MAC 2311 - Calculus with Analytic Geometry I (424)
Syllabus Spring 2016

INSTRUCTOR:	Renee Torres
OFFICE:	NM 108
PHONE:	727-791-2563 (office)
E-MAIL:	(while enrolled, please e-mail Faculty through ANGEL)
TEXT:	***Calculus***, 10th Edition, Larson & Edwards, Houghton Mifflin
	(supplementary software will not be used in this course)
	(Note: your Calculus II and III instructors may require software access)
	(Note: if you are a transfer student and/or are not planning to take Calculus II and III using this text, the 8th or 9th edition will suffice)

PREREQUISITE:	MAC 1140 and MAC 1114, or MAC 1147, or satisfactory score on the mathematics placement test.
Calculator:	A scientific calculator will be required and a graphing calculator is strongly recommended, but not required. A basic four-function calculator (nonscientific) will be permitted on in-class portions of tests.
Website:	https://mycourses.spcollege.edu (your log-in is your student ID # and your password is the one you created for your *MySPC* account at the college.)
Syllabus Addendum:	http://www.spcollege.edu/addendum/

COURSE DESCRIPTION

In this first calculus course the topics include limits and continuity, the derivative of algebraic, trigonometric, logarithmic and exponential functions, implicit differentiation, applications of the derivative, differentials, indefinite and definite integrals, and applications of exponential functions. Five credit hours.

Note: Credit is not also given for MAC 2233 or MAC 2253.

MAJOR LEARNING OUTCOMES

1. The student will engage critical thinking skills in the use of the limit and continuity concepts of real-valued functions of a single variable.
2. The student will engage critical thinking skills in the use of the derivative of a function and its applications.
3. The student will engage critical thinking skills in the use of the antiderivative of a function and its applications.
4. The student will engage critical thinking skills in the use of the Riemann sum and Riemann integral of a function.

IMPORTANT DATES

January 11	Classes Begin
January 18	Martin Luther King Jr's Birthday – College Closed
March 6 – 13	Spring Break – College Closed
March 23	Last Day to Withdraw with a grade of W
March 25-27	Easter – College Closed
May 2–5	Finals

MEETING INFORMATION

Course Location:	NM 157 (CL)
Meeting Days:	Mon/Wed
Class Times:	5:30pm-7:45pm

COURSE EXPECTATIONS

It is essential that the material in this course be understood and that all calculations are routine before moving on to Calculus II. I will make every effort to thoroughly cover all concepts during lecture and also be available outside of class to address any questions or concerns about the material. The assessments created for this course are designed to be challenging so that you receive accurate feedback on the extent to which the material has been mastered. It is important that you practice effective and efficient study habits in order to keep up with the material contained in this course and to prepare for more difficult courses to come.

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ASSESSMENTS

There will be five (5) tests which will include both in-class and take-home portions and a mandatory final exam. **ALL Pre-ARRANGED MAKE-UP TESTS MUST BE COMPLETED BEFORE THE NEXT CLASS MEETING;** otherwise a zero will be recorded. The lowest test grade (excluding the final exam) will be replaced by the grade on your final if it is beneficial to your grade. The in-class portions of each test will be non-calculator (four-function calculators allowed). There will also be periodic quizzes assigned throughout the course in order to assess consistent progress. Calculators will also be prohibited on in-class quizzes. Complete solutions will be required for full credit on both the in-class and take-home portions of all assessments.

GRADING POLICY

Your semester grade will be measured by the average of the five tests (100 points each), quizzes and homework (100 points) and a mandatory comprehensive final examination (100 points).

No Make-Up tests will be given. If you miss a test, your final exam score will replace the missed test score. If you have taken all the tests, your lowest test score will be replaced by your score on the final exam, if this is higher than your lowest test score. If more than one test is missed, a zero will be recorded for the score. Extremely extenuating circumstances may be discussed with your instructor. Documentation **must** be provided.

The grade scale is **A (100-90), B (89-80), C (79-70), D (69-60), F (59-0)**

ASSIGNMENTS

Graded quizzes and homework will be assigned for each unit but are not included in this syllabus; they can be found posted in MyCourses**.** For practice, however, a list of recommended textbook problems for the semester is attached. These problems will not be collected and will not count toward your final grade; they are optional but it is highly recommended that you do them. Doing the textbook problems will be of great benefit and are a great tool to help prepare for tests. Calculus is not the easiest subject to learn, but practice definitely helps.

