San Diego Community College District
Mesa College
Course Syllabus, Fall 2019

Subject Area and Course Number: Mathematics 141
Course Title: Precalculus **Units:** 5.0
Class Meets: Monday, Wednesday 12:10 - 2:35 P.M., room MS320 **Class Number:** 11532
Instructor: Russell La Puma **Office:** MS222E
Voice mail: (619) 388-2767 x5503 **Office Hours:** MW 4:30 - 5:30 PM
Web: http://homework.sdmesa.edu/rlapuma **E-mail:** lapumath@gmail.com
WebAssign Class Key: `sdmesa 8897 4872`

Prerequisite: Math 104 with a grade of "C" or better, or equivalent.

Course Description: This course is a study of numerical, analytical, and graphical properties of functions. The course content includes polynomial, rational, irrational, exponential, logarithmic, and trigonometric functions. Additional topics include: inverse functions, complex numbers, polar coordinates, matrices, conic sections, sequences, series and the binomial theorem. This course is designed as a preparation for calculus and is intended for the transfer student planning to major in mathematics, engineering, economics, or disciplines included in the physical or life sciences.

Student Learning Objectives: Upon successful completion of the course the student will be able to:

1. Define and distinguish between higher order polynomial functions and non-polynomial functions and relations, and analyze the graphs of functions by determining their domains and ranges.
2. Analyze properties of functions and their graphs, including symmetries, increasing and decreasing intervals and their end behavior asymptotes.
3. Prove algebraically and justify graphically when a function is one-to-one.
4. Graph a variety of algebraic, rational, exponential, logarithmic, and trigonometric functions, and where applicable, use rigid and non-rigid transformations, intercepts and asymptotes.
5. Perform algebraic operations on various functions including composition of functions, and determine the domain of the resulting function.
6. Calculate the inverse of a one-to-one function, determine the domain and range of the inverse and describe the relation between their graphs.
7. Solve equations and application problems involving exponential and logarithmic functions.
8. Simplify difference quotients involving a variety of functions including polynomial, rational, trigonometric, exponential, and logarithmic functions.
9. Apply a variety of root finding theorems and tests in order to factor polynomials or solve polynomial equations whose degree is higher than quadratic.
10. Simplify rational expressions and expressions involving radicals that arise from calculus operations, such as those from the product or quotient rules.
11. Determine the partial fraction decomposition of rational functions.
12. Define, evaluate, describe and graph all trigonometric and inverse trigonometric functions, and solve equations involving these functions.
13. Derive and prove fundamental trigonometric identities including the sum, difference, double and half angle identities.
14. Apply the laws of sines and cosines in solving oblique triangles and in applications.
15. Represent complex numbers in standard, trigonometric and exponential forms and perform arithmetic operations with each.
16. Perform algebraic operations involving matrices.
17. Apply matrices in solving linear systems of equations.
18. Compute the determinant of a square matrix, and apply determinants to various applications.
19. Apply vector algebra to problems involving vector quantities.
20. Perform the vector operations of the dot product and the cross product, and formulate their geometric interpretations.

21. Analyze, identify, and graph the four conic sections.
22. Solve systems of non-linear equations and inequalities, including those involving conic sections.
23. Define and analyze sequences and series, including arithmetic and geometric sequences and series, find the sum of finite and infinite geometric series.
24. Apply the binomial theorem to expand powers of binomial expressions.
25. Prove elementary mathematical statements using the principle of Mathematical Induction.

Course Learning Outcomes: By representing a transformation of a given graph $y = f(x)$, a student will identify the a, h and k variables in the expression $y = af(x - h) + k$.
Students will calculate the difference quotient for a quadratic function and simplify it.

Evaluation: There will be four tests and a final examination. To avoid the need for make-up tests, the score of any missed test will be dropped and the final and remaining tests given extra weight. There will be no make-up tests. There will be short quizzes tentatively scheduled for every other class meeting, with the lowest two quiz scores dropped. Homework will be done either on line using WebAssign, or from the textbook. The final grade will be determined as 90-100% A, 80-89% B, 70-79% C, 60-69% D, with the following weights in effect:

Homework	10%	
Quizzes	10%	
Tests, best three @	18%	each
Test, worst	6%	
Final	20%	

Text and Supplies: *Precalculus - Mathematics for Calculus*, 7th Edition, Stewart, Redlin, & Watson, ISBN: 1-305-70161-5.
A scientific calculator capable of evaluating log and trig functions is required for the course. A graphing calculator (e.g. a TI-84) is highly recommended. You will be allowed to use a calculator on any test unless otherwise directed. The use of a mobile phone or a computer *will not* be allowed on tests or quizzes.

Attendance Requirements: A student accumulating unexcused absences of more than 6% of the total hours that the class meets (equal to two class meetings) may be dropped by the instructor. If there are unexcused absences of more than 12% (four class meetings), district rules state the student *must* be dropped. The withdrawal deadline is **October 25**. Any student still enrolled in the course after that date cannot receive a "W." It is the student's responsibility to add, drop, or withdraw from classes before course deadlines.

Tardiness: Class begins at the set hour. It is understood that tardiness is occasionally unavoidable, but chronic tardiness disrupts the learning environment. Likewise, it is usually inappropriate to leave before the end of class without consulting the instructor. If the instructor is more than twenty minutes late, students may leave after signing an attendance sheet.

Classroom Behavior and Student Code of Conduct: Students are expected to respect and obey standards of student conduct while in class and on campus. The student Code of Conduct, disciplinary procedure, and student due process (Policy 3100, 3100.1, and 3100.2) can be found in the current college catalog. Under most circumstances, food, beverages, and phones, are unnecessary and unwelcome in the classroom.

Collaboration and Cheating: You are encouraged to work with tutors or other students on homework and class topics, provided you share learning, not just answers. (Consider attending the MT2C Math & Science Tutoring, LRC 1st floor.) Collaboration on exams or quizzes, however, is regarded as cheating and will result in a zero for that exam.

Accommodation of Disability: Students with disabilities who may need academic accommodations should discuss options with their professors during the first two weeks of class.

Math 141 – La Puma – Fall 2019				
week	Mon		Wed	
1	Aug 19	introduction 2.1, 2.2	Aug 21	2.3 2.4
2	Aug 26	2.6 2.7	Aug 28	2.8 3.2
3	Sep 2	*Labor Day*	Sep 4	3.3 3.4
4	Sep 9	3.5 3.6	Sep 11	3.7 4.1
5	Sep 16	4.2 4.3, 4.4	Sep 18	**Test 1**
6	Sep 23	4.5 4.6, 4.7	Sep 25	6.1-6.4 5.1-5.2
7	Sep 30	5.3 5.4	Oct 2	6.5 6.6
8	Oct 7	5.5 7.1	Oct 9	**Test 2**
9	Oct 14	7.2 7.3	Oct 16	7.4, 7.5 8.1
10	Oct 21	8.2 8.3	Oct 23	9.1, 9.2 *Withdrawal deadline 10/25*
11	Oct 28	10.1, 10.2 10.3	Oct 30	**Test 3**
12	Nov 4	10.4 10.5, 10.6	Nov 6	10.7 10.8
13	Nov 11	*Veterans Day*	Nov 13	11.1 11.2
14	Nov 18	11.3 11.4	Nov 20	**Test 4**
break	Nov 25	*break*	Nov 27	*Thanksgiving Day*
15	Dec 2	8.4 12.1, 12.2	Dec 4	12.3 12.5
16	Dec 9	12.5 12.6	Dec 11	catch up review
F	Dec 16	**Final**	Dec 18	*no class*

Schedule subject to change with prior notice.