Pre-calculus Syllabus

MAT 186 CRN 10894
Max Wentworth, Instructor
Room E204, Monday/Wednesday 1:00-2:40PM
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Office Hours: Monday 11:30-12:30; Wednesday 5:00-6:00, Room D205E

Course Description

This course prepares students for the study of Calculus I. The topics include: polynomial and rational functions and their graphs, operations on radical expressions, matrices, exponential and logarithmic functions, trigonometric functions and their graphs, trigonometric identities, trigonometric applications, and determinants.

Method of Evaluation

Quizzes 10%
Take Home Assignments 20%
Tests 40%
Final 30%

Quizzes will be unannounced and at the beginning of class.

Take Home Assignments will be due one week after they are assigned. Students are encouraged to work together on take home assignments, but each student is responsible for understand the material. Late assignments will be accepted one class after they are due with 5 points taken off. A zero will assigned for any take home which is not handed in before or during the grace period.

Tests will be announced one week in advance. If you are going to be absent the day of a test, you **must** let me know, by email or phone **before or on that day**. Failure to do so will result in a zero for that test.

The **final** is comprehensive.

Academic Integrity

Academic integrity is essential to a useful education. Failure to act with academic integrity severely limits a person's ability to succeed in the classroom and beyond. Furthermore, academic dishonesty erodes the legitimacy of every degree awarded by the College. In this class and in the course of your academic career, present only your own best work; and act at all times with honor.

Grading

A 93-100	C 73-76
A- 90-92	C- 70-72
B+ 87-89	D+ 67-69
B 83-86	D 63-66
B- 80-82	D- 60-62
C+ 77-79	F below 60.

Attendance

Attendance is extremely important. Regular attendance is expected. Arriving on time is essential, as all quizzes will be administered at the beginning of class.

Required Text

Precalculus, 2007, 5th edition, J. Stewart, L. Redin and S. Watson

Homework

You are expected to do the homework when it is assigned. Questions on homework will be covered at the beginning of each class.

Disabilities Statement

Students with Learning Disabilities should contact the Learning Specialist, Chris Scarborough at 860-892-5751 or at cscarborough@trcc.commnet.edu as soon as possible to ensure timely accommodations.

Students with Physical Disabilities should contact Judy Hilburger at 860-892-5744 or at jhilburger@trcc.commnet.edu or Matt Liscum at 860-383-5420 or via email at mliscum@trcc.commnet.edu to facilitate accommodations.

If you have a hidden or visible disability, which may require classroom or test-taking modifications, please see me as soon as possible so we may discuss options. If you have not done so, please contact Chris Scarboro, the disability counselor, at 823-2831.

Resources

Free tutoring is available at the Tutoring and Academic Success Center (TASC). Please use this service as needed.

College Withdrawal Policy

Students may withdraw, at the Registrar's Office, for any reason on or before Dec 9, 2011.

CELL PHONES MUST BE TURNED OFF DURING CLASS.

MAT186 Course Outcomes

1. For each function, identify the domain, range, end behavior, local behavior and average rate of change over given intervals.
2. From an equation graph each function; and from a graph or data identify an equation
3. To any function, apply transformations involving vertical and horizontal shifting and stretching/shrinking.
4. Perform symbolic manipulations for algebraic representations of the various functions
   a) Factor polynomials
   b) Apply rules for radicals
   c) Evaluate expressions with rational exponents
   d) Apply rules for exponents and logarithms
   e) Apply trigonometric formulas and identities: Pythagorean, reciprocal, sum, difference, double and half angle formulas.
5. Given an independent variable, find the dependent variable (given and x find y): evaluate
6. Given a dependent variable, find all possible independent variables (given y find x):solve
7. Graph piecewise defined functions.
8. Use elementary functions to model data and solve practical problems.
9. Find the sum, difference, product and quotient of functions
10. Compose functions
11. De-compose functions
12. Tell if a function is invertible
13. Find the inverse of a function
14. Tell whether two functions are inverses by composition
15. Graph the inverse of a function using symmetry to y=x
16. Find the six trigonometric values of an acute angle, and the inverse trig values of a ratio of sides.
17. Solve triangles using right triangle trig, distinguish between the angle of depression and elevation.
18. Solve non –right triangles using the laws of sines and cosines
19. Solve applied problems using right triangle trigonometry
20. Add, subtract, multiply and divide complex numbers
21. Evaluate an integral power of *i*
22. Identify the conjugate of complex numbers
23. Find determinants of an nxn matrix
24. Solve a system using Cramer’s rule
25. Solve a system using row reduced echelon form

Additional homework may be assigned in class.

