SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
Department of Applied Science

Semester/Year		Third/Fourth	Program		B.Tech.
Subject Category	Departmental Core	Subject Code:		Subject Name:	Numerical Method &Integral Transforms

Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
End Sem	Mid-Sem	Quiz	End Sem	Lab-Work		L	T	P	
60	20	20	-	-	100	2	1	-	3

Prerequisites:

Basic knowledge of Mathematics: Simultaneous Equations, Differentiation, Integration, Matrices

Course Objective:

The objective of this course is to familiarize the prospective engineers with techniques in Integral Transforms and Numerical Methods. It aims to equip the students to deal with advanced level of mathematics and applications that would be essential for their disciplines.

Course Outcomes:

This course primarily contributes to applied mathematics program outcomes that develop students abilities to:
1.Interpolation will help them to find the solution of various types of problems like census problems, weather problems etc.
2.It is useful to solve various differentiation and integration problems using numerical techniques.
3.It will be very much useful to find the solution of Simultaneous Linear Equations using Numerical methods
4.Students will learn the expansion of functions and various transformations.
5.It will help them to solve various physical science and engineering with the application of Laplace transform.
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5.It will be very much useful to solve various boundary value problems.

UNITs	Descriptions	Hrs.	CO's
I	**Interpolation :** Finite Differences, Factorial Notations , Newton's Forward Interpolation Formula, Newton's Backward Interpolation Formula, Gauss Forward Interpolation Formula, Gauss Backward Interpolation Formula, Bessel's Formula, Sterling Formula, Newton's Divided Difference Interpolation Formula, Lagrange's Interpolation Formula.	8	1
II	**Numerical Differentiation:** Methods of Numerical Differentiation, **Numerical Integration** : Quadrature Formula, Trapezoidal Rule, Simpson's One-third Rule, Simpson's Three-Eight Rule and Weddle's Rule.	8	2
III	**Solution of Simultaneous Linear Equations** : Solution of simultaneous linear equations by Gauss elimination, Gauss Jordan, Crout's Methods, Jacobi's and Gauss-Siedel Iterative Method.	8	3
IV	**Fourier Series and Fourier Transform :** Fourier Series, Change of Interval, Half Range Sine and Cosine Series, Fourier Transform, Fourier Sine Transform and Fourier Cosine Transform.	8	4
V	**Laplace Transform:** Laplace Transform of Elementary Functions, Properties of Laplace Transform: Change of scale property, Second shifting theorem, Laplace Transform of derivatives, Inverse Laplace Transform and its properties, Convolutions theorem, Application of Laplace Transform to solve the ordinary differential equations.	8	5
Total Hours		40	

Reference Books:

1 .Higher Engineering Mathematics by B.S.Grewal
2. Engineering Mathematics by B. V. Rammana
3. Engg. Mathematics by H.K. Dass
4 . Numerical Methods by B.S.Grewal