

Syllabus
Three Rivers Community College
MAT 254-Calculus 1
Spr 2014 Tues Thurs noon-1:40
Course Registration Number (CRN) –

Instructor:

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Office Hours: Wed 4:00-4:50, Thurs 10-11:50 in office Room C124

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 studying science math engineering or technologies

Text: Calculus, Early Transcendentals (ET) 7th ed, by James Stewart. (blue violin scroll on the front cover) We use only chapters 2-5. You will use the remaining chapters in Calculus 2 and Calculus 3. The text is available in hard copy or electronically. An e-copy of the text is available on the Webassign software that we will be using for doing math problems.

Online Homework: www.webassign.com Sign up for a free 13 day trial using the

Create your own login and password; be sure to enter your email since that is the email I will use to communicate with you. When you login in the future, remember that the Institution is trcc.mohegan

Webassign includes an interactive copy of the text, lecture videos, great review and practice lessons. IF you purchase WebAssign, you need not purchase a hard copy of the text. WebAssign is good for 3 semesters of calculus 1, 2, and 3.

The online purchase price is approximately \$120. (if you want a 1 semester contract, it costs about \$75) . If you or a friend has an unused webassign card that comes free with the PreCalc and the Calc texts, you can use the card for Calc even if it came with the Precalc book.

Calculator: You will need some calculating and graphing device. You may use calculator apps for your ipods or laptops. The most often used calculator is the TI 89 or 84. Instead of a calculator you may use any of the free math programs downloadable from the web. Two free computer algebra systems are Wolfram Alpha and Microsoft Mathematics available at www.microsoft.com/mathematics . Though you don't need a computer algebra system for this course, you will want to become familiar with one.

Tutoring at TASC: You may sign up for a regular free tutor session in the tutor center in Room C117 by the library. Appointments fill up quickly, so call the tutor desk is 860-215-9082, as soon as

you think you might want to engage a tutor on a regular basis. Walk in tutoring is on a space available basis.

Grading Policy:

There will be homework, 3 tests, and a final problem set and a final exam. Students who receive lower than 40% on the final exam will fail the course regardless of their other grades.(This is to discourage “cheating”.)

3 tests: each test counts 15% of the final grade

Homework on webassign counts 15% of the final grade

The final problem set counts 15% of the final grade

The final exam counts 25% of the final grade

You will be given the opportunity to retake one of the three tests during the last week of the course. IF you miss a test, then you will receive a zero for that test. At the end of the semester, you may elect to make up that test. The higher score will prevail.

I will calculate the end of semester homework grade by taking the percent of problems you worked correctly and add 10%. For example, if you do 4/5th of the homework problems correctly, you will receive an 80% plus 10% for a 90% grade on your homework. This is designed to compensate you for any errors that occur in computer grading, and any of the usual issues that arise with homework. The webassign problems must be completed by the due date. Your Webassign grade will be the percentage of problems you do plus 20%. These running totals of problems done and problems assigned are tallied on the webassign program. I STRONGLY SUGGEST THAT YOU PRINT OUT THE PROBLEMS AT A COMPUTER HERE AT SCHOOL, doing as many problems as you can without the computer hints. Then you can enter the answers when you are able to get to a computer. When you print the problems, I find that I need to print at about 80% the original size to be sure that the questions do not run over the margins and get cut off.

Digication and General Education:

Each student has a subscription to DIGICATION, an electronic portfolio that is active forever. As part of your general education requirements, you will upload your work from one of the class assignments onto DIGICATION for me to grade. More information and guidance will occur when the time comes.

College Withdrawal Policy and the N (no show) grade:

You may withdraw from this class any time up to and including May 11, 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 before April 10, you will receive a grade of “N” which means “no show”. Financial aid students MAY have to reimburse the college for courses in which they have an N. If you do not take the final exam, you will receive a grade of F, regardless of the other work you do. No one’s signature other than your own is required on the Withdrawal form. However, I strongly suggest you discuss your withdrawal with me before you submit the forms so that we can discuss your

status and your options. Financial aid students should also discuss withdrawal from a course with a financial aid counselor so that you know the monetary ramifications.

