

Syllabus
Three Rivers Community College
MAT 254-Calculus 1
Fall 2011
Course Registration Number (CRN) – 31804

Instructor:

June Decker

Office: C124

Office Hours: Tuesday 12:00 – 1:00 pm in office C124
Monday and Wednesday 8:00 – 8:50 am in room D219
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MAT* K254 (formerly MAT K151) 4 CREDIT HOURS CALCULUS I *Prerequisite: MAT* K186.* This is a first course in the calculus sequence intended for students who plan on

Grading Policy:

There will be 3 tests and a final exam. The final exam counts double a test. A minimum grade of 40% on the final exam is necessary but not sufficient to pass the course. (This means the final exam is required).

If you do your homework on Webassign, I will give you credit for one more test for that work. To receive full credit on a single homework assignment, you must earn an 80% or better on that homework and you must complete it by the due date. Your homework grade will be the percentage of homeworks for which you receive 80% or better. So if you do homework on Webassign, your grade will be the average of your 3 tests, your final (counted twice) and your homework grade. If you do homework on Webassign, it will count 1/6 toward your final grade for the semester. If the homework grade does not benefit you, then I will count just the 3 tests and final exam

College Withdrawal Policy:

You may withdraw from this class any time up to and including Dec 9 and you will receive a W grade on your transcript. However, you must complete a withdrawal form in the Registrar's Office at the time of withdrawal; if you merely stop attending classes you will be assigned a grade of F. Any eligibility for refund of tuition is based on the date that the registrar receives the withdrawal. No one's signature other than your own is required on the Withdrawal form.

Disabilities Statement:

If you have a hidden or visible disability that may require classroom or test-taking modifications, please see me as soon as possible so arrangements can be made. If

you have not already done so, please contact the Learning Specialist, Chris Scarborough, at 892-5751.

Course Outcomes:

(note that #1-11 are Precalculus topics)

1. Find the domain and range for a given function.
2. Classify the elementary functions; know their properties and graphs.
3. Understand the inverse of a function graphically, algebraically, and by coordinate pairs.
4. Compute the value of a function at the given independent variable. (Given x , find y .)
5. Solve for an independent variable given a value for the dependent variable. (Given y , find x .)
6. Classify a function as odd, even or neither.
7. Compose two or more functions. Decompose a function into simpler functions.
8. Sketch the graphs of functions using translations and reflections of the elementary functions.
9. Identify whether or not a relation is a function. The relation may be given as a graph, table or algebraic equation.
10. Find and interpret the slope of a line.
11. Find an equation of a line given the slope and a point or given two points.
12. Find the limit of a function using algebra, a table of values or a graph.
13. Determine whether or not a function is continuous. Indicate the points of discontinuity and whether the discontinuity is essential or not.
14. Understand the derivative as the instantaneous rate of change at a point in contrast with the average rate of change between 2 points on a curve.
15. Use the limit definition of the derivative to differentiate a function, understanding that it is the slope of the tangent to the curve at a given point.
16. Use the rules for differentiation, including the chain rule, to find the n th derivative of a function. Functions include the trigonometric, exponential and logarithmic functions.
17. Compute the derivative of the inverse of a function given the derivative of the function.
18. Solve applications involving exponential growth and decay.
19. Apply L'hospital's Rule to find limits of functions.
20. Find an equation of a line tangent to a function at a given point.
21. Solve applications involving rates of change of a function, including velocity and acceleration problems.
22. Use implicit differentiation to find the derivative of a function.
23. Solve related rates problems.
24. Use Newton's method to approximate a solution to an equation.
25. Find and apply the differential of a function.
26. Understand the relationship between the graph of a function and the graph of its derivative.
 - a. Given two graphs, determine which is the function and which is the derivative of the function.
 - b. Given the graph of a function, sketch its derivative.
 - c. Given the graph of the derivative of a function, sketch the function.

