		NA	RAYA	<u>S</u> ANA I	SEMI ENGI	<u>esti</u> neei	E <u>R I</u> RING	COL	LEGE	::NE	LLOF	RE		
			CF	IEMI	STRY	FOF	R CIV	IL EN	GINI	EERII	NG			R21
Semester		Н	lours /	Week			Total	0	Credit			Max I	Marks	
Semester]	L	Т		Р		hrs		С	0	CIE	SE	EΕ	TOTAL
Ι		3	0		0		48		3		40	6	0	100
Pre-requise day to day	site: 1 life, a	Basic aware	conce ness o	epts in on env	ironm	nistry nent,	, Adva	anced	engi	neerii	ng ma	terials	s, chen	nistry in
Course Ol	ojecti	ives:												
1. 2. 3. 4. 5.	To fa To i To m To t mate To tr	amilian mpart nake th rain th rials. rain th	rize ch the co ne stud ne stud e stud	emistroncept lents to lents of ents of	ry for of sof o get a on the p	civil e t and waren princip	engined hard w ness or ples an	ering a vaters, n envir nd app d appl	and its softer ronme licatio	appli- ning m nt. ns of s	cation aethod advan coil ch	s. s of ha ced en emistr	ard wat gineer y.	er
Course Ou	utcon	nes: A	fter s	ucces	sful c	omple	etion o	of the	cours	e, the	stude	nt will	l be ab	le to:
CO 1	Illu	strate	the co	oncept	s of v	vater	techn	ology	and it	s app	licatio	ons (B	L-3)	
CO 2	Der BL-	nonst -3)	rate tl	ne cor	rosior	ı prev	entior	1 met	nods a	nd fa	ctors	affecti	ing cor	rosion(
CO 3	Uno ació	dersta 1 rain	nd va .(BL-2	rious 2)	cause	s of p	ollutio	n ,glo	bal w	armir	ıg, ozo	one de	pletion	ı, and
CO 4	Exp	olain t	he set	ting a	nd ha	rdeni	ng of	cemer	nt and	conc	rete p	hase (BL-2)	
CO 5	Cla 3)	ssify	variou	ıs soil	s phy	sical	and c	hemio	cal pro	operti	es anc	l their	· impa	ets.(BL-
						CO-P	O Maj	pping						
						Р	0							PSO
со	PO 1	PO 2	РО 3	РО 4	РО 5	PO 6	РО 7	РО 8	PO 9	РО 10	РО 11	PO 12	PSO 1	PSO 2
CO1	3													
CO2	3		3											
CO3	3		3											
CO4	3													
CO5	3	3												

NARAYANA ENGINEERING COLLEGE::NELLORE											
		PI	ROBLEM	SOLVING	AND PROG	RAMMIN	G	R21			
Semeste	r H	ours / We	ek	Total hrs	Credit		Max Mark	s			
	L	Т	T P C CIE SEE TOT								
Ι	3	0	0	48	3	40 60 100					
Pre-requisite: Mathematics Knowledge, Analytical and Logical skills											
Course	Course Objectives:										
 Τοι 	inderstand va	rious steps	s in Progra	m developm	ent.						
 Τοι 	inderstand th	e basic cor	cepts in C	Programmir	ng Language.						
 Tol 	earn how to	write modu	lar and rea	adable C Pro	grams.						
 Tol 	earn the synt	ax and sen	nantics of a	a C Program	ning language	e.					
 Tol 	earn structur	ed progran	ming app	roach for pro	blem solving.						
Course	Outcomes:	After succ	essful con	npletion of t	he course, th	e student w	vill be able t	o:			
CO 1	Iden	tify metho	ds to solve	a problem th	irough compu	iter progran	nming. (BL	- 3)			
CO 2		Unde	erstand the	use of opera	tors and input	t/output. (B	L - 2)				
CO 3	Understand the difference and the usage of various control statements and Functions(BL - 2)										
CO 4	Apply the Arrays and Pointers for solving problems. (BL - 3)										
CO 5		Ех	plain Use	r-Defined Da	ta Types and	Files. (BL -	- 2)				