EXTRA HELP

All students are encouraged to seek additional help during my office hours, which are posted on my instructor page and office door. I am there for your benefit and you can also make appointments to meet with me besides the hours posted, if necessary. Tutoring is available from the Learning Support Center, which is located in the LA building. Students are also strongly encouraged to form study groups with other members in this class (or other classes) to gain additional understanding. The use of additional resources such as textbooks, videotapes, inter-net, and self-help books could also be an advantage.

ATTENDANCE

Students are required to attend class regularly and on time. Missing class is a substantial disadvantage to the student as important information is given on each class day. Due to the rapid pace and cumulative nature of this course, missing class typically causes students to lag behind in concepts and connections of course material. If, for any reason, a student is absent, he or she is responsible for class notes (i.e. make copies from classmates) and forfeits the opportunity to complete any graded assignments.

GORDON RULE

A grade of "C" or better is required if you are using this course to meet the Gordon Rule mathematics requirements.

STUDENT EXPECTATIONS

All electronic devices such as cell phones, beepers, pagers, and related devices are to be turned off prior to entering the classroom. The use of these devices will not only impede your performance, but is also distracting to other students who are trying to learn.

Each student's behavior in the classroom is expected to contribute to a positive learning environment, respecting the rights of others and their opportunity to learn. No student has the right to interfere with the teaching/learning process, including the posting of inappropriate materials on chat-room or Web page sites.

The instructor has the authority to ask a disruptive student to leave the classroom, lab, or Web course and to file disciplinary charges if disruptive behavior continues.

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COURSE OBJECTIVES

1. The student will engage critical thinking skills in the use of the limit and continuity concepts of real-valued functions of a single variable by:

   a. stating the definition of the limit of a function.

   b. proving that the limit of a function exists by the epsilon – delta definition.

   c. finding the limit of a function by use of appropriate limit theorems (including the squeeze theorem).

   d. using limits as they apply in graphing a function (horizontal and vertical asymptotes and discontinuities).

   e. stating the definition of continuity at a point and on an interval for a function.

   f. determining for which values a function is continuous.

2. The student will engage critical thinking skills in the use of the derivative of a function and its applications by:

   a. stating the definition of the derivative of a function and use it or appropriate derivative theorems to find the derivatives of algebraic, trigonometric, logarithmic, and exponential functions either explicitly or implicitly.

   b. applying the derivative to the following: slope of the tangent to a curve; rate of change related rates, intervals on which a function is increasing or decreasing, extrema, concavity and inflection points of a function, rectilinear motion, curve sketching, the Mean Value Theorem, growth and decay problems, and Newton's Method.

3. The student will engage critical thinking skills in the use of the antiderivative of a function and its applications by:

   a. finding the differentials and antiderivatives of algebraic, trigonometric, logarithmic, and exponential functions.

   b. using antiderivative formulas to solve velocity/acceleration problems and separable differential equations.

4. The student will engage critical thinking skills in the use of the Riemann sum and Riemann integral of a function by:

   a. graphing a function on a closed interval and showing the rectangles used in finding the Riemann sum with appropriate labels.

   b. stating the definition of the Riemann Integral and applying it over a given interval.

   c. evaluating a definite integral of a function using the Fundamental Theorem of Integral Calculus.

Criteria Performance Standard:

Upon successful completion of the course the student will, with a minimum of 70% accuracy, demonstrate mastery of each of the above stated objectives through classroom measures developed by individual course instructors.

