JIMMA UNIVERSITY

COLLEGE OF NATURAL SCIENCES

DEPARTMENT OF MATHEMATICS

Applied Mathematics II Course Outline

COURSE CODE: Math 2012

CREDIT HOURS: 4

PRE-REQUISTE: Applied Mathematics I

Chapter One: Real Sequences and series

1.1. Definitions and Notions
1.2. Bounded and Monotonic sequences
1.3. Convergence of sequences
1.4. Real series
    1.4.1. Convergence, Absolute and conditional
    1.4.2. Tests ; comparison, ratio, root, integral and alternating series test

Chapter Two: Power and Fourier series

2.1. Power series
    2.1.1. Radius of Convergence
    2.1.2. Operations between converging power series
    2.1.3. Differentiation and integration of power series
    2.1.4. Taylor series
2.2. Fourier series and orthogonal functions

Chapter Three: Differential calculus of functions of several variables

3.1. Notions, examples and graphs
3.2. Limit and continuity
3.3. Partial Derivatives
3.4. Directional Derivatives and Gradient
3.5. Total Differential and Tangent plane Approximation
3.6. Chain Rule and Implicit Differentiation
3.7. Relative Extreme of Functions of two variables
3.8. Largest and smallest values of function on a given set
3.9. Extreme values under constraint conditions, Lagrange's Multiplier

Chapter Four: Multiple Integrals

4.1. Double Integrals and their calculation by iterated integrals
4.2. Double integrals in polar coordinates
4.3. Application of double integrals
4.4. Triple integrals and their calculations by iterated integrals
4.5. Triple integrals in spherical and in cylindrical Coordinates
4.6. Application : volume, center of mass

Text Books

1. Robert Ellis and Danny Gulik: Calculus with Analytic Geometry
2. H.Anton, Calculus with Analytic Geometry, 5th edition

References

1. Edwards and Penny : Calculus with Analytic geometry
2. Johnson and Kiokemes : Calculus with Analytic Geometry
3. Thomas, Calculus and Analytic Geometry, 9th edition
4. Leithold, Calculus with Analytic Geometry, 3th edition