

LINEAR ALGEBRA AND ORDINATRY DIFFERENTIAL EQUATIONS I B. Tech. I Semester 20CE101/MA01																	
IB. Tech. I Semester 20CE101/MA01 Lectures : 2 Hours/Week Tutorial : 1 Hour/Week Practical : 0																	
Lectures:2 Hours/WeekTutorial:1 Hour/WeekPractical:0CIE Marks:30SEE Marks:70Credits:3														0			
CIE Mark	KS	:	30				SE	E Ma	rks	:	70			Cre	dits	:	3
Pre-Requ	uisite	: No	ne														
Course C)bjec	tives	s: Stu	ıdent	ts wil	l leai	rn ho	ow to									
 Solve a system of linear homogeneous and non-homogeneous equations, finding the 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 appropriate 																	
A	Ider anal equa	ntify ytica ation	the training the training the training the training the training term of term o	ype o chnio	of a g que	iven for	diffe findi	erentia ng th	al eq le so	uatic oluti	on and on of	l sele f firs	ct and st ord	l apply ler or	v the ap dinary	propri differ	ate ential
\checkmark	Crea solv	ate a e ap	nd a plica	nalyz tion	ze m probl	ather ems	natic that	al mo arise i	odels in en	s usi: igine	ng hig ering.	gher	order	differ	ential o	equation	ons to
\blacktriangleright	Solv cone	ve a dition	linea ns us	ar di sing I	ffere Lapla	ntial ce Ti	equa ransf	ation forms.	with	cor	istant	coef	ficien	ts wit	h the g	given	initial
Course C	Outco	mes	: Aft	er stı	udyin	ig thi	s coi	urse, t	he st	tuder	nts wi	ll be	able t	0			
CO-1	Find	l the	eige	n val	ues a	ind e	igen	vecto	rs of	f a gi	ven n	natrix	and	its invo	erse.		
CO-2	App diffe	oly th erent	ie ap ial e	prop quati	riate on.	analy	ytica	l tech	niqu	e to	find t	he sc	olutior	n of a	first or	der ore	linary
CO-3	Solv engi	ve hi ineer	igher ing <i>e</i>	· ord	ler li catio	near 1s.	diff	erenti	al e	quati	ions v	with	const	ant co	oefficie	nts ar	ise in
CO-4	Арр	ly L	aplac	e tra	insfo	rms t	o sol	lve di	ffere	ntial	equat	tions	arisin	ig in ei	ngineer	ring	
Monning	ofCo	111160	Out			h Duo	anar	n Out	0000		Drogr	am S	naaifi	o Outo	omos		-
Mapping		uise	Out	come	S WIU		ngi ai Di	$\frac{110uu}{020}$	come	es a	Trogr		peem	c Oute	DEC) /6	
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CO-2		<u> </u>	$\frac{3}{2}$	2	-	-	-	-	-	-	-	-	2	2	-	-	-
CO-3		3	$\frac{3}{2}$	3	-	-	-	-	-	-	-	-	2	2	-	-	-
CO-4		3	3	3		-	-	-	-	-	-	-	Z	Z	-	-	-
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T	1		D1	f	- 1/	r		1-1	4	4	<u> </u>		C			12 H0	urs)
Linear A	Alged	ra:	Kank	< 01 	a N	Contraction	i; El	emen	tary	tran	SIOrm	ation	IS OI	a ma	trix; G	auss-J	ordan
method c		aing	the	inve	rse;	Cons	sister	icy of	[lin	ear	Syster	n oi	equa	tions:	Rouch	es the	orem,
System of	I line	ar No	on-ne	omog	geneo	ous e	quat	ions, s	Syste	em o	I linea	ar no	moge	neous	equation	ons; ve	ctors;
rigen va	iues;	prop	Jertie	-5 01	EIg	en v	arues	s(with	out	proc	ois); C	Jayle	у-па	miton	theore	m (w	nnout
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.]																	
						I	UNI	Т-2									



		(12 Hours)
Differential Equa	tions of first order: Definitions; Formation of a Different	tial equation;
Solution of a Dif	ferential equation; Equations of the first order and first degr	ree; variables
separable; Linear	: Equations; Bernoulli's equation; Exact Differential equation	ns; Equations
reducible to Exact	equations: I.F found by inspection, I.F of a Homogeneous equation	uation, In the
	$\frac{\partial M}{\partial N} = \frac{\partial N}{\partial M}$	
equation M dx+ N	dy = 0, $\frac{\partial y}{\partial x}$ is a function of x and $\frac{\partial x}{\partial x}$ is a function	n of y.
	N M	
Applications of a	First order Differential equations: Newton's law of eacling: Pat	a of doory of
Radio active mater	ials	e of decay of
[Soctions: 11 1: 11	1015. 2· 11 /· 11 5· 11 6· 11 0· 11 10· 11 11· 11 12 1· 11 12 2· 11 12 /·	12 6. 12 8]
	5, 11.4, 11.5, 11.6, 11.9, 11.10, 11.11, 11.12.1, 11.12.2, 11.12.4, UNIT_3	(12 Hours)
Linear Differenti	al Equations: Definitions: Theorem: Operator D: Rules fo	r finding the
complementary fu	action: Inverse operator: Rules for finding the Particular Integ	ral. Working
procedure to solve	the equation: Method of Variation of Parameters: Application	ons of Linear
Differential Equation	ons: 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)
Laplace Transfor	ms: Definition; conditions for the existence; Transforms of	of elementary
functions; propertie	es of Laplace Transforms; Transforms of derivatives; Transform	s of integrals;
Multiplication by	t ⁿ ; Division by t; Inverse transforms- Method of partial fra	ctions; Other
methods of findin	g inverse transforms; Convolution theorem(without proof); A	application to
differential equation	ns: Solution of ODE with constant coefficients using Laplace tran	nsforms.
[Sections:21.2.1; 2:	1.2.2; 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 th edition, Khan	na publishers,
201	7.	
References : [1]	Erwin Kreyszig, "Advanced Engineering Mathematics", 9 th	edition, John
Wi	ley & Sons.	
[2]	N.P.Bali and M.Goyal, "A Text book of Engineering Mathem	natics" Laxmi
Put	plications, 2010.	



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IB. Tech.II Semester20CE201/MA02Lectures:2 Hours/WeekTutorial:1 Hour/WeekPractical:0CIE Marks:30SEE Marks:70Credits:3																	
CIE Marl	٢S	:	30)			SE	EE Ma	rks	:	70			Cr	edits	:	3
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Pre-Req	uisite	No	ne														
Course (Object	tive	s: St	uder	ıts wi	11 lea	ırn h	ow to									
\triangleright	Solv num	e a eric	lgeb al m	raic, etho	tran ds.	iscen	denta	al and	ł sy	vstem	n of	linea	r equ	ations	with	the he	elp of
~	App are r with	ly th not a the	ne te appl give	chnio icabl en in	ques e anc itial c	of nu 1 solv condi	umer ve th tion	ical in e first using	tegr ord diff	ation ler of erent	n whe rdinai t metl	neven ry dif hods.	and ferent	where ial equ	ver rout uations	ine me numei	ethods rically
\checkmark	Eval	uate	e doi	uble	and t	riple	integ	grals a	nd a	pply	then	n to fi	nd ar	eas and	d volum	nes.	
>	Eval appl	uate icati	the the	e lin	e, su	rface	e and	i volu	ime	inte	grals	and	learn	their	inter-re	elation	s and
Course (Dutco	mes	: Af	ter st	udyi	ng th	is co	ourse, t	the s	stude	nts w	vill be	able	to			
CO-1	Solv tech	e no niqu	on-li les.	near	equa	tions	s and	l syste	m o	of lin	ear e	quatio	ons w	ith the	e help o	f Num	nerical
CO-2	Solv cond	e th litio	e fi n.	rst oi	der o	ordin	ary o	differe	entia	l equ	latior	is nui	meric	ally w	ith the	given	initial
CO-3	Find integ	the grals	e ar	ea a	nd v	olum	e of	f plane	e ai	nd tł	nree	dime	nsiona	al figu	ires usi	ng mu	ultiple
CO-4	App invo	ly v lvin	ecto g cii	r inte rcula	egral tion,	theo1 flux,	ems and	to obt diverg	tain genc	the s e in	olutio vecto	ons of or fiel	f engi ds.	neerin	g proble	ems	
N	60		0		•	(1 D		0.4		0	D						
Mapping	of Co	urse	Ou	tcom	es wit	th Pr	ogra	$\frac{m Out}{O_{\alpha}}$	com	les &	Prog	gram S	Specif	ic Out	comes	<u>)'a</u>	
CO		1	2	3	4	5	6		8	0	10	11	12	1	2	<u> </u>	4
CO-1		3	3	2	-	-	-	-	-	-	-	-	2	2	-	-	-
CO-2		3	3	2	-	-	-	-	-	-	-	-	2	3	_	-	-
CO-3		3	3	2	-	-	-	-	-	-	-	-	2	2	-	-	-
CO-4		3	3	2	-	-	-	-	-	-	-	-	2	3	-	-	-
N T -	. ~						UNI	<u>T-1</u>		~	1 .				((12 Ho	ours)
Numeric	al So	luti	on	of l	lqua	tions	: In	troduc	tion	ı; So	olutio	n of	alge	braic	and tra	inscen	dental
deduction	B_{1} B1S	ecti n +h	on _ N	meth	ioa, n-Ra	ivieth	100 n for	or ral	ISE	posi	uon,	inew	ion-F	taneor	n meth	ioa; l	JseIul Direct
methods	of so	n u Intia	$n \cdot i$	Gaus	n-Ra s eli	mina	tion	metho	bc	Gaus	s-Ior	illeal dan 1	nethc	nd Fa	torizati	ion me	ethod.
Iterative	metho	ds c	of so	lutio	n: Ja	cobi'	s itei	rative	metl	hod.	Gaus	s-Sei	del ite	erative	method	1.	- mou,
[Sections	:28.1;	28.	2; 2	8.3;2	28.5;	28.6	; 28.	7.1;28	.7.2].							
							UNI	T-2									



		$(12 II \dots)$
		(12 Hours)
Finite differe	ences and Interpolation: Finite differences: Forward difference	es, Backward
differences; Ne	ewton's interpolation formulae: Newton's forward interpolation form	ula, Newton's
backward inter	rpolation formula; Interpolation with unequal intervals; Lagrange's	interpolation
formula; Divi	ded differences; Newton's divided difference formula; Numerica	l integration;
Trapezoidal ru	Ile; Simpson's one-third rule; Simpson's three-eighth rule; Numeric	al solution of
ODE's: Introdu	uction; Picard's method; Euler's method; Runge-Kutta method.	
[Sections:29.1;	; 29.1-1; 29.1.2; 29.6; 29.9; 29.10; 29.11; 29.12; 30.4; 30.6; 30.7; 30.	.8; 32.1; 32.2;
32.4; 32.7].		
	UNIT-3	(12 Hours)
Multiple Integ	grals: Double integrals; Change of order of integration; Double inte	grals in polar
coordinates; A	area enclosed by plane curves; Triple integrals; Volumes of solids	s: Volume as
Triple integral,	, Change of variables.	
[Sections: 7.1;	7.2; 7.3; 7.4; 7.5; 7.6.2; 7.7.2].	
	TTN TEAM A	(10 33
	UNIT-4	(12 Hours)
Vector calcul	UNIT-4 us and its Applications: Scalar and vector point functions; Del app	(12 Hours) blied to scalar
Vector calcule point function	UNIT-4 us and its Applications: Scalar and vector point functions; Del app ns-Gradient: Definition, Directional derivative; Del applied to	(12 Hours) blied to scalar vector point
Vector calculu point function functions: Div	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acro	(12 Hours) blied to scalar vector point oss a surface;
Vector calcule point function functions: Div Green's theore	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau	(12 Hours) blied to scalar vector point oss a surface; ss divergence
Vector calcule point function functions: Div Green's theore theorem(witho	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau ut proof).	(12 Hours) blied to scalar vector point bss a surface; ss divergence
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4;	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to regence, Curl; Line integral; Surfaces: Surface integral, Flux acrossm in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16]	(12 Hours) blied to scalar vector point bss a surface; ss divergence
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khan	(12 Hours) blied to scalar vector point oss a surface; ss divergence
Vector calculu point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017.	(12 Hours) blied to scalar vector point oss a surface; ss divergence na publishers,
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossm in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017.	(12 Hours) blied to scalar vector point bss a surface; ss divergence na publishers,
Vector calculu point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to rergence, Curl; Line integral; Surfaces: Surface integral, Flux acro em in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017.	(12 Hours) blied to scalar vector point oss a surface; uss divergence na publishers, edition, John
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to rergence, Curl; Line integral; Surfaces: Surface integral, Flux acro em in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9 th Wiley & Sons.	(12 Hours) blied to scalar vector point bss a surface; ss divergence na publishers, edition, John
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to rergence, Curl; Line integral; Surfaces: Surface integral, Flux across em in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9 th Wiley & Sons. [2] N.P.Bali and M.Goval, "A Text book of Engineering Mathem	(12 Hours) olied to scalar vector point oss a surface; ass divergence na publishers, edition, John natics" Laxmi
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	 UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossm in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44thedition, Khant 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9th Wiley & Sons. [2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics, 2010. 	(12 Hours) olied to scalar vector point oss a surface; ss divergence na publishers, edition, John natics" Laxmi



