<table>
<tr><td colspan="5">Devi Ahilya Vishwavidhyalaya, Indore, India
Institute of Engineering & Technology</td><td>II Year B.Tech. (Electronics and Instrumentation Engineering)</td></tr>
<tr><td>Course Code & Name</td><td colspan="5">Instructions Hours per Semester and Credits</td></tr>
<tr><td rowspan="2">3REBS1

APPLIED MATHEMATICS-III</td><td colspan="2">Classroom Instruction (CI)</td><td>Lab Instruction (LI)</td><td>Term Work (TW) and Self Learning (SL)</td><td>Total no. of Hours Per semester</td><td>Total Credits (Total Hours/30)</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>TW+SL</td><td rowspan="2">90</td><td rowspan="2">3</td></tr>
<tr><td>30</td><td>10</td><td>0</td><td>50</td></tr>
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Course Learning Objectives:

- To develop an understanding of the underlying mathematics as a preparation for a specialist study of applications areas like electromagnetic and electrostatic field theory, control theory, communication and signal processing, power transmission, design of discrete times Systems, circuit analysis etc.
- Numerical approach enables solution of a complex problem with a great number of very simple operations. It is useful to find the solution with use of computers making calculation easy and fast.

Prerequisites:

Basic knowledge of algebra of complex numbers, determinants, matrices, differentiation and integration of functions and probability theory.

COURSE CONTENTS

Unit-I

Function of Complex variables: Analytic functions, Cauchy's integral theorem and integral formulae, Taylor's and Laurent' series, Residue theorem, Solution of integrals.

Unit-II

Random variables, mass and density functions, stochastic processes, autocorrelation, Markov chain, Multistep in Markov chain.

Unit-III

Interpolation: Finite difference operators, Newton's and Stirling's interpolation, Numerical differentiation and integration.

Unit-IV

Numerical solutions of algebraic and transcendental equations-Bisection, Regula-Falsi and Newton-Raphson methods. Numerical solution of system of linear equation-Iterative methods, Numerical solutions of differential equations - single and multi-step methods.

Unit-V

Fourier series, change of intervals, continuous-time and discrete-time Fourier series, Fourier Integral and transforms.

Course Outcomes:

CO.No.	CO
CO1	Apply complex analysis in AC circuit analysis, heat transfer, potential flows, processing of radio, telephone and video signals etc.
CO2	Stochastic processes can be used as mathematical models of systems and phenomena that vary in a random manner. Markov processes can be used to determine the future behaviour of the process by its present state. Reliability helps to create the most reliable and fail-safe system.
CO3	Interpolation techniques will help to fill in the blanks, that is use interpolation helps to understand how things behaved in the past or in future, rate of change etc. even when one do not have full information (about the related function or formula).
CO4	Numerical method techniques will help to approximate Mathematical procedures, because either the procedure cannot be solved analytically or the analytical method is inflexible.
CO5	Fourier series can be used to analyse the frequency components of signal data, signal filtering, noise removal, compression of audio signals etc.

Books Recommended:

[1]. B.S.Grewal, "*Engineering Mathematics*", Khanna Publishers, 42/e, 2015.
[2]. Erwin. Kreyszig, "*Advanced Engineering Mathematics*", 8th edition, John Willy and sons Publications, 1999.
[3]. Gupta P.P. & Malik G.S., "*Calculus of Finite Differences and Numerical Analysis*", Krishna Prakashan Mandir, Meerut, 21/e, 2006.
[4]. Kasana H.S., "*Complex Variables: Theory and Applications*", Prentice-Hall of India Pvt. Ltd, 2nd edition, 2005.
[5]. T. Veerarajan, "*Probability, Statistics and Random Processes*", Tata McGraw – Hill Education, 2002.
[6]. G. Paria, "*Statistics and Stochastic Processes Part II*", Scholar's Publication, Indore.
[7]. A.R. Vasishtha and R.K. Gupta, "*Integral Transforms*", Krishna Prakashan Media Ltd, Meerut, India, 2000.
[8]. Murray R. Spiegel, "*Schaum's Outline of Fourier Analysis*", McGraw-Hill, New York, 2004.

CO-PO-PSO Relationship

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO 1	PSO 2	PSO 3
3REBS1.CO1	3	3	2	2	3							3	2	1
3REBS1.CO2	3	3	2	2	3							2	3	1
3REBS1.CO3	3	3	2	2	3							3	2	1
3REBS1.CO4	3	3	2	2	3							2	3	1

3REBS1.CO5	3	3	2	2	3							3	2	1