Syllabus

Three Rivers Community College
MAT 268 – Calculus III
Spring 2015

Instructor:

Roxanne N. Tisch
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Office Hours: To be announced
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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 via email. Please make sure that your email addresses MyCommNet is 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 2 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:

Grade	Percent of Points Earned
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 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 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:

Students with disabilities are guaranteed reasonable accommodation under the provisions of the Americans with Disabilities Act of 1992. Disclosure of a disability must be voluntary. Valid and reliable documentation to verify eligibility for accommodation is required and must be submitted to the Student Development Offices of Student Services. If you have accommodations documented through the Student Services office, please see me as soon as possible so arrangements can be made. If you would like more information or want to schedule a confidential meeting, please contact the Learning Specialist, Chris Scarborough, at 860-892-5751.

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

Book: Calculus, Early Transcendentals, 7th Ed. by James Stewart

Chapter 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

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

Chapter 14

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

Chapter 15

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

Chapter 16

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

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