

Banach's contraction principle – Further extensions- Caristi – Ekeland principle -Equivalence of Caristi- principles. Fixed Point Theorems in partially ordered spaces and other abstract spaces.

Tarski's Fixed point theorem - Hyperconvex spaces – Properties – fixed point theorems – intersection of hyper convex spaces – Isbell's convex hull.

Uniformly convex Banach spaces – Fixed point theorem of Browder, Gohde and Kirk. Reflexive Banach spaces –Normal structure- Fixed point theorems.

Generalized Banach Fixed-point theorem- Upper and lower semi continuity of multivalued maps – Generalized Schauder Fixed point theorem – Variational Inequalities and the Browder Fixed-Point theorem – Extremal Principle –Applications to Game Theory – Michael's selection theorem.

Fixed point theorem for continuous functions - Brouwer's theorem -Schauder's theorem - applications - Hairy ball theorem - pancake problems- Kyfan's best approximation theorem.

#### **TEXT BOOKS/ REFERENCES:**

1. E. Zeidler, *Nonlinear Functional Analysis and its applications*, Vol. I Springer –Verlag New York (1986)
2. M. A. Khamsi & W. A. Kirk, *An introduction of Metric spaces and Fixed point theory*, John Wiley & sons (2001).
3. D.R. Smart, *Fixed point theory*, Cambridge University Press, (1974).
4. V.I. Istratescu, *Fixed point theory*, D. Reidel Publishing Company, Boston (1979)