

The Maharaja Sayajirao University of Baroda Polytechnic Diploma in Electronics & Communication Engg. (HPP)			ACADEMIC YEAR 2021-22		
Year	I	APPLIED MATHEMATICS-II (AMT3219)	Lecture /Tutorial Hrs per week	4/2	
Semester	II		Max marks	100	
Pre-Requisite: 10th Standard Mathematics, Applied Mathematics I					
CO1	Solve the system of linear equations using determinants and matrices; Determine the eigen values of matrices and apply Cayley Hamilton theorem.				
CO2	Evaluate indefinite integrals of algebraic, exponential, logarithmic, trigonometric functions using different methods.				
CO3	List and prove the properties of definite integrals and utilize them to evaluate the definite integrals.				
CO4	Solve the first order, first degree ordinary differential equations and higher order linear equations with constant coefficients.				
CO5	Solve examples based on various numerical methods. Solve examples based upon the concept of Vector Algebra.				
BT	1. Remember 2. Understand 3. Application 4. Analysis 5. Evaluation 6. Creation				
COURSE CONTENT/SYLLABUS					
Unit	Unit Name		Hrs	Weightage	CO
1	Matrices and Determinants: Determinants (up to 3rd order only), row and column expansion, properties of determinants, applications of determinants to solutions of linear equations, Cramer’s rule, Matrices, algebraic structures on matrices, properties of addition, multiplication and scalar multiplication of matrices, some special matrices, Symmetric, skew symmetric, Hermitian and skew Hermitian matrices, solution of linear equations by matrix method, elementary matrices, reduction of a matrix to a triangular form, adjoints and inverses, Characteristic equation, Cayley Hamilton theorem, Application of Cayley Hamilton theorem in computing inverse of a square matrix		12	18	CO1
2	Indefinite Integrals Standard formulae, Integration by substitution, Integration by Algebraic functions, Integration by parts, Integration by the method of partial fractions, Trigonometric substitutions		10	20	CO2
3	Definite Integrals Definite Integrals : Definition, Definite Integrals as the limit of a sum, properties of definite integrals, reduction formula		8	15	CO3
4	Differential Equations: Order and degree of Differential Equations, Formation of differential equations, Separation of variables, Equations reducible to separation of variables, Homogeneous differential equations, Equation reducible to homogeneous, Linear Differential Equation, Equation Reducible to Linear form, Exact Differential Equation		12	25	CO4
5	Numerical Methods: Introduction to error analysis: Absolute, relative and percentage error, number and their accuracy Solution of algebraic and transcendental equations of one variable: Bisection Method, Method of false position, Newton Raphson’s Method. Finite differences, Newton’s interpolation, Lagrange’s formula. Numerical integration: Trapezoidal Rule, Simpson’s 1/3 & 3/8th rules.		12	20	CO5

6	Vector Algebra Concept of a vector, representation of a point by a vector, vectors in Cartesian and polar form, arithmetic operations on vectors, addition, subtraction, scalar multiplication, scalar and vector product of two vectors, applications of vectors in mechanics and electromagnetism	6	2	CO5
		60	100	

REFERENCE BOOKS:

1.	Integral Calculus by Shanti Narayan, Dr. P.K.Mittal, S.Chand Publications (35th Edition,2005)
2.	Introductory methods of numerical analysis, S.S. Sastry Prentice- Hall India.
3.	Mathematics for Polytechnic students By S. P. Deshpande (For Diploma Students). Pune Vidyarthi Gruha Prakashan
4.	A textbook of Engineering Mathematics by N .P. Bali Laxmi Publications(2016)
5.	Numerical methods for Scientific & Engineering computations, M.K.Jain, Iyenger & R.K.Jain New Age Publishers.