PROBABILITY AND STATISTICS II B. Tech. III Semester 20CE301/MA03																			
Lectu	II B. Lech.III Semester20CE301/MA03Lectures:2 Hours/WeekTutorial:1 Hour/WeekPractical:0CIE Marks:30SEE Marks:70Credits:3																		
CIEN	Mark	S		•	$\frac{210}{30}$	0 41 5/			SI	EE M	arks		70			Credits		3	
	viuin			•	50						uno		10			oreans	•		
Pre-I	Reau	isit	e: N	Jone	;														
Course Objectives: Students will learn how to Apply the continuous probability densities to various problems in science and																			
 Apply the continuous probability densities to various problems in science and engineering. Estimate the point and interval estimators of the mean, variance and proportion for the 																			
	>	Est giv	tima ven S	ite tl Sam	he p ple (oint data	and and	inte app	rval ly Z	estin -test,	nator t-tes	rs of tl t to va	he mea arious	an, vari real-lif	iance a e probl	ind prop lems	ortio	n for tl	ne
	>	Ap	ply pula	vari tion	lous bas	sam ed o	ple i n sa	tests mpl	like e da	e F-te: ta.	st and	d χ2 -1	test fo	r decisi	on ma	king reg	gardin	g the	
population based on sample data. Compute the level of correlation, the best fit curve to the given data by the method of least squares and also perform ANOVA arising in the field of engineering.																			
least squares and also perform ANOVA arising in the field of engineering.																			
Course Outcomes: After studying this course, the students will be able to																			
CO-	-1	Ap En	ply gine	disc eerin	erete 1g ap	anc anc	l con atio	ntinı ns.	ious	prob	abili	ty dis	tributi	ons to	variou	s proble	ems a	rising	in
CO-	-2	Per	rfor	m To	est c	of Hy	ypot	hesi	s for	· a poj	pulat	ion pa	aramet	ter for s	singles	sample.			
CO-	-3	Per	rfor	m To	est c	of Hy	ypot	hesi	s for	. popı	ılatio	on para	ameter	rs for n	nultiple	e sample	es.		
CO-	-4	Int	erpr	et th	ie re	sult	s of	corr	elati	on, re	egres	sion a	nd on	e way A	ANOV	A for the	ne giv	en data	ι.
Mapp	oing o	of C	our	se O	utco	mes	wit	h Pr	ogra	m Ou	itcom	ies &	Progra	ım Spe	cific O	utcomes			1
			1		2		-	(P O)'S	0	10	11	10	1	PSO's	2	-	-
	$\frac{CU}{10}$		1	2	3	4	5	0	1	8	9	10	11	12	1	2	3	4	-
	$\frac{1-0}{10}$		<u> </u>	2	-	-	-	-	-	-	-	-	-	2	<u> </u>	-		-	-
	$\frac{-0-2}{10-2}$		$\frac{3}{2}$	2	$\frac{2}{2}$	-	-	-	-	-	-	-	-	$\frac{2}{2}$	2	-		-	-
	<u>-0-3</u> -0-4		2	2	$\frac{2}{2}$	-	-	-	-	-	-	-	-	$\frac{2}{2}$	2	-		-	-
	.0-4		3	5	3	-	-	-	-	-	-	-	-	2	Z	-		-	
									UNI	[T-1							(12)	Hours)	
Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial Distribution, Uniform Distribution, Gamma Distribution and its applications, Beta Distribution and its applications, Weibull distribution, Joint Distributions (Discrete), Joint Distributions (Continuous). (Sections 5.1, 5.2, 5.3, 5.5, 5.7, 5.8, 5.9, 5.10)																			
									UN	T_2									



	(12 Hours)
Populations and Samples, The sampling distribution of the mean (σ known)	, The sampling
distribution of the mean (σ unknown), The sampling distribution of the	variance, Point
estimation, Interval estimation, Tests of Hypotheses, Null Hypothesis and Tests	of hypotheses,
Hypothesis concerning one mean.	
(Sections 6.1, 6.2, 6.3, 6.4, 7.1, 7.2, 7.4, 7.5, 7.6)	
UNIT-3	(12 Hours)
Comparisons-Two independent Large samples, Comparisons-Two independent	small samples,
matched pairs comparisons, The estimation of variances, Hypotheses concernin	g one variance,
Hypotheses concerning two variances.	-
(Sections 8.2, 8.3, 8.4, 9.1, 9.2, 9.3) .	
UNIT-4	(12 Hours)
Estimation of proportions, Hypotheses concerning one proportion, Hypotheses con-	ncerning several
proportions. The method of least squares, curvilinear regression, multiple regress	ion, correlation,
Completely Randomized Designs.	
(10.1, 10.2, 10.3, 11.1, 11.3, 11.4, 11.6, 12.1, 12.2)	
Text Books : Miller & Freund's "Probability and Statistics for Engineers", Rich	ard A. Johnson,
8 th Edition, PHI.	
References: 1. R.E Walpole, R.H. Myers & S.L. Myers 'Probability of	& Statistics for
Engineers and Scientists', 6 th Edition, PHI.	
2. Murray R Spiegel, John J.Schiller, R. AluSrinivasa, 'Probabi	lity &Satistics',
Schaum's outline series.	



LINEAR ALGEBRA AND ORDINATRY DIFFERENTIAL EQUATIONS I B. Tech. I Semester 20CS101/MA01																			
	LINEAR ALGEBRA AND ORDINATRY DIFFERENTIAL EQUATIONS IB. Tech. I Semester 20CS101/MA01 Lectures : 2 Hours/Week Tutorial : 1 Hour/Week Practical : 0																		
Le	ctures		:	2 Ho	urs/V	Veek	Γ	utori	al	:	1	Hou	r/Wee	ek	Practic	al	:	0	
CI	E Marl	KS .	:	30			S	SEE N	/larks	s :	7	0			Credit	S	:	3	
Pr	e-Requ	uisite:	Non	e															
Co	ourse (Dbjecti	ves:	Stude	ents v	vill lea	arn	how t	to										
	 Solve a system of linear homogeneous and non-homogeneous equations, finding the 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 appropriate 																		
		Ident analy equat	ify th tical ions.	tech	e of a nique	a given e for	n di fin	fferer ding	tial the	equa solu	tion a tion	and se of f	elect a îrst	and aj order	pply the ordina	e appı ary d	opri iffer	ate enti	al
 Create and analyze mathematical models using higher order differential equations to solve application problems that arise in engineering. Solve a linear differential equation with constant coefficients with the given initial 																			
Solve a pincation problems that arise in engineering. Solve a linear differential equation with constant coefficients with the given initial conditions using Laplace Transforms.																			
conditions using Laplace Transforms.																			
Course Outcomes: After studying this course, the students will be able to																			
C	CO-1	Find	the e	igen v	alue	s and	eige	en vec	ctors	of a	givei	n mat	rix ar	nd its	inverse				
C	CO-2	Apply differ	y the entia	appro al equa	opria ation	te ana	lyti	cal te	chnie	que t	o fin	d the	solut	tion o	f a firs	t orde	r orc	lina	ry
C	CO-3	Solve engin	e hig leerir	her o ng app	rder licat	linea ions.	r di	ffere	ntial	equ	ation	s wit	h co	nstan	t coeff	icient	s ar	ise	in
C	CO-4	Appl	y Laj	place	trans	forms	to s	solve	diffe	renti	al eq	uatio	ns ari	sing	in engir	neerin	g		
M	apping	of Cou	rse (Outcor	nes w	vith Pr	rogr	am O	utco	mes e	& Pro	ogran	1 Spe	cific (Outcom	es			
	<u> </u>							PC	D's			<u> </u>			-	PSO'	s		
Ī	С	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2		3	
	CC)-1	3	3	2	-	-	-	-	-	-	-	1	2	-	3		-	
	CC)-2	3	3	3	-	-	-	-	-	-	-	-	2	-	2		-	
-	CC)-3	3	3	3	-	-	-	-	-	-	-	-	2	-	2			
	CC)-4	3	3	3	-	-	-	-	-	-	-	-	2	-	2		-	
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	near A	Algebr	a: K	ank (or a	Matri	IX;	Elem	entar	y tra	ansio	ormati	ons	of a	matrix	; Gal	ISS-J	orda	n n
	stem o	n innea f linea	nig i r Noi	he m	veise	$\frac{1}{2}$, $\frac{1}{2}$	19191 19191	ation	s Sv	stem	ofli	near l	bomo	luatio		uciton	uic s: ve	ector	11, .c.
Ei	gen va	lues: r	orope	rties	of E	igen	valu	ies(w	ithou	it pr	oofs)	: Cay	vlev-I	Hami	lton the	eorem	, v€ ⊨ (w	itho	ut
pro	proof).																		
ÎSe	ections	: 2.7.1;	2.7.	2; 2.7	.6; 2.	10.1;	2.10).2; 2	.10.3	8; 2.1	2.1;	2.13.1	1; 2.1	4; 2.1	.5.]				
							UN	IT-2											



		(12 Hours)
Differential Equa	tions of first order: Definitions; Formation of a Different	tial equation;
Solution of a Dif	ferential equation; Equations of the first order and first degr	ree; variables
separable; Linear	: Equations; Bernoulli's equation; Exact Differential equation	ns; Equations
reducible to Exact	equations: I.F found by inspection, I.F of a Homogeneous equation	uation, In the
	$\frac{\partial M}{\partial N} = \frac{\partial N}{\partial M}$	
equation M dx+ N	dy = 0, $\frac{\partial y}{\partial x}$ is a function of x and $\frac{\partial x}{\partial x}$ is a function	n of y.
	N M	
Applications of a	First order Differential equations: Newton's law of eacling: Pat	a of doory of
Radio active mater	ials	e of decay of
[Soctions: 11 1: 11	1015. 2· 11 /· 11 5· 11 6· 11 0· 11 10· 11 11· 11 12 1· 11 12 2· 11 12 /·	12 6. 12 8]
	5, 11.4, 11.5, 11.6, 11.9, 11.10, 11.11, 11.12.1, 11.12.2, 11.12.4, UNIT_3	(12 Hours)
Linear Differenti	al Equations: Definitions: Theorem: Operator D: Rules fo	r finding the
complementary fu	action: Inverse operator: Rules for finding the Particular Integ	ral. Working
procedure to solve	the equation: Method of Variation of Parameters: Application	ons of Linear
Differential Equation	ons: 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)
Laplace Transfor	ms: Definition; conditions for the existence; Transforms of	of elementary
functions; propertie	es of Laplace Transforms; Transforms of derivatives; Transform	s of integrals;
Multiplication by	t ⁿ ; Division by t; Inverse transforms- Method of partial fra	ctions; Other
methods of findin	g inverse transforms; Convolution theorem(without proof); A	application to
differential equation	ns: Solution of ODE with constant coefficients using Laplace tran	nsforms.
[Sections:21.2.1; 2:	1.2.2; 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 th edition, Khan	na publishers,
201	7.	
References : [1]	Erwin Kreyszig, "Advanced Engineering Mathematics", 9 th	edition, John
Wi	ley & Sons.	
[2]	N.P.Bali and M.Goyal, "A Text book of Engineering Mathem	natics" Laxmi
Put	plications, 2010.	



