

Chesapeake College
Wye Mills, Maryland
21679

MAT 115 – 101
Precalculus

Monday & Wednesday
12:00 p.m. – 2:20 p.m.

Fall, 2013
Donna Andrew

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Precalculus 115 - 101

Chesapeake College
P.O. Box 8
Wye Mills, Maryland 21679
Fall Semester, 2013

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e-mail: **dandrew@chesapeake.edu**
College FAX 410-827-5814 Attn: Donna Andrew
Please forward e-mail to the **address listed above.**

Class Schedule: Monday & Wednesday 12:00 p.m. – 2:20 p.m. H – 112

Office Hours: Monday & Wednesday 11:30 a.m. – 12:00 p.m. H – 129
Tuesday & Thursday 10:00 a.m. – 11:15 p.m. H – 129

Textbook: *Precalculus: A Unit Circle Approach*, with MyMathLab: first edition. J.S. Ratti, Marcus McWaters 2010. Addison-Wesley;Pearson. Graphing calculator and textbook required IN class. Graphing calculator may NOT be used on parts of some tests, but will be used in class and on parts of tests. TI-89 or TI-92 may NOT be used on any tests. Student solutions manual is NOT required.

Prerequisite: 2 units of high school algebra and appropriate score on placement test (CM 45+) or MAT – 031 and MAT – 032 (MAT 113 recommended). It has been the experience of the instructor that students who enter this class from MAT 032 or who did not have any courses above Algebra II in high school will have great difficulty in the class. It is HIGHLY recommended that you get a tutor in the ASC immediately!

Introduction: Precalculus is a prerequisite for calculus and for most courses in science and engineering. It provides an essential background for many other college-level mathematics courses. The topics covered in this course include the real number system; algebraic, exponential, logarithmic, trigonometric, and inverse functions; polynomials; and systems of equations. Graphing calculators are utilized to further illustrate many concepts.

This course is a **five-credit** lecture course that meets two times a week. **(Therefore a weekly minimum average of TEN hours of out-of-class work time is not unusual.) As with any mathematics course the best way to study is to work many problems. Class assignments represent a minimum course of study.**

Please note: College policy prohibits children from accompanying parents to class.

Course Policies

Grading: Final grades will be determined according to the following criteria and grading scale.

<u>Criteria</u>		<u>Scale</u>
MML Assignments	10%	A 90 – 100%
Class Homework	4%	B 80 – 89%
In-class Quizzes or Graded Work	6%	C 70 – 79%
Tests	55%	D 65 – 69%
Final Exam	25%	F below 65%

Students should be aware that Chesapeake College has adopted a policy limiting the number of times a course can be repeated to two. This includes audits and withdrawals. You may enroll in the class a total of three times.

Attendance: It is to the benefit of students to be present at each class session. Students whose attendance is sporadic often do not do well because of the nature of the course. It is assumed that students are mature enough to realize the necessity of regular attendance. **It is the student's responsibility to stay informed of any test/schedule changes announced during an absence.**

Most students need guidance in understanding the procedures involved in developing a new mathematical concept and it is often difficult to teach oneself mathematics. **If you find yourself in difficulty, contact the instructor immediately.** Be aware that tutoring and help services are available in the Academic Support Center in the LRC.

It should be noted that students missing any homework or in-class quizzes will receive a 0 for that grade. Quizzes may not be made up. Graded homework will not be accepted late.

Classroom Etiquette: Students are expected to behave in a manner becoming of an adult with thoughtfulness and respect for others. **Please refrain from talking to other students during inappropriate times and keep phones silent, visible, and unused at all times. It will be assumed that a student texting in class is not interested in the day's lesson and may be asked to leave class for that day. Except for emergency situations, if you leave the class for any reason, you may not be allowed to return during that class time.** Thank you in advance for your consideration of others who have paid to learn what this course has to offer.

