Stat-214 Advance Calculus and Differential Equation
100 Marks: 03 Credits
Number of Class: 35-40

Advanced Calculus: Function of Several Variables, Limit, Continuity, Differentiability of Function of Several Variables, Taylor's Series, Lagranges Method of Undetermined Multipliers, Jacobian of Transformation, and their Applications in Statistics.

Double, Triple and Multiple Integrations, Change of Variables, Dirichlet's Integral, and its Extension. Beta and Gamma Functions and their proPerties. Incomplete Beta and Gamma Functions. Fourier Series and Fourier Integrals, Transformations of Integrals, Existence of Laplace Transformation, Properties of Laplace Transformation, Inverse Laplace Transformation, their Application, Change of the Order of Integration.

Differential Equations: Definition, Classification, Origin and Application. Initial-value and Boundary-value Problems. Ordinary Differential Equations of First Order and Degree, Separation of Variables. Exact Equations. Separable Equations, Homogeneous Equations, and non-Homogenous Equations, Linear Equations, Bernoulli Equations, Linear Equation with Constant Coefficients, Simple Cases of Differential Equations of First Order and of Degree Higher than One, Partial Differential Equations of First and Second Order, Ordinary Simultaneous Differential Equations. Equation Reducible to Homogenous Forms and Homogenous Linear Equations.

Text

1. Anton, H (2006): *Calculus with Analytic Geometry*, Wiley, New York.
2. Ross, S.L. (1989): *Differential Equations*, 4th Ed., Wiley, N.Y.

References

1. Ayres, F. (1997): *Differential Equations*, McGraw-Hill, NY.
2. Ayres, F. and Meldelson, E. (1992): *Calculus*, McGraw-Hill, 3rd edition, New York.
3. Bacon, H.M. (1942): *Differential and Integral Calculus*, 2nd edition, McGraw-Hill, New York.
4. Binmore, K.G. (1983): *Calculus*, CUP, London.
5. Buck, R. C. (1977): *Advanced Calculus*, 3rd ed. McGraw – Hill, N.Y.
6. Das, B. C., and Mukharjee, B. N. (2009-2010): *Integral Calculus*, Revised edition, U. N. Dhur & Sons Private Ltd.
7. Das, B. C., and Mukharjee, B. N. (2010-2011): *Differential Calculus*, Revised edition, U. N. Dhur & Sons Private Ltd.
8. Edwards, J, (1994): *Differential Calculus*, Macmillan, London.
9. Hall, Maple and Vinograde (1959): *Introduction to the Laplace Transform*, Appleton-Century, N.Y.
10. Maxwell, A.E. (1957): *An Analytical Calculus*, Part I & II, C.U.P., London.
11. Meldelson, E. (1988): *Calculus.*
12. Widder, D.V. (1989): *Advanced Calculus*, 2nd Ed. Prentice-Hall, N.Y.