

**Syllabus**  
**Three Rivers Community College**  
**MAT 268 – Calculus III**  
**Spring 2012**  
**Course Registration Number (CRN) – 12403**  
**Tuesday 6:00 – 9:30 pm, Room E-212**

**Instructor:**

Roxanne N. Tisch  
Office: C-248  
Office Hours: To be announced  
Email: rtisch@trcc.commnet.edu

**Course Description:**

Prerequisite: MAT 256

This third semester of calculus is intended for students who plan on majoring in mathematics, science or engineering technologies. It exposes students to the calculus of several variables. Topics include vectors, dot and cross product, equations of lines and planes, functions of several variables, limits and continuity, partial derivatives, chain rule, gradient, maximizing and minimizing functions of several variables, Lagrange multipliers, multiple integrals, polar, cylindrical, spherical coordinate systems, vector fields, line integrals, Green's and Stokes' and the Divergence Theorems.

**Attendance:**

Attendance in classes is strongly recommended. *I will teach a class only once; you are responsible for getting the class notes, homework, and any other assignments from another student and completing that work by the next class after any missed class.*

**Contact:**

All communication will occur by announcements in MyMathLab or via email. Please make sure that your email addresses in MyMathLab and MyCommNet are accurate. Check your email regularly to be informed of any changes in schedule.

**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. In this class and in the course of your academic career, present only your own best work; clearly document the sources of the material you use from others; and act at all times with honor. A full copy of the college's academic integrity policy is in the school's catalog and in the student handbook.

## **Grading Policy:**

Your grade will be based on 3 tests, a final exam, and other homework/projects throughout the semester. Each test will be worth 100 points, the final exam will be worth 150 points, and the other assignments will be worth a total of 150 points.

Letter grade equivalents are listed below:

<b>Grade</b>	<b>Percent of Points Earned</b>
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

## **College Withdrawal Policy:**

You may withdraw from this class any time up to and including May 7 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.

## **Disabilities Statement:**

If you have a hidden or visible disability that may require classroom or test-taking modifications, please contact the Learning Specialist, Chris Scarborough, at 892-5751.

**Course Outline:** The dates listed in this outline are approximate. Dates when we cover material are subject to change.

**Book: Calculus, Early Transcendentals, 7<sup>th</sup> Ed. by James Stewart**

**Chapter 12** 1/24/12 – 2/07/12

- 12.1 Three-Dimensional Coordinate Systems
- 12.2 Vectors
- 12.3 The Dot Product
- 12.4 The Cross Product
- 12.5 Equations of Lines and Planes

**Chapter 13** 2/07/12 – 2/28/12

- 13.1 Vector Functions and Space Curves
- 13.2 Derivatives and Integrals of Vector Functions
- 13.3 Arc Length and Curvature
- 13.4 Motion in Space: Velocity and Acceleration

**TEST 1 on Chapters 12 & 13 - 2/28/12**

**Chapter 14** 3/13/12 – 4/3/12

- 14.1 Functions of Several Variables
- 14.2 Limits and Continuity
- 14.3 Partial Derivatives
- 14.4 Tangent Planes and Linear Approximation
- 14.5 The Chain Rule
- 14.6 Directional Derivatives and the Gradient Vector
- 14.7 Maximum and Minimum Values
- 14.8 Lagrange Multipliers

**TEST 2 on Chapter 14 - 4/3/12**

**Chapter 15** 4/10/12 - 4/24/12

- 15.1 Double Integrals over Rectangles
- 15.2 Iterated Integrals
- 15.3 Double Integrals over General Regions
- 15.4 Double Integrals in Polar Coordinates
- 15.7 Triple Integrals
- 15.8 Triple Integrals in Cylindrical Coordinates
- 15.9 Triple Integrals in Spherical Coordinates
- 15.10 Change of Variables in Multiple Integrals

**TEST 3 on Chapter 15 - 4/24/12**

## **Chapter 16** 5/1/12 – 5/08/12

- 16.1 Vector Fields
- 16.2 Line Integrals
- 16.3 The Fundamental Theorem for Line Integrals
- 16.4 Green's Theorem
- 16.5 Curl and Divergence
- 16.6 Parametric Surfaces and Their Areas
- 16.7 Surface Integrals
- 16.8 Stokes' Theorem
- 16.9 The Divergence Theorem

## **FINAL EXAM** 5/15/12

### **Course Objectives:**

Students should be able to:

- ◆ Perform the operations on vectors, find dot and cross products
- ◆ Find the equations of lines and planes
- ◆ Describe and sketch cylinders and quadric surfaces
- ◆ Sketch the plane curve with a given vector equation
- ◆ Find the derivatives and integrals of vector functions
- ◆ Find the length of the curve and curvature
- ◆ Solve problems on motion in space
- ◆ Find the domain of a function in several variables, sketch its graph
- ◆ Find the limit of the function in several variables, determine the set of points at which the function is continuous
- ◆ Find the partial derivatives of the functions
- ◆ Find an equation of the tangent plane to the given surface at the specified point
- ◆ Find the linear approximation of the function
- ◆ Use the Chain Rule to find the derivative of the function
- ◆ Find the directional derivatives and gradient vector of the function
- ◆ Find maximum and minimum values of the function
- ◆ Use Lagrange multipliers to find the maximum and minimum values of function subject to the given constraint(s)
- ◆ Evaluate double integrals, double integrals in polar coordinates
- ◆ Evaluate triple integrals, triple integrals in cylindrical and spherical coordinates
- ◆ Evaluate the integrals by making an appropriate change of variables in multiple integrals
- ◆ Sketch the vector fields
- ◆ Evaluate the line integrals
- ◆ Evaluate the line integrals by using Green's Theorem
- ◆ Find the curl and divergence of the vector field
- ◆ Find the parametric representation of the surface and its area
- ◆ Evaluate the surface integrals
- ◆ Use Stokes' Theorem to evaluate surface integrals
- ◆ Use the Divergence Theorem to evaluate surface integrals