K.S. Rangasamy College of Technology

(Autonomous Institution)



Curriculum & Syllabus

of

M.E. Computer Aided Design &

M.E. Engineering Design

(For the batches admitted in 2010-11 onwards)

R 2010

Courses Accredited by NBA, Accredited by NAAC with 'A' Grade, Approved by AICTE, Affiliated to Anna University, Chennai.

KSR Kalvi Nagar, Tiruchengode – 637 215. Namakkal District, Tamil Nadu, India.

	K.S.Rangasar	ny College of Tech	nolo	gy, Tiı	ruche	ngode - 6	37 215	5	
	Curriculum	for the programme	es und	ler Au	tonom	ous Schei	me		
Regulation		R 2010							
Department		Department of Me	chani	cal En	ginee	ring			
Programme (Code & Name	PCA : M.E. Comp	uter A	ided [Design				
		Seme	ester I						
Course Code	Cours	se Name		Hours Week		Credit	Ма	ximum	Marks
			L	Т	Р	С	CA	ES	Total
	THEORY								
10 PCA 101	Advanced Math PCA)	nematics (PED,	3	1	0	4	50	50	100
10 PCA 102	(PED, PCA)	ications in Design	3	0	0	3	50	50	100
10 PCA 103	Finite Element PCA)	• • •	3	1	0	4	50	50	100
10 PCA 104	Concepts of En (PED, PCA)	oncepts of Engineering Design 3 0 0 3 50 50						50	100
10 PCA 105	Engineering Sy	stem Dynamics	3	1	0	4	50	50	100
10 PCA E**	Elective I		3	0	0	3	50	50	100
	PRACTICAL								
10 PCA 106	CAD Laborator	y (PED, PCA)	0	0	3	2	50	50	100
10 PCA 107	Computer Aide Laboratory I (P		0	0	3	2	50	50	100
		Total	18	3	6	25		800	
		Seme	ester II						
Course Code	Cours	se Name		Hours Week		Credit	Ма	ximum	Marks
			L	Т	Р	С	CA	ES	Total
	THEORY								
10 PCA 201	Mechanical Vib PCA)		3	1	0	4	50	50	100
10 PCA 202	Product Design Development (I		3	0	0	3	50	50	100
10 PCA 203	Integrated Mec	•	3	1	0	4	50	50	100
10 PCA 204	Metallic Materia Manufacturing		3	0	0	3	50	50	100
10 PCA E**	Elective II		3	0	0	3	50	50	100
10 PCA E**	Elective III		3	0	0	3	50	50	100
	PRACTICAL								
10 PCA 205	Computer Aide Laboratory II (F	PED, PCA)	0	0	3	2	50	50	100
10 PCA 206	Technical Repo		0	0	2	0	100	00	100
		Total	18	2	5	22		800	

	K.S.Rangasamy College of Technology, Tiruchengode - 637 215									
	Curriculur	n for the pro	gramme	es unc	ler Au	tonom	ous Schei	me		
Regulation		R 2010								
Department		Departmer	nt of Me	chanio	cal En	gineer	ing			
Programme Co	de & Name	PCA : M.E	. Comp	uter A	ided [Design				
			Seme	ester II	I					
Course Code	Cou	ırse Name			Hours Week		Credit	Ма	ximum	Marks
Course Code	Cou	iise ivaille		L	Т	Р	С	СА	ES	Total
	THEORY									
10 PCA E**	Elective IV			3	0	0	3	50	50	100
10 PCA E**	Elective V			3	0	0	3	50	50	100
10 PCA E**	Elective VI			3	0	0	3	50	50	100
	PRACTICAL	-								
10 PCA 301	Project Work	κ - Phase I		0	0	12	2	100	00	100
			Total	9	0	12	11		400	
			Seme	ster I\	/					
Course Code	Cou	ırse Name			Hours Week		Credit	Ма	ximum	Marks
Course Code	000							Total		
	PRACTICAL	-								
10 PCA 401	Project Work	c - Phase II		0	0	40	10	50	50	100
			Total	0	0	40	10		100	

