Math 1261

Survey of Calculus

Master Syllabus

Valdosta State University

Mathematics Department

Math 1261 is a 3 credit hour course.

Prerequisites:
Math 1101(Math Modeling) or Math 1111(College Algebra) with a grade of C or better)

Course Description:
This course is an introduction to basic calculus with emphasis on applications in business, economics, management, information science and related fields.

Learning Outcomes

1. **Students will use exponential and logarithm functions to solve practical problems including compound interest, doubling time of an investment, growth and decay, and half – life of a substance.**

2. **Students will use limits of functions to solve real world problems.**

3. **Students will find derivatives of functions using various techniques of differentiation.**

4. **Students will use calculus to solve applied problems encompassing Marginal Analysis.**

5. **Students will use derivatives to sketch graphs of functions**

For additional information about your particular course including grading, textbook, assignments and tests, contact your course instructor for your course syllabus.

General Outline of Topics

1.)Functions and Graphs.
- **Graphs of functions including Quadratic, Rational, Exponential, and Logarithm functions**
- **Identify asymptote lines**
- **Applications of Exponential and Logarithm functions including growth, decay, compound interest, investment, and half-life.**

2.)Limits and Derivatives
- **Analysis of a limit & One-sided limits.**
- **Limit Properties**
- **Difference Quotient**
- **Limits to infinity and Infinite limits**
- **Continuity & Partition Number**
- **Average & Instantaneous Rate of Change**
- **Slope of the tangent line**
- **Sales Analysis**
- **Differentiation Properties – Power Rule, Sum & Difference**
- **Instantaneous velocity**
- **Marginal Analysis**
  - **Cost, Revenue, Profit functions**
  - **Exact, Marginal, and Average Cost, Revenue & Profit**

3.)Additional Derivative Topics
- **Graphing Growth functions**
- **Derivatives of Exponential and Logarithm functions**
  - **Review of Logarithm Laws and Properties**
- **Product and Quotient Rules with Applications**
- **The Chain Rule**
- **Implicit Differentiation**

4.)Graphing and Higher Derivatives
- **Increasing & Decreasing Intervals on a graph**
- **Local Extrema and Critical numbers**
- **2^{nd} & Higher Derivatives**
- **Graphs using the 2^{nd} Derivative**
- **Inflection Points & Curve Sketching**
- **L'Hopitals Rule**
- **Absolute Maxima and Minima**
- **Extreme Value Theorem**