MAT 258, CALCULUS III
Spring 2010

Pre-requisite: Calculus II, MAT 254

Text: Essential Calculus by James Stewart

Supplementary Material: TI Graphing Calculator is required.

Course Description: Vectors, dot and cross product, equations of lines and plains, 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, Stokes' and the Divergence theorems.

Measurements: Quizzes, projects - 15%, each test – 20%, and final exam - 25%.

Attendance: Your attendance, participation in classroom work /projects and preparation for each class is required and is essential to your success in the course.

Support Services: Tutorial services. Meeting with me for an extra help.

Office Hours: M, W 3:30 - 5:30 p.m. **Room C104**
E-mail lalikhanova@trcc.commnet.edu Check your e-mail regularly for test/quiz/homework announcements. Check you email and MyCommNet for class cancellations.

Disabilities Statement: Students with disabilities, who may require special accommodations and support services, are encouraged to notify:

1. Chris Scarborough, who is coordinating services to students with disabilities.
2. The instructor during the first two weeks of class.

Course Outline, Content, and Assignments.

Section	Topic	Homework exercises (odd numbers). This is a guide only, assignments may vary
13.1	Three Dimensional Coordinate plane	805/1, 3, 7, 13, 23-27
13.2	Vectors	813/5,7, 9-19,21
13.3	The Dot Product	820/3 -9, 15,17
13.4	The Cross Product	828/1-5, 15
13.5	Equations of lines and Planes	838/3 – 11
14.1	Vector Functions	858/1, 3, 15,
14.2	Derivatives and Integrals of Vector Functions	864/9 – 13, 17, 23, 25, 33, 35
14.3	Arc Length	872/1, 17
14.4	Motion in space: velocity, acceleration	882/ 9, 11, 15, 19
TEST		
15.1	Functions of several Variables	902/7, 9, 11, 39
15.2	Limits and Continuity	913/ 5, 7, 9, 11, 13, 29, 33
15.3	Partial Derivatives	925/15–31, 39, 41, 45, 51, 57, 61
15.4	Tangent Planes, Linear Approximation	935/1, 3, 11, 25
15.5	The Chain Rule	943/1-11
15.6	Directional Derivatives, the Gradient Vector	956/5, 7, 9, 11
15.7	Maximum and Minimum Values	967/1, 5, 9
15.8	Lagrange Multipliers	977/3, 5, 7
TEST		
16.1	Double Integrals	994/11-13
16.2	Itirated Integrals	1000/3 - 21
16.3	Double Integrals over general regions	1008/1, 5, 7–15,19, 21,39, 45, 49
16.4	Double Integrals in Polar Coordinates	1015/1, 3, 7, 9, 11, 19
16.6	Triple Integrals	1034/3 - 13
16.7	Triple Integrals in Cylindrical Coordinates	1040/1, 3, 17
16.8	Triple Integrals in Spherical Coordinates	1046/1, 3, 17
16.9	Change of Variables in Multiple Integrals	1056/1 -5
TEST		
17.1	Vector Fields	1068/1, 3, 21
17.2	Line Integrals	1079/1 –11, 19, 21
17.3	The Fundamental theorem for Line Integrals	1089/3, 5, 13, 19
17.4	Green's Theorem	1096/1, 5, 7, 11
17.5	Curl and Divergence	1104/1, 3, 13, 15

FINAL EXAM

Calculus III course objectives:

Student should be able to:

- Graph in three dimensional coordinate system
- 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