Class Communication: Students are expected to check Skipjack e-mail and announcements every day. All course-related information will be posted there in the event of necessary changes in assignments or other important course information. Students are expected to e-mail the instructor with questions. You are not expected to come to class with incomplete homework because of questions if you have not contacted the instructor. E-mail questions to dandrew@chesapeake.edu for more immediate response or call x 327.

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In the event that it is necessary to cancel class due to inclement weather or other emergency, important class information will be posted on Canvas. Students will be expected to keep assigned work current during time of cancellation. If internet connections are off, textbook work should still be continued.

Academic Honesty

Policy: As described in the Student Code of Conduct, "If based on substantial evidence, a student is deemed guilty of academic dishonesty, the College may initiate disciplinary action as follows:

- The student may be required to repeat the assignment or the examination.
- **The student may be given a failing grade for the assignment or the examination. (In this class a 0 will be given.)**
- The student may be given a failing grade for the course.
- The student may be suspended or dismissed from the college.

Looseleaf Notebook:

- Must have indexed sections: class notes (optional), MML homework, textbook homework, quizzes, tests, extra credit
- **Papers clearly headed with:**
 - Student name**
 - Assignment date**
 - MML or Text**
 - Section #**
 - From Text: Page # and list of text problems assigned**
- Needed for in-class, open notebook quizzes and homework

Homework:

- Homework will be assigned in MyMathLab www.mymathlab.com. This program allows students to receive immediate feedback upon completing each problem in an assignment. It also provides students with step-by-step assistance on how to solve problems.
- An access code for MyMathLab is located in your textbook. If you don't have one, you will need to purchase one at the Bookstore or on-line. Use **andrew_____** Course ID) and **21679** (zip code) when registering in MML. Registration Tutorial:
- Each section assignment of 10 – 30 problems should be worked out completely in a neat, legible, and orderly manner using the process of the section on notebook paper (to be submitted in class). Then the answers should be submitted to MML for immediate feedback or grading. Remember that you may check answers on MML as you go so that you can make corrections and insure proper understanding.
- Each MML assignment will receive a percentage grade. All MML assignment scores will be averaged for a single MML score.
- Assignments will be collected and must be kept in notebook at their return.
- **No work, no credit – method must be shown even if calculator used**

Textbook
Homework:

- Textbook homework will be collected and graded by the instructor
- **Textbook homework will NOT be accepted late! It may be submitted early.**
- Returned homework should be kept in the appropriate section of the notebook. Homework problems must be completed in good mathematical form. The instructor reserves the right to return ungraded any homework that does not communicate well. A 0 will be given for those homework points. **Skip one line between homework problems.**
- Final textbook homework score will be determined by the percentage $\left(\frac{\text{total correct semester homework points}}{\text{total possible semester homework points}} \right) \times 100$. Homework must be done neatly, completely, in pencil.

Quizzes:

- 4 – 8 problems similar to assigned homework problems
- May be unannounced
- 2 – 4 points per problem
- Begin with 10 free points
- **No make-ups**
- Open notebook but not open textbook for unannounced quizzes
- No notebook for announced quizzes.
- Final percentage based upon $\left(\frac{\text{total correct quiz points}}{\text{total possible quiz points}} \right)$
- Any graded assignment other than textbook homework will count under quiz category of the final grade

Tests:

- Dates on course calendar
- Dates may be changed as necessary (weather, etc)
- **Student is responsible for keeping informed of changes**
- Lowest test grade will be replaced by exam grade unless exam grade is lower
- A missed test counts as a 0 and is the lowest test grade. Additional missed tests remain a 0.
- Two-day advance notice (with verification/validation) of unavoidable absence on test day **MAY** result in make-up in Testing Center before next class time
- No more than 1 make-up test (if advance notice) per semester for any reason
- **May not leave classroom during test!!**
- **Cell phone calculators may not be used in class at any time.**

Final Exam: The final examination is cumulative. Monday, December 9, 2013
11:00 – 1:00

Formula for grade calculation at any time throughout the semester:

