Math 1080

Course Concept:

The idea behind this course is to introduce business students to the concepts of calculus and a wide variety of application problems. The concentration will be on business applications including cost, revenue, and profit functions. A TI-83/84 calculator will be used throughout the course as a tool to help solve problems and further understand concepts. Students should become much more advanced in their algebra skills throughout the semester.

Core list of Topics to be covered:

Limits:

- Definition of a limit (both at a point and left and right)

- Limit Rules (Sum, difference, constant, constant multiple, product, quotient)

- Evaluating limits of Polynomial, Rational, piece-wise defined, and Root functions (or any combination) both algebraically and graphically. Include indeterminate form.

- limits of the difference quotient (linear, quadratic, root, rational, or any combination)

Continuity:

- Definition of continuity (using limit and value at the point)

- Determine intervals of continuity for any Polynomial, Rational, piece-wise defined, and Root functions (or any combination) both algebraically and graphically

Differentiation:

- Definition using limits, calculating derivative using the definition

- Differentiation techniques: constant rule, constant multiple, sum/difference, product rule, quotient rule, power rule, general power/chain rule.

- Higher order derivatives and their interpretation (ex: acceleration)

- Evaluate derivative of any polynomial, rational, or root function (or any combination)

- Interpreting the derivative:

- First derivative test

- Second derivative test

- Determine local/absolute extreema for any rational or polynomial function

- Determine any inflection points

- Applied max/min problems (area, cost, revenue, profit)

- Graph sketching: Use first and second derivative to analyze and sketch graph of any polynomial or rational function

- Marginals (cost, revenue, profit)

- Derivatives of exponential and logarithmic functions (including general form)

- (Optional)- differentials, implicit differentiation, related rates, given the graph of a function sketch the graph of the derivative, given the derivative of the function sketch a possible graph of the function.

Integration:

- Indefinite integrals including the rules: constant, constant multiple, sum/difference, power

- Area beneath a curve: use rectangles and summation notation to evaluate

- Definite integration: basic rules such as constant, constant multiple, sum/difference, power, breaking up the terms of integration (a to c = a to b + b to c), integral from a to a=0.

- Fundamental theorem of Calculus

- Integration technique: Substitution

- Application problems: Using the marginal (cost, revenue, profit) to determine total (cost, revenue, profit)

- (Optional)- Area between two curves, any further applications