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 860-215-9289 for accommodations information for disabilities.

Course Outcomes:

(note that #1-11 are 9 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. 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.

In-class test and the final exam are considered individual work and must be completed without unauthorized assistance of any kind, including help of other students, tutors, unauthorized technology 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.

I encourage you to collaborate on homework, take-home problems, projects, etc. However, you must understand what you hand in to me. I may verify that you have learned them material covered by the work you have handed in by asking you to explain your work. I may give you a 0 on any work you hand in or any answers you put in Webassign that you do not understand or cannot explain.

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

Emergency Closings or class cancellations

If the college administrators decide to issue an emergency school closing, you can receive immediate notifications if you go to my.commnet.edu and register for the mycommnet.ALERT that will phone or text you as soon as a closing is announced. The Alert is more reliable than my email, since sometimes I lose internet service during a storm. If I am going to cancel class or office hours, I will try my best to email everyone, so please be sure your email on WebAssign system is correct.

Schedule of classes Calculus 1 SPRING 2015 Mat 254, Professor Decker

We will cover the following sections in class on the given dates. You must read the corresponding section from the book or view the lecture video BEFORE class.

Jan 22

Section 2.1 Tangent and Velocity Problem
Section 2.2 Limit of a Function

Jan 27

Section 2.7 Derivatives and Rates of Change

Feb 3

Section 2.8 The Derivative as a Function

Feb 10

Section 3.1 Derivatives of Polynomial and Exponential Functions
Section 3.2 The Product and Quotient Rules

Feb 17

Section 3.3 Derivatives of Trig function
Section 3.4 The Chain Rule

Feb 24

Section 3.5 Implicit Differentiation
Section 3.6 Logarithmic Differentiation
Section 3.7 rates of change in the natural and social sciences

March 3

Section 3.8 Exponential Growth and Decay
Section 3.9 Related Rates

March 10

Test on Section 2.1-2.2, 2.7, 2.8 and chapter 3.1 – 3.9

Spring Break

March 24

Section 3.10 Linear Approx and Differentials
(Section 3.11 Hyperbolic Functions: quick exposure to hyperbolic compared to circular trig functions. Use formulas on Derivative formula sheet to find the derivatives of hyperbolic functions.)

Section 4.1 Maximum and Minimum Values

Section 4.2 Mean Value Theorem

March 31

Section 4.3 How derivatives affect the shape of a graph

Sections 2.2, 2.3, Limits

Section 2.5 Continuity

Section 2.6 Limits at infinity: horizontal asymptotes.

Apr 7

Section 4.4 Indeterminate Forms and L'Hospital's Rule

Section 4.5 Summary of Curve Sketching

Section 4.6 Graphing with a Calculator

TAKE HOME TEST ON SECTIONS 2.2, 2.3, 2.5, 2.6, 3.7-3.10, 4.1-4.6

Open book, open notes, working with other people is fine. Just be sure that you can explain any answers you hand in to me. DUE April 16 – Thursday.

Section 4.7 Optimization Problems

Section 4.8 Newton's Method for finding roots

Apr 14

Section 4.9 Antiderivatives

Section 5.1 Areas and Distance

Apr 21

Section 5.2 Definite Integral

Section 5.3 Fundamental Theorem of Calculus

Section 5.4 Indefinite Integrals and the Net Change Theorem

Apr 28

Section 5.5 The Substitution Rule and review Sections 4.9 and ch 5.9

Year end problem set distributed. Due Thursday May 14.

May 5

Test Ch 5 and section 4.9

Thurs May 7: section 6.1 area and 6.2 volume of solids of revolutions

May 12: Make up test day if needed, otherwise, review for final exam

May 14: Students present solutions for problem set.

Final Exam TUESDAY MAY 19 during in our usual classroom at the usual class time.