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TENTATIVE SCHEDULE

Week	Date	Section(s)	Topic(s)	Page	Exercises
1	1/11	Introduction			
		P.1	Graphs and Models	8	1-4, 41-57 odd, 63-69 odd
		P.2	Linear Models and Rates of Change	16	1-13 odd, 19, 23-27 odd, 51-57 odd
		P.3	Functions and Their Graphs	27	1-29 odd, 41-47 odd, 49-54, 59-63 odd
		P.4	Fitting Models to Data	34	1-4
		1.1	A Preview of Calculus		
		1.2	Finding Limits Graphically and Numerically	55	1-13 odd, 15-29, 33, 37-40, 57-61, 67-70
2	1/18	1.3	Evaluating Limits Analytically	67	1-79 odd, 89, 115-120
		1.4	Continuity and One-Sided Limits	79	1-21 odd, 27-53 odd, 61-69 odd, 87, 89, 95, 99-104
		1.5	Infinite Limits	88	1-49 odd, 65-68
3	1/25	Test Review	Chapter 1 Review	91	5, 6, 7-25 odd, 29, 31, 39-83 odd
		Test 1 (1.2 - 1.5)			
		2.1	The Derivative and the Tangent Line Problem	103	1, 3, 11-23 odd, 45, 46, 65-79 odd, 85-89 odd, 93-96
4	2/1	2.2	Basic Differentiation Rules and Rates of Change	114	1-67 odd, 70-74, 87-92, 93-105 odd
		2.3	Product and Quotient Rules and Higher-Order Derivatives	125	1-55 odd, 67-75 odd, 81, 83, 87, 91-105 odd, 107-111, 115, 129-134
		2.4	The Chain Rule	136	1-35 odd, 41-89 odd, 95-101, 103, 115, 125-128
5	2/8	2.5	Implicit Differentiation	145	1-53 odd, 59, 68
		2.6	Related Rates	153	1, 3, 7, 11-17 odd, 21, 25, 27, 29, 33, 35, 39, 41

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6	2/15	Test Review **Test 2 (2.1 – 2.6)**	Chapter 2 Review	157	1-87 odd
		3.1	Extrema on an Interval	167	1-37 odd, 52, 55-61 odd, 63-66
7	2/22	3.2	Rolle's Theorem and the Intermediate Value Theorem	174	1-21 odd, 27-45 odd, 51, 73-76
		3.3	Increasing and Decreasing Functions and the First Derivative Test	183	1-49 odd, 57-60, 70, 81-85 odd, 91-96
		3.4	Concavity and the Second Derivative Test	192	1-43 odd, 51, 53, 55, 58, 61, 75-78
8	2/29	3.5	Limits at Infinity	202	1-6, 13-37 odd, 45, 47, 59-73 odd, 103, 104
		3.6	A Summary of Curve Sketching	212	1-4, 5-25 odd, 35-38, 59, 60
		3.7	Optimization Problems	220	7-19 odd, 29-39 odd, 48
9	**3/7**		**Spring Break!**		**College Closed**
10	3/14	3.8	Newton's Method	236	7-31 odd, 32, 35, 44, 45, 47-50
		3.9	Differentials	238	1-49 odd, 53-83 odd, 91-95 odd
		Test Review **Test 3 (3.1 – 3.9)**	Chapter 3 Review		
11	3/21	4.1	Antiderivatives and Integration	251	1-41 odd, 50, 51-61 odd, 69-76
		4.2	Area	263	7-25 odd, 31, 37-41, 45-53 odd, 70-72
		4.3	Riemann Sums and Definite Integrals	273	5-31 odd, 41, 43, 47, 49-51, 63-68
12	3/28	4.4	The Fundamental Theorem of Calculus	301	1-71 odd, 77, 79, 82, 91-96
		4.5	Integration by Substitution	288	1-59 odd, 60, 61, 66, 73-95 odd, 102, 105, 111, 112
		4.6	Numerical Integration		

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13	4/4	Test Review **Test 4 (4.1 – 4.6)** 5.1	Chapter 4 Review Differentiating the Natural Logarithmic Function	312 325	1-85 odd 5-8, 9-15 odd, 19-33 odd, 37-83 odd, 89-93 odd, 98-102
14	4/11	5.2 5.3 5.4	Integrating the Natural Logarithmic Function Inverse Functions Differentiating and Integrating Exponential Functions	334 343 352	1-39 odd, 45-57 odd, 63-73 odd, 79-82, 85-89 odd, 93-97 odd, 103-106 5, 9-12, 23-31 odd, 35-47 odd, 71, 73, 88-92 1-19 odd, 33-59 odd, 63- 71 odd, 91-127 odd
15	4/18	5.5 6.2 Test Review	Bases Other Than *e* and Applications Growth and Decay Models Chapter 5 Review	362 412 393	1-13 odd, 15-18, 19-25 odd, 37-83 odd, 87 1-31 odd, 37-41 odd, 49, 60 1-65 odd
16	4/25	**Test 5 (5.1-5.5, 6.2)** Final Review			
17	5/2 (Mon) 5:00^{pm}-6:50^{pm}	**Final Exam** The final exam for the course is comprehensive and designed to assess an overall understanding of Calculus I			

Note the above schedule is tentative and may be changed as some material can be covered more quickly while other topics may require more time to cover in sufficient detail.