

## Ergodic Theory

Code:MSM5014

Lectures : 2 Poincare's Recurrence Theorem, Hopf's Maximal Ergodic Theorem, Birkoff's Individual ergodic Theorem, von Neumann's Mean Ergodic Theorem. Ergodicity, Mixing, Eigenvalues. Discrete Spectrum Theorem. Ergodic automorphisms of Compact Groups. Conjugacy. Entropy.

Tutorials : 2

Practical : 0

Credits : 3

### References

1. Halmos, P.R., Intordocutory Lectures in Ergodic Theory
2. Nadakarni, M.G., Ergodic Theory, Hindustan Book Agency, 3rd edition.

## Fixed Point Theory

Code:MSM5015

Lectures : 2 The Background of Metrical Fixed Point Theory, Fixed Point Formulation of Typical Functional Equations Fixed Point Iteration Procedures, The Principle of Contraction mapping in complete metric spaces, Some generalizations of Contraction mapping, A converse of Contraction Principle, some applications of Contraction Principle.

Tutorials : 2

Practical : 0

Credits : 3

Convexity, Smoothness, and Duality Mappings, Geometric Coefficients of Banach Spaces, Existence Theorems in Metric Spaces, Existence Theorems in Banach Spaces, Approximation of Fixed Points, Strong Convergence Theorems.

Compactness in metric spaces. Measure of noncompactness, Measure of noncompactness in Banach spaces, Classes of special operators on Banach spaces. The Fixed point property, Brower's Fixed point theorem, equivalent formulations, some examples and applications, The computation of fixed points, Schauder's fixed point theorem and its generalizations, , Applications of Fixed Point Theorems.

### References

1. V.Berinde, Iterative approximation of fixed points, Springer-Verlag Berlin Heidelberg 2007.
2. V.I.Istratescu, Fixed Point Theory - An Introduction, D.Reidel Publishing Company, Dordrecht, Holland, 1981.
3. R.P. Agarwal, Maria Meehan and D.O' Regan, Fixed point theory and applications, Cambridge University Press, 2001.
4. K.Goebel and W.A.Kirk, Topics in Metric fixed point theory, Cambridge University Press 1990.
5. A. Granas and J. Dugundji, Fixed point theory, Springer Monographs in Mathematics, 2003.
6. M.A.Khamsi and W.A.Kirk, An Introduction to Metric Spaces and Fixed Point Theory, A Wiley-Interscienc Publication, 2001.
7. W.A.Kirk and B.Sims, Handbook of Metric Fixed Point Theory, Kluwer Academic Publishers, 2001.
8. Sankatha Singh, Bruce Watson and Pramila Srivastava, Fixed point theory and best approximation: The KKM-Map principle, Kluwer Academic Publishers, 1997.
9. E.Zeidler, Nonlinear Functional Analysis and its Applications I: Fixed Point Theorems, Springer-Verlag, New York, 1986.