Description: This course extends many of the ideas from one-dimensional calculus into higher dimensions. In particular, this course studies the mathematical concepts of vectors, vector operations, and vector functions; multivariate functions, partial derivatives, gradients, and multiple integrals; integration in vector fields, Greens, Stokes, and the Divergence (Gauss') theorems.


Course Requirements:
- Three in-class exams (If a student must miss an exam due to an excused absence, special arrangements should be made in advance.)
- A comprehensive final exam (Final Exam Schedule)
- Homework will be assigned and collected.
- Class attendance and participation: Students are expected to attend all class meetings, arriving on time.

Communication: Check your university email regularly, as you may be sent reminders, assignments, or announcements.

Homework: Homework is due at the begging of class, no exceptions. If you are late, you may not be allowed to turn in your homework.

Grading Policy: 55% Exams  
15% Homework  
20% Comprehensive Final Exam  
10% Project  

Grading Scale:  
90% - 100%: A  
80% - 90%: B  
70% - 80%: C  
60% - 70%: D  
Below 60%: F

Course Outline:  
- Parametric Equations, Polar Coordinates, and Conic Sections  
  o Parametric Equations  
  o Arc Length  
  o Polar Coordinates  
  o Area and Arc Length in Polar Coordinates  
  o Conic Sections  
- Vector Geometry  
  o Vectors in the Plane  
  o Vectors in Three Dimensions  
  o Dot Product and the Angle Between Two Vectors  
  o The Cross Product
- Planes in 3-Space
- A Survey of Quadric Surfaces
- Cylindrical and Spherical Coordinates

- Calculus of Vector-Valued Functions
  - Vector-Valued Functions
  - Calculus of Vector-Valued Functions
  - Arc Length
  - Curvature
  - Motion in 3-Space

- Differentiation in Several Variables
  - Functions of Two or More Variables
  - Limits and Continuity in Several Variables
  - Partial Derivatives
  - Differentiability and Tangent Planes
  - The Gradient and Directional Derivatives
  - The Chain Rule
  - Optimization in Several Variables
  - Lagrange Multipliers: Optimizing with a Constraint

- Multiple Integration
  - Integration in Two Variables
  - Double Integrals over More General Regions
  - Triple Integrals
  - Integration in Polar, Cylindrical and Spherical Coordinates
  - Applications of Multiple Integrals
  - Change of Variables

- Line And Surface Integrals
  - Vector Fields
  - Line Integrals
  - Conservative Vector Fields
  - Parametrized Surfaces and Surface integrals
  - Surface integrals of Vector Fields

- Fundamental Theorems of Vector Analysis
  - Green’s Theorem
  - Stokes’ Theorem
  - Divergence Theorem

**Department syllabus:** Please read the official Department of Mathematics & Statistics syllabus for MTH 333 at [http://www2.sfasu.edu/math/courses/syllabi/mth305syllabus.pdf](http://www2.sfasu.edu/math/courses/syllabi/mth305syllabus.pdf).

**Attendance Policy:** Students are expected to attend all class meetings, arriving on time. If you are absent, you are responsible for determining what you missed and for being prepared for class when you return. Do not come to my office expecting me to teach you the lesson you missed.

**AARC:** The Academic Assistance and Resource Center (AARC) located on the first floor of the Steen Library offers several types of academic assistance. All services are FREE. See the AARC web pages for more information [http://libweb.sfasu.edu/aarc](http://libweb.sfasu.edu/aarc).
**Academic Integrity (Policy A-9.1)**

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

The penalty for a student found cheating on any part of an assignment, quiz, or exam in this class will range from a grade of zero on the work to a grade of F in the course, and may result in additional, more severe disciplinary measures. A student who allows another to copy his work and the student copying the work are both guilty of cheating. Do your own work. Do not show your completed work to others. Do not allow others to copy your work.

**Definition of Academic Dishonesty**

Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at [http://www.sfasu.edu/policies/academic_integrity.asp](http://www.sfasu.edu/policies/academic_integrity.asp).

**Withheld Grades Semester Grades Policy (A-54)**

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

**Students with Disabilities**

To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices](http://www.sfasu.edu/disabilityservices).

**Acceptable Student Behavior**

Classroom behavior should not interfere with the instructor's ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1 [http://www.sfasu.edu/policies/student_conduct_code.asp](http://www.sfasu.edu/policies/student_conduct_code.asp)). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.