19BSM706T - Integral Equations									
Teaching Scheme					**Examination Scheme**				
L	**T**	**P**	**C**	**Hrs/Week**	**Theory**			**Practical**		**Total**
					MS	**ES**	**IA**	**LW**	**LE/Viva**	**Marks**
3	1	--	4	4	25	50	25	--	--	100

OBJECTIVES

1. Course is aimed to develop understanding of integral equations arise in several physical problems.
2. To make students familiar with the methods of solving of integral equations.

SYLLABUS

Unit-I   10

Integral Equation: Volterra integral equation, Fredholm integral equation, Singular Integral Equation, Non-linear Integral Equation, Differentiation of a function under an integral sign, Relation between differential and integral equation, Examples.

UNIT II   10

Solution of integral Equations: Solution of a non-homogeneous Volterra's integral equation of second kind by the method of successive substitution., Solution of a non-homogeneous Volterra's integral equation of second kind by the method of successive approximation, Determination of some resolvent kernels, Voletrra integral equation of first kind, Solution of Fredholm integral equation by the method of successive substitutions, Iterated Kernels, Solution of Fredholm integral equation by the method of successive approximations, Voletrra's solution of Fredholm's equation

UNIT III   10

Fredholm Integral Equations: Fredholm First Theorem, Unique solution of the non-homegeneous Fredholm integral equation, Hadamard's Theorem, Fredholm Second Theorem, Orthogonality of Charecteristics solutions, Solution of Homogeneous integral equation.

UNIT IV   9

Symmetric Kernel, Orthogonality, Orthogonality of fundamental functions, Eigen values of a symmetric kernel, Schmidt's solution of the non homogeneous integral equations, Solution of the Fredholm integral equation of first kind.

APPROXIMATE TOTAL	**39 Hours**

OUTCOMES

1. On successful completion of the course students will be able to recognize difference between Volterra and Fredholm Integral Equations, First kind and Second kind, homogeneous and inhomogeneous etc.

2. The can apply different methods to solve integral equations.

3. Students will have much better and deeper understanding of the integral equations.

TEXTS AND REFERENCES

1. M. Krasnov, A. Kiselev, G. Makarenko, Problems and Exercises in Integral Equations – Mir Publishers in 1971 A.R Vasistha& A.K Vasistha, Statics and Dynamics, Krishna Publication.
2. A D Polyanin , A V Manzhirov, *Handbook of Integral Equation* – Chapman & Hall / CRC
3. Shanti Swarup, Integral Equations- Krishna Prakashan