ŀ	K.S.Rangasamy College of Technology, Tiruchengode - 637 215								
	Curriculum	for the programmes	under	Auto	nom	ous Scher	ne		
Regulation		R 2010							
Department		Department of Med	chanica	l Eng	jinee	ring			
Programme Cod	de & Name	PCA: M.E. Compu	ıter Aid	ed D	esigr	1			
		List of El	ectives						
Course Code	Соц	ırse Name		ours/ /eek		Credit	Ma	ximum I	Marks
			L	Т	Р	С	CA	ES	Total
		Electi	ves						
10 PCA E01	Analysis	inite Element	3	0	0	3	50	50	100
10 PCA E02	Optimization Design	Techniques in	3	0	0	3	50	50	100
10 PCA E03	Tribology in		3	0	0	3	50	50	100
10 PCA E04	Advanced S Materials	trength of	3	0	0	3	50	50	100
10 PCA E05	Product Data	a Management	3	0	0	3	50	50	100
10 PCA E06	Design of Hy Pneumatic S		3	0	0	3	50	50	100
10 PCA E07	Applied Eng	ineering Acoustics	3	0	0	3	50	50	100
10 PCA E08	Advanced T	ool Design	3	0	0	3	50	50	100
10 PCA E09	Micro Electro Systems De	o Mechanical sign	3	0	0	3	50	50	100
10 PCA E10		of Composite	3	0	0	3	50	50	100
10 PCA E11	Rapid Proto	typing and Tooling	3	0	0	3	50	50	100
10 PCA E12	Mechanics of	f Fracture	3	0	0	3	50	50	100
10 PCA E13	Applied Objet		3	0	0	3	50	50	100
10 PCA E14	Design of M Equipments	aterial Handling	3	0	0	3	50	50	100
10 PCA E15	Measureme	nt Techniques	3	0	0	3	50	50	100
10 PCA E16	Vibration Co	ndition Monitoring	3	0	0	3	50	50	100
10 PCA E17	Mechanics	Materials and its	3	0	0	3	50	50	100
10 PCA E18	Systems	sis of Mechanical	3	0	0	3	50	50	100
10 PCA E19	Integrated M Systems	lanufacturing	3	0	0	3	50	50	100
10 PCA E20	Theory of Pl	ates and Shells	3	0	0	3	50	50	100
10 PCA E21	_	eat Exchangers	3	0	0	3	50	50	100
10 PCA E22	Bearing Des Dynamics	ign and Rotor	3	0	0	3	50	50	100
10 PCA E23		nal Fluid Dynamics	3	0	0	3	50	50	100
10 PCA E24	Re-Enginee		3	0	0	3	50	50	100
10 PCA E25	Mechatronic Systems	s in Manufacturing	3	0	0	3	50	50	100
10 PCA E26	Industrial Ro	botics	3	0	0	3	50	50	100
10 PCA E27	Creativity in		3	0	0	3	50	50	100
10 PCA E28	Enterprise find Planning	Resource	3	0	0	3	50	50	100

K.S.Ranga	samy College of Techn	ology - Au	tonom	ous Re	gulation		R 20	10
Department	Mechanical Engineering	Programm Nar		e &	PCA : M	1.E. Co Desi	mputer A	Aided
		Semes	ster I					
Course	Ossans Nassa	Но	urs / W	/eek	Credit	Ma	aximum l	Marks
Code	Course Name	L	Т	Р	С	CA	ES	Total
10 PCA 101	PCA)	ED, 3	1	0	4	50	50	100
Objective(s)	At the end of the stud able to solve linear siteration, Solve BVP be and solve numerically hyperbolic types with a engineering design.	systems by the method y partial di	method of fini fferent	ods of e te differe ial equa	eliminatio ences and ations of	n, triar d Rayle parab	ngularisa eigh Ritz olic, elli	tion and methods ptic and
1 SIMULTA	NEOUS EQUATIONS A	ND NUMER	RICAL	Tota	al Hrs		12	
Simultaneous relaxation med Weddle's rule.	Equations: Gauss elim thod. Numerical Integrat	ination metion: Trepez	thod-C coidal r	holeski ule and	scheme- simpson	Gauss 's 1/3	s seidel and 3/8	method- th rules-
2 BOUNDA PROBLEI	RY & CHARACTER	RISTIC V	ALUE	Tota	al Hrs		12	
	through finite difference eigenvalues / vectors by							
	JS OF VARIATIONS			Tota	al Hrs		12	
dependant on Rayleigh Ritz	functionals involving one higher order derivative method. PARTIAL DIFFERENTIA	s- several	indepe	ndent v				
						liak		a a th a d
derivative bou	ce expressions for partial ndary conditions- Poisso	n equation.			-	– Lier		netnoa –
	NTIAL EQUATIONS		RTIAL		al Hrs		12	
	E - Explicit method – Cra polic PDE - Solution by d.							
Total hours to	be taught					60		
Text book (s) :								
Second e								
company,		matics for	engine	ering a	nd Scien	ce; Na	tional P	ublishing
Reference(s) :								
Company	J Faires and Riched I							
2 John H M	athews and Kurtis D Fink	k, "Numerica	al Meth	ods usir	ng MATLA	∖B", Pre	entice Ha	all, 1998.
	eney and David Kincaid g Company, Fourth Editio		al Mat	thematic	s and C	omputii	ng", Bro	oks/Cole

