

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM

SYLLABUS FOR 2015 -2019

ENGINEERING MATHEMATICS-IV (Common to all Branches)

Course Title: Engineering Mathematics - IV

Credits: 04

Contact Hours/Week : 04

Exam. Marks : 80

Exam. Hours : 03

Course Code : 15MAT41

L-T-P: 4-0-0

Total Hours: 50

IA Marks : 20

Course Objectives:

The purpose of this course is to make students well conversant with numerical methods to solve ordinary differential equations, complex analysis, sampling theory and joint probability distribution and stochastic processes arising in science and engineering.

MODULE	RBT Levels	No. of Hrs
MODULE-I Numerical Methods: Numerical solution of ordinary differential equations of first order and first degree, Taylor's series method, modified Euler's method, Runge - Kutta method of fourth order. Milne's and Adams-Bashforth predictor and corrector methods (No derivations of formulae).	L1 & L2	10
MODULE-II Numerical Methods: Numerical solution of second order ordinary differential equations, Runge-Kutta method and Milne's method. Special Functions: Series solution-Frobenius method. Series solution of Bessel's differential equation leading to $J_n(x)$ -Bessel's function of first kind. Basic properties and orthogonality. Series solution of Legendre's differential equation leading to $P_n(x)$ -Legendre polynomials. Rodrigue's formula, problems	L3	10
MODULE-III Complex Variables: Review of a function of a complex variable, limits, continuity, differentiability. Analytic functions-Cauchy-Riemann equations in cartesian and polar forms. Properties and construction of analytic functions. Complex line integrals-Cauchy's theorem and Cauchy's integral formula, Residue, poles, Cauchy's Residue theorem (without proof) and problems. Transformations: Conformal transformations, discussion of transformations: $w=z^2$, $w=e^z$, $w = z + (1/z)(z \neq 0)$ and bilinear transformations-problems.	L1 & L3 L3	10
MODULE-IV Probability Distributions: Random variables (discrete and continuous), probability mass/density functions. Binomial distribution, Poisson distribution. Exponential and normal distributions, problems. Joint probability distribution: Joint Probability distribution for two discrete random variables, expectation, covariance, correlation coefficient.	L3	10