		NU	MER	ICA I E	L MF B. Tec	ETH eh.	ODS AN II Semes	D A ter	DVA 20CS	NCE 5201/N	D CAI MA02	LCULI	JS			
Lectures		:	2 Ho	urs/W	Veek	T	utorial	:	1	Hou	r/Week	Pra	ctical	:		0
CIE Marl	٢S	:	30			S	EE Mark	s :	7	70		Cre	edits	:		3
															•	
Pre-Req	uisite:	Non	e													
Course (Object	ives:	Stude	ents v	vill le	arn	how to									
\blacktriangleright	Solve nume	e alg rical	gebraio l meth	c, tra ods.	anscei	nden	tal and	syste	m o	f line	ear equ	ations	with	the	help	o of
	Appl are n with	y the ot ap the g	e techr oplical given i	iques ole ar nitial	s of n nd sol cond	ume lve t litioi	rical inte he first o n using di	gratic rder ffere	on wl ordin nt me	henev hary d ethods	er and ifferen s.	wherev tial equ	ver rou ations	itine 5 nui	metł neric	nods ally
\triangleright	Evalı	iate	double	e and	triple	e inte	egrals and	lapp	y the	em to	find ar	eas and	l voluı	nes.		
>	Evalı appli	iate catio	the li ns.	ne, s	surfac	e ar	nd volum	e int	egra	ls and	d learn	their	inter-	relat	ions	and
Course (Outcon	nes:	After	study	ving tl	his c	ourse, the	e stuc	ents	will ł	be able	to				
CO-1	Solve techn	e nor ique	n-linea s.	ır equ	uation	is an	id system	of li	near	equat	tions w	vith the	help	of N	ume	rical
CO-2	Solve cond	the tion	first	order	ordin	nary	different	ial e	quati	ons n	umeric	ally wi	th the	giv	en in	itial
CO-3	Find integ	the rals.	area	and	volur	ne o	of plane	and	three	e dim	ension	al figu	res us	sing	mult	tiple
CO-4	Appl invol	y ve ving	ector circul	integ lation	ral tł ı, flux	neor (, an	ems to o d diverge	btain	n the	e solu etor fie	utions elds.	of eng	ineeri	ng	probl	ems
Manning	of Cou	rea (Jutcor	nos u	rith P	roar	am Auteo	mag	Pr Dr	oaron	, Snacif	fic Aut	omos			
			Juicol	11C3 W	11111	ugr	PO's	11103 (x 1 f	ugi all	i Speci		PS	<u>'0'</u>		
C	0	1	2	3	4	5	$\begin{array}{c c} 1 \\ \hline 6 \\ \hline 7 \end{array}$	8	9	10	11	12 1		$\frac{10}{2}$	3	
	<u> </u>	3	3	2	_	-		-	-	-	-	2 -		3	-	
CC)-2	3	3	2	-	-		-	-	-	-	2 -		3	-	
CC)-3	3	3	2	-	-		-	-	-	-	2 -		2	-	
CC)-4	3	3	2	-	-		-	-	-	-	2 -		3	-	
						UN	IT-1							(12	Hou	rs)
Numeric	al So	lutio	n of	Equ	ation	s: I	ntroducti	on; S	Solut	tion c	of alge	braic	and tr	anso	ende	ental
equations	: Bise	ectio	n me	thod,	Met	thod	of false	e po	sition	n, Ne	wton-F	Raphso	n me	thod	; Us	eful
deduction	is from	1 the	Newt	on-R	aphso	on fo	ormula; S	olutio	on of	f linea	ir simu	ltaneou	s equa	ation	is; Di	rect
methods	ot sol	utior	1: Gau	iss e	limina	atioi	n method	, Gai	uss-J	ordan	metho	od, Fac	toriza	tion	met	nod;
[Sections	:28.1;	28.2	; 28.3	on: J ; 28.5	acobi 5; 28.6	5; 28	8.7.1;28.7	.2].	, Ga	uss-So		erative	metho	oa.		
						UN	IT-2									



		$(12 II \dots)$
		(12 Hours)
Finite differe	ences and Interpolation: Finite differences: Forward difference	es, Backward
differences; Ne	ewton's interpolation formulae: Newton's forward interpolation form	ula, Newton's
backward inter	rpolation formula; Interpolation with unequal intervals; Lagrange's	interpolation
formula; Divi	ded differences; Newton's divided difference formula; Numerica	l integration;
Trapezoidal ru	Ile; Simpson's one-third rule; Simpson's three-eighth rule; Numeric	al solution of
ODE's: Introdu	uction; Picard's method; Euler's method; Runge-Kutta method.	
[Sections:29.1;	; 29.1-1; 29.1.2; 29.6; 29.9; 29.10; 29.11; 29.12; 30.4; 30.6; 30.7; 30.	.8; 32.1; 32.2;
32.4; 32.7].		
	UNIT-3	(12 Hours)
Multiple Integ	grals: Double integrals; Change of order of integration; Double inte	grals in polar
coordinates; A	area enclosed by plane curves; Triple integrals; Volumes of solids	s: Volume as
Triple integral,	, Change of variables.	
[Sections: 7.1;	7.2; 7.3; 7.4; 7.5; 7.6.2; 7.7.2].	
	TTN TEAM A	(10 33
	UNIT-4	(12 Hours)
Vector calcul	UNIT-4 us and its Applications: Scalar and vector point functions; Del app	(12 Hours) blied to scalar
Vector calcule point function	UNIT-4 us and its Applications: Scalar and vector point functions; Del app ns-Gradient: Definition, Directional derivative; Del applied to	(12 Hours) blied to scalar vector point
Vector calculu point function functions: Div	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acro	(12 Hours) blied to scalar vector point oss a surface;
Vector calcule point function functions: Div Green's theore	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau	(12 Hours) blied to scalar vector point oss a surface; ss divergence
Vector calcule point function functions: Div Green's theore theorem(witho	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau ut proof).	(12 Hours) blied to scalar vector point bss a surface; ss divergence
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4;	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossm in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16]	(12 Hours) blied to scalar vector point bss a surface; ss divergence
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khan	(12 Hours) blied to scalar vector point oss a surface; ss divergence
Vector calculu point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017.	(12 Hours) blied to scalar vector point oss a surface; ss divergence na publishers,
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossm in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017.	(12 Hours) blied to scalar vector point bss a surface; ss divergence na publishers,
Vector calculu point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to rergence, Curl; Line integral; Surfaces: Surface integral, Flux acro em in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017.	(12 Hours) blied to scalar vector point oss a surface; uss divergence na publishers, edition, John
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to rergence, Curl; Line integral; Surfaces: Surface integral, Flux acro em in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9 th Wiley & Sons.	(12 Hours) blied to scalar vector point bss a surface; ss divergence na publishers, edition, John
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to rergence, Curl; Line integral; Surfaces: Surface integral, Flux across em in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9 th Wiley & Sons. [2] N.P.Bali and M.Goval, "A Text book of Engineering Mathem	(12 Hours) olied to scalar vector point oss a surface; ass divergence na publishers, edition, John natics" Laxmi
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	 UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossm in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44thedition, Khant 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9th Wiley & Sons. [2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics, 2010. 	(12 Hours) olied to scalar vector point oss a surface; ss divergence na publishers, edition, John natics" Laxmi



					Р П І	ROE 3. Te	BAB	ILIT III S	Y Al Seme	ND S ster	TAT 20C	TISTI S301/	CS MA0	3				
Le	ctures		:	2 Ho	urs/V	Veek	1	Tutor	ial	:	1	Hou	r/We	ek	Practi	cal :		0
CI	E Marl	ζS	:	30			S	SEE N	Mark	s :	7	0			Credit	ts :		3
												-						
Pr	e-Requ	uisite:	Non	e														
	•																	
Co	ourse ()bject	ives:	Stude	ents v	vill le	arn	how	to									
	 Apply the continuous probability densities to various problems in science and engineering. Estimate the point and interval estimators of the mean, variance and proportion for the 																	
	\mathbf{A}	Estin giver	nate 1 San	the po nple d	oint a ata a	nd in nd ap	terva ply 2	al esti Z-tes	imato t, t-te	ors of est to	f the vario	mean ous re	, var al-lif	iance e pro	and pi blems	oportio	on for	[•] the
Apply various sample tests like F-test and χ^2 -test for decision making regarding the population based on sample data.																		
population based on sample data. Compute the level of correlation, the best fit curve to the given data by the method of least squares and also perform ANOVA arising in the field of engineering.																		
least squares and also perform ANOVA arising in the field of engineering.																		
Course Outcomes : After studying this course, the students will be able to																		
С	O-1	Appl Engi	y dis neeri	screte ng ap	and oplicat	contin tions.	nuou	is pro	babi	lity c	listril	bution	ns to	vario	us pro	blems	arisin	g in
С	O-2	Perfc	orm 7	Test of	f Hyp	othes	sis fo	or a p	opula	ation	para	meter	for s	single	sampl	e.		
С	O-3	Perfc	orm 7	fest of	f Hyp	othes	sis fo	or poj	pulati	ion p	aram	eters	for n	nultip	le sam	ples.		
C	O-4	Inter	pret 1	the res	sults	of con	rrela	tion,	regre	ession	1 and	one	way 1	ANO	VA for	the give	ven d	ata.
Ma	pping	of Cou	irse (Dutco	mes v	vith P	rogr	am C) utco	mes d	& Pr	ogran	ı Spe	cific (Outcom	ies		
					1			P	O's			1		1		PSO's	5	
	C	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	_
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-)-2	3	3	$\frac{2}{2}$	-	-	-	-	-	-	-	-	2	-	3	-	_
-	$\frac{cc}{cc}$)-3	3	3	2	-	-	-	-	-	-	-	-	2	-	3	-	_
)-4	3	3	3	-	-	-	-	-	-	-	-	2	-	3	-	
							UN	NIT-1								(12	Hou	rs)
Co Dis and (Co (Se	Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial Distribution, Uniform Distribution, Gamma Distribution and its applications, Beta Distribution and its applications, Weibull distribution, Joint Distributions (Discrete), Joint Distributions (Continuous). (Sections 5.1, 5.2, 5.3, 5.5, 5.7, 5.8, 5.9, 5.10)																	
							UN	√ГГ-2	2									



	(12 Hours)
Populations and Samples, The sampling distribution of the mean (σ known)	, The sampling
distribution of the mean (σ unknown), The sampling distribution of the	variance, Point
estimation, Interval estimation, Tests of Hypotheses, Null Hypothesis and Tests	of hypotheses,
Hypothesis concerning one mean.	
(Sections 6.1, 6.2, 6.3, 6.4, 7.1, 7.2, 7.4, 7.5, 7.6)	
UNIT-3	(12 Hours)
Comparisons-Two independent Large samples, Comparisons-Two independent	small samples,
matched pairs comparisons, The estimation of variances, Hypotheses concernin	g one variance,
Hypotheses concerning two variances.	-
(Sections 8.2, 8.3, 8.4, 9.1, 9.2, 9.3) .	
UNIT-4	(12 Hours)
Estimation of proportions, Hypotheses concerning one proportion, Hypotheses con-	ncerning several
proportions. The method of least squares, curvilinear regression, multiple regress	ion, correlation,
Completely Randomized Designs.	
(10.1, 10.2, 10.3, 11.1, 11.3, 11.4, 11.6, 12.1, 12.2)	
Text Books : Miller & Freund's "Probability and Statistics for Engineers", Rich	ard A. Johnson,
8 th Edition, PHI.	
References: 1. R.E Walpole, R.H. Myers & S.L. Myers 'Probability of	& Statistics for
Engineers and Scientists', 6th Edition, PHI.	
2. Murray R Spiegel, John J.Schiller, R. AluSrinivasa, 'Probabi	lity &Satistics',
Schaum's outline series.	