27. Use the first derivative to determine whether a function is increasing, decreasing or neither. Find the critical points.
28. Use the second derivative to determine whether a function is concave up, down or neither. Find the points of inflection.
29. Find absolute extrema of a function on a given interval.
30. Use the First and Second Derivative Tests to find relative extrema of a function.
31. Sketch the graph of a function using techniques from calculus. (Show all intercepts, relative extrema, points of inflection, concavity, and asymptotes.)
32. Understand Integration as the inverse of Differentiation, as the limit of Riemann sums, and as area under a curve.
33. Evaluate indefinite and definite integrals using rules for integration, including substitution.
34. Compute the average value of a function. Solve applications involving average value.
35. Use integration to find the area under a curve or bounded by two curves.
36. Use integration to find the volumes of solids of revolution by the Disk Method.
37. State, understand and apply the Fundamental Theorem of Calculus, the Mean Value Theorem, and the Intermediate Value Theorem.

Academic Integrity:

Academic integrity is essential to a useful education. Failure to act with academic integrity severely limits a person's ability to succeed in the classroom and beyond. Furthermore, academic dishonesty erodes the legitimacy of every degree awarded by the College. Collaboration is encouraged on many assignments such as seminar assignments and homework. Tutors are available to assist you with this sort of work.

Exams are considered individual work and must be completed without unauthorized assistance of any kind, including help of other students, tutors, or notes. All test material is to be turned in with the test paper. Attempting to bring work out of the testing area and/or share that work with other students is consider cheating. Cheating on tests, misrepresentation of attendance, falsifying records, or lying will result in loss of credit for all work involved.

A full copy of the college's academic integrity policy is in the school's catalog and in the student handbook.

Schedule of classes:

August 31 : Sections 2.1 Tangent and Velocity Problem, and 2.2 Limit of a Function

Sept 7: Section 2.2 continued,

Section 2.3 Calculating Limits using the limit laws.

Sept 12 Section 2.4 (read on your own – optional)

Section 2.5 Continuity

Section 2.6 Limits at Infinity: Horizontal Limits

Sept 14 Section 2.7 Derivatives and Rates of Change

Section 2.8 The Derivative as a Function

Sept 19 Section 3.1 Derivatives of Polynomial and Exponential Functions

Sept 21 Section 3.2 The Product and Quotient Rules

Sept 26 Section 3.3 Derivatives of Trig function

Section 3.4 The Chain Rule

Sept 28 Section 3.5 Implicit Differentiation

Section 3.6 Logarithmic Differentiation

Oct 3 Section 3.7 rates of change in the natural and social sciences

Section 3.8 Exponential Growth and Decay

Oct 5 Section 3.9 Related Rates

Oct 10 (NOTE THAT THERE IS CLASS TODAY, EVEN THOUGH IT IS COLUMBUS DAY) Section 3.10 Linear Approx and Differentials

Oct 12 Section 3.11 Hyperbolic Functions

Oct 17 TEST ON CHAPTER 2 and 3 :LIMITS AND DERIVATIVES

Oct 19 Section 4.1 Maximum and Minimum Values

Oct 24 Section 4.2 Mean Value Theorem

Section 4.3 How derivative affect the shape of a graph

Oct 26 Section 4.4 Indeterminate Forms and L'Hospital's Rule

Section 4.5 Summary of Curve Sketching

Section 4.6 Graphing with a Calculator

Oct 31 Section 4.7 Optimization Problems

Nov 2 Section 4.8 Newton's Method

Section 4.9 AntiDerivatives

Nov 7 Review ch 4

Nov 9 TEST CHAPTER 4

Nov 14 Section 5.1 Areas and Distance

Nov 16 Section 5.2 Definite Integral

Nov 21 Section 5.3 Fundamental Theorem of Calculus

Section 5.4 Indefinite Integrals and the Net Change Theorem

Nov 23 NO CLASS TODAY – day before thanksgiving

Nov 28 NO CLASSES ???

Nov 30 Section 5.5 The Substitution Rule

Dec 5 TEST CHAPTER 5

Dec 7 Section 6.1 Areas between curves

Dec 9 Section 6.2 Volumes of revolution (disc method)

Dec 12 REVIEW and/or Make-up test date (Student Choice)

Dec 14 FINALEXAM