5. J. Brown and R. Churchill, Complex Variables and Applications, McGraw-Hill Education, 2013.

Code:MSM523 Topology

Topological Spaces, Basis for a topology, Subspace topology, Closed sets and Limit points,

Lectures : 3 Tutorials : 2 Practical : 0 Credits : 4
Continuous Functions, Product Topology, Quotient Topology. Connected spaces, Con

nected subspaces of the Real line, Components and Local Connectedness, Path connect edness, Compact spaces, Limit-point compactness, Local compactness.

Countability and Separation axioms, Urysohn Lemma, Urysohn Metrization Theorem, Tietze Extension Theorem, Tychonoff Theorem

References

1. J.R. Munkres, Topology, 2nd Ed., Pearson Education India, 2001. 2. K.D. Joshi, Introduction to General Topology, New Age International, New Delhi, 2000.
3. J. Dugundji, Topology, Allyn and Bacon, Inc. 1966.
4. J.L. Kelley, General Topology, Van Nostrand, 1955.
5. M.G. Murdeswar, General Topology, New Age International, 1990. 6. G.F. Simmons, Introduction to Topology and modern Analysis, International Stu dent edition, 1963.

Code:MSM524 Multivariable Calculus

Functions of several - variables, Directional derivative, Partial derivative, Total deriva

Lectures : 3 Tutorials : 2 Practical : 0 Credits : 4
tive, Jacobian, Chain rule and Mean - value theorems, Interchange of the order of differ entiation, Higher derivatives, Taylor's theorem, Inverse mapping theorem, Implicit func tion theorem, Extremum problems, Extremum problems with constraints, Lagrange's multiplier method.

7

Multiple integrals, Properties of integrals, Existence of integrals, iterated integrals, change of variables.

Curl, Gradient, div, Laplacian cylindrical and spherical coordinate, line integrals, surface integrals, Theorem of Green, Gauss and Stokes.

References

1. Apostol T.M., Mathematical Analysis, Original Edition .
2. C.H.Edwards Jr.: Advanced Calculus of Several Variables. Academic Press, 1973. 3. Apostol T.M., Calculus-II - Part-2,Non-Linear Analysis

Code:MSM525 Partial Differential Equations Partial Differential Equations- First Order Partial Differential

Equations - Linear equa

Lectures : 3 Tutorials : 2 Practical : 0 Credits : 4
tions of first order. Nonlinear Partial Differential Equations of the first order - Cauchys method of characteristics - Compatible systems of first order equations - Charpits method- Special types of First order equations - Jacobis method.
Partial Differential Equations of Second order - The origin of Second-order Equations - Linear Partial Differential Equations with constant coefficients - Equations with vari able coefficients - Characteristics curves of second - order equations- Characteristics of

equations in three variables.
The Solution of Linear Hyperbolic Equations - Separation of variables - The Method of Integral Transforms - Nonlinear Equations of the second order. Laplaces Equation - The occurrence of Laplaces Equation in Physics- Elementary solution of Laplaces Equation - Families of Equipotential surfaces Boundary value problems - Separation of variables- Problems with axial symmetry.
The wave equation - The occurrence of wave equation in Physics - Elementary solutions of the one-