CO-PO Mapping														
						PO	<u>с</u>						PS	50
CO	PO	РО	PO	PO	PO	PO	PO	PO	РО	PO	PO	PO	PSO	PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3											1	
CO2	1	2	1										1	
CO3	1	2	1		2								2	2
CO4	2	2	3	2	1							2	3	2
CO5	3	3	2	2								1	2	
1: Low, 2-Medium, 3- High														
COURSE CONTENT														
MODULE – 1 Fundamentals of Computers and Programming 10 HOURS														
Introducti	on to	Prog	ramm	ing, 1	Algori	thms	and	Flow	charts	: Pro	grams	and	Program	nming,
Programmi	ng lang	uages,	Comp	iler, In	terpret	er, Als	gorithn	ns, Flo	wchar	ts, Hov	v to D	evelop	a Progra	am.
Basics of	C: Intro	ductio	n, Cha	racter	Set, S	tructu	re of a	C Pro	ogram,	A Si	nple C	Prog	ram, Va	riables,
Data Types and Sizes, Declaration, Identifiers, Keywords, Constants, Assignment, and Initialization.														
At the end of the Module 1, students will be able to:														
1. Solve problems using language independent notations. (BL - 3)														
2. Understand the compilers and interpreters. (BL - 2)														
3. Un	derstand	Basic S	Structu	red of F	rogran	nming i	n C. (B	L - 2)						
4. Dev	velop alg	gorithm	s and fl	owchar	ts for p	roblem	s.(BL -	- 3)						
5. Unc	lerstand	various	s Toke	1s in C	langua	ige.(BI	L - 2)		<u> </u>					- Da
MODU	LE -2			(Operat	tors an	id Inpu	it and	Outpu	t			9 HO	URS
Operators	and E	xpress	ions:	Arithm	etic O	perato	rs, Rel	ational	l Oper	ators,	Logic	al Op	erators, l	Bitwise
Operators,	Conditi	onal O	perato	r, Com	ima op	erator,	size o	f opera	ator, E	xpress	ions, I	. value	es and R	values,
Expression	Evalua	tion- P	recede	nce an	d Asso	ociativi	ity, Ty	pe Cor	iversio	n.		_		
Input and	Outpu	it: Bas	ic Scr	een an	d Key	board	I/O in	C, Fo	ormatte	ed Inpu	it and	Outpu	ıt, Unfor	matted
Input and C	Dutput I	unctio	ns.											
At the end	l of the	Modul	e 2, sti	idents	will be	e able t	o:							
1. Illu	istrate th	ie work	ting of	expres	sions.(BL - 2))							
2. Un	derstand	the pr	eceden	ce and	Associ	ativity i	rules of	operat	tors. (E	SL - 2)				
3. Understand the rules of type conversion. (BL - 2)														
4. Explain the Formatted and Unformatted I/O functions. (BL - 2)														
MODULE-3 Control Statements and Functions 10 HOURS									UKS					
Control Statements: Selection Statements - if, Nested if, if-else, Nested if-else, else-if ladder, switch														
Looping Statements - while, do-while, for, Nested loops, Unconditional Statements - goto, break,														
Continue, 1	eturn.			Б		л ·				.				
Functions: Introduction, Using Functions, Passing Arguments to a Function, Working with Function,														
Scope and	Extent,	Scope and Extent, Recursion, The C Preprocessor, Storage classes												

	NARAYANA ENGINEERING COLLEGE:NELLORE											
		ENGINEERING GRAPHICS										
Semester		Max Mar	ks									
	L	L T P hrs C CIE SEE										
Ι	0 1 4 80 3 40 60											

Pre-Requisite: Basic Mathematics (Geometry)

Course Objectives:

- 1. To impart skills on using drawing instruments
- 2. To convey exact and complete information of any physical object.
- 3. To Construct Engineering Curves.
- 4. To Learn and practice basic AutoCAD commands.
- 5. To Instruct the utility of drafting & modelling packages in orthographic and isometric drawings

	Course Outcomes: At the end of the course, student will be able to:
CO 1	Define the qualities of precision and accuracy in engineering drawing. (BL-1)
CO 2	Draw engineering curves with different methods(BL-3).
CO 3	Develop the orthographic projection of points and straight lines(BL-3)
CO 4	Construct the planes and simple solids.(BL-3).
CO 5	Understand and practice basic AUTOCAD commands (BL-2)

COURSE CONTENT

	Part-A Manual Drawing	l l						
TASK-1	Introduction and Conic sections	10 Hours						
Introduction to Engin	neering graphics: Principles of Engineering Graphics and their	significance;						
various instruments us	ed, drawing sheet sizes and title block, lettering, BIS convention	ions, types of						
lines and dimensioning	; methods.							
Geometrical constructi	ons: simple constructions, construction of Pentagon, Hexagon by	y general						
	Method only.							
Conic Sections:	Types of conics: Ellipse, Parabola and Hyperbola (Eccentricit	ty method only),						
TASK2	Orthographic Projections 10 Hours							
Objectives and Princ	iple of projection, Methods of projections, Comparison between	een firstangle						
and third angle project	ion.							
Projections of points:	Projection of points placed in different quadrants.							
Projection of straight	t lines: Fundamental concepts, Line parallel, perpendicular an	d inclined to						
one and two reference	planes placed in first quadrant only.							
TASK-3	Projections of Solids	15 Hours						
Projections of plane and inc Projections of Perpendicular to one	 s: Projection of planes (Triangle, Square, Pentagon, Circle) planed to one and two reference planes placed in first quadram Types of solids; Polyhedra, Solids of revolution, regular solids (Prisms, Pyramids, Cylinders and Cone), plane and parallel to other plane, Axis inclined to one plane and 	barallel,Perpendicular t only. with its axis d parallel to						
The other states	other plane.	1011						
TASK-4	Isometric and Orthographic views	10Hours						

NARAYANA ENGINEERING COLLEGE:NELLORE											
		С	hemistry f	or Civil En	gineering la	b		R2021			
Semester	Н	ours / Wee	k	Total	Credit		Max Mai	rks			
	L	Т	Р	hrs	С	CIE	SEE	TOTAL			
I	0	0	3		1.5	40	60	100			
Pre-requisi	Pre-requisite: Nil										
Course Objectives:											
1. To provide the learners hands-on-training on the practical applications of											
the concepts learnt in the theoretical sessions on water treatment,											
electrochemistry, lubricants, and using simple chemical methods.											
2. <u>The</u>	course wi	ill also tra	ain the le	arner to	observe	good lab j	practices.	, record			
read	ings and	graphica	ally repr	esent th	e results.	as well	as analy	ze and			
inter	pret the i	nfluence	of reactio	on condit	ions on th	e results.					
Course O	utcomes:	After succ	essful co	ompletior	of the co	urse, the st	udent wil	ll be able to:			
CO 1	Analyze of	quality par	ameters o	f water sa	mples fror	n different	sources				
CO 2	Perform of	quantitativ	e analysis	using ins	trumental i	nethods.					
CO 3	Utilize tl	ne fundar	nental lab	oratory to	echniques	for analys	es such	as titrations,			
	separation	/purificatio	n/ and Spe	ctroscopy	-	-					
CO 4	To be ab	le to analy	vze and g	ain exper	imental sl	dill.					

