

## **BAPATLA ENGINEERING COLLEGE:: BAPATLA**

(Autonomous)

CIE Marks       :       30       SEE Marks       :       70       Credits       :         Pre-Requisite: None					Ι	B.Te	ch.	I Semes		EE1	01/MA	<b>NO1</b>		QUATI				
Pre-Requisite: None         Pre-Requisite: None         Solve a system of linear homogeneous and non-homogeneous equations, finding inverse of a given square matrix and also its Eigen values and Eigen vectors         Identify the type of a given differential equation and select and apply the appropriat analytical technique for finding the solution of first order ordinary differential equations.         Create and analyze mathematical models using higher order differential equation solve application problems that arise in engineering.         Solve a linear differential equation with constant coefficients with the given in conditions using Laplace Transforms.         Course Outcomes: After studying this course, the students will be able to         CO-1       Find the eigen values and eigen vectors of a given matrix and its inverse.         CO-2       Apply the appropriate analytical technique to find the solution of a first order ordin differential equations.         CO-4       Apply Laplace transforms to solve differential equations arising in engineering         Mapping of Course Outcomes with Program Outcomes & Program Specific Outcomes         PO's       PSO's         CO-1       3       3       -       -       -       2       3       -         Mapping of Course Outcomes with Program Outcomes & Program Specific Outcomes       PSO's       CO-1       3       3       -       -       -       2       3       -       -         <					urs/V	Veek			:			·/Wee			1:	:	0	
Course Objectives: Students will learn how to         Solve a system of linear homogeneous and non-homogeneous equations, finding inverse of a given square matrix and also its Eigen values and Eigen vectors         Identify the type of a given differential equation and select and apply the appropriat analytical technique for finding the solution of first order ordinary different equations.         >       Create and analyze mathematical models using higher order differential equation solve application problems that arise in engineering.         >       Solve a linear differential equation with constant coefficients with the given in conditions using Laplace Transforms.         Course Outcomes: After studying this course, the students will be able to         CO-1       Find the eigen values and eigen vectors of a given matrix and its inverse.         CO-2       Apply the appropriate analytical technique to find the solution of a first order ordin differential equation.         CO-3       Solve higher order linear differential equations with constant coefficients arise engineering applications.         CO-4       Apply Laplace transforms to solve differential equations arising in engineering         Mapping of Course Outcomes with Program Outcomes & Program Specific Outcomes         CO-1       3       3       -       -       -       2       3       -         CO-2       3       3       3       -       -       -       2       3       -	CIE Mar	ks	:	30			SI	EE Mark	ts :	7	0			Credits	:		3	
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inverse of a given square matrix and also its Eigen values and Eigen vectors         Identify the type of a given differential equation and select and apply the appropriat analytical technique for finding the solution of first order ordinary difference equations.         Create and analyze mathematical models using higher order differential equation solve application problems that arise in engineering.         Solve a linear differential equation with constant coefficients with the given in conditions using Laplace Transforms.         Course Outcomes: After studying this course, the students will be able to         CO-1       Find the eigen values and eigen vectors of a given matrix and its inverse.         CO-2       Apply the appropriate analytical technique to find the solution of a first order ordin differential equation.         CO-3       Solve higher order linear differential equations with constant coefficients arise engineering applications.         CO-4       Apply Laplace transforms to solve differential equations arising in engineering         Mapping of Course Outcomes with Program Outcomes & Program Specific Outcomes         CO-1       3       3       2       -         CO-1       3       3       2       -       -       2       3       -         CO-1       3       3       -       -       -       -       2       3       -         CO-3       3       3       -       -	Course (	Object	ives:	Stude	ents v	vill le	arn h	low to										
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Linear Algebra: Rank of a Matrix; Elementary transformations of a matrix; Gauss-Jon	CO-1 CO-2 CO-3 CO-4 Mapping	Find Appl differ Solve engin Appl of Cou of Cou D-1 D-2 D-3	the ei y the centia e high eerin y Lap rse O 1 3 3 3	appro appro l equa her o g app lace <b>Dutcor</b> 2 3 3 3 3	values opriation order plication trans <b>mes w</b> <b>3</b> 2 3 3 3	s and te ana linea ions. forms rith P	eiger alytica ar dif s to so rogra 5 - - - -	a) vectors         al techn         ferential         blve diff         m Outco         PO's         6       7         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -         -       -	s of a ique t erenti omes 8 - - -	give to fin ation al eq	n matr d the s with uation ogram	rix and soluti h con ns aris	d its on or stant ific C 12 2 2 2 2	f a first of t coeffic n engine Dutcomes Pt 1 3 3 3	ients ering 60's 2 - - - -	s aris		

method of finding the inverse; Consistency of linear System of equations: Rouches theorem, System of linear Non-homogeneous equations, System of linear homogeneous equations; vectors; Eigen values; properties of Eigen values(without proofs); Cayley-Hamilton theorem (without proof).

[Sections: 2.7.1; 2.7.2; 2.7.6; 2.10.1; 2.10.2; 2.10.3; 2.12.1; 2.13.1; 2.14; 2.15.]



## BAPATLA ENGINEERING COLLEGE:: BAPATLA

(Autonomous)

	UNIT-2	(12 Hours)						
<b>Differential Equations of first order</b> : Definitions; Formation of a Differential equation; Solution of a Differential equation; Equations of the first order and first degree; variables separable; Linear Equations; Bernoulli's equation; Exact Differential equations; Equations reducible to Exact equations: I.F found by inspection, I.F of a Homogeneous equation, In the equation M dx+ N dy = 0, $\frac{\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x}}{N}$ is a function of x and $\frac{\frac{\partial N}{\partial x} - \frac{\partial M}{\partial y}}{M}$ is a function of y.								
	of a first order Differential equations: Newton's law of cooling; Rat	te of decay of						
Radio-active n	.; 11.3; 11.4; 11.5; 11.6; 11.9; 11.10; 11.11; 11.12.1; 11.12.2; 11.12.4;	12 6. 12 8]						
	UNIT-3	(12 Hours)						
Linear Differ	rential Equations: Definitions; Theorem; Operator D; Rules fo	r finding the						
procedure to a Differential Ec	complementary function; Inverse operator; Rules for finding the Particular Integral; Working procedure to solve the equation; Method of Variation of Parameters; Applications of Linear Differential Equations: Oscillatory Electrical Circuits.							
[Sections: 13.1	; 13.2.1; 13.3; 13.4; 13.5; 13.6; 13.7;13.8.1;14.1;14.5].							
	UNIT-4	(12 Hours)						
<b>Laplace Transforms:</b> Definition; conditions for the existence; Transforms of elementary functions; properties of Laplace Transforms; Transforms of derivatives; Transforms of integrals; Multiplication by t <sup>n</sup> ; Division by t; Inverse transforms- Method of partial fractions; Other methods of finding inverse transforms; Convolution theorem(without proof); Application to differential equations: Solution of ODE with constant coefficients using Laplace transforms. [Sections:21.2.1; 21.2.2; 21.3; 21.4; 21.7; 21.8; 21.9; 21.10; 21.12; 21.13; 21.14; 21.15.1]								
Text Books :	B.S.Grewal, "Higher Engineering Mathematics", 44 <sup>th</sup> edition, Khan 2017.	na publishers,						
References :	<ul> <li>[1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9<sup>th</sup></li> <li>Wiley &amp; Sons.</li> <li>[2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathematical Mathematical States and Math</li></ul>							
	Publications, 2010.							