Math 10250 Goals and Perspectives

DESCRIPTION. This course is an introduction to calculus, the subject that studies change. We will begin with two essential precursors to calculus: variables and functions. With variables, we will be able to work with changing quantities; with functions, we will be able to express relationships between variables. Then, we will introduce the key idea of calculus: limits. Using limits we will be able to understand and calculate the rate of change at an instant (the derivative), and the total change that occurs over time (the integral).

MAJOR INSTRUCTIONAL GOALS. This course serves as an introduction to the concepts of calculus and how they apply to life and work. With this in mind, the course methodology will emphasize *understanding* and skill acquisition rather than mechanical learning and rote memorization. Once this course is completed, you will have a good grasp of the *practical* side of math and calculus, enhancing your **quantitative and analytical reasoning skills**. Our goals include:

1. Identify and explain fundamental principles and theories in calculus and its applications.
2. Identify connections between mathematical ideas and the 'real world'.
3. Express ideas and arguments clearly, logically and persuasively.
4. Apply ideas, theories, principles, and concepts in new contexts and situations, and solve real-world problems that are quantitative in nature.

- **Learning modeling skills.** Through math, we can turn a mass of confusing information into a clear and precise system. Describing real-life problems with math is called 'modeling'. In the future, when you make an investment - like in a home or a car - you're going to need to use unique equations to calculate how you'll pay for it. You will need to know what variables, symbols and math concepts to use, as well as how to read the results, adapting the equation if necessary.
- **Understanding mathematical symbols and formulas.** Whenever you try to use or comprehend equations, you will need to be able to convert thoughts to formulae or symbols, and translate symbols or formulae back to ideas. Math 10250 will require understanding, not memorization of formulae and symbols, just like 'real life'.
- **Emphasizing conceptual learning.** If we understand the core concepts of calculus, we can draw links between our understanding of it and different components of math, as well as to the wider world. Don't forget that even basic, everyday things like velocity and marginal profit are derived from calculus!
- **Making connections.** Mathematical modeling can help us tackle even the largest problems, such as environmental, social, political and economic issues. In Math 10250, you will work on finding and exploring just one of these plethoric connections between math and the wider world, furthering your understanding and application of math.

Always remember to note the practical application of the course concepts. This will help your understanding and application of mathematical skills long after you finish Math 10250.

As you work through the course, keep these goals in mind, think positively, participate and ask questions, and you will succeed. "Yes! You will, indeed! (98 and 3/4 percent guaranteed.)" [*Dr. Seuss*]