

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

<b>Paper Code: PS03EMTH05</b>	<b>Total Credit: 4</b>
<b>Title Of Paper: Harmonic Analysis - I</b>	

Unit	Description in detail	Weighting (%)
I	Fourier series and integrals, elementary properties of Fourier series, $L^2$ -theory of Fourier series, convolution in $L^1(\mathbb{T})$ , approximate identity, $L^1(\mathbb{T})$ and $L^p(\mathbb{T})$ as Banach algebras.	25%
II	Fourier Stiltjes coefficients, the measure algebra $M(\mathbb{T})$ . Fejer kernel and Poisson kernel, harmonic extension of $L^1$ - functions, pointwise summability, positive definite sequence and Herglotz theorem.	25%
III	Fourier transform in $L^1(\mathbb{R})$ , convolution, inverse Fourier transform, inversion theorem, uniqueness.	25%
IV	Kernels on $\mathbb{R}$ , Plancherel theorem. Bochner's theorem, the Poisson summation formula.	25%

**Basic Text & Reference Books:-**

- Henry Helson, Harmonic Analysis, Second edition, Hindustan Book Agency.
- R.E. Edwards: Fourier Series - A modern introduction Vol-I, Rinehart & Winston Inc., 1967.
- Y. Katznelson: An introduction to Harmonic Analysis John Wiley and Sons, 1968.
- John J. Benedetto: Harmonic Analysis and Applications (CRC Press, 1997).