- Use the formula: $(0.10 \times (\text{HWavg}\% + \text{THWavg}\%)/2) + 0.10 \times \text{Qavg}\% + 0.55 \times \text{Tavg}\% / 0.75 = \text{current } \%$
- To determine final grade after final exam: $0.10 \times (\text{HWavg}\% + \text{THWavg}\%)/2 + 0.10 \times \text{Qavg}\% + 0.55 \times \text{Tavg}\% + 0.25 \times \text{FEx}\% = \text{Final average}$

Academic Instruction Emergency Management Plan

In the event that Chesapeake College needs to close for an extended period of time due to a flu pandemic, severe weather event, or other emergency situation, consideration will be given to the timing and duration of the closure as follows:

1. Closure during the semester for up to one week – there will be an opportunity to make up work missed without significant alteration to the semester calendar.
2. Closure extending beyond one week (or in situations where classes are cancelled on the same days/evenings over multiple weeks) – the College may extend the length of the semester. Depending on the timing of the closure, scheduled breaks, end of semester dates, and/or the processing of final grades might be impacted.
- 3. For MAT 115 students are expected to continue textbook and MML homework as assigned. In the event of severe weather, check your course e-mail for additional instructions. Please contact the instructor through e-mail or at 410-673-7168 for questions.**

Students can acquire information about closures on the College website or by calling 410-822-5400 or 410-228-4360. Chesapeake College courses held at off campus sites will follow the protocol of the host facility.

Extra Credit

The only extra credit assignments accepted (besides occasional problems in class) will be journal entries. These entries must be on standard-size, loose-leaf paper without fringe and may be handwritten with pen or pencil, but must be legible. When entries are returned they must be kept in class notebook section marked Extra Credit. Each journal entry is valued at 1 – 3 points. Journal entries must be outstanding to receive a 3.

Entries must be submitted at the beginning of the next class after the lecture (no journal entries following a class test) on the material. Entries will not be accepted late.

Entries must be a minimum of 1½ pages in length. Writing needs to be concise and thoughtful. Spelling, punctuation, and grammar may be marked in an effort to help the student learn, but will NOT be considered in the grading of the journal.

Entries should include a brief summary (in complete sentences) in the student's own words of the mathematical concepts presented during the class. This should be followed by "directions" that would explain how to address the type(s) of problems associated with the lesson. DO NOT simply hand in your notes.

Journal entries should include:

Format: Name
Date of lecture
Course
Summary of material in sections (Hmmm!) mandatory
Comments on application, evaluation, relevancy,
Student reactions, etc. (Aaah!) mandatory
Difficulties and questions (Urg!) optional
Enlightenment (Eureka!!!) optional (This may refer to past
material that suddenly becomes clearer as well.)

*Occasional extra credit questions may be given in class. Well-written explanations are necessary and point value will vary. Additional points may be awarded if the student is the only student to do the extra credit work correctly or if less than half of the class does the extra work correctly.

Extra Credit Scoring: Total # of points x 0.05 will be added to the final % average.

Mathematics 115
Precalculus
Course Topics

Topic	Chapter
Graphs and Function	Chapter 1
Polynomial and Rational Functions	Chapter 2
Exponential and Logarithmic Functions	Chapter 3
Trigonometric Functions	Chapter 4
Analytic Trigonometry	Chapter 5
Applications of Trigonometric Functions	Chapter 6
Trigonometric Functions of Angles	Chapter 6

Course Student Learning Outcomes

Learning Outcomes: Students will be able to:
1. Apply the mathematical skills required in problem-solving using appropriate techniques to solve algebraic and transcendental equations.
2. Analyze mathematical models, such as formulas, tables, and graphs relating to real-world applications in business, science, and medicine
3. Communicate mathematical information conceptually, symbolically, visually, and numerically through written and oral discussion of functions and development of their graphs.
4. Evaluate and/or interpret mathematical information, relationships, facts, concepts, and theories through the development of algebraic and transcendental functions and analysis of their graphs.