COMPLEX VARIABLES AND SPECIAL FUNCTIONS II B. Tech. IV Semester 20EC401/20EI401/MA04																	
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	13	•	30			0		aiks	•		/0			Cicui	15	•	5
Pre-Req	uisite:	Non	e														
Course (Object	ives:	Stude	ents v	vill lea	arn l	how to)									
\blacktriangleright	Perce comp conc	eive 1 plex epts.	the im analy	porta sis a	nce o nd th	f ac eir	quirin promi	g su inent	ffici t ro	ent l les	know] in va	ledge rious	on u app	nderly licatior	ing pr ns of	inci nur	ples of nerous
\triangleright	Dete: resid	rmin ue co	e Tay oncept	lor a to ev	nd La valuat	aure e ma	nt seri any dif	ies e fficu	expa lt re	nsio al in	ns of itegral	the states.	giver	n funct	ions	and	utilize
\checkmark	Appl addre	y th essin	e ide g the 1	as of eal w	f Fou vorld j	rier orob	Integ olems i	rals, n an	Fo effe	urie ectiv	r Tra re mai	nsfori 1ner.	ms a	and the	eir In	vers	es for
	Anal hiera diffe	yze rchy rentia	the pr in r al equ	roper ecuri ation	ties o ence s in di	f S _] rela	pecial ations ent cas	Fur and ses t	nctio 1 ol 0 ov	ons t btair rercc	for th the me th	e em rele ^v ne cha	piric vant lleng	al prin Series ging cir	ciples S Sol	s of ution tanc	effect ns for es.
Course (Dutcor	nes:	After	study	ving th	nis c	ourse,	the	stud	ents	will	be abl	e to		1		1
CO-1	Make Anal appli	e use ytic cabil	e of f Funct ity in	undai ion, varic	menta Conti ous co	ls o inuit ncep	of Con ty, Ha ots.	nple: armo	x A nic	naly Coi	sıs lil njugat	ke n tes ar	roots 1d th	of Content	omple porta	x nı nt r	umber, ole of
CO-2	Evalu calcu Laur	uate Ilus a ent S	certai ind als eries.	n con so de	mplica rive tl	ated he s	real i eries e	integ expa	grals nsio	uno ns o	der C f give	ontou en fun	r int ctior	egratio 1s by T	n usi `aylor	ng 1 seri	esidue es and
CO-3	Utiliz inclu	ze va ding	arious Conv	proj olutio	perties on Th	s an eore	d app m in h	olicat nand	tions	s of scie	Fo ntific	ourier and to	tran echni	sforms	s, the olicati	ir ir ons.	verses
CO-4	Ident Prop	tify t erties	he me s of Sp	eanin becial	gful S Func	Serie tion	es Solu is in sc	utio1 olvin	ns fo g sp	or E ecif	Differe	ential gineer	Equa ing p	ations roblem	and a	naly	ze the
Mapping	of Coi	irse (Dutcor	nes w	vith Pr	ogr	am Ou	itcon	nes d	& Pr	ogran	n Spec	cific (Outcon	nes		
						3-	PO	's			8				PSO	's	
C	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2		3
CC)-1	3	3	2	-	-	-	-	-	-	-	-	3	-	2		-
CC)-2	3	3	2	-	-	-	-	-	-	-	-	2	-	2		-
CC)-3	3	3	2	-	-	-	-	-	-	-	-	3	-	2		-
)-4	3	3	2	-	-	-	-	-	-	-	-	2	-	2		-
	UNIT_1 (12 Hours)																
Complex	Num	bers	and	funct	ions:	Cor	mplex	Nur	nbei	rs; C	Beome	tric R	lepre	sentati	on of	Ima	ginary
numbers;	Roots	s of a	a com	plex	numb	er;	Comp	lex	func	tion	; Real	l and	imag	ginary	parts	of c	ircular
and hype	rbolic	fune	ctions	Cal	lculus	of	comp	lex	fun	ctio	ns: Ir	ntrodu	ctior	n; Lim	it of	a co	mplex



BAPATLA ENGINEERING COLLEGE:: BAPATLA (Autonomous)

function; Der Cauchy's theo [Sections: 19.1	ivative of f(z); Analytic functions; Harmonic functions; Comple rem; Cauchy's integral formula. 1; 19.2; 19.5; 19.7; 19.12; 20.1; 20.2; 20.3; 20.4; 20.5;20.12; 20.13; 20	x integration;).14]
	UNIT-2	(12 Hours)
Calculus of c	omplex functions :Series of complex terms; Taylor series; Laurent's	s series; Zeros
of an analyti	c function; Singularities of an analytic function; Residues; Resi	due theorem;
Calculation of	Fresidues; Evaluation of real definite integrals: Evaluation around t	he unit circle,
Evaluation aro	ound a small semi-circle.	
[Sections: 20.1	16.1; 20.16.2; 20.16.3; 20.17.1; 20.17.2; 20.18.1; 20.18.2; 20.19; 20.20	<u>[]</u>
	UNIT-3	(12 Hours)
Fourier trans	forms: Introduction; Definition; Fourier integral theorem (without p	roof); Fourier
sine and cosin	e integrals; Complex form of Fourier integrals; Fourier integral repre	esentation of a
function; Four	rier transforms ; Properties of Fourier transforms; Convolution the	eorem(without
proof); Fourier	r transforms of the derivative of a function.	
[Sections: 22.]	1; 22.2; 22.3.1; 22.3.3; 22.3.4; 22.4; 22.5; 22.6.2; 22.9]	1
	UNIT-4	(12 Hours)
Series Solution	on of Differential Equations and Special Functions: Introduction	n; Validity of
series solution	; Series solution when $x = 0$ is ordinary point of the equation; Frob	enius method;
Bessel's funct	ion; recurrence formula for $J_n(x)$; expansions for J_0 and J_1 ; value of J	1/2; generating
function for J _n	(x); Orthogonality of Bessel functions.	
[Sections: 16.]	1;16.2;16.3;16.4;16.5,16.6;16.7;16.8;16.9;16.11]	
Text Books :	B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khan	na publishers,
	2017.	
References :	[1].Erwin Kreyszig, "Advanced Engineering Mathematics",	
	9 th edition, John Wiley & Sons.	
	[2].P.Bali and M.Goyal,"A Text book of Engineering Mathem Publications, 2010.	atics" Laxmi



LINEAR ALGEBRA AND ORDINATRY DIFFERENTIAL EQUATIONS I B. Tech. I Semester 20EC101/MA01																		
Lectures			2 Ho	urs/V	Veek	<u>и</u> . т	<u>I Sci</u>	al			Hou	r/Wee	-k	Practic	a1		0	
CIF Marl	75	•	30		VCCK	5	EFF N	Aarks	· ·	$\frac{1}{7}$	'0			Credits	11	• •	3	
	10	•	50					VIAINS	, .	/	0			Cicuits		•	5	
Pre-Requ	uisite:	Non	e															
Course C)bject	ives:	Stude	ents v	vill lea	rn 1	how 1	to										
	 Solve a system of linear homogeneous and non-homogeneous equations, finding the 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 appropriate 																	
A	Ident analy equat	ify tl tical tions	he typ tech	e of a nique	a given e for	di fin	fferer ding	ntial e the	equat solu	tion a tion	and se of f	elect a irst	and aj order	pply the ordina	appı ry d	opri	ate renti	al
\triangleright	Creat solve	te an app	d ana licatio	lyze n pro	mather blems	na tha	tical at aris	mode se in	els u engin	sing neeri	highe ng.	er ord	ler di	fferenti	al eq	uati	ons	to
\triangleright	Solve	e a l ition	inear s using	diffe Jar	rential blace T	eq ran	uatio sform	on wi ns.	th c	onsta	int co	oeffici	ients	with th	e giv	/en	initi	al
				5														
Course C	Jutcor	nes:	After	study	ving thi	is c	ourse	e, the	stud	ents	will b	be abl	e to					
CO-1	Find	the e	eigen v	value	s and e	ige	en veo	ctors	ofa	give	n mat	rix an	d its	inverse				
CO-2	Appl differ	y the rentia	e appro al equa	opria ation	te anal	yti	cal te	chnic	que t	o fin	d the	solut	ion o	f a first	orde	r or	dina	ry
CO-3	Solve	e hig neerii	gher c ng app	order olicat	linear ions.	di	ffere	ntial	equa	ation	s wit	h coi	nstan	t coeffi	cient	s ar	ise	in
CO-4	Appl	y La	place	trans	forms	to s	olve	diffe	renti	al eq	uatio	ns ari	sing i	in engin	eerin	g		
													0	0		0		
Mapping	of Cou	irse (Outcor	nes w	vith Pro	ogr	am O	utco	mes d	& Pr	ogran	1 Spec	cific (Outcome	S			
							PO	D's						I	'SO'	S		
C	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2		3	
CC)-1	3	3	2	-	-	-	-	-	-	-	-	2	-	2		-	
CC)-2	3	3	3	-	-	-	-	-	-	-	-	2	-	2		-	
CC)-3	3	3	3	-	-	-	-	-	-	-	-	2	-	2		-	
CC)-4	3	3	3	-	-	-	-	-	-	-	-	2	-	2		-	
															_			
						UN	IT-1								(12	2 Ho	ours)	
Linear Algebra: Rank of a Matrix; Elementary transformations of a matrix; Gauss-Jordan 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).																		



	UNIT-2	(12 Hours)							
Differential Equations of first order : Definitions; Formation of a Different Solution of a Differential equation; Equations of the first order and first degres separable; Linear Equations; Bernoulli's equation; Exact Differential equation reducible to Exact equations: I.F found by inspection, I.F of a Homogeneous equation equation M dx+ N dy = 0, $\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x}$ is a function of x and $\frac{\partial N}{\partial x} - \frac{\partial M}{\partial y}$ is a function M Applications of a first order Differential equations: Newton's law of cooling; Rat Radio-active materials.									
Applications of Radio-active ma	a first order Differential equations: Newton's law of cooling; Rataterials.	e of decay of							
[Sections: 11.1;	<u>11.3; 11.4; 11.5; 11.6; 11.9; 11.10; 11.11; 11.12.1; 11.12.2; 11.12.4;</u>	12.6; 12.8]							
I D'ff	UNIT-3	(12 Hours)							
complementary procedure to so Differential Equ [Sections: 13.1;	function; Inverse operator; Rules for finding the Particular Integrations: Oscillatory Electrical Circuits. 13.2.1; 13.3; 13.4; 13.5; 13.6; 13.7;13.8.1;14.1;14.5].	gral; Working ons of Linear							
	UNIT-4	(12 Hours)							
Laplace Trans functions; prope Multiplication methods of fin differential equa [Sections:21.2.1	sforms: Definition; conditions for the existence; Transforms of erties of Laplace Transforms; Transforms of derivatives; Transform by t ⁿ ; Division by t; Inverse transforms- Method of partial fra iding inverse transforms; Convolution theorem(without proof); A ations: Solution of ODE with constant coefficients using Laplace tran L; 21.2.2; 21.3; 21.4; 21.7; 21.8; 21.9; 21.10; 21.12; 21.13; 21.14; 21.	of elementary s of integrals; actions; Other Application to asforms. 15.1]							
Text Books :	B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khan 2017.	na publishers,							
References :	 [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9th Wiley & Sons. [2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathem Publications, 2010. 	edition, John natics" Laxmi							