						CO-PO) Map	ping						
со						Р	0						PS	0
	PO	PO	РО	РО	РО	PO	PO	PO	РО	PO	PO	РО	PSO	PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3													
CO2	3													
CO3	3													
CO4	3													
1: Low, 2-Medium, 3- High														
COURSE CONTENT										со				
Task-1 : De	termi	nation	of Ha	ardnes	s of a	grour	nd wat	tersar	nple					
Objectives	;								-					
1. Determine the total hardness (total calcium and magnesium ion concentration)														
2. Learn ho	2. Learn how to titrate with EDTA solution.									CO1				
3.Determin	ermine permanent hardness and the temporary hardness													
							•							
Task-2 : Est	timatio	on of D	O by w	inkler	s meth	nod								
Objectives	:													
1. To dete	rmine t	the lev	el of d	issolve	d oxyg	gen in	a samp	ole of v	vater u	sing W	Vinkler	's metl	hod.	CO 1
2. Analyze	e the ef	ffects c	of vario	ous fac	tors of	n the le	evel of	dissol	ved ox	ygen i	in a wa	ater sar	nple (e.g	,, CO 1
sal	t conte	nt, tem	peratu	ire, deg	gree of	mixin	g, and	the pro	esence	of red	ucing	compo	unds).	
Task- 3: De	termir	nation	of chl	oride	conte	nt of v	vater.							
Objectives:										CO 1				
1. To determine the amount of chlorine present in given water sample.														
2.Learn ho	w to ti	itrate v	with S	ilver n	itrate	and ob	oserve	differ	ent le	vels of	titrati	ion		
Task-4 : Po	tentio	metry	- det	ermin	ation	of red	-ox p	otenti	als an	d emf				

NARAYANA ENGINEERING COLLEGE::NELLORE										
		Pl	ROBLEM	SOLVING	AND PROC	GRAMMIN	G	R21		
Semeste	r H	ours / We	ek	Total hrs	Credit		Max Mark	s		
	L	Т	Р	$\begin{array}{c cccc} C & CIE & SEE \\ \hline & & & & & & & \\ \hline & & & & & & & \\ \hline & & & &$						
Ι	3	0	0	48	3	40	60	100		
Pre-requisite: Mathematics Knowledge, Analytical and Logical skills										
Course	Course Objectives:									
 Τοι 	• To understand various steps in Program development.									
 Τοι 	understand th	e basic con	ncepts in C	Programmir	ng Language.					
 Tol 	earn how to	write modu	ilar and re	adable C Pro	grams.					
 Tol 	earn the synt	ax and sen	nantics of a	a C Program	ning languag	e.				
 Tol 	earn structur	ed progran	uming app	roach for pro	blem solving.					
Course	Outcomes:	After succ	essful con	mpletion of t	he course, th	e student w	vill be able 1	to:		
CO 1	Iden	tify metho	ds to solve	e a problem tl	nrough compu	iter program	nming. (BL	- 3)		
CO 2	CO 2 Understand the use of operators and input/output. (BL - 2)									
CO 3	Understand the difference and the usage of various control statements and Functions(BL - 2)									
CO 4	Apply the Arrays and Pointers for solving problems. (BL - 3)									
CO 5		Ex	plain Use	r-Defined Da	ta Types and	Files. (BL ·	- 2)			

	CO-PO Mapping													
		РО												50
CO	PO	PO	PO	PO	РО	PO	PSO	PSO						
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3											1	
CO2	1	2	1										1	
CO3	1	2	1		2								2	2
CO4	2	2	3	2	1							2	3	2
CO5	3	3	2	2								1	2	
1: Low, 2-Medium, 3- High														

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	COURSE CONTENT							
MODULE – 1	Fundamentals of Computers and Programming	10 HOURS						
Introduction to	Programming, Algorithms and Flowcharts: Programs and	Programming,						
Programming langua	ages, Compiler, Interpreter, Algorithms, Flowcharts, How to Develo	p a Program.						
Basics of C: Introd	uction, Character Set, Structure of a C Program, A Simple C Pro-	gram, Variables,						
Data Types and Size	s, Declaration, Identifiers, Keywords, Constants, Assignment, and I	nitialization.						
At the end of the M	odule 1. students will be able to:							
4 Solve probler	ns using language independent notations (BL - 3)							
5. Understand th	ne compilers and interpreters. (BL - 2)							
6. Understand B	asic Structured of Programming in C. (BL - 2)							
4. Develop algor	ithms and flowcharts for problems.(BL - 3)							
5. Understand va	arious Tokens in C language.(BL - 2)							
MODULE -2	Operators and Input and Output	9 HOURS						
Operators and Exp	ressions: Arithmetic Operators, Relational Operators, Logical Or	erators, Bitwise						
Operators, Condition	al Operator, Comma operator, size of operator, Expressions, L valu	es and R values.						
Expression Evaluation	on- Precedence and Associativity. Type Conversion.	,						
Input and Output:	Basic Screen and Keyboard I/O in C. Formatted Input and Outp	ut. Unformatted						
Input and Output Fu	nctions.	,						
At the end of the M	odule 2 students will be able to:							
5 Illustrate the	working of expressions (BL - 2)							
6 Understand t	he precedence and Associativity rules of operators $(\mathbf{BL} - 2)$							
7 Understand t	he rules of type conversion (BL - 2)							
8 Explain the F	8. Evaluate the Formatted and Unformatted I/O functions (BL - 2)							
MODULE-3	Control Statements and Functions	10 HOURS						
Control Statement	Control Statements and Functions	if ladden avvitab						
Control Statements	S: Selection Statements - II, Nested II, II-else, Nested II-else, else	-II ladder, switch						
Looping Statements	- while, do-while, for, inested loops, Unconditional Statement	is - goto, break,						
Continue, return.								

NARAYANA ENGINEERING COLLEGE: NELLORE										
I-B. Tech	VECTOR CALCULUS COMPLEX VARIABLES &									
TRANSFORMS										
Semester	Hours / Week Total Credit Max Marks									
Semester	L	T	Р	hrs	C	CIE	SEE	TOTAL		
II	3	1	0	64	4	40	60	100		
Pre-requis	site: inter	mathemati	cs							
Course Of	jectives: 1	This course	aims to pro	viding the	knowledge	for the stud	lent about on			
1. To	enlighten th	ne learners i	in the conce	pt of vecto	r differentia	tion and in	tegration.			
2. To	understand	the concept	t the limit, o	continuity &	& differentia	ation of cor	nplex variable			
3. To	Evaluate th	e improper	integrals by	y complex i	integration					
4. To	understand	the concept	ts of Laplac	e transform	ns and Inver	se Laplace	transforms & its	5		
pro	perties.									
5. To	understand	the concept	ts of Fourie	r series, Fo	urier transfo	orms and it	s properties.			
Course Ou	itcomes: A	fter succes	sful compl	etion of th	e course, th	e student v	will able to:			
CO 1	Interpretat	te the diffe	rent operat	ors such as	s gradient, o	curl and di	vergence to find	out point		
	function							(L-3)		
CO 2	Understan	d the conce	pt the limit,	, continuity	& different	tiation of co	omplex variable	(L-3)		
CO 3	Evaluate th	he integral	by using co	ntour integ	ration			.(L-5)		
CO 4	Apply the	Laplace tra	insform to c	convert tim	e domain in	to frequenc	y domain & Inv	erse Laplac		
	transform	s technique	s to solve th	he different	ial equation	is.		(L-3		
CO 5	Develop th	ne Fourier S	Series to the	given peri	odic functio	ons		(L-3)		

CO-PO Mapping															
	РО													PSO	
CO	PO1	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PSO	PSO	
		2	3	4	5	6	7	8	9	10	11	12	1	2	
CO1	3	3													
CO2	3	3													
CO3	3	3													
CO4	3	3													
CO5	3	3													
					1-	Low, 2-	Medium,	3-High							

COURSE CONTENT										
MODULE – 1	Vector Calculus	Hours: 12h(9L+3T)								
Scalar and vector applied to vector integral-flux, Gre integral, Diverger	point functions, vector operator del, del applies to scalar po point functions-Divergence and Curl, Line integra circu en's theorem in the plane (without proof), Stoke's theorem theorem (without proof) and applications of these theorem	int functions Gradient, del lation-work done, surface n (without proof), volume ns.								

