PRECALCULUS
MATH 1730

Class Hours: 5.0   **Credit Hours: 5.0**

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

Catalog Course Description:

Precalculus for students in University Parallel/College Transfer Programs of science, mathematics, engineering or computer science. This course prepares students for Calculus I. Review of algebraic, trigonometric, logarithmic and exponential functions for students with a previous precalculus/ trigonometry course. All topics in MATH 1710 and MATH 1720 will be covered in this course. MATH 1710 followed by MATH 1720 is recommended for students with an ACT math score below 22 or no previous precalculus/trigonometry course.

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 Reference Materials Basic to the Course:

Textbook:
Blitzer, Robert F. Precalculus Essentials. Third Edition. Upper Saddle River, NJ: Pearson Prentice Hall, 2010

References:
Algebra and Trigonometry with Analytic Geometry, 12th edition, Swokowski/Cole, Cengage;
Algebra and Trigonometry, 2nd Edition, Stewart/Redlin/Watson, Cengage.

Personal Equipment:
A graphics calculator is required; the TI-83, TI-83 Plus, or TI-84 Plus is recommended. A symbolic manipulator such as the TI-89 or TI-92 is not permitted.

I. Week/Unit/Topic Basis:

Week	Topic
1	Brief review of fundamental algebra topics, Readiness test, Introduction to functions. P1-P9, 1.2
2	Graphs of functions, Linear functions, Slope and average rate of change. 1.2 – 1.5
3	Transformations of functions, Coordinate geometry (distance, midpoint, circles), modeling with functions. 1.6, 1.9, 1.10
4	Test 1, Complex numbers, Quadratic functions, Polynomial functions. 2.1 – 2.3
5	Long and synthetic division, Zeros of polynomial functions, rational functions, Polynomials and rational inqualities. 2.4 – 2.7
6	Variation, Test 2, Composition of functions, Inverse functions 2.8, 1.7, 1.8

7	Exponential and logarithmic functions, properties and equations. 3.1 – 3.4
8	Applications and modeling with exponential and logarithmic functions, 3.5, Test 3
9	Angle measure, Right triangle trigonometry, Law of sines. 4.1, 4.3, 6.1
10	Law of cosines, Vectors. 6.2, 6.6
11	Test 4, Unit circle, trigonometric functions of any angle, Graphs of trigonometric functions. 4.2, 4.4, 4.5
12	Inverse trigonometric functions, periodic modeling. 4.6, 4.7, Test 5
13	Trigonometric identities, Double angle, sum, difference, and other formulas. 5.1 –5.3
14	Trigonometric equations, DeMoivre's Theorem. 5.4, 5.5, 6.5, Test 6
15	Final Exam

II. Course Objectives*:

The course will:

A. Build the algebraic, geometric, and trigonometric manipulation skills necessary for success in the engineering technologies and transfer programs. VI.1,2,3

B. Use function notation and concepts for evaluating algebraic/ trigonometric functions and interpreting the results. VI.1,2,3

C. Illustrate techniques for interpreting algebraic/ trigonometric graphs and demonstrate how they relate to other disciplines. VI.1,2,3,4

D. Look at technology as a tool for analyzing data, graphs, and solutions to enhance understanding of algebraic/trigonometric concepts and determining if solutions are reasonable. VI. 2,3,4,5,6

E. Develop the problem solving skills for solving real world applications that require the use of algebraic/trigonometric equations for a wide-range of disciplines with emphasis on the sciences and engineering. VI.3,4,5,6

*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. Compute areas and volumes of simple geometric figures and solids. A

2. Solve elementary algebraic equations and literal formulas. A

3. Translate verbal situations into an algebraic or trigonometric equation by using appropriate problem-solving techniques. E

4. Interpret, graph, and manipulate polynomial and rational functions. B, C, D

5. Solve equations algebraically, numerically and graphically. A, B, C, D

6. Define and use the six trigonometric ratios. A

7. Apply the trigonometric ratios to right triangle problems from geometry and

technology. A, D, E

8.   Model data mathematically. D

9.   Solve fractional and quadratic equations and applications. A, E

10.   Determine trigonometric and inverse trigonometric functional values for any angle measured in degrees and radians. A,B, C, D

11.   Apply radian measure to geometry and technology. A, C, D

12.   Add vectors geometrically and algebraically. A, D, E

13.   Use law of sines and cosines to solve oblique triangles. A, D, E

14.   Sketch sine and cosine graphs, noting the amplitude, period, and horizontal   displacement. A, C

15.   Simplify rational exponential expressions and convert to radical equivalent. A

16.   Convert from exponential to logarithmic form and vice versa. A

17.   Solve exponential and logarithmic equations and work problems. A, E

18.   Convert between polar and rectangular forms of complex numbers. A

19.   Solve equations involving complex numbers. A

20.   Solve radical equations. A

21.   Prove trigonometric identities by using the fundamental and double-angle identities. A

22.   Solve conditional trigonometric equations by using identities. A

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

IV. Evaluation:

A. Testing Procedures:

    Students are evaluated primarily on the basis of tests, quizzes, and homework. A minimum of 5 major tests 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:

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93 - 100   A
88 - 92    B+
83 - 87    B
78 - 82    C+
70 - 77    C
60 - 69    D
Below 60 F
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V. Policies:

A. 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:

Make Up Work:
Instructor discretion about make-up tests and/or assignments.

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