NUMERICAL METHODS AND ADVANCED CALCULUS I B. Tech. II Semester 20EC201/MA02																
Lectures		:	2 Ho	urs/V	Veek	T	utorial	:	1	Hou	r/Week	I	Practica	ıl :		0
CIE Marl	٨S	:	30			S	SEE Marks	s :	7	0		(Credits	:		3
Pre-Req	uisite:	Non	e			•						•				
Course (Objecti	ives:	Stude	ents v	vill le	arn	how to									
\triangleright	Solve nume	e alg crical	gebraio meth	c, tra ods.	anscei	nden	ital and s	syste	m o	f line	ear equ	lation	ns witl	n the	hel	lp of
 Apply the techniques of numerical integration whenever and wherever routine methods are not applicable and solve the first order ordinary differential equations numerically with the given initial condition using different methods. Evaluate double and triple integrals and apply them to find areas and volumes. 																
 Evaluate double and triple integrals and apply them to find areas and volumes. 																
>	Evalı appli	iate catio	the li ns.	ne, s	surfac	e ar	nd volum	e int	egra	ls and	d learn	the	ir inter	-rela	tions	and
Course (Outcon	nes:	After	study	ving tl	his c	ourse, the	stud	ents	will ł	be able	to				
CO-1	Solve techn	e nor ique	n-linea s.	ır equ	uation	is an	id system	of li	near	equa	tions w	vith t	he help	of N	Jume	erical
CO-2	Solve condi	the the	first	order	ordi	nary	different	ial eo	quati	ons n	umeric	ally	with th	e giv	ven i	nitial
CO-3	Find integr	the rals.	area	and	volur	ne o	of plane	and	three	e dim	ension	al fi	gures 1	ising	mu	ltiple
CO-4	Appl invol	y ve ving	ector circul	integ lation	ral tł 1, flux	neor (, an	ems to o d diverger	btair nce ii	the the	e solu tor fi	utions elds.	of e	inginee	ring	prot	olems
Manning	of Cou	rso (Jutcor	nes u	vith P	roar	am Autco	mes	e Pr	oaran	n Sneci	fic O	utcome	5		
	01 COU		Juicol	nes v	1111 1	lugi	PO's	incs (<u>x 1 1 (</u>	ogran	<u>i speci</u>		<u>utcome</u> P	<u>,</u> 'SO's	1	
C	0	1	2	3	4	5	6 7	8	9	10	11	12	1	2	3	
CC)-1	3	3	2	-	-		-	-	-	-	2	-	2	-	
CC)-2	3	3	2	-	-		-	-	-	-	2	-	2	-	
CC)-3	3	3	2	-	-		-	-	-	-	2	-	2	-	
CC)-4	3	3	2	-	-		-	-	-	-	2	-	3	-	
														(1.0		
NT	-1 6-1	4 °	C	F	- 4 •				1 - 14	•	£ 1.	1 : .	1	(12	Hou	urs)
equations	al Sol	ection	n ol n me	Equ thod	ation Met	IS: I thod	of false	n; :	solut	ion (Ne	on alge	anh	son m	trans	cend	seful
deduction	ns from	the	Newt	on-R	aphso	on fa	ormula: So	olutio	on of	i, inea	r simu	ltane		iatio	ι, Ο 1s: Γ	Direct
methods	of sol	utior	n: Gau	iss e	limin	ation	n method.	Gai	iss-J	ordan	metho	od, F	Factoriz	ation	me	thod;
Iterative	Iterative methods of solution: Jacobi's iterative method, Gauss-Seidel iterative method.															
[Sections	Sections:28.1; 28.2; 28.3; 28.5; 28.6; 28.7.1;28.7.2].															
						UN	IT-2									



		$(12 II \dots)$
		(12 Hours)
Finite differe	ences and Interpolation: Finite differences: Forward difference	es, Backward
differences; Ne	ewton's interpolation formulae: Newton's forward interpolation form	ula, Newton's
backward inter	rpolation formula; Interpolation with unequal intervals; Lagrange's	interpolation
formula; Divi	ded differences; Newton's divided difference formula; Numerica	l integration;
Trapezoidal ru	Ile; Simpson's one-third rule; Simpson's three-eighth rule; Numeric	al solution of
ODE's: Introdu	uction; Picard's method; Euler's method; Runge-Kutta method.	
[Sections:29.1;	; 29.1-1; 29.1.2; 29.6; 29.9; 29.10; 29.11; 29.12; 30.4; 30.6; 30.7; 30.	.8; 32.1; 32.2;
32.4; 32.7].		
	UNIT-3	(12 Hours)
Multiple Integ	grals: Double integrals; Change of order of integration; Double inte	grals in polar
coordinates; A	area enclosed by plane curves; Triple integrals; Volumes of solids	s: Volume as
Triple integral,	, Change of variables.	
[Sections: 7.1;	7.2; 7.3; 7.4; 7.5; 7.6.2; 7.7.2].	
	TTN THEM A	(10 33
	UNIT-4	(12 Hours)
Vector calcul	UNIT-4 us and its Applications: Scalar and vector point functions; Del app	(12 Hours) blied to scalar
Vector calcule point function	UNIT-4 us and its Applications: Scalar and vector point functions; Del app ns-Gradient: Definition, Directional derivative; Del applied to	(12 Hours) blied to scalar vector point
Vector calculu point function functions: Div	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acro	(12 Hours) blied to scalar vector point oss a surface;
Vector calcule point function functions: Div Green's theore	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau	(12 Hours) blied to scalar vector point oss a surface; ss divergence
Vector calcule point function functions: Div Green's theore theorem(witho	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossem in the plane (without proof); Stokes theorem (without proof); Gau ut proof).	(12 Hours) blied to scalar vector point bss a surface; ss divergence
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4;	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossm in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16]	(12 Hours) blied to scalar vector point bss a surface; ss divergence
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khan	(12 Hours) blied to scalar vector point oss a surface; ss divergence
Vector calculu point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017.	(12 Hours) blied to scalar vector point oss a surface; ss divergence na publishers,
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossm in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017.	(12 Hours) blied to scalar vector point bss a surface; ss divergence na publishers,
Vector calculu point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to rergence, Curl; Line integral; Surfaces: Surface integral, Flux acro em in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017.	(12 Hours) blied to scalar vector point oss a surface; uss divergence na publishers, edition, John
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to rergence, Curl; Line integral; Surfaces: Surface integral, Flux acro em in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9 th Wiley & Sons.	(12 Hours) blied to scalar vector point bss a surface; ss divergence na publishers, edition, John
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to rergence, Curl; Line integral; Surfaces: Surface integral, Flux across em in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khant 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9 th Wiley & Sons. [2] N.P.Bali and M.Goval, "A Text book of Engineering Mathem	(12 Hours) olied to scalar vector point oss a surface; ass divergence na publishers, edition, John natics" Laxmi
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	 UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossm in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44thedition, Khant 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9th Wiley & Sons. [2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics, 2010. 	(12 Hours) olied to scalar vector point oss a surface; ss divergence na publishers, edition, John natics" Laxmi



		PROB	AB		Y AN	ND S	TA	FISTI	CS					
T /		\mathbf{B} . Tec	ch.	$\frac{111}{1}$	emes	ter	20E	<u>C301/</u>	MA03	5				<u> </u>
Lectures : 2	2 Hours	Week		utori		:		Hou	r/Wee	ĸ	Practica	1 :	()
CIE Marks : 3	30		S	SEE N	Aarks	:	Í	0			Credits	:		3
Pre-Requisite: None														
Course Objectives: S	Students	will le	arn	how t	to									
Apply the	contin		noh	abilit	v de	nciti	e t	0 1/21	ious	nroh	lems in	sci	ence	and
	contin	uous _F	01000	aunn	y uc	1151110	5 0	U vai	lous	proo		5010		anu
engineering	<u>.</u>													
Estimate th	e point	and int	terva	il esti	mato	rs of	the	mean	, varia	ance	and prop	ortic	on for	the
given Samp	ole data	and ap	ply 2	<u>Z-test</u>	t, t-te	$\frac{\text{st to}}{1}$	vari	ous re	$\frac{al-lite}{1}$	e prol	olems	1.	.1	
Apply varie	ous sam	ple test	ts lik	te F-t	est ar	$d \chi^2$	-tes	t for o	lec1s10	on m	aking reg	gardi	ng the	
population	based o	n samp	ole da	ata.						-				
Compute th	ne level	of cor	relat	ion, t	the be	est fi	t cui	ve to	the g	iven	data by	the n	nethod	l of
least square	es and a	lso peri	form	AN(OVA	arisi	ng i	n the	field o	of eng	gineering	.		
Course Outcomes: A	fter stu	dying tl	his c	ourse	e, the	stud	ents	will ł	be able	e to				
Apply diag	roto ond	loontir		a mr o	hahil	itud	liatri	hution	a to r	iorio	us probl		origin	
CO 1 Engineerin	a applic	ations	luou	s pro	JUAUII	ny u	115111	oution	15 10 1	ano	us proble	21115	ansing	g m
	g applie	ations.												
Perform Te	et of Hy	mothes	is fo	ran	onula	tion	nara	meter	· for si	ingle	sample			
CO-2	51 01 11	poines	515 10	n a p	opula		para		101 5	ingic	sample.			
Perform Te	est of Hy	nothes	sis fo	or nor	mlati	on n	aram	eters	for m	ultin	le sampl	25		
CO-3		pounes	10 10	n por	Juiuti	on p	arun	leters	101 111	ump	ie sampi			
CO-4 Interpret th	e results	s of cor	rela	tion.	regre	ssior	n and	lone	wav A	NOV	VA for th	ne gi	ven da	ta.
	e result	01 001	Teru		10510	55101	I UIIC	. 0110	iiuy 11			ie gi	ven aa	
Mapping of Course Or	utcomes	with P	rogr	am O	utcor	nes d	& Pr	ogran	1 Spec	ific (Outcomes			
			8-	PC	$\overline{\mathbf{D}'s}$			<u> </u>			P	SO's	;	
CO 1	2 3	4	5	6	7	8	9	10	11	12	1	2	3	1
CO-1 3	3 -		-	-	_	-	-	-	-	2	-	2	-	-
$\begin{array}{c c} \hline CO-2 & 3 \\ \hline \end{array}$	$\frac{3}{3}$ 2		_	_	_	-	_	-	_	2	-	2	_	-
CO-3 3	$\frac{2}{3}$ 2		_	_	_	-	_	-	_	2	-	2	_	-
	$\frac{2}{3}$ $\frac{2}{3}$	-	_	_	_	-	_	-	_	2	-	2	_	-
CO-4 3										-		-		
CO-4 3														
CO-4 3														
CO-4 3			UN	IT-1								(12	Hour	s)
CO-4 3 CO-4 3	Variab	les, No	UN	(IT-1 1 Dis	stribu	tion,	No	rmal	Appro	oxima	ation to	(12 the	Hour	s) nial
Continuous Random Distribution, Uniform	Variab Distril	les, No oution,	UN orma Gar	IT-1 1 Dis nma	stribu Distr	tion, ibuti	No: on a	rmal and its	Appro	oxima	ation to ons, Bet	(12 the a Di	Hour Binon stribut	s) nial ion
Continuous Random Distribution, Uniform and its applications,	Variab Distril Weibu	les, No oution, 11 distr	UN orma Gar ribut	I IT-1 1 Dis nma tion,	stribu Distr Joint	tion, ibuti	No: on a strib	rmal and its	Appro s appl	oxima icatio	ation to ons, Bet), Joint	(12 the a Dis Dis	Hour Binon stribut tributi	s) nial ion ons
Continuous Random Distribution, Uniform and its applications, (Continuous).	Variab Distril Weibu	les, No oution, 11 distr	UN orma Gar ribut	I T-1 1 Dis nma ion,	stribu Distr Joint	tion, ibuti	No: on a strib	rmal and its utions	Appro s appl (Dis	oxima icatio crete	ation to ons, Bet), Joint	(12 the a Dis Dis	Hour Binon stribut tributi	s) nial ion ons



UNIT-2	(12 Hours)
Populations and Samples, The sampling distribution of the mean (σ known),	The sampling
distribution of the mean (σ unknown), The sampling distribution of the v	ariance, Point
estimation, Interval estimation, Tests of Hypotheses, Null Hypothesis and Tests	of hypotheses,
Hypothesis concerning one mean.	
(Sections 6.1, 6.2, 6.3, 6.4, 7.1, 7.2, 7.4, 7.5, 7.6)	
UNIT-3	(12 Hours)
Comparisons-Two independent Large samples, Comparisons-Two independent	small samples,
matched pairs comparisons, The estimation of variances, Hypotheses concerning	; one variance,
Hypotheses concerning two variances.	
(Sections 8.2, 8.3, 8.4, 9.1, 9.2, 9.3) .	
UNIT-4	(12 Hours)
Estimation of proportions, Hypotheses concerning one proportion, Hypotheses con	cerning several
proportions. The method of least squares, curvilinear regression, multiple regressi	on, correlation,
Completely Randomized Designs.	
(10.1, 10.2, 10.3, 11.1, 11.3, 11.4, 11.6, 12.1, 12.2)	
Text Books : Miller & Freund's "Probability and Statistics for Engineers", Richa	rd A. Johnson,
8 th Edition, PHI.	
References: 1. R.E Walpole, R.H. Myers & S.L. Myers 'Probability &	Statistics for
Engineers and Scientists', 6 th Edition, PHI.	
2. Murray R Spiegel, John J.Schiller, R. AluSrinivasa, 'Probabili	ty &Satistics',
Schaum's outline series.	



