- Please sit at the front of the classroom. I promise to maintain appropriate dental hygiene.

All of these expectations are intended to make you more successful in the class.

General Education Requirements: Math 250A does not meet any specific general education requirements. (You would have already met the mathematics requirement in a prerequisite course.) However, Math 250A will satisfy the following general education learning goals:

1. To understand and appreciate the varied ways in which mathematics is used in problem-solving.
2. To understand and appreciate the varied applications of mathematics to real world problems.
3. To perform appropriate numerical calculations, with knowledge of the underlying mathematics, and draw conclusions from the results.
4. To demonstrate knowledge of fundamental mathematical concepts, symbols, and principles.
5. To solve problems which require mathematical analysis and quantitative reasoning.
6. To summarize and present mathematical information with graphs and other forms which enhance comprehension.
7. To utilize inductive and deductive mathematical reasoning skills in finding solutions, and be able to explain how these skills were used.
8. To explain the overall process and the particular steps by which a mathematical problem is solved.
9. To demonstrate a sense of mastery and confidence in the ability to solve problems which require mathematical concepts and quantitative reasoning.

Course Objectives & Learning Goals:

1. To understand and graph parametric curves and vector-valued functions in two and three-space, to understand and use the concepts of limits and continuity for vector-valued functions, and to be able to find and interpret their derivatives. To understand the geometry of three-dimensional real space, of lines, planes, spheres and vectors.
2. To understand the concepts of, and to be able to calculate, the unit tangent, unit normal and unit binormal vectors, as well as arc length and curvature for planar and space curves.
3. To grasp the concepts of the velocity and acceleration of a particle moving according to a given trajectory described by a differentiable curve, to be able to integrate vector-valued functions, and to apply this knowledge to solve a variety of application problems.
4. To understand the concept of a function $f(x,y)$ of two variables, to be able to determine the domain and range of $f(x,y)$, and to successfully sketch wire frame diagrams of these functions in three-space.
5. To grasp the concepts of contour lines and level surfaces and to be able to sketch their graphs.
6. To study and grasp the concepts of limits and continuity for $f(x,y)$, and to be capable of calculating a limit (if it exists) or showing that a limit does not exist.
7. To understand the concept of a partial derivative and to be able to calculate and interpret partial derivatives of multivariate functions.
8. To know the equation of the tangent plane to the graph of a function $f(x,y)$, and to know how to use the function's local linearization and differential to solve problems.
9. To successfully apply the Chain Rule to take derivitives of multivariate composite functions.
10. To understand, calculate, and interpret directional derivatives and gradient vectors.
11. To be able to categorize critical points for a function $f(x,y)$ using the Second Derivative Test, to effectively use the method of Lagrange Multipliers to find global extrema for functions of two and three variables subject to a constraint, and to use this knowledge to solve application problems.
12. To understand the concept of a double Riemann Sum, to understand the theory of the double integral and its geometric interpretation, and to be able to calculate double integrals over rectangular regions using iterated integrals.
13. To be able to describe general regions in two-space with sets of inequalities, and to use these to set-up, evaluate and interpret double integrals as iterated integrals over general regions.
14. To successfully convert and evaluate double integrals in polar coordinates and to be able to tell when to use this method to evaluate double integrals.
15. To understand and evaluate triple integrals in rectangular, cylindrical, and spherical coordinate systems, and to be able to calculate double and triple integrals using a change of variables.