	NARAYANA ENGINEERING COLLEGE:NELLORE													
			I T WORK SHOP R2021											
						1								
	Semester		Hours / V	Veek	Total hrs	Credits	Max	Marks						
		L T P C CIE SEE							TOTAL					
	II	0	0	4	64	2	40	60	100					
	Pre-requisite: Basic mathematics.													
	Course Objectives:													
1.	1. To know basic workshop processes and adopt safety practices while working with various													
	tools and	equipment	s											
2.	To identif & equipm	fy, select ar nents.	nd use vari	ous marki	ng, measu	ring, holdi	ng, striki	ng and cu	tting tools					
3.	To know	about the in	nternal par	ts of a cor	nputer, ass	embling a	compute	er from the	e parts,					
	preparing	a compute	r for use b	y installin	g the oper	ating syste	em	G	11 /					
4.	To gain Presentat	knowledge	about th	e usage	of tools	like Word	l process	ors, Sprea	dsheets,					
5.	To learn a	about Netw	orking of	computers	and use Ir	nternet faci	ility for							
	Browsing	rowsing and Searching												
	Cours	Outcom	s. After s	uccessful	completio	on of the c	ourse th	e student	will be able to					
	COULS CO 1	Un Un	nderstand	the safety	aspects in	using the	tools and	equipmen	$\frac{\text{will be able it}}{\text{ts. (BL-2)}}$					
	CO 2	Apply tools for making models in respective trades of engineering workshop (BL-2)												
	CO3 Apply basic electrical engineering knowledge to make simple house wiring circuits													
	60.4	Tuda		and ch	neck their t	functionali	ty.(BL-3)						
	CO 4	Unde	rstand to d	isassembi	omputer re	adv to use	(BL-2)	mputer ar	id prepare the					
	CO 5	Apply kno	wledge to	Interconr	nect two or	more con	puters fo	or informa	tion sharing (B					
						3)								
		0	COURSE C	ONTENT	(TRADES	FOR PRA	CTICE)							
For	ilionity with	different tra	an of wood	Trade -1	Carpentry	y (8 H) od working	and mak	a fallowing	i i i i i i i i i i i i i i i i i i i					
гап	iiiiai ity with	unierent ty	of	300x40x25	5 used in wo 5 mm soft w	ood stock.	, and make	e tonowing	g joints nom out					
a) 1	Half–Lap jo	int.												
b) [Mortise and	Tenon joint												
				Turda	E:44:	II)								
L L	amiliarity y	vith different	types of to	ols used in	fitting and	n) do the fittir	a evercia	es out of 8	0 x 50 x 5 mm					
1	annnarny w		types of it		M.S. stock	do the fitth	ig exercis	es out of 8	0 x 50 x 5 mm					
				a) V-f	fit b) Doveta	ail fit								
					Trad	e - 3 Sheet	Metal W	ork (8 H)						
	Familiarity v	vith differen	t types of to	ols used in	sheet meta	l working,	Developn sheet	nents of fol	lowing sheet					
			inctar ju) Tapered t	tray b) Coni	cal funnel	SHOOL							
1				/ I	. ,	a) rapide tray of contear funite								

Trade - 4 Electrical House Wiring (8 H)

