

## COURSE APPROVAL DOCUMENT

Southeast Missouri State University

Department: Mathematics \_\_\_\_\_

Course No. MA111 \_\_\_\_\_

Title of Course: Precalculus Review \_\_\_\_\_

Date: 10-31-17 \_\_\_\_\_

Please check:  New  
 Revision

### I. Catalog Description (Credit Hours of Course):

Review of polynomial, rational, exponential, logarithmic and trigonometric functions and equations with applications. (1 hour)

### II. Prerequisite(s):

MA133 with a grade of C or higher if credit is needed for MA117.

MA134 with a grade of C or higher if credit is needed for MA116.

MA133 and MA134 or MA135 with a grade of C or higher if credit is needed for MA137.

### III. Purposes or Objectives of the Course (optional):

This course will provide an individualized in-depth review of selected topics in precalculus to prepare students for the first course in a calculus sequence.

### IV. Course Learning Outcomes (Minimum of 3):

- A. Students will be able to construct and simplify a difference quotient.
- B. Students will be able to solve exponential and logarithmic equations.
- C. Students will be able to simplify expressions involving trigonometric and inverse trigonometric functions.

### V. Names of Faculty Qualified to Teach the Proposed Course:

1. Henry Clark
2. Dan Daly
3. Paul Deiermann
4. Natalya Kutsevalova
5. Avelina Lichtenegger
6. Garion Lovig
7. Cheryl McAllister
8. James McEwen
9. William McNeary
10. Peter Oman
11. Laurie Overmann
12. Michael Presho
13. Tamela Randolph
14. Craig Roberts
15. Ann Schnurbusch
16. Andrew Schwartz
17. Pradeep Singh
18. Emmanuel Thompson
19. Caroline Thornburgh
20. Mohan Tikoo

21. Haohao Wang
22. Jerzy Wojdylo
23. Yanping Xia

**VI. Course Content or Outline (Indicate number of class hours per unit or section):**

<b>Modules</b>
<b>Precalculus A</b>
1. Linear Equations and Applications, Absolute Value Equations and Inequalities, Rectangular Coordinates, Functions, Linear Functions
2. Complex Numbers, Solving Quadratic Equations (Factoring, Completing the Square, Quadratic Formula) and Applications, Solving Polynomial and Rational Inequalities
3. Catalog of Parent Functions (Identity, Squaring, Cubic, Square Root, Cube Root, Absolute Value), Piecewise Defined Functions, Graphing with Transformations, Function Operations and Composition
4. Quadratic Functions, Synthetic Division, Zeros of Polynomial Functions, Graphs of Polynomial and Rational Functions
5. Inverse Functions, Exponential and Logarithmic Functions and Equations, Exponential Growth and Decay
6. Systems of Linear Equations and Inequalities, Matrices, Matrix Operations
<b>Precalculus B</b>
7. Distance Formula, Midpoint Formula, Angles, Reciprocal, Pythagorean and Quotient Identities, Right-Triangle Definition of Trigonometric Functions, Solutions and Applications of Right Triangles
8. Circles, Radian Measure, Unit Circle, Unit Circle Definition of Trigonometric Functions
9. Graphs of Trigonometric Functions (Sine, Cosine, Tangent, Cotangent, Secant, Cosecant), Transformations of Graphs of Trigonometric Functions
10. Verifying Trigonometric Identities, Sum, Difference, Double-Angle and Half-Angle Identities
11. Inverse Trigonometric Functions, Solving Equations Involving Trigonometric and Inverse Trigonometric Functions, Law of Sines, Law of Cosines
12. Vectors, Dot Product, Polar Form of Complex Numbers, DeMoivre's Theorem, Polar Equations and Graphs

Signature: \_\_\_\_\_  
Chair

Date: \_\_\_\_\_

Signature: \_\_\_\_\_  
Dean

Date: \_\_\_\_\_



### MA111-01 Precalculus Review

(This is a sample syllabus for a student who would want credit for MA116 and needs to complete the entire refresher. Each student would have a different tentative schedule based on initial pre-test results.)

