Instructor:
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　　Office Hours:　　　Wed 11-noon and 1:30-2:20 Thurs 2-2:50 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

Course key　　　　　　　trcc.mohegan 0651 6128

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, 4 tests, and a final exam. The final exam counts 2/7th (about 28%), each test counts 1/7th (about 14%) and homework counts 14% Students who receive lower than 40% on the final exam will fail the course regardless of their other grades.

You will be given the opportunity to retake one of the four 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 20%. For example, if you do 4/5th of the homework problems correctly, you will receive an 80% plus 20% for a 100% grade on your homework. This is designed to compensate you for any errors that occur in compute grading, and any of the usual issues that Problems done on line through Webassign count the equivalent of 1 test. 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 are tallied on the webassign program. If you do 80% or more of the WebAssign problems I will award you a 100% for your WebAssign grade. The purpose of this is to compensate you if you have been unfairly graded by the computer, if you were "locked out" of the problems at the last minute, or if there were other routine glitches that occur whenever we use computers. 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 12, 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 is 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 nth 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'hopital'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 and emergency school closing, you can receive immediate notifications if you go to my.commnet. 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 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.

Week 1 Jan 23
        Section 2.1 Tangent and Velocity Problem homework due on 8/26
        Section 2.2 Limit of a Function (homework on 2.2 due 9/4)

Week 2 Jan 28,30
        Section 2.3 Calculating Limits using the limit laws.
        Section 2.4 Precise definition of Limits
        Section 2.5 Continuity

Week 3 Feb 4 NO CLASSES FEB 6: Professional day for all faculty
        Section 2.6 Limits at Infinity: Horizontal Limits
        Section 2.7 Derivatives and Rates of Change

Week 4 Feb 11, 13
        Section 2.8 The Derivative as a Function
FEB 13, THURSDAY TEST CH 2

Week 5 Feb 18, 20
        Section 3.1 Derivatives of Polynomial and Exponential Functions
        Section 3.2 The Product and Quotient Rules
        Section 3.3 Derivatives of Trig function

Week 6 Feb 25, 27
Section 3.4 The Chain Rule
Section 3.5 Implicit Differentiation
Section 3.6 Logarithmic Differentiation

Week 7 Mar 4,6
Section 3.7 rates of change in the natural and social sciences
Section 3.8 Exponential Growth and Decay
Section 3.9 Related Rates

Week 8 Mar 11,13
Review word problems

March 13 THURS TEST on ch 3.1-3.9 Derivatives

Week 9 SPRING BREAK : Mar 16-22

Week 10 March 25, 27
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

Week 11Apr 1, 3
Section 4.3 How derivatives affect the shape of a graph
Section 4.4 Indeterminate Forms and L'Hospital's Rule
Section 4.5 Summary of Curve Sketching
Section 4.6 Graphing with a Calculator

Week 12 Apr 8, 10
Section 4.7 Optimization Problems
Section 4.8 Newton's Method for finding roots

Week 13 Apr 15, 17
Section 4.9 Antiderivatives

APRIL 17 THURS   TEST ch 4: Applications of the derivative

Week 14 Apr 22, 24
Section5.1 Areas and Distance
Section5.2 Definite Integral
Section5.3 Fundamental Theorem of Calculus

Week 15 Apr 29, May 1
Section 5.4 Indefinite Integrals and the Net Change Theorem
Section 5.5 The Substitution Rule

Week 16 May 6, 8
Review ch 5.

MAY 8 THURSDAY   TEST Ch 5 Integrals

Week 17   May 13
Make up test day for students who wish to replace their grade on one of the 4 tests.
(higher grade prevails) If student does not wish to do a make-up test, he need not come to class.

THURSDAY MAY 15 FINAL EXAM during class period. Will cover material from entire course.