LINEAR ALGEBRA AND ORDINATRY DIFFERENTIAL EQUATIONS I B. Tech. I Semester 20EE101/MA01																		
Lectures		•	2 Ho	urs/V	Veek	Γ	<u>utori</u>	al		1	Hou	r/Wee	ek	Practic	al	•	0	
CIE Mark	s	:	30		, con	S	SEE N		<u>.</u>	7	'0			Credit	5	:	3	
		•	20			~		10111	· .		0			create		<u> </u>		
Pre-Requ	isite:	Non	e															
																		-
Course C	Course Objectives: Students will learn how to Solve a system of linear homogeneous and non-homogeneous equations, finding the																	
A	 Solve a system of linear homogeneous and non-homogeneous equations, finding the 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 appropriate 																	
À	 Identify the type of a given differential equation and select and apply the appropriate analytical technique for finding the solution of first order ordinary differential equations. Create and analyze mathematical models using higher order differential equations to 																	
\blacktriangleright	Creat solve	e an app	d ana licatio	lyze n pro	mather blems	ma tha	tical at aris	mode se in	els u engi	sing neeri	highe ng.	er ord	ler di	fferent	al eq	uati	ons t	0
\checkmark	Solve	e a l ition	inear s using	diffe g Lar	rential blace T	eq ran	uatic sforr	on wi ns.	ith c	onsta	ant co	oeffici	ients	with th	ne giv	/en	initia	al
				<u> </u>													-	
Course C	Outcon	nes:	After	study	ving th	is c	course	e, the	stud	ents	will ł	be abl	e to					
CO-1	Find	the e	eigen v	value	s and e	eige	en veo	ctors	ofa	give	n mat	rix an	d its	inverse	•			
CO-2	Appl differ	y the entia	e appro al equa	opria ation	te anal	yti	cal te	chnic	que t	o fin	d the	solut	ion o	f a firs	t orde	r or	linar	у
CO-3	Solve engin	e hig ieerii	gher c ng app	order olicat	linear ions.	di	iffere	ntial	equa	ation	s wit	h coi	nstan	t coeff	icient	s ar	ise i	n
CO-4	Appl	y La	place	trans	forms	to s	solve	diffe	renti	al eq	uation	ns ari	sing i	in engir	neerin	g		
Mapping	of Cou	rse (Outcor	nes w	vith Pro	ogr	am O	utco	mes d	& Pr	ogran	1 Spec	cific (Dutcom	es			
							PO	D's		1					PSO'	S		
C	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2		3	
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)-2	3	3	3	-	-	-	-	-	-	-	-	2	3	-		-	
)-3	3	3	3	-	-	-	-	-	-	-	-	$\frac{2}{2}$	3	-	-	-	
)-4	3	3	3	-	-	-	-	-	-	-	-	2	3	-		-	
						TTN									(1)	<u>, 11</u>		
						UN	11-1								(12	2 HC	urs)	
Linear A method o System o Eigen va proof). [Sections	UNIT-1(12 Hours)Linear Algebra: Rank of a Matrix; Elementary transformations of a matrix; Gauss-Jordan 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).Fortierer: 271:272:276:2101:2102:2101:2121:2121:211:211:211:21																	



	UNIT-2	(12 Hours)							
Differential Equations of first order : Definitions; Formation of a Different Solution of a Differential equation; Equations of the first order and first degres separable; Linear Equations; Bernoulli's equation; Exact Differential equation reducible to Exact equations: I.F found by inspection, I.F of a Homogeneous equation equation M dx+ N dy = 0, $\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x}$ is a function of x and $\frac{\partial N}{\partial x} - \frac{\partial M}{\partial y}$ is a function M Applications of a first order Differential equations: Newton's law of cooling; Rat Radio-active materials.									
Applications of Radio-active ma	a first order Differential equations: Newton's law of cooling; Rataterials.	e of decay of							
[Sections: 11.1;	<u>11.3; 11.4; 11.5; 11.6; 11.9; 11.10; 11.11; 11.12.1; 11.12.2; 11.12.4;</u>	12.6; 12.8]							
I D'ff	UNIT-3	(12 Hours)							
complementary procedure to so Differential Equ [Sections: 13.1;	function; Inverse operator; Rules for finding the Particular Integrations: Oscillatory Electrical Circuits. 13.2.1; 13.3; 13.4; 13.5; 13.6; 13.7;13.8.1;14.1;14.5].	gral; Working ons of Linear							
	UNIT-4	(12 Hours)							
Laplace Trans functions; prope Multiplication methods of fin differential equa [Sections:21.2.1	sforms: Definition; conditions for the existence; Transforms of erties of Laplace Transforms; Transforms of derivatives; Transform by t ⁿ ; Division by t; Inverse transforms- Method of partial fra iding inverse transforms; Convolution theorem(without proof); A ations: Solution of ODE with constant coefficients using Laplace tran L; 21.2.2; 21.3; 21.4; 21.7; 21.8; 21.9; 21.10; 21.12; 21.13; 21.14; 21.	of elementary s of integrals; actions; Other Application to asforms. 15.1]							
Text Books :	B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khan 2017.	na publishers,							
References :	 [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9th Wiley & Sons. [2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathem Publications, 2010. 	edition, John natics" Laxmi							



(Autonomous)

NUMERICAL METHODS AND ADVANCED CALCULUS I B. Tech. II Semester 20EE201/MA02 2 Hours/Week Tutorial • 1 Hour/Week Practical 0 Lectures CIE Marks 30 SEE Marks 70 Credits 3 : : **Pre-Requisite**: None Course Objectives: Students will learn how to Solve algebraic, transcendental and system of linear equations with the help of \geq numerical methods. Apply the techniques of numerical integration whenever and wherever routine methods are not applicable and solve the first order ordinary differential equations numerically \geq with the given initial condition using different methods. Evaluate double and triple integrals and apply them to find areas and volumes. \geq Evaluate the line, surface and volume integrals and learn their inter-relations and \triangleright applications. Course Outcomes: After studying this course, the students will be able to Solve non-linear equations and system of linear equations with the help of Numerical CO-1 techniques. Solve the first order ordinary differential equations numerically with the given initial CO-2 condition. Find the area and volume of plane and three dimensional figures using multiple CO-3 integrals. Apply vector integral theorems to obtain the solutions of engineering problems CO-4 involving circulation, flux, and divergence in vector fields. Mapping of Course Outcomes with Program Outcomes & Program Specific Outcomes PO's PSO's CO 2 3 4 5 9 10 11 12 1 6 7 8 1 2 3 **CO-1** 3 3 2 3 ----_ _ --2 -_ **CO-2** 3 3 2 2 2 _ _ _ _ _ _ _ _ _ **CO-3** 3 3 2 2 3 ----------3 3 **CO-4** 2 ---_ 2 3 UNIT-1 (12 Hours) Numerical Solution of Equations: Introduction; Solution of algebraic and transcendental equations: Bisection method, Method of false position, Newton-Raphson method; Useful deductions from the Newton-Raphson formula; Solution of linear simultaneous equations; Direct methods of solution: Gauss elimination method, Gauss-Jordan method, Factorization method; Iterative methods of solution: Jacobi's iterative method, Gauss-Seidel iterative method. [Sections:28.1; 28.2; 28.3; 28.5; 28.6; 28.7.1; 28.7.2].



	UNIT-2	(12 Hours)
Finite differ	ences and Interpolation: Finite differences: Forward differences	nces. Backward
differences: N	lewton's interpolation formulae: Newton's forward interpolation for	rmula. Newton's
backward inte	erpolation formula: Interpolation with unequal intervals: Lagrang	e's interpolation
formula: Div	ided differences: Newton's divided difference formula: Numer	ical integration:
Trapezoidal r	ule: Simpson's one-third rule: Simpson's three-eighth rule: Nume	erical solution of
ODE's: Introd	luction: Picard's method: Euler's method: Runge-Kutta method.	
[Sections:29.1	: 29.1-1: 29.1.2: 29.6: 29.9: 29.10: 29.11: 29.12: 30.4: 30.6: 30.7:	30.8: 32.1: 32.2:
32.4: 32.7].	, _, _, _, _, _, _, _, _, _, _, _, _, _,	<i>c</i> , <i>c</i> <u></u> , <i>c</i> <u></u> ,
	UNIT-3	(12 Hours)
Multiple Inte	grals: Double integrals; Change of order of integration; Double i	ntegrals in polar
coordinates; A	Area enclosed by plane curves; Triple integrals; Volumes of so	lids: Volume as
Triple integral	l, Change of variables.	
[Sections: 7.1]	; 7.2; 7.3; 7.4; 7.5; 7.6.2; 7.7.2].	
	UNIT-4	(12 Hours)
Vector calcu	UNIT-4 lus and its Applications: Scalar and vector point functions; Del a	(12 Hours) applied to scalar
Vector calcul point function	UNIT-4 lus and its Applications: Scalar and vector point functions; Del and sector point functions; Del applied	(12 Hours) applied to scalar to vector point
Vector calcul point function functions: Div	UNIT-4 lus and its Applications: Scalar and vector point functions; Del and scalar and vector point functions; Del applied vergence, Curl; Line integral; Surfaces: Surface integral, Flux a	(12 Hours) applied to scalar to vector point cross a surface;
Vector calcul point function functions: Dir Green's theory	UNIT-4 lus and its Applications: Scalar and vector point functions; Del ans-Gradient: Definition, Directional derivative; Del applied vergence, Curl; Line integral; Surfaces: Surface integral, Flux a em in the plane (without proof); Stokes theorem (without proof); C	(12 Hours) applied to scalar to vector point cross a surface; Gauss divergence
Vector calcul point function functions: Dir Green's theore theorem(without	UNIT-4 Ius and its Applications: Scalar and vector point functions; Del a ns-Gradient: Definition, Directional derivative; Del applied vergence, Curl; Line integral; Surfaces: Surface integral, Flux a em in the plane (without proof); Stokes theorem (without proof); C out proof).	(12 Hours) applied to scalar to vector point across a surface; Bauss divergence
Vector calcul point function functions: Dir Green's theorem theorem(without [Sections: 8.4]	UNIT-4 lus and its Applications: Scalar and vector point functions; Del a ns-Gradient: Definition, Directional derivative; Del applied vergence, Curl; Line integral; Surfaces: Surface integral, Flux a em in the plane (without proof); Stokes theorem (without proof); C out proof). ; 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16]	(12 Hours) applied to scalar to vector point across a surface; Gauss divergence
Vector calcul point function functions: Div Green's theorem theorem(without [Sections: 8.4] Text	UNIT-4 lus and its Applications: Scalar and vector point functions; Del ans-Gradient: Definition, Directional derivative; Del applied vergence, Curl; Line integral; Surfaces: Surface integral, Flux a em in the plane (without proof); Stokes theorem (without proof); Cout proof). (5, 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] (B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Kh	(12 Hours) applied to scalar to vector point cross a surface; Gauss divergence
Vector calcul point function functions: Dir Green's theore theorem(withou [Sections: 8.4] Text Books :	UNIT-4 lus and its Applications: Scalar and vector point functions; Del a ns-Gradient: Definition, Directional derivative; Del applied vergence, Curl; Line integral; Surfaces: Surface integral, Flux a em in the plane (without proof); Stokes theorem (without proof); C out proof). ; 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Kh 2017.	(12 Hours) applied to scalar to vector point across a surface; Bauss divergence
Vector calcul point functions functions: Div Green's theoret theorem(without [Sections: 8.4] Text Books :	UNIT-4 lus and its Applications: Scalar and vector point functions; Del ans-Gradient: Definition, Directional derivative; Del applied vergence, Curl; Line integral; Surfaces: Surface integral, Flux a em in the plane (without proof); Stokes theorem (without proof); Cout proof). (8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Kh 2017.	(12 Hours) applied to scalar to vector point cross a surface; Gauss divergence
Vector calcul point function functions: Dir Green's theore theorem(without [Sections: 8.4] Text Books : References	UNIT-4 Ius and its Applications: Scalar and vector point functions; Del a ns-Gradient: Definition, Directional derivative; Del applied vergence, Curl; Line integral; Surfaces: Surface integral, Flux a em in the plane (without proof); Stokes theorem (without proof); Cout proof). ; 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Kh 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9	(12 Hours) applied to scalar to vector point across a surface; Bauss divergence anna publishers,
Vector calcul point function functions: Div Green's theory theorem(without [Sections: 8.4] Text Books : References :	UNIT-4 lus and its Applications: Scalar and vector point functions; Del ans-Gradient: Definition, Directional derivative; Del applied vergence, Curl; Line integral; Surfaces: Surface integral, Flux a em in the plane (without proof); Stokes theorem (without proof); Cout proof). (5) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2	(12 Hours) applied to scalar to vector point cross a surface; Bauss divergence anna publishers,
Vector calcul point function functions: Dir Green's theore theorem(with [Sections: 8.4] Text Books : References :	UNIT-4 lus and its Applications: Scalar and vector point functions; Del a ns-Gradient: Definition, Directional derivative; Del applied vergence, Curl; Line integral; Surfaces: Surface integral, Flux a em in the plane (without proof); Stokes theorem (without proof); Cout proof). ; 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Kh 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9 Wiley & Sons. [2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics"	(12 Hours) applied to scalar to vector point across a surface; Bauss divergence anna publishers, Oth edition, John
Vector calcul point function functions: Div Green's theory theorem(withe [Sections: 8.4] Text Books : References :	UNIT-4 lus and its Applications: Scalar and vector point functions; Del a ns-Gradient: Definition, Directional derivative; Del applied vergence, Curl; Line integral; Surfaces: Surface integral, Flux a em in the plane (without proof); Stokes theorem (without proof); Cout proof). ; 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Kh 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9 Wiley & Sons. [2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics, 2010.	(12 Hours) applied to scalar to vector point cross a surface; Bauss divergence anna publishers,



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Pr	e-Requ	uisite:	Non	e															
Co	ourse C)bject	ives:	Stude	ents v	will le	arn	how	to										
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	\triangleright	Appl	y va latio	rious s n base	samp ed on	le test samp	s lik	ke F-t ata	est ai	nd χ2	2 -tes	t for	decisi	on m	aking 1	regar	ding	the	
	population based on sample data.Compute the level of correlation, the best fit curve to the given data by the method of																		
	Compute the level of correlation, the best fit curve to the given data by the method of least squares and also perform ANOVA arising in the field of engineering															01			
		10000	2 1			<u>- p</u>									5	8.			
Co	ourse C	Jutcor	nes:	After	study	ying tl	his c	course	e, the	stuc	ents	will l	be abl	le to					
		Appl	y dis	screte	and	contin	nuou	is pro	babil	ity c	listri	bution	ns to	vario	us pro	blem	s ari	sing	in
C	0-1	Engi	neeri	ng ap	plica	tions.													
C	O-2	Perfo	orm]	Fest of	f Hyp	othes	is fo	or a p	opula	ition	para	meter	r for s	single	sampl	e.			
C	O-3	Perfo	orm [Fest of	f Hyp	othes	is fo	or pop	oulati	on p	aram	eters	for n	nultip	le sam	ples.			
C	0-4	Inter	pret	the res	sults	of cor	rela	tion,	regre	ssio	1 and	one	way A	ANO	VA for	the g	given	n data	a.
Ma	opping	of Cou	ırse (Outco	mes v	vith P	rogr	'am C	utco	nes	& Pr	ogran	n Spe	cific (Dutcom	es			
								P	D's							PSO	<u>'s</u>		
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							UN	NIT-1	-							()	2 H	ours))
Co	Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial																		
Di	stributi	on, U	nifoi	m Di	stribu	ition,	Gar	mma	Dist	ibut	ion a	ind it	s app	olicati	ons, B	eta I	Distr	ibutio	on
and	and its applications, Weibull distribution, Joint Distributions (Discrete), Joint Distributions																		
	ontinuc	ous).	~ -	2		<u> </u>		- 1 (1)											
(Se	ections	5.1, 5	.2, 5	.3, 5.5	,3.7,	5.8, 5	.9, :	5.10)											



UNIT-2	(12 Hours)									
Populations and Samples, The sampling distribution of the mean (o known), The same										
distribution of the mean (σ unknown), The sampling distribution of the variance, Point										
estimation, Interval estimation, Tests of Hypotheses, Null Hypothesis and Tests of hypotheses,										
Hypothesis concerning one mean.										
(Sections 6.1, 6.2, 6.3, 6.4, 7.1, 7.2, 7.4, 7.5, 7.6)	-									
UNIT-3	(12 Hours)									
Comparisons-Two independent Large samples, Comparisons-Two independent	small samples,									
matched pairs comparisons, The estimation of variances, Hypotheses concerning	one variance,									
Hypotheses concerning two variances.										
(Sections 8.2, 8.3, 8.4, 9.1, 9.2, 9.3) .										
UNIT-4	(12 Hours)									
Estimation of proportions, Hypotheses concerning one proportion, Hypotheses con	cerning several									
proportions. The method of least squares, curvilinear regression, multiple regression	on, correlation,									
Completely Randomized Designs.										
(10.1, 10.2, 10.3, 11.1, 11.3, 11.4, 11.6, 12.1, 12.2)										
Text Books : Miller & Freund's "Probability and Statistics for Engineers", Richa	rd A. Johnson,									
8 th Edition, PHI.										
References: 1. R.E Walpole, R.H. Myers & S.L. Myers 'Probability &	Statistics for									
Engineers and Scientists', 6th Edition, PHI.										
2. Murray R Spiegel, John J.Schiller, R. AluSrinivasa, 'Probability	& Satistics',									
Schaum's outline series.										



LINEAR ALGEBRA AND ORDINATRY DIFFERENTIAL EQUATIONS																			
T	I D. I CCII. I Semester ZUNIE 101/MA01 Lectures · 2 Hours/Week Tutorial · 1 Hours/Weak																		
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CI	E Marl	KS	:	30			S	SEE M	larks	s :	ĺ ĺ	/0			Credit	S	:	3	
Pre-Requisite: None																			
Course Objectives: Students will learn how to																			
		Solve a system of linear homogeneous and non-homogeneous equations, finding the 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 appropriate analytical technique for finding the solution of first order ordinary differential equations.																	
	\blacktriangleright	Create and analyze mathematical models using higher order differential equations to solve application problems that arise in engineering.																	
		Solve condi	e a l ition	inear s using	diffe g Lap	rentia place 7	l eq Гran	uation sform	n wi ıs.	ith c	onsta	ant co	oeffic	ients	with tl	ne gi	ven	initi	al
Са	ourse (Outcon	nes:	After	study	ying th	nis c	ourse	, the	stud	ents	will b	be abl	e to					
C	CO-1	Find	the e	eigen v	value	s and	eige	en vec	tors	of a	give	n mat	rix ar	nd its	inverse				
C	CO-2	Appl differ	y the entia	e appro	opria ation	te ana	lytio	cal tec	chnic	que t	o fin	id the	solut	tion o	f a firs	t orde	er or	dina	ry
C	CO-3	Solve engin	e hig ieerii	gher c ng app	order olicat	linea ions.	r di	fferen	itial	equa	ation	is wit	h co	nstan	t coeff	icien	ts ar	ise	in
C	CO-4	Appl	y La	place	trans	forms	to s	solve o	liffe	renti	al eq	uation	ns ari	sing	in engir	neerii	ıg		
М	anning	of Con	reo (Jutoo	nos u	uith Dr	oar	am Or	utoo	mos	Pr Dr	ogran	Sno	oifia (Jutcom	06			
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	C	0	1	2	2	4	5		7	0	0	10	11	12	1	<u>1 30</u> 2	<u> </u>	2	
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							UN	IT-1								(1	2 Ho	ours))
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me	ethod c	of find	ing	the in	verse	e: Cor	nsist	encv	of 1	inea	· Sv	stem	of eq	uatio	ns: Ro	uche	s the	orer	n.
Sv	stem o	f linea	r No	n-hon	loger	ieous	equ	ations	, Sy	stem	ofli	inear l	homo	gene	ous equ	atior	ıs; ve	ector	s;
Eig	gen va	lues; 1	orop	erties	of E	ligen	valu	ıes(wi	thou	it pr	oofs); Cay	yley-I	Hami	lton th	eorer	n (w	vitho	ut
pro	oof).	× 1	I			C				I	,	· · •					`		
[Se	ections	: 2.7.1	; 2.7	.2; 2.7	.6; 2.	10.1;	2.10).2; 2.	10.3	; 2.1	2.1;	2.13.2	1; 2.1	4; 2.1	.5.]				
	UNIT-2																		



		(12 Hours)							
Differential Equations of first order: 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 E	reducible to Exact equations: I.F found by inspection, I.F of a Homogeneous equation, In the								
	$\frac{\partial M}{\partial N} = \frac{\partial N}{\partial M}$								
equation M dx+ N dy = 0, ∂y ∂x is a function of x and ∂x ∂y is a function of y.									
	N M								
Annlingtions of	f a first ander Differential amotional Newton's law of applies. Bat	a of decour of							
Applications o	of a first order Differential equations: Newton's law of cooling; Rat	e of decay of							
Kadio-active II	Identials.	12 6. 12 0]							
	$\frac{1}{1}$ 11.3; 11.4; 11.5; 11.0; 11.9; 11.10; 11.11; 11.12.1; 11.12.2; 11.12.4; UNIT 2	12.0; 12.8j							
Linean Differ	UNIT-3	(12 Hours)							
Linear Differ	ential Equations: Definitions; Theorem; Operator D; Rules to	r finding the							
complementary	y function; inverse operator; Rules for finding the Particular integration of Departmentation Application	gral; working							
Differential Ea	solve the equation; Method of Variation of Parameters; Application	ons of Linear							
Differential Eq	[uations: Oscillatory Electrical Circuits.]								
	$\frac{1}{1}$ $\frac{1}$	(12 II							
I T	UNII-4	(12 Hours)							
Laplace I ran	istorms: Definition; conditions for the existence; I ransforms (of elementary							
Iunctions; prop	berues of Laplace Transforms; Transforms of derivatives; Transform h_{x} the Division has to Inverse transforms. Mathed of neutral fue	s of integrals;							
matheda of f	by t; Division by t; niverse transforms- Method of partial fra	anniastion to							
differential equ	noting inverse transforms, Convolution theorem (without proof), F	Application to							
[Soctions:21.2	1, 21, 2, 21, 2, 21, 4, 21, 7, 21, 8, 21, 0, 21, 10, 21, 12, 21, 12, 21, 14, 21	151011115.							
Tort Doolyn	1, 21.2.2, 21.3, 21.4, 21.7, 21.0, 21.9, 21.10, 21.12, 21.15, 21.14, 21.	13.1]							
TEXT DOORS :	D.S. Olewal, Higher Eligineering Mathematics, 44 edition, Kilan	na publishers,							
	2017.								
References ·	[1] Erwin Kreyszig "Advanced Engineering Mathematics" 9th	edition John							
	Wilow & Song	cannon, John							
	[2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathem	hatics" Laxmi							
	Publications, 2010.								