**Meeting Time and Place:** 1:30-2:20pm, MWF, Johnson Hall 223

**Instructor:** Dr. Dan Daly      **Office:** Johnson Hall 304      **Phone:** 573-651-2565

**Office Hours:** (JH 304) 3-4:30pm MW, 11-12pm TR and by apt; (JH 112): 1-2pm F

**Website:** learning.semo.edu, then look for MA111 under "My Courses"

**Email:** ddaly@semo.edu (put MA111 and time of class in subject line)

**Prerequisites:** MA133 with a grade of C or higher if credit is needed for MA117, MA134 with a grade of C or higher if credit is needed for MA116, MA133 and MA134 or MA135 with a grade of C or higher if credit is needed for MA137.

**Textbook:** Lumen Learning (Open Educational Resources). You will be given information on how to access Lumen Learning on the first day of class.

**Catalog Description:** Review of polynomial, rational, exponential, logarithmic and trigonometric functions and equations with applications. (1 hour)

**Course Learning Outcomes:**

- A. Students will be able to construct and simplify a difference quotient.
- B. Students will be able to solve exponential and logarithmic equations.
- C. Students will be able to use matrices to solve linear systems in three variables.

**Grading Information:** At the beginning of the semester, students will be required to take a pre-test. Based on their performance on the pre-test, they will complete all required modules from the list above. To complete a required module, a student will be required to complete all of the homework and the post-test for that particular module. Students must complete all homework for a module at 100% prior to being allowed to take the post-test for the module. If a student receives an 80% or higher on the post-test for a module, then he/she will have completed that module successfully. Students must complete all required modules to receive credit (CR) for the course. Students will receive credit (CR) for this course if they receive a grade of 80% or higher on each of the required post-tests.

**Tentative Schedule: The instructor reserves the right to adjust the schedule.**

		Monday	Wednesday	Friday
1	8/21	Intro to Class, Linear Equations and Applications	Linear Equations and Applications	Complex Numbers
2	8/28	Solving Quadratic Equations by Factoring and Completing the Square	Quadratic Formula	Solving Polynomial Inequalities
3	9/4	Labor Day No Classes	Solving Rational Inequalities	Solving Rational Inequalities
4	9/11	Absolute Value Equations and Inequalities	Absolute Value Equations and Inequalities	Rectangular Coordinate System, Distance Formula, Midpoint Formula
5	9/18	Circles	Functions	Exam 1
6	9/25	Linear Functions and a Catalog of Parent Functions	Piecewise Defined Functions	Piecewise Defined Functions
7	10/2	Transformations	Transformations	Transformations
8	10/9	Transformation	Function Operations and Composition	Function Operations and Composition
9	10/16	Quadratic Functions, Synthetic Division	Zeros of Polynomial Functions	Zeros of Polynomial Functions
10	10/23	Graphs of Polynomial and Rational Functions	Graphs of Polynomial and Rational Functions	Exam 2
11	10/30	Graphs of Polynomial and Rational Functions	Inverse Functions	Inverse Functions

12	11/6	Exponential Functions	Logarithmic Functions	Logarithmic Functions
13	11/13	Exponential and Logarithmic Equations	Exponential and Logarithmic Equations	Exponential Growth and Decay
14	11/20	Thanksgiving	Thanksgiving	Thanksgiving
15	11/27	Systems of Linear Equations and Inequalities	Systems of Linear Equations and Inequalities	Exam 3
16	12/4	Matrices, Matrix Operations	Matrices, Matrix Operations	Matrices, Matrix Operations
17	12/11	Final Exam Week	Final Exam Week	Final Exam Week <b>Final Exam</b> <b>12-2:00pm</b>

**Important Dates:** Friday, November 17 by 5:00 pm is the last day to drop a full semester class or withdraw from the university without failing grades. The Mathematics Department Chairperson and the College of Science, Technology, and Agriculture Dean do not make exceptions to this deadline. **Wednesday, 12/13, 12-2:00pm** is the comprehensive final exam date for this course. Any student who does not take the final exam will earn an "X" (failing and non-attending) for this course.

**Required Materials:** Students purchase a subscription to the on-line learning website, Lumen Learning, upon enrollment in this course. In addition to bringing writing implements and paper to every class period, students may use a calculator for most activities. There is no required brand of calculator. Calculators with computer algebra systems (CAS) and/or internet access are not allowed. A phone or other electronic device may not be used as a calculator during quizzes or exams. Calculator sharing during quizzes or exams is not allowed.

**Internet Browser:** Lumen Learning works best with Chrome.

**General Information:** This is a fast-paced course with much material to cover. Students will be required to do significant work outside of class. The class reviews material from Intermediate Algebra along with College Algebra. The instructor may lecture or students may have an activity during the class period. For any remaining class time, students will use class time wisely, working on mathematics the entire class period. In this course missing a single class period is equivalent to missing two class periods in a standard three credit hour course. To be successful, plan to attend and engage in every class period without exception.

**Lumen Learning Practice Assignments** - Each section has a practice assignment.

**Class Policies:**

- Lumen Learning assignments may be completed past the due date for 70% credit. A 30% penalty will be deducted only on those exercises scored after the due date. The final deadline for submitting any Lumen Learning practice assignments will be at class time on the day of the final exam.
- Much of the value of any math course comes from communicating about mathematics through participation in class activities and discussion. Students are expected to participate in all classroom activities for full or partial credit. You will be scored on your ability to communicate written mathematics effectively. Without a university-sanctioned activity written excuse, in class activities or cannot be submitted early or made up; absent students will simply earn a zero for the assignment.
- The lowest four Lumen Learning Practice scores will be dropped at the end of the semester.
- Missed paper quizzes may **not** be made up, but the lowest quiz score will be dropped at the end of the semester.
- To make up an hour exam, you must contact the instructor as soon as possible, prior to the exam. Appropriate documentation must be provided. Missed exams must be made up prior to their return, usually the following class period. Exams must be returned to students in a timely manner, so if an exam is graded and returned to students, you lose the right to make up the exam. Missed exam make-up appointments will result in the loss of the right to take the exam.
- If your final exam percentage is greater than your lowest test score, the final exam will count two ways – once as the final exam grade and once to replace one lower test score. If your final exam percentage is lower than all the tests, the percentage on the final will only be used as the final exam grade.

**Academic Honesty:** See your bulletin for a description of the Academic Honesty policy. Cheating on an exam or assignment will result in a zero for that activity, and may result in disciplinary action by the University. Students are encouraged to work together to study and do problems for this course, but each student is expected to turn in work that represents his or her own effort. During a quiz or exam no homework or notes should be visible. All electronic devices will be stowed in pocket, purse, or backpack. Devices may not be on worktable or in lap.

**Getting Help:** There is no shame in needing help in any university course; seek help immediately so as to not fall behind.

- Attend your instructor's office hours.

- Visit the Math Learning Center in Johnson 112 (a computer lab) and Memorial Hall 104 where an advanced mathematics tutor is always available. The hours in both centers are 9 am to 5 pm Monday through Thursday, and 9 am to 2 pm on Fridays. Also on Tuesday and Thursday evenings, the JH112 lab is open until 7 pm.
- Sign up for a free tutor from the Learning Assistance Programs in the University Center, (573) 651-2512, <http://www.semo.edu/sss/>
- Get counseling for math anxiety, test anxiety, personal problems from the University Counseling Services (573) 986-6191, <http://www.semo.edu/ucs/>.
- If you have a documented disability, meet with the instructor early in the semester to discuss accommodations.

**Classroom Conduct:** Diversity in all its form is valued and merits respect. A major determinant of a successful educational experience is a shared sense of respect among students and their instructor. In our classroom, mutual respect will be maintained at all times, both in word and deed. To minimize disruption to your fellow classmates, please remember not to leave the classroom until class is dismissed, not to carry on personal conversations unrelated to the topic at hand, and turn off cell phones.

**Use your Southeast email account:** You are responsible for the information in any Southeast e-mail sent by any Southeast employee. When you email, for your own protection, use your Southeast account.

**Questions?:** Questions, comments, or requests regarding this class should be directed to me, Dr. Daly. Unanswered questions or unresolved issues involving this class may be taken to Dr. Tamela Randolph, Chairperson of the Department of Mathematics.