K.S.	Rangasa	my College of Ted	hnology -	Autor	omou	s Reg	gulation		R 20	10	
Departn	nent	Mechanical Engineering	_	mme C Name			PCA : N	M.E. Co Des	mputer sign	Aided	
			Sei	mester	I						
	<u> </u>			Hou	rs / We	eek	Credit	Ма	ximum I	Marks	
Course	e Code	Course Na	me	L	Т	Р	С	CA	ES	Total	
10 PC	CA 102	COMPUTER APPLICATIONS DESIGN (PED, P		3	0	0	3	50	50	100	
Objec	ctive(s)	To Impart knowle computers in des mechanical components for ma	sign, to lea conents ar	arn sof	twares develo	like p the	Lisp, vis	ual bas	sic in d	esigning	
1 INTRODUCTION TO COMPUTER APPLICATIONS IN NEW PRODUCT DESIGN Total Hrs 9											
Concep	t design	Parametric skcaling, Rotation – V									
2 CO	MPUTER	S IN DESIGN				То	tal Hrs		9		
Nesting	and de ering of	of Mechanical com velopment – Plas components – As	stic parts	with d	raft a	nd sh	nrinkage	allowa	nce –	Reverse	
3 CO	MPUTER	S IN TOOLING DE	SIGN			То	tal Hrs		9		
	design – s – Rapid	Jigs and fixtures tooling	design – (Check	for int	erfere	nces – N	dechan	ism des	sign and	
4 CO	MPUTER	S IN DESIGN PRO	DUCTIVIT	Y		То	tal Hrs		9		
		ious software by design of shafts, ge		ıal bas	ic, pro	o/prog	ram, scr	ipt, LIS	SP etc	to write	
5 MA	NAGING	PRODUCT DESIG	N DATA			То	tal Hrs		9		
	among p	- Library creation – eer groups – Desi									
	ours to be	taught							45		
Text bo	ok (s) :										
	liam M. N . Singapo	leumann and Robe re, 1989.	rt Sproul "F	Principle	es of C	Compu	ıter Grap	hics" M	cGraw I	Hill Book	
2 Ibra	ahim Zeid	"CAD/CAM - Theo	ory and Pra	ctice" –	McGr	aw Hi	II, Interna	tional E	dition 19	998.	
Referen	nce(s):										
1 PN	l Rao "CA	AD/CAM: Principles	and Applic	ations"	Tata N	/lcGra	w Hill, Se	cond E	dition. 2	004.	
2 Sch	nlechtend	ahl, E. G, CAD – Da	ata transfer	for So	lid Mod	dels, S	Springer \	/erlag,E	Berlin, 19	989.	
3 Doi	nald Hear	n and M Pauline Ba	aker "Comp	uter G	aphics	s" Pre	ntice Hall	Inc199	2.		