NUMERICAL METHODS AND ADVANCED CALCULUS I B. Tech. II Semester 20ME201/MA02															
Lectures	ures : 2 Hours/Week Tutorial : 1 Hour/Week Practical : 0														0
CIE Marl	٢S	:	30			S	SEE Marl	ks	:	70		Cred	its	:	3
Pre-Req	uisite:	Non	e												
Course Objectives: Students will learn how to															
\triangleright	Solve algebraic, transcendental and system of linear equations with the help of numerical methods.														
~	Apply the techniques of numerical integration whenever and wherever routine methods are not applicable and solve the first order ordinary differential equations numerically with the given initial condition using different methods.														
\succ	Evalı	iate	double	e and	triple	e inte	egrals an	d ap	oly tł	nem to	find ar	eas and v	olum	es.	
>	Evalı appli	iate catio	the li ns.	ne, s	surfac	e ar	nd volun	ne i	tegr	als an	d learn	their in	ter-re	latio	is and
Course (Outcon	nes:	After	study	ving tl	his c	ourse, th	ie stu	dent	s will	be able	to			
CO-1	Solve techn	e nor ique	n-linea s.	ır equ	uation	is an	nd system	n of	linea	r equa	tions w	ith the h	elp of	Nur	nerical
CO-2	Solve condi	e the	first	order	ordin	nary	differen	itial	equat	tions n	numeric	ally with	the g	given	initial
CO-3	Find integ	the rals.	area	and	volur	ne o	of plane	and	thre	e din	nension	al figures	s usir	ng m	ultiple
CO-4	Appl invol	y ve ving	ector circul	integ lation	ral tł ı, flux	neor (, an	ems to d diverge	obta ence	n th in ve	e solu ector fi	utions elds.	of engin	eering	g pro	oblems
Manning	of Con		<u>)taa.</u>				am Quita		<i>е</i> . п		n Engaid	Fa Autoor	2 0.0		
			Juicol	nes w	nui P	rogr		omes	αr	rografi	n speci		Des Dev)°e	
C	0	1	2	3	4	5	6 7	8	9	10	11	12 1	$\frac{150}{2}$		3
	<u>0</u>)-1	3	3	$\frac{3}{2}$	-	-		-		-		$\frac{12}{2}$ 1	-		-
)-2	3	3	$\frac{2}{2}$	-	-		-	-	_	_	$\frac{2}{2}$ 3	-		_
)-3	3	3	$\frac{2}{2}$	_	_		+_	<u> </u>	_	_	$\frac{2}{2}$ 3	-		_
)-4	3	3	2	-	-		-	-	_	_	$\frac{2}{2}$ 3	-		_
											1				
						UN	IT-1						(12 H	ours)
Numeric equations	al So l : Bise	l utio ectio	n of n me	Equ thod,	ation Met	s: I thod	ntroduct of fals	ion; se p	Solu ositic	ition on, Ne	of alge ewton-I	braic an Raphson	d trai meth	nscer od;	ıdental Useful
deduction	ns fron	n the	Newt	on-R	aphso	on fo	ormula; S	Solut	ion c	of linea	ar simu	ltaneous	equati	ons;	Direct
methods	of sol	utior	n: Gau	iss e	limin	ation	n methoo	d, G	uss-	Jordar	n metho	od, Facto	rizatio	on m	ethod;
Iterative [Sections	methoo: 28.1;	is of 28.2	soluti; 28.3;	on: J ; 28.5	acobi 5; 28.6	's 1t 6; 28	erative m 8.7.1;28.7	nethc 7.2].	d, G	auss-S	eidel it	erative m	ethod	•	
	UNIT-2														



		$(12 II \dots)$							
		(12 Hours)							
Finite differences and Interpolation: Finite differences: Forward differences, Backward									
differences; Newton's interpolation formulae: Newton's forward interpolation formula, Newton's									
backward inte	rpolation formula; Interpolation with unequal intervals; Lagrange's	interpolation							
formula; Divi	formula; Divided differences; Newton's divided difference formula; Numerical integration;								
Trapezoidal rule; Simpson's one-third rule; Simpson's three-eighth rule; Numerical solution of									
ODE's: Introduction; Picard's method; Euler's method; Runge-Kutta method.									
[Sections:29.1]	; 29.1-1; 29.1.2; 29.6; 29.9; 29.10; 29.11; 29.12; 30.4; 30.6; 30.7; 30	.8; 32.1; 32.2;							
32.4; 32.7].									
	UNIT-3	(12 Hours)							
Multiple Integ	grals: Double integrals; Change of order of integration; Double inte	grals in polar							
coordinates; A	area enclosed by plane curves; Triple integrals; Volumes of solids	s: Volume as							
Triple integral,	, Change of variables.								
[Sections: 7.1;	7.2; 7.3; 7.4; 7.5; 7.6.2; 7.7.2].								
UNIT-4 (12 Hours)									
	UNIT-4	(12 Hours)							
Vector calcul	UNIT-4 us and its Applications: Scalar and vector point functions; Del app	(12 Hours) blied to scalar							
Vector calcule point function	UNIT-4 us and its Applications: Scalar and vector point functions; Del app ns-Gradient: Definition, Directional derivative; Del applied to	(12 Hours) blied to scalar vector point							
Vector calcult point function functions: Div	UNIT-4 us and its Applications: Scalar and vector point functions; Del app is-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acro	(12 Hours) blied to scalar vector point oss a surface;							
Vector calcule point function functions: Div Green's theore	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau	(12 Hours) blied to scalar vector point oss a surface; ss divergence							
Vector calculation point function functions: Div Green's theore theorem(witho	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossm in the plane (without proof); Stokes theorem (without proof); Gau ut proof).	(12 Hours) blied to scalar vector point bss a surface; ss divergence							
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4;	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossm in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16]	(12 Hours) blied to scalar vector point bss a surface; ss divergence							
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khan	(12 Hours) blied to scalar vector point oss a surface; ss divergence							
Vector calcult point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Kham 2017.	(12 Hours) blied to scalar vector point oss a surface; oss divergence na publishers,							
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossm in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khan 2017.	(12 Hours) blied to scalar vector point bss a surface; ss divergence na publishers,							
Vector calcult point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applies-Gradient: Definition, Directional derivative; Del applied to vergence, Curl; Line integral; Surfaces: Surface integral, Flux acrossment in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Kham 2017.	(12 Hours) blied to scalar vector point oss a surface; uss divergence na publishers, edition, John							
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to rergence, Curl; Line integral; Surfaces: Surface integral, Flux acro em in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khan 2017.	(12 Hours) olied to scalar vector point oss a surface; ss divergence na publishers, edition, John							
Vector calcula point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to rergence, Curl; Line integral; Surfaces: Surface integral, Flux across em in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khan 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9 th Wiley & Sons. [2] N.P.Bali and M.Goval, "A Text book of Engineering Mathem	(12 Hours) olied to scalar vector point oss a surface; ass divergence na publishers, edition, John							
Vector calcult point function functions: Div Green's theore theorem(witho [Sections: 8.4; Text Books : References :	UNIT-4 us and its Applications: Scalar and vector point functions; Del applied to rergence, Curl; Line integral; Surfaces: Surface integral, Flux acro em in the plane (without proof); Stokes theorem (without proof); Gau ut proof). 8.5; 8.5.1; 8.5.3; 8.6; 8.11.1; 8.12.2; 8.12.3; 8.13; 8.14; 8.16] B.S.Grewal, "Higher Engineering Mathematics", 44 th edition, Khan 2017. [1] Erwin Kreyszig, "Advanced Engineering Mathematics", 9 th Wiley & Sons. [2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathem Publications, 2010.	(12 Hours) olied to scalar vector point oss a surface; ss divergence na publishers, edition, John natics" Laxmi							



PROBABILITY AND STATISTICS II B. Tech. III Semester 20MF301/MA03																		
Lee	ctures		:	2 Ho	urs/V	Veek	T	utori	ial	:	1	Hou	r/We	ek	Practi	cal :		0
CI	E Marl	ζS	:	30			S	SEE N	Mark	s :	7	0			Credit	ts :		3
Pr	e-Requ	uisite:	Non	e														
Course Objectives: Students will learn how to																		
	\triangleright	Apply the continuous probability densities to various problems in science and engineering.																
	\mathbf{A}	Estin giver	nate 1 San	the po nple d	oint a ata a	nd int nd ap	terva ply Z	ul esti Z-test	imato t, t-te	ors of st to	the vario	mean ous re	, var al-lif	iance e pro	and pi blems	oportio	on for	the
		Appl popu	y vai latio	rious s n base	samp ed on	le test samp	ts lik de da	te F-t ata.	est a	nd χ2	l -tes	t for o	decisi	ion m	aking	regardi	ng the	2
		Com least	pute	the le	vel o d als	of cor	relat	$\frac{1}{100}$	the b	est fi	t cur	ve to	the g	given of en	data b	y the n	nethoo	d of
		Teast	oquu	105 ui	u uib	o pen			0 11	un	ing n	1 110	liela	<u>or en</u>	51110011	<u>115</u> .		
Course Outcomes: After studying this course, the students will be able to																		
С	O-1	Appl Engi	y dis neeri	screte ng ap	and oplicat	contir tions.	nuou	s pro	babi	lity c	listril	oution	ns to	vario	us pro	blems	arisin	g in
С	O-2	Perfo	orm 7	fest of	f Hyp	othes	sis fo	or a p	opula	ation	para	meter	for s	single	samp	e.		
С	O-3	Perfo	orm 7	fest of	f Hyp	othes	sis fo	or pop	oulati	ion p	aram	eters	for n	nultip	le sam	ples.		
С	O-4	Inter	pret 1	the res	sults o	of cor	rela	tion,	regre	ession	n and	one	way 1	ANO	VA for	the give	ven da	ata.
Ma	pping	of Cou	irse (Dutco	mes w	vith P	rogr	am C) utco	mes e	& Pr	ogran	ı Spe	cific (Outcon	ies		
								P	O's							PSO's		
	C	0	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
-	CC)-1	3	3	-	-	-	-	-	-	-	-	-	2	2	-	-	
	CC)-2	3	3	2	-	-	-	-	-	-	-	-	2	2	-	-	_
	CC)-3	3	3	2	-	-	-	-	-	-	-	-	2	2	-	-	_
	CC)-4	3	3	3	-	-	-	-	-	-	-	-	2	3	-	-	
							UN	IT-1	_							(12	Hour	s)
Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial Distribution, Uniform Distribution, Gamma Distribution and its applications, Beta Distribution and its applications, Weibull distribution, Joint Distributions (Discrete), Joint Distributions (Continuous). (Sections 5.1, 5.2, 5.3, 5.5, 5.7, 5.8, 5.9, 5.10)																		
		UNIT-2																



	(12 Hours)								
Populations and Samples, The sampling distribution of the mean (σ known),	The sampling								
distribution of the mean (σ unknown), The sampling distribution of the variance, Point									
estimation, Interval estimation, Tests of Hypotheses, Null Hypothesis and Tests	of hypotheses,								
Hypothesis concerning one mean.									
(Sections 6.1, 6.2, 6.3, 6.4, 7.1, 7.2, 7.4, 7.5, 7.6)									
UNIT-3	(12 Hours)								
Comparisons-Two independent Large samples, Comparisons-Two independent	small samples,								
matched pairs comparisons, The estimation of variances, Hypotheses concernin	g one variance,								
Hypotheses concerning two variances.									
(Sections 8.2, 8.3, 8.4, 9.1, 9.2, 9.3) .									
UNIT-4	(12 Hours)								
Estimation of proportions, Hypotheses concerning one proportion, Hypotheses cor	cerning several								
proportions. The method of least squares, curvilinear regression, multiple regress	ion, correlation,								
Completely Randomized Designs.									
(10.1, 10.2, 10.3, 11.1, 11.3, 11.4, 11.6, 12.1, 12.2)									
Text Books : Miller & Freund's "Probability and Statistics for Engineers", Rich	ard A. Johnson,								
8 th Edition, PHI.									
References: 1. R.E Walpole, R.H. Myers & S.L. Myers 'Probability &	& Statistics for								
Engineers and Scientists', 6th Edition, PHI.									
2. Murray R Spiegel, John J.Schiller, R. AluSrinivasa, 'Probabil	ity &Satistics',								
Schaum's outline series.	-								