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Virginia Community College Course Content Summary

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Course Title: ___MTH 262:_Applied Calculus II_____

Course Description

Covers techniques of integration, an introduction to differential equations and multivariable calculus, with an emphasis throughout on applications in business, social sciences and life sciences. Lecture 3 hours per week. 3 credits.

General Course Purpose

The general purpose of this second course in Applied Calculus is to extend the study of the techniques and applications of calculus and prepare students in business, social sciences and life sciences to apply these concepts in future mathematics and degree coursework. This course is intended for those who will transfer to an institution requiring two semesters of applied calculus in one of these disciplines.

Course Prerequisites/Corequisites

Prerequisite: Completion of MTH 261 or equivalent with a grade of C or better.

Course Objectives

Upon completing the course, the student will be able to:

Integration and Its Applications

- Use basic integration formulas to find indefinite integrals of algebraic, exponential, and logarithmic functions.
- Develop the concept of definite integral using Reimann Sums.
- Evaluate definite integrals using Fundamental Theorem of Calculus.
- Use the method of integration by substitution to determine indefinite integrals.
- Evaluate definite integrals using substitution with original and new limits of integration.
- Calculate the area under a curve over a closed interval [a, b].
- Calculate the area bounded by the graph of two or more functions by using points of intersections.
- Use integration to solve applications in business and economics, such as future value and consumer and producer's surplus.

Techniques of Integration – Differential Equations

- Use the method of integration by parts to find antiderivatives and evaluate definite integrals.
- Integrate using tables of integrals.
- Approximate integrals using numerical integration (Trapezoidal and Simpson's rules).
- Evaluate improper integrals.
- Solve basic first order differential equations.
- Use simple integration and separation of variables to solve differential equations.

Multivariable Calculus

- Evaluate functions of several variables and sketch three-dimensional surfaces.
- Calculate partial derivatives of functions of several variables.
- Calculate maxima and minima of functions of several variables.
- Calculate constrained maxima and minima using the Method of LaGrange Multipliers.
- Evaluate multiple integrals.

Note: To meet transfer requirements, applications presented in this course must include where applicable a balance of life science applications such as exponential growth and decay and biological applications and business applications such as cost, revenue, profit, marginal analysis, supply/demand, elasticity, compound interest, and applications of exponential functions.

Major Topics to be Included

Integration and Its Applications

Techniques of Integration – Differential Equations
Multivariable Calculus