Calculus I – FALL 2015
Course #: MAT K254 T2 CRN 30189
Thursday: 5:30 PM – 9:00 PM, Room E225

Course Prerequisite: MAT 186, Precalculus

Course Text: *Calculus, Early Transcendentals*, by James Stewart, 8th edition
Publisher: Thomson/Brooks/Cole

Course Description: Introduces functions, continuity, limits, derivatives of algebraic and early transcendental functions, antiderivatives, definite integrals, and their applications. Uses graphing calculators to enhance and broaden the range of concepts and applications discussed.

Course Instructor: Mark Vesligaj

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OFFICE HOURS:	Monday (11:00am – 12:30pm) & Wednesday (2:00pm – 3:30pm), and by appointment QVCC Danielson Campus

Course Support: Tutorial services. Peers. Office hours with instructor.

Course Portfolio: All students are required to maintain an online learning portfolio using a TRCC designed template. Through this electronic tool, students can see their own growth in college-wide learning. The student can keep and continue to use the *Digication* account after graduation. A Three Rivers General Education Assessment Team will select random works to improve the college experience for all. No names will be attached to the assessment work; it will remain private and anonymous for college improvement purposes. In class outlines, students will find recommended assignments which support various college-wide learning abilities. The student will have a tool which can integrate their learning from the classroom, school, and life and allow for another opportunity of learning at TRCC! Students will be able to make multiple portfolios.

Class Cancellation: In case of increment weather, check the college website for class cancellations or call 860-215-9000 for recorded message.

MyCommNet Alert: *MyCommNet* is a system that sends text messages and emails to anyone signed up in the event of a campus emergency. Additionally, TRCC sends messages when the college is delayed or closed due to weather. All students are encouraged to sign up for *MyCommNet* Alert. A tutorial is available on the Educational Technology and Distance Learning Students page of the web site.
http://www.trcc.commnet.edu/div_it/educationaltechnology/Tutorials/myCommNetAlert/MIR3.html

Course Objectives: Upon completion of the course, student should be able to:

1. Find the natural domain and range of the given function.
2. Compute the value of the function at the indicated value of x.
3. Know the classification of the functions, their basic properties and graphs,
4. Classify a function as even, odd, or neither.
5. Find the composite of two functions, and express a function as the composition of two or more functions.
6. Sketch the graphs of the functions using concepts of reflections and translations, intercepts.
7. Use vertical line test to identify whether the given graph is the graph of a function.
8. Find the limit of a function, using graph, table of values, or algebra. Find limits involving infinity.
9. Determine whether the given function is continuous or not, find and describe all points of discontinuity.
10. Know the Intermediate Value Theorem.
11. Use the definition of the derivative to differentiate a function. Understand graphical and physical meanings of the derivative.
12. Find whether the function is differentiable or not.
13. Use the techniques of differentiation, the Chain Rule to find first and higher derivatives of algebraic, trigonometric, inverse functions, exponential, and logarithmic functions.
14. Find the equation of the line tangent to the graph of a function at the specified point.
15. Solve the word problems on rate of change of the function.
16. Find the derivative of a function by implicit differentiation; apply it to related rate problems.
17. Find the derivative of a function by logarithmic differentiation.
18. Find the differential of a function. Find the linear approximation of a function.
19. Identify which of the given curves represents a function and which represents its first and second derivative. Sketch the graph of the derivative of a function defined by the graph.
20. Know the Mean value and Rolle's Theorem.
21. Use the first and second derivatives to find the shape of graph, show where the function is increasing / decreasing, concave up/ concave down; find the inflection points. Use the First and Second Derivative Tests to find relative extrema.
22. Sketch the graph of a function (show all critical points, inflections, asymptotes, etc.)
23. Find the absolute maximum and absolute minimum of a function on a given interval
24. Solve optimization problems.
25. Find antiderivatives.
26. Know the definition of a definite integral, area and distance problems that lead to the definite integral.
27. Know the Fundamental Theorem of Calculus; recognize the differentiation and integration as two inverse processes.
28. Perform the indefinite and definite integration using basic integration rules, substitution method.
29. Find the average value of a function on a given interval.
30. Solve problems on applications of integration to geometry, physics, and engineering.

Disabilities Statement:
If you have a question regarding a disability that may affect your progress in this course, please contact one of the college's Disability Service Providers as soon as possible. Chris Scarborough (215-9289) generally works with students who have learning disabilities or attention deficit disorder. Kathleen Gray (215-9248) generally works with students who have physical, visual, hearing, medical, mobility, and psychiatric disabilities. Matt Liscum (215-9265) also works with students who have disabilities. If you will need accommodations for this class, you must contact the Disabilities Counseling Services. To avoid any delay in the receipt of accommodations, you should contact the counselor as soon as possible. *The instructor cannot provide accommodations until an accommodation letter from the Disabilities Counselor is received.*

Academic Integrity:
At TRCC, we expect the highest standards of academic honesty. The Board of Regents' Student Conduct Policy prohibits cheating on examinations, unauthorized collaboration on assignments, unauthorized access to examinations or course materials, plagiarism.

