INFOLINK UNIVERSITY COLLEGE

Department Of Computer Science
Course Title Applied Mathematics for Computer science
Course Code Math 233
Credit Hours: 3
Course Category Supportive

Course Description: This course introduces the concepts of limit, continuity, differentiation, integration, and their applications.

Course Objectives: On completion of the course, successful students will be able to:
Understand the formal definition of limit and continuity, evaluate limits of functions, determine the continuity of functions, evaluate derivatives of different types of functions, apply derivatives to solve problems, evaluate integrals of different types of functions, and apply integrals to find the area.

Course Content

Chapter 1: Limits and continuity

- 1.1 Basic limit Rule (properties)
- 1.2 One-sided limits
- 1.3 Infinite limits and limits at infinity
- 1.4 Continuity

Chapter 2. Derivatives

- 2.1 Definition of derivative
- 2.2 Tangent and normal lines
- 2.3 Properties of derivatives
- 2.4 Derivative of common functions
- 2.5 The chain rule
- 2.6 Higher order derivatives
- 2.7 Implicit differentiation

Chapter 3. Inverse functions

- 3.1 Properties of inverse functions
- 3.2 Derivative of inverse functions
- 3.3 Inverses of trig functions and their derivatives
- 3.4 Exponential function
- 3.5 logarithmic functions

Chapter 4. Applications of derivatives

- 4.1 Extreme values of functions
- 4.2 Rolle's Theorem, the Mean Value Theorem, and their applications
- 4.3 Monotonic functions
- 4.4 The first and second derivative tests
- 4.5 Applications to extreme values
- 4.6 Concavity & inflection points

4.7 Graph sketching

Chapter 5. Techniques of integration

5.1 Table of integration
5.2 Integration by substitution
5.3 Integration by parts
5.4 Integration by partial fractions
5.5 Trigonometric integral
5.6 Trigonometric substitution

Quizzes ……..10%
Assessment…….20%
Mid-semester examination ……20%
Attendance……10%
Final examination ……40%
Textbook: -
Robert Ellis and Denny Gulick, Calculus with analytic geometry, 6thed, Harcourt Brace Jovanovich,Publisher s, 5th ed, 1993
Reference:

- R. T. Smith and R. B. Minton, Calculus concepts and connections, McGram-Hill Book Company, 2006
- Leithold, The calculus with analytic geometry, 3rd Edition, Herper& Row, publishers.
- D. V. Widder, Advanced calculus, Prentice-Hall, 1979
- Ross L. Finney et al, Calculus, Addison Wesley, 1995
- E. J. Purcell and D. Varberg, Calculus with analytic geometry, Prentice-Hall INC., 1987
- Adams, Calculus: A complete course, 5th ed, Addison Wesley, 2003
- R. Wrede and M. R. Spiegel, Theory of advanced calculus, 2nd ed., McGraw-Hill, 2002.
- A. E. Taylor and W. R. Mann, Advanced calculus, 3rd ed, John-Wiley and Son, INC, 1995.