MATH 3303: Multi-Variant Calculus
Sul Ross State University ~ Rio Grande College
Fall 2016

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Course Description   MTH 3303 is intended as an introduction to multi-variant calculus, including multiple integrals, partial derivatives, vectors, derivatives and integrals of vector fields.

Course Objectives   Students will explore parametric equations and curvilinear motion, vector arithmetic and the geometry of space, vector-valued functions and their uses in mathematical physics, functions of several variables, multiple integratals, and vector analysis.

Mathematics Program Outcomes   The graduating student will be able to demonstrate content knowledge in mathematics including arithmetic, algebra, geometry, probability, statistics, and calculus.

Class Time   Tuesday & Thursday, 4:30 – 5:45 p.m.

Class Location   Del Rio 107; Eagle Pass B112; Uvalde B114c; Castroville 119

Required Text   Morris Kline, *Calculus: An Intuitive and Physical Approach*, ISBN 0486404536

Office Hours   M/W, 12:00 – 2:00; T/Th, 10:30 – 12:30

Course Policies

Attendance Policy

Attendance is mandatory. You will be held responsible for all material covered in class or in the reading assignments. If you have to miss a class, it is your responsibility to obtain all notes, assignments, and announcements from someone else in the class. Make-up exams will be given only in the event of an emergency, in which case written justification and/or documentation must be provided and approved.

Communication

I will post course documents, reminders, announcements, and assignments on the Blackboard system. I may also occasionally send announcements via e-mail. You should make sure you know how to access and use these tools. E-mail is the best way to contact me.
    You are welcome to stop by my office if you need help with the homework or wish to speak

about your progress in the course. If you would like to meet with me and can't travel to Uvalde, please let me know, and we will try to arrange an appointment.

I am here to help you. Ask questions in class, call me, e-mail me, or come to my office. If you don't communicate with me, then I can't help you.

Homework

Homework will be assigned for each section that we cover. Worksheets will be made available for download and printing on Blackboard. Your homework will be prepared on paper and submitted to me or via your site secretary. Each problem will be worth 2 points unless otherwise noted. ALWAYS TURN IN THE HOMEWORK. SHOW ALL YOUR WORK. LATE WORK WILL NOT BE ACCEPTED.

Grading Policy

Your grades will be weighted as follows:

Homework	20%
Exam 1	20%
Exam 2	20%
Final Exam	40%

A student who averages at least 90% will receive an A; at least 80% will receive at least a B; at least 70% will receive at least a C; at least 60% will receive at least a D.

Exams

There will be two midterm exams. Their tentative dates are September 29 and November 1. These are subject to change. You will be notified of a change at least one week in advance. Make-up exams will be given only in the event of an emergency, in which case written justification and/or documentation must be provided and approved.

Implicit in registering for this course is your agreement that you will be present to take the final exam at the time determined by the University, which is Tuesday, December 6, from 3:00 – 5:45. The final exam will be comprehensive.

Subject Outline

Below is a tentative outline of the subjects we will cover in this course.

I. Polar Coordinates: *the polar coordinate system – curves in polar coordinates – conic sections in polar coordinates – relation with rectangular coordinates – the derivative of a function in polar coordinates – area and arc length*

II. Rectangular Parametric Equations and Curvilinear Motion: *parametric equations of a curve – projectile motion – slope, area, and arc length – curvature – vector arithmetic – velocity and acceleration – tangential and normal acceleration*

III. Kepler's Laws: *polar parametric equations – velocity and acceleration – Newton's laws of motion and gravitation – Kepler's laws of planetary motion*

IV. Multivariable Functions: *functions of two or more variables – Cartesian coordinates – planes – lines – quadric surfaces*

V. Partial Differentiation: *basic definition – geometric meaning – the directional derivative – the chain rule – maxima and minima – envelopes*

VI. Multiple Integrals: *volume under a surface – the double integral – triple integrals*

Schedule

This schedule is tentative only. The unit numbers refer to the above outline.

Unit I	August 23 – September 6
Unit II	September 6 – 27
Exam 1	**September 29**
Unit III	October 4 – 13
Unit IV	October 13 – 27
Exam 2	**November 1**
Unit V	November 3 – 17
Unit VI	November 17 – December 1
Thanksgiving Holiday	*November 23 – 25*
Final Exam	**December 6**

Americans With Disabilities Act

Sul Ross State University is committed to equal access in compliance with the Americans With Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Kathy Biddick, Student Services Administrative Secretary.