polynomial Functions 4.4; Regression
13	Rational Expressions R.5; Rational Functions and Models 4.6
14	Chapter 4 Test; Review for Exam
15	Final Exam

II. Course Objectives*:

The goal of MATH1130 College Algebra is to extend the algebraic skills of the students that are necessary for success in their educational goals beyond the high school level. The course will focus on the tools of problem solving, critical thinking and the appropriate use of modeling and technologies to expand the student's knowledge of mathematics and its applications.

A. Find appropriate regression equations to model real data using statistical analysis. VI.1-6

B. Master the use of a graphing utility to solve problems and to check solutions. VI.1-6

C. Construct and analyze graphs of linear, quadratic, polynomial, rational, radical, exponential and logarithmic functions. VI.1-6

D. Construct appropriate mathematical models to solve applications. VI.1-6

E. Interpret and apply functional notation and concepts. VI.1-6

F. Analyze and explore linear, quadratic, polynomial, piecewise, rational, radical, exponential and logarithmic functions and their applications. VI.1-6

G. Solve and check the solutions of linear, absolute value, piecewise, quadratic, polynomial,

rational, radical, exponential and logarithmic equations analytically, numerically and graphically. VI.1-6

      H.   Solve and check variation application problems. VI.1-6

*Roman numerals after course objectives reference goals of the Mathematics program (Career Program Goals and General Education Goals are listed http://www.pstcc.edu/departments/curriculum_and_instruction/syllabi/)

III. Expected Student Learning Outcomes*:*:

The student should be able to:

1.   Determine the slope of a line and explain its meaning numerically, graphically and analytically. A, C, F

2.   Determine the equations of all lines, including parallel and perpendicular, numerically, graphically and analytically using the point-slope or slope-intercept forms. C, F

3.   Determine if a relation is a function and work with functional notation. C, E

4.   Evaluate the difference quotient for a polynomial function of degree one or higher. E

5.   Sketch careful graphs of functions by hand and find suitable windows to create comprehensive graphs of functions on a graphing utility: linear, absolute value, piecewise, quadratic, polynomial, radical, rational, exponential, and logarithmic. A, B, C

6.   Find the real zeros of functions analytically and graphically. B, C, E

7.   Analytically and graphically analyze graphs of linear, absolute value, piecewise, quadratic, polynomial, rational, radical, exponential, and logarithmic functions: determine domain, range, intercepts, extrema, increasing/decreasing intervals, continuity, end behavior, and asymptotes. B, C

8.   Interpret linear, piecewise, quadratic, polynomial, rational, exponential, and logarithmic models to solve applications. D

9.   Use transformations to build new functions from basic functions; determine domain and range of new functions. B, C, E

10.   Use statistical regression on a graphing utility to find linear, quadratic, cubic, exponential, and logarithmic models and use them to make meaningful predictions. A, B, D

11.   Use the quadratic formula to find exact solutions to quadratic equations. F

12.   Optimize quadratic functions. B, F

13.   Make a reasonable sketch of a polynomial function based on an analysis of its degree, leading coefficient, zeros and end behavior. C

14.   Write a polynomial function given its real zeros and their multiplicities and determine the

real zeros and their multiplicities for a polynomial function. E, F

15. Find the equations of the horizontal and vertical asymptotes of rational functions. C

16. Solve linear, quadratic, polynomial, and rational inequalities analytically or graphically. B, C

17. Use the zeros of a function and its graph to solve related inequalities. B, C

18. Determine if a function is one-to-one and find formulas for inverses of one-to-one functions. E

19. Use the graph of a one-to-one function to draw the graph of its inverse function. B C

20. Convert between exponential and logarithmic notation. E

21. Use the change of base formula to evaluate logarithms. B

22. Use the properties of logarithms to rewrite and simplify expressions. E, F

23. Solve equations analytically: linear, absolute value, quadratic, rational, radical, special polynomials, exponential, and logarithmic. G

24. Solve equations on a graphing utility using the intersection of graphs method. B

25. Solve exponential growth and decay applications analytically using statistical regression or algebraic methods. A, B, D

*Letters after performance expectations reference the course objectives listed above.

IV. Evaluation:

A. Testing Procedures:

Students are evaluated primarily on the basis of tests, projects, homework, quizzes, and a comprehensive final exam. A minimum of four major exams is recommended.

B. Laboratory Expectations:

As assigned by instructor

C. Field Work:

As assigned by instructor

D. Other Evaluation Methods:

As assigned by instructor

E. Grading Scale:

93-100%   A
88-92   B+

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83-87      B
78-82      C+
70-77      C
60-69      D
Below 60   F
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V. Policies:

A. Attendance Policy:

Attendance policy.
Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of the Learning Division, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of the Learning Division.

B. Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:
• Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
• Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
• Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one's own work.
• Taking an exam for another student.
• Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
• Any of the above occurring within the Web or distance learning environment.

C. Accommodations for disabilities:

Students who need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127, 132, 134, 135, 131 or by phone: 539-7153 or TTY 694-6429. More information is available at www.pstcc.edu/departments/swd/.

D. Other Policies:

Cell phones are to be turned off or put in vibration mode while in class. Instructor discretion as to penalty.