Attendance:
Attendance is required to succeed in this course. If you miss class on the day of a quiz or exam you will not be allowed to make it up. Attendance will be taken for all classes.

Withdrawal:
A student who finds it necessary to discontinue a course must complete a "Withdrawal Request Form" available in the Registrar's office within the time limits of the semester calendar. Students who do not withdraw, but stop attending will be assigned an "N" which may impact their financial aid status. The last day to withdraw from classes can be found on the Academic Calendar the college website.

Grading Policy:
Your final grade will be earned by the following component breakdowns:

- Quizzes / Short Projects   20%

- Exams (3 at 20% each)   60%

- Final Exam   20%
  TOTAL   **100%**

Grading Equivalents:
Your final letter grade will be determined according to the following equivalents:

A: 93 – 100, A-: 90 – 92
B+: 87 – 89, B: 83 – 86, B-: 80 – 82
C+: 77 – 79, C: 73 – 76, C-: 70 – 72
D+: 67 – 69, D: 63 – 66, D-: 60 – 62
F: below 60
N: if the student completed less than 60% of work.

Chapter Content Overview:

Chapter 1:   Functions and Their Representations. A Catalog of Essential Functions.
> ➢ Sections 1.1 – 1.5

Chapter 2:   The Limit of a Function. Calculating Limits. Limits Involving Infinity. Continuity.
> ➢ Sections 2.2, 2.3, 2.5 – 2.8

TEST 1: (Chapters 1, 2)

Chapter 3:   Derivatives and Rate of Change. The Derivative as a Function. Basic Differentiation Formulas. The Product and Quotient Rules. The Chain Rule. Implicit Differentiation. Logarithmic Differentiation. Related Rates. Linear Approximation. Differential.
> ➢ Sections 3.1 – 3.7, 3.9, 3.10

Chapter 4:   Maximum and Minimum Values. The Mean Value Theorem. Derivatives and the Shapes of Graphs. Curve Sketching. Optimization Problems. Newton's Method. Antiderivatives.
> ➢ Sections 4.1 – 4.3, 4.5, 4.7 – 4.9

TEST 2: (Chapters 3, 4)

Chapter 5:   Areas, Distances. The Definite Integral. Evaluating Definite   Integrals. The Fundamental Theorem of Calculus. The Substitution Rule.
> ➢ Sections 5.1 – 5.5

Chapter 6:   Areas between the Curves. Review.
> ➢ Section 6.1

TEST 3: (Chapters 5, 6)

Chapter Homework Overview: Odd numbers only. This is a guide, and assignments may vary.

Chapter 1:

Sec 1.1 – p.19	3, 7, 9, 27, 29,41,43,45, 47, 69 - 77
Sec 1.2 – p.33	1, 3
Sec 1.3 – p.42	1, 3,5,17, 21, 31, 33, 35, 43-47, 53
Sec 1.4 – p.53	17, 19
Sec 1.5 – p.66	3, 5, 7, 17, 29, 31

Chapter 2

Sec 2.2 – p.92	5, 7, 9,11,15,17
Sec 2.3 – p.102	11 – 29, 47
Sec 2.5 – p.124	3, 5,7,21, 23, 41, 43, 53
Sec 2.6 – p.137	3, 5, 7,9,15 – 23, 41, 47
Sec 2.7 – p.148	5, 17, 31 – 35
Sec 2.8 – p.160	3, 5 – 11, 21,23,41,43

Chapter 3

Sec 3.1 – p.180	3 – 31, 33, 39, 47, 49, 55
Sec 3.2 – p.188	3 – 25, 27, 29, 31
Sec 3.3 – p.196	1 – 15, 21, 23
Sec 3.4 – p.204	1 – 25, 47, 49, 51
Sec 3.5 – p.215	5, 7, 11
Sec 3.6 – p.223	3 – 11, 15, 23, 39, 43, 45
Sec 3.7 – p.233	1, 15, 23
Sec 3.9 – p.249	1, 3, 7, 13 – 17
Sec 3.10 – p.256	1, 3, 7, 9, 11-13

Chapter 4:

Sec 4.1 – p.283	3, 5, 7, 9,17,21,29 – 33, 47, 49
Sec 4.2 – p.291	5, 7, 11, 13
Sec 4.3 – p.300	1, 5, 7, 9 – 15, 25, 35, 37 – 45, 49
Sec 4.5 – p.321	1, 3, 9, 15, 21
Sec 4.7 – p.336	3, 7, 9, 13, 15
Sec 4.8 – p.348	6
Sec 4.9 – p.355	1 – 47, 59-63

Chapter 5:

Sec 5.1 – p.375	1, 17
Sec 5.2 – p.388	5, 17 -19, 33, 35, 47, 49, 51, 53
Sec 5.3 – p.399	3, 19 – 43
Sec 5.4 – p.408	1, 5 – 45, 61
Sec 5.5 – p.418	1 – 47, 53 - 59

Chapter 6:

Sec 6.1 – p.434	1 – 27