

SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Mathematics)
Semester: IV
Syllabus with Effect from: November-2013

Paper Code: PS04EMTH02	Total Credit: 4
Title Of Paper: Operator Theory	

Unit	Description in detail	Weighting (%)
I	Review of Hilbert space H , orthogonal complement in H , bounded operator, existence of adjoint operator and its properties, self-adjoint operator and its properties, unitary operator and its properties, Fuglede-Putnam-Rosenblum theorem (i.e., Commutativity Theorem).	25%
II	Resolution of the identity E , the algebra $L^\infty(E)$, identifying $L^\infty(E)$ with a closed subalgebra of $BL(H)$, spectral theorem and its applications, spectral decomposition.	25%
III	Symbolic calculus for normal operators and applications, invariant subspace problem, eigenvalues of normal operators, positive operators and square roots, polar decomposition and its uniqueness, unitarily equivalent.	25%
IV	Hilbert-Schmidt operators and their properties, trace class operators, Hilbert-Schmidt and trace class norms, relations between these two types of operators.	25%

Basic Text & Reference Books:-

- W. Rudin, Functional Analysis, Tata McGraw Hill Pub. Company, New Delhi, 1973.
- J. B. Conway, A Course in Operator Theory, Graduate Studies in Mathematics, Volume 21, American Mathematical Society, Rhode Island, 2000.