Section	Title	Exercise #
Chapter 1	***Fundamentals***	
1.5	Equations	1, 7, 21, 29, 33, 41, 43, 45, 51, 55, 63, 65, 71, 75, 81, 97, 99
1.7	Inequalities	1, 5, 7, 17, 21, 25, 29, 33, 41, 47, 51, 57, 61, 63, 71, 79, 83
Chapter 2	***Functions***	
2.1	What is a Function?	1, 5, 13, 15, 21, 25, 29, 37, 39, 41, 43, 45, 55, 61, 83
2.2	Graphs of Functions	1, 13, 23, 25, 31, 33, 37, 41, 49, 53, 55, 57, 83
2.3	Increasing and Decreasing Functions: Average Rate of Change	1, 3, 11, 15, 17, 19, 27, 31, 33
2.5	Quadratic Functions: Max and Min	1, 5-37 odd, 41, 51
2.7	Combining Functions	1, 3, 7, 13, 17, 19, 21, 29, 31, 35
2.8	One-to One Functions and their Inverses	1, 7, 9, 17, 21, 31, 33, 35, 37
Chapter 3	***Polynomials and Rational Functions***	
3.1	Polynomial Functions and their Graphs	5-10 all, 11, 13, 23, 27, 47, 55, 57
3.2	Dividing Polynomials	1, 7, 8, 13, 37, 39, 51, 53, 55, 57
3.3	Real Zeros (Roots) of Polynomials	1, 7, 11, 13, 29, 41, 59, 95
3.4	Complex numbers	1-11 odd, 25, 31, 33, 43-51 odd, 57
3.5	Complex Zeros and the Fundamental Theorem of Algebra	1, 3, 9, 13, 41, 43, 47, 59, 61, 63
3.6	Rational Functions	5, 7, 15, 17, 19, 33, 35, 39, 57, 59, 75
Chapter 4	***Exponential and Logarithmic Functions***	
4.1	Exponential Functions	1, 7, 13, 15, 19-24 all, 65
4.2	Logarithmic Functions	3-35 odd
4.3	Laws of Logarithms	1-17 odd, 39, 41, 49, 51
4.4	Exponential and Logarithmic Equations	1-49 odd, 55, 59
4.5	Modeling with Exponential and Logarithmic Functions	1, 3, 7, 8, 11,13,15,19, 21, 33,35
Chapter 6	***Trigonometric Functions of Angles***	
6.1	Angle Measure	1-45 odd
6.2	Trigonometry of Right Triangles	1, 7, 17, 23, 25, 45, 49, 53
6.3	Trigonometric Functions of Angles	1, 5, 7, 9, 11, 13, 33-45 odd
6.4	The Law of Sines	1, 3, 11, 17, 27, 39
6.5	The Law of Cosines	1, 3, 5, 11, 13, 19, 23, 25
Chapter 5	***Trigonometric Functions of Real Numbers***	
5.2	Trigonometric Functions of Real Numbers	1, 3, 5-13 odd, 19,27,29,37,39,41,43,49,51,53,55,63,65,79, 81
5.3	Trigonometric Graphs	1, 5, 15-31 odd, 37-47 odd, 69, 71, 75
5.4	More Trigonometric Graphs	1-37 odd
Chapter 7	***Analytic Trigonometry***	
7.1	Trigonometric Identities	1, 3, 11, 13, 25-31 odd, 89
7.2	Addition and Subtractions of Formulas	1, 13, 19, 25, 29
7.3	Double-Angle, Half-Angle and Product-Sum Laws	1, 15, 27, 35, 47, 59
7.4	Inverse Trigonometric Functions	1, 3, 9, 11, 13, 15, 29, 31, 41, 43
7.5	Trigonometric Equations	1-13 odd, 17
Chapter 9	***Systems of Equations and Inequalities***	
9.3	Systems of Linear Equations	5, 13, 15, 17, 27, 57
9.4	Systems of Linear Equations: Matrices	15, 25, 31, 35
9.5	The Algebra of Matrices	3, 5, 9, 17, 27, 35, 29
9.6	Inverses of Matrices and Matrix Equations	1, 5, 11, 17
9.7	Determinants and Cramer's Rule	1, 15, 27, 35, 59
9.8	Partial Fractions	11, 15, 19, 21, 41