		NARAY	'ANA EN	GINEERIN	G COLLE	GE: NE	LLORE		
				ENGINE	ERING M	ECHAN	ICS	R2021	
Semeste	er	Hours	/ Week	Total	Credit		Max Ma	arks	
	L	Т	Р	hrs	С	CIE	SEE	TOTAL	
II	3	1	0	48	4	40	60	100	
	Pre-requisite	: Different	iation and	l integration t	opics in ma	thematic	s.		
	 To learn th To learn th 	ne fundame	ntals of r	Course O nechanics cor	bjectives: ncept of form	ce and its	types.		
 8. To develop knowledge in analyzing different types of trusses. 9. To gain proficiency in understanding the concept moment of inertia. 10. To learn kinematics, kinetics of particle and rigid body related principles. 									
	Course O	utcomes: A	After succ	essful comple	etion of the	course, t	he student will	be able to:	
	Compute the	resultant of	system o	of forces in pl	ane and spa	ce acting	on bodies. (BL	2-3)	
	Solve	e the mecha	nics prob	olems associa	ted with frie	ction forc	es. (BL-3)		
I	Determine the s	upport-read	ctions and trus	l analyze the ses and frame	internal for s. (BL-4)	ces of the	e members of va	arious	
	C	Calculate th	e location	n of centroid	of composit	e areas. (BL-4)		
	Apply tr	ansfer theo	rems to d	letermine proj	perties of va	arious see	ctions. (BL-4)		
		So	lve probl	ems related to	kinetics. (BL-3)			
				OUDSE CO	NITENT				
	MODUL	F 1	t	OURSE CO	NIENI				
	MODUL					00	- 10		
a .	. 1 1			Sysi	tem of Ford	es	10	H	
Composit	tion and resolu	tion of for	ces, paral	llelogram law	, principle	of transr	nissibility, type	s of force systems	
Composit concurrer Varignon	tion and resolu nt and concurr 's theorem, con	tion of fore rent coplan	ces, paral ar forces e body di	Syst llelogram law , resultant o agrams, conc	f coplanar pt of equil	of transm force sy ibrium of	nissibility, type stems couple, f coplanar force	b H es of force systems moment of a force e systems.	
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	NARAYANA ENGINEERING COLLEGE: NELLORE											
				MATI	ERIAL SCIENCE	and ENG	INEERIN	G	R2021			
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		L	Т	Р		С	CIE	SEE	TOTAL			
	Π	3	0	0	48	3	40	60	100			
	Course Objectives:											
1.1	1. To study structure of metals and types of solids.											
о т	2 To understand about equilibrium diagrams and properties of steel and iron											
2.1	2. To understand about equilibrium diagrams and properties of steel and iron.											
3. 1	3. To learn about heat treatment of steel.											
4. To study about properties and structures of ceramic materials.												
5. 1	5. To study about properties and structures of composite materials.											
	(Course O	utcomes: /	After succ	essful completion	of the cours	se, the stuc	lent will b	be able to:			
		eourse o	utcomes. 1	inter succ	contraction -	or the court	, the stat		e dole to.			
	CO 1		Define be	onds, crys	tallization of metal	ls ,grain siz	es of meta	ls and				
					alloys . (BL-1	1)						
	CO 2	Unders	tand about	construct	ion of equilibrium	diagrams a	nd to study	v about ph	nase			
					diagrams.	(BL-2)						
	CO 3	Underst	and propert	ies and st	ructures of various	ferrous and	l non-ferro	ous metals	s and			
					alloys.(BL-2)						
	CO 4		appl	y the cond	cepts of heat treatm	ent of alloy	/s. (BL-3)					
	CO 5		Find vario	us ceram	ic materials and co	mposite m	aterials (B	L-1)				
					COUDSE CONTE	NT						
COURSE CONTENT MODULE 1 Structure of Motols 10 H												
MODULE – I Structure of Metals IO H									10 H			
B	MODUI	LE – 1 olids – N	letallic bon	d - crysta	Structure of	Metals	grain bou	ndaries et	10 H			
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B Con	MODUI Sonds in S	LE – 1 olids – N bounda of Alloys	Aetallic bon aries on the : Necessity	d - crysta propertie of alloyir	Structure of Illization of metals, s of metal / alloys ag, types of solid so	Metals , grain and – determina plutions,	grain boun ation of gr	ndaries, et ain size.	10 H ffect ofgrain			
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B Con	MODUI conds in S stitution o MODUI	LE – 1 olids – N bounda of Alloys LE -2	Aetallic bon aries on the : Necessity	d - crysta propertie of alloyir	Structure of Ilization of metals. s of metal / alloys g, types of solid so Equilibrium of L	Metals , grain and – determina blutions, Diagrams	grain bour ation of gr	ndaries, el ain size.	10 H ffect ofgrain 10 H			