Mathematics 115 - Precalculus
Objectives

Chapter 1

This chapter contains an introduction to the function concept.

Upon completion of this chapter, the student should be able to:

1. Find the distance between two points.
2. Find the midpoint of a line segment.
3. Sketch a graph by plotting points.
4. Find the intercepts of a graph.
5. Find the symmetry in a graph.
6. Find the equation of a circle.
7. Write the equation of a line in the three basic forms.
8. Recognize the equations of vertical, horizontal, parallel, and perpendicular lines.
9. Identify the graph of a function.
10. Use function notation and find function values.
11. Find the domain and range of a function.
12. Find the average rate of change of a function.
13. Determine whether a function is increasing or decreasing in an interval.
14. Recognize relative maximum and minimum values of a function.
15. Identify even and odd functions
16. Evaluate and graph piecewise functions.
17. Graph functions using transformations.
18. Use basic operations on functions and find domain of resultant functions.
19. Form composite functions and indicate domain.
20. Define and build inverse functions.
21. Solve applied problems by using functions and function operations.

Chapter 2

This chapter contains an introduction to graphing and solving rational and polynomial equations and an explanation of graphing helps for polynomial and rational functions.

Upon completion of this chapter, the student should be able to:

1. Graph quadratic functions.
2. Graph polynomial functions using the Leading Term Test, the Real Zeros Properties, multiplicity, and turning points.
3. Divide polynomials.
4. Use the Remainder and Factor theorems and the Rational Zeros Test to locate the zeros of a polynomial function.
5. Graph rational functions using vertical, horizontal, and oblique asymptotes and zeros.
6. Solve direct, inverse and joint variation problems.

Chapter 3

This chapter contains an introduction to logarithmic and exponential functions.

Upon completion of this chapter, the student should be able to:

1. Recognize, evaluate, and graph exponential functions.
2. Use function transformation to graph exponential functions.
3. Use exponential functions and equations to model and solve real-life problems.
4. Recognize, evaluate, and graph logarithmic functions.
5. Use logarithmic functions and equations to model and solve real-life problems.
6. Rewrite logarithmic functions with different bases.
7. Rewrite logarithmic expressions by expanding or condensing.
8. Solve simple and complex exponential and logarithmic equations.

Chapter 4

This chapter contains an introduction to trigonometric functions.

Upon completion of this chapter, the student should be able to:

1. Describe angles and use radian and degree measure.
2. Convert angle measure from degree to radian and back.
3. Find complements and supplements of angles
4. Compute arc length, linear and angular speed, and area of a sector of a circle.
5. Identify a unit circle and its relationship to real numbers.
6. Evaluate trigonometric functions using the unit circle.
7. Approximate trigonometric function values using a calculator.
8. Find reference angles.
9. Use basic trigonometric identities.
10. Define periodic functions.
11. Graph sine and cosine functions using period amplitude and phase shift.
12. Graph tangent, cotangent, cosecant and secant functions.
13. Graph inverse sine, inverse cosine, and inverse tangent functions.
14. Evaluate inverse trigonometric functions using a calculator.

Chapter 5

This chapter contains an introduction to analytic trigonometry.

Upon completion of the sections in this chapter the student should be able to:

1. Use fundamental trigonometric identities to evaluate trigonometric functions.
2. Simplify a complicated trigonometric expression.
3. Verify or disprove that a given equation is an identity.
4. Solve trigonometric equations of varying complexity.
5. Use sum and difference formulas.
6. Use cofunction identities.
7. Use double-angle, power-reducing, half-angle formulas, product-to-sum and sum-to-product formulas.
8. Verify trigonometric identities using multiple identities.

Chapter 6

This chapter contains an introduction to right-triangle trigonometry.

Upon completion of this chapter, the student should be able to:

1. Express the trigonometric functions using a right triangle.
2. Evaluate trigonometric functions of angles in a right triangle.
3. Solve right triangles.
4. Use right-triangle trigonometry in applications.
5. Use the Law of Sines and Law of Cosines to solve any triangle.