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

Subject Area and Course Number: Mathematics 151Course Title: Calculus with Analytic Geometry IIUnits: 4.0Class Meets: Monday, Wednesday 2:45 - 4:45 PM, room MS418CRN: 22739Instructor: Russell La PumaOffice: MS222EVoice mail: (619) 388-2767 x5503Office Hours: M,W 1:30 - 2:30 PMWeb: http://homework.sdmesa.edu/rlapumaE-mail: lapumath@gmail.comWebAssign Class Key: schesa 3381 2609Calculation

Prerequisite: Math 150 with a grade of "C" or better, or equivalent.

Course Description: This is the second course in the calculus and analytic geometry sequence. This course covers more advanced topics in analytic geometry, differentiation and integration of algebraic and transcendental functions, infinite series, Taylor series, and parametric equations. This course also covers a general introduction to the theory and applications of power series, techniques of integration, and functions in polar coordinates, as it serves as a basis for multivariable calculus and differential equations, as well as most upper division courses in mathematics and engineering. This course is intended for the transfer student planning to major in mathematics, computer science, physics, chemistry, engineering or economics.

Student Learning Objectives:

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

1. Solve first-order separable differential equations and initial value problems.

2. Solve application problems involving first-order separable differential equations, such as exponential growth and decay.

3. Solve integral problems by first examining the integral, then selecting and applying the appropriate technique of integration.

4. Apply integration to physics problems relating to mass, centers of mass, work, and fluid force.

5. Identify, analyze, and evaluate improper integrals.

6. Evaluate the limits of functions which have the indeterminate forms "zero/zero" and "infinity/infinity" using L'Hôpital's Rule.

7. Transform the other indeterminate forms into those which L'Hôpital's Rule can be implemented.

8. Define an infinite sequence; analyze and assess the monotonicity and convergence of a given sequence.

9. Identify some basic series, including the geometric series, harmonic series, and a telescoping sum.

10. Compare the different convergence tests, including the Integral Test, the Ratio Test, the Root Test, the Comparison Test, the Limit Comparison Test, the Alternating Series Test, and the Divergence Test.

11. Assess the convergence of a series by formulating the comparison of the given series to a known series.

12. Assess if an alternating series converges absolutely, converges conditionally, or diverges. 13. Analyze a series, assess which convergence tests can be applied in determining its

behavior, and apply this test to show series convergence or divergence.

14. Derive the Taylor series of a given function using a variety of techniques.

15. Calculate the radius of convergence of a given power series.

16. Apply Taylor's Theorem and Taylor polynomials to approximate to a certain degree of accuracy, the values of functions at non-trivial points.

17. Apply the known power series expansions of important functions to generate the series expansion of other functions.

18. Express a given second degree equation in the form of its standard conic equation and sketch the standard conic sections.

19. Analyze a conic section by rotating it to a standard position.

20. Sketch the graphs of functions in polar coordinates, including cardiods, lemniscates, and limaçons.

21. Calculate the areas of polar regions.

- 22. Calculate the arc length of polar curves, and the surface area bounded by polar curves.
- 23. Calculate the equation of tangent lines to polar curves.
- 24. Express a curve with parametric equations.
- 25. Calculate the tangent lines and arc lengths of parametrized curves.
- **Course Learning Outcome:** Students will show the relationship between a function and its infinite series; Students will use appropriate methods to calculate integrals.
- **Evaluation:** There will be three 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 or quizzes. There will be short quizzes tentatively scheduled for every second 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 two @	24%	each
Test, worst	8%	
Final	24%	

Text and Supplies: Calculus of a Single Variable, 11th edition, Larson & Edwards, ISBN: 978-1-337-27536-1, Cengage Learning.

A scientific calculator, capable of evaluating trigonometric functions is required for the course. A graphing calculator (e.g. a TI-84) is recommended, but its use may be restricted on quizzes and tests.

- 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), or missed tests, the student *will* be dropped. The withdrawal deadline is April 12. Any student still enrolled in the course after that date cannot receive a grade of "W." It is the student's responsibility to add, drop, or withdraw from classes before the deadlines stated in the class schedule.
- **Tardiness:** Class begins at the set hour. While tardiness is unavoidable on rare occasions, 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 4th 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 151 – La Puma – Spring 2019				
week		Mon		Wed
	Jan 28	introduction	Jan 30	8.1 substitution
1		8.1 substitution		8.2 integration by parts
	Feb 4	8.2 integration by parts	Feb 6	8.3 trig integrals
2				
	Feb 11	8.3 trig integrals	Feb 13	8.4 trig substitution
3		8.4 trig substitution		8.5 partial fractions
	Feb 18	Washington's	Feb 20	8.7 tables & other integrals
4		birthday		5.6 L'Hospital's rule
	Feb 25	5.6 L'Hospital's rule	Feb 27	6.13 slope flds, growth &
5		8.8 improper integrals		decay, separation of vars
	Mar 4	7.57 physics applications	Mar 6	Test 1
6		review		
	Mar 11	7.57 physics applications	Mar 13	9.1 sequences
7		9.1 sequences		9.2 series
	Mar 18	9.3 integral test	Mar 20	9.4 comparison tests
8		9.4 comparison tests		9.5 alt series test, abs conv
0	Mar 25	break	Mar 27	break
break				
broun	Apr 1	9.6 ratio, root tests	Apr 3	9.7 Taylor polynomials
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5	Apr 8	9.8 power series	Apr 10	Test 2
10	1	review	1	withdrawal deadline 4/12
10	Apr 15	9 9 power series as functions	Apr 17	9 10 Taylor series
	, pr 10		, ipi 17	
	Apr 22	10.1 conic sections	Apr 24	10.1 conic sections
10	, ipi <u></u>		, ipi <u>–</u> i	App.D rotation of axes
12	Apr 29	App D rotation of axes	May 1	10.2 plane curves
	70120	10.2 plane curves	iviay i	10.3 tangents & arc length
13	Movie		Mov 9	
	Iviay O	review	iviay o	lest 3
14	Mov 10		Mov 15	10 Flores are legath in polor
	way 13	10.4 polar coordinates	way 15	10.5 area, arc length in polar
15				
	May 20	review	May 22	Final
16				

Schedule subject to change with prior notice.