B Con	MODUI conds in S stitution o MODUI Experin	LE – 1 olids – M bounda of Alloys LE -2 mental r	fetallic bon aries on the Necessity nethods of	d - crysta properties of alloyin	Structure of Ilization of metals, s of metal / alloys ag, types of solid so Equilibrium of E ction of equilibri	Metals , grain and – determina blutions, Diagrams ium diagra	grain boun ation of gr ums, Ison	ndaries, et ain size.	10 H ffect ofgrain 10 H alloy			
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B Con sys rea rul Ca iro of Str Ef	MODUI sonds in S stitution o Experin tems, equ ction. Tra e. MODU st Irons a n, Spherio plain carb etals and A ucture and MOI fect of allc	LE – 1 olids – M bounda f Alloys LE -2 mental r nilibrium unsformat ULE-3 und Steel dal graph on steels, Alloys: propertic DULE-4 bying eler temperin IODULF	Actallic bon rries on the Necessity nethods of cooling an ions in the s : Structur nite cast iro Low alloy es of copper nents on Iro g , Harden a	d - crysta propertie of alloyir ` constru nd heatin solid sta e and pro n, Alloy o steels, H and its al n - Iron ca ability, su	Structure of Ilization of metals, s of metal / alloys g, types of solid so Equilibrium of E ction of equilibri g of alloys, Leve net – allotropy, eu Metals & operties of White C cast irons. Classific adfield manganese loys, Aluminium an Heat treatm arbon system, Anna rface - hardening m	Metals , grain and – determina olutions, Diagrams ium diagra er rule, eut tectoid, pe & Alloys Cast iron, M cation of sto e steels, tool and its alloys ment of Alle ealing, norm nethods, Ag and Comp	grain boun ation of gr ums, Ison tectic syst ritectoid r lalleable C ceels, struct l and die s , <u>Titanium</u> yy malizing, F ge hardeni osites	ndaries, et ain size. horphism ems, per eactions, dast iron, j ure and p teels. Non and its al and its al fardening. ng treatmos	10 H ffect of grain 10 H alloy itectic phase 9 H grey cast oroperties 16 ferrous lloys. 10 H , TTT diagrams, ent,. 9 H			
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NARAYANA ENGINEERING COLLEGE: NELLORE															
	Physics for Mechanical Engineering R21														
Semester	Hours / Week Total Credit					Total Credit Max M		Total Credit M		Max Marks			ırks		
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Ι	3 0 0 49 3 40 60 100													00	
Pre-requisite:															
Course O 6. To exp 7. To imp 8. To id polariz 9. To im Engine 10. Famili Course O	 Course Objectives: 6. To explain the significant concepts of Crystals and different types of ultrasonic's. 7. To impart knowledge in basic concepts of mechanics. 8. To identify the importance of the optical phenomenon i.e. interference, diffraction and polarization related to its Engineering applications 9. To impart knowledge in basic concepts of Optical fibers and LASERs along with its Engineering applications. 10. Familiarize types of sensors for various engineering applications 														
CO 1	CO 1 Classify types of crystal structures														
CO 2	Und	ersta	nd the	e basic	c conc	ept of	f Osci	llatior	15						
CO 3	Dese	cribe	the pł	ienom	enon	of int	erfer	ence, o	liffra	ction	and p	olariz	ation.		
CO 4	Mal	ke use	of th	e lasei	rs and	optic	al fib	ers							
CO 5	Арр	ly the	e diffe	rent t	ypes o	of sens	sors fo	or Eng	gineer	ing aj	pplica	tions			
					C	O-PC) Map	ping							
СО						Р	0						PS	50	
	PO 1	PO 2	РО 3	РО 4	PO 5	PO 6	РО 7	PO 8	PO 9	PO 10	PO 11	РО 12	PSO 1	PSO 2	
CO1	7												2		
CO2	9														
CO3	15												1		
CO4	9												2		
CO5	8												7	7	
					1: Lov	w, 2-M	ledium	n, <mark>3-</mark> Hi	igh						

	COURSE CONTENT						
MODULE – 1	CRYSTALLOGRAPHY AND ULTRASONICS	7 Hrs					
Crystallography:	Introduction – Space lattice –Unit cell – Lattice parameters – C	Crystal systems,					
Bravias lattice, di	rections and planes in a crystal, Miller indices – inter-planar dista	nces – Packing					
fractions of SC, B	ractions of SC. BCC and FCC. Brage's law-Laue method and powder methods for crystal structure						