K.S.Ranga	samy College of Technology	- Auton	omous	s Reg	ulatior	1	R 20)10
Department	Mechanical Engineering		ramme Nam		e &		: M.E. Co lided Des	
	Se	emester	l					
Course Code	Course Name	Hou	rs / We	eek	Credi	t N	laximum	Marks
Course Code		L	Т	Р	С	CA	ES	Total
10 PCA 103	FINITE ELEMENT ANALYSIS (PED, PCA)	3	1	0	4	50	50	100
Objective(s)	To teach students the conce engineering problems and vanalysis tools and their use in	vorking design.	knowle					
1 INTRODU	ICTION & ONE-DIMENSIONAL	PROBL	EMS	Tot	al Hrs		12	
energy approamechanics and 2 TWO-DIM Poisson equations	f FEA - Finite element modelingth - Galerkin's approach - Heat transfer - Finite element ENSIONAL PROBLEMS tion - Laplace equation - Weements - Evaluation of inte	One di model fo	mension or bear m – I	onal f ms. Tota Eleme	inite e al Hrs nt ma	trices	models 12 or triang	in Solid
Applications - Transient analy	 Conduction and convection ysis - Theory of elasticity – Pla ual displacement. 	heat tr	ansfer	- T	orsiona	al cylin	drical me	ember –
	METRIC ELEMENTS			Tot	al Hrs		12	
Numerical inte- calculations – I	Bilinear quadrilateral elements gration – Gauss quadrature – S Examples of 2D and 3D applica JRAL DYNAMICS APPLICATIO	Static co		sation				
			NI-ton					
of number of D – Harmonic response spec	tions – Mass and damping ma OF-response history – Model r sponse – Direct integration tech tra – Example problems. EAR PROBLEMS & ERROR ES	nethods nniques	– Ritz –Expli	vecto cit and	rs –Co	mpone	nt mode s	synthesis
non-linearity -	Material non-linearity – Elasto Large displacement – Error aptive refinement.							
Total hours to l							60	
Text book (s):								
1 Reddy J.N 1993.	I., "An Introduction to the Finite	Elemen	t Meth	od", M	lcGraw	Hill,Int	ernationa	l Edition,
	., "A First Course in the Finite	Elemen	Meth	od", T	hird Ed	dition,T	nomson L	earning,
Reference(s):		_						
1 Cook, Rol & Sons 19	pert Davis et al "Concepts and no	Applicati	ons of	Finite	Eleme	ent Ana	lysis", Wil	ey, John
	L.J., "Applied Finite Element Ar	nalysis",	John V	Viley,	1984.			
0	'Finite Element Analysis", 2002							
	cz, O.C. and Taylor, R.L., "The I v Hill International Edition, Phys				d", Fo	urth Ed	tion, Volu	imes 1 &
5 Bathe K.J	., "Finite Element Procedures in	Engine	ering A	nalysi	is", Pre	ntice H	all, 1990.	

K.S	.Ranga	samy College of Technology ·	- Aut	onomo	ous Re	gulation	1		R 20	10
Depa	rtment	Mechanical Engineering	Pro	gramm Nai		e & P	CA : N		. Compu Design	ter Aided
		S	emes	ster I						
Coi	urse	Carrea Nama	Но	urs / W	eek/	Credit		Ма	ximum l	Marks
Co	ode	Course Name	L	Т	Р	С	CA	Ą	ES	Total
10 PC	CA 104	CONCEPTS OF ENGINEERING DESIGN (PED, PCA)	3	0	0	3	50		50	100
Objec	tive(s)	To impart knowledge on de modeling, geometric modelin processing, Environmental and	g, m	aterial	selec es.	tion for				
1 1	THE DES	SIGN PROCESS			To	tal Hrs			9	
Morph detaile	nology o ed Desig	Process - need identification of Design steps of Product D in – Concurrent Engineering – Concurr	esigr	ı – Čo	ncept Huma	ual Desi	gn, E	Ξmb	odimen	
Creati Design	vity and n, Mathe	I problem solving, Decision The matical modeling, Geometric no Finite Difference method, Montagramming, Structural and shape	nodel te Ca	ling, fin arlo me	eling - ite ele thod -	- Role o	delin	ıg, F	s in En Rapid Pr	ototyping
3 1		AL SELECTION AND MATE				al Hrs			9	
indice databa Design	s, Use o ases – [ning with	aterial selection – Ashby Chart of material selection Chart, Pug Design for brittle fracture, Design plastics.	gh se n for	lection	metho failur	od, selec e, Desig	tion	with	compurosion re	ted aided
4		AL PROCESSING AND DESIG				al Hrs			9	
proces manuf	ss seled facturing	of manufacturing processes a ction, use of process selection g, Design for forging and she elding and assembly, design for	n cha eet m resid	art and netal fo ual stre	d com orming	puterized , Desigr	d data	aba cas	se – D sting, D	esign for
5	LEGAL, SAFETY ENGINE	ETHICAL ENVIