# Math 10260 Goals and Perspectives

Description. This course is an introduction to mathematical ideas and techniques that are useful in understanding and solving problems arising in economics and business. Mathematical concepts are introduced through interesting business problems. Using available computer technology, real life problems, which may lead to non-trivial computations and graphs, are considered. Topics include integration, differential equations, Taylor polynomial approximations, unconstrained and constrained optimization for functions of several variables, probability and statististics, with interesting real-life applications throughout.

Major Instructional Goals. Upon completion of this course you should have learned the basic calculus ideas and techniques that are useful in understanding and solving problems arising in economics and business. It will enchance problem solving skills, critical thinking, rational decision making and appreciation for mathematics. Our major goals include:

1. Identify and explain fundamental principles and theories in calculus and its applications to business.
2. Identify connections between mathematical ideas and life experiences.
3. Express ideas and arguments clearly and persuasively.
4. Analyze, question and evaluate ideas, assumptions, arguments and points of view.
5. Apply ideas, theories, principles and concepts in new contexts and situations, and solve real world problems that are quantitative in nature.

- **Understanding mathematical symbols and formulas.** Learn how to read and understand mathematical symbols and formulas and to be able to express thoughts in symbols and equations. Realize that each formula expresses a precise and clear relation between the variables involved. It is often said that the best way for clarifying one's thoughts is to put them into an equation. Equations are not there to be memorized but to be understood. In many situations they form the bridge between mathematics and our world.

- **Emphasizing conceptual learning.** For example, understanding the definite integral as expressing total change by summing up instantaneous change is fundamental for being able to use it. More importantly, by learning the fundamental concepts you are able to understand that there is a commonality in the world of mathematics and there are connections. There are fundamental concepts (like the integral) from which many others are derived (like future and present value of income streams and the producer and consumer surplus). This learning helps you see the big picture of mathematics and its connections to our world.

- **Learning modeling skills.** They include describing the situation under consideration clearly, translating appropriate aspects into equations using suitable variables, symbols, and mathematical concepts, and interpreting possible mathematical solutions in terms of the original process. Models should be thought of as approximations of real situations and as such require continuous adjustments.

- **Making connections.** We stress the connections between mathematics and modern society by considering a wide variety of problems ranging from environmental and economic issues to social and political situations that can be modeled and solved by mathematical means. Take advantage of this opportunity to make your own connections between the mathematics considered in the class and your other courses and consider working on a special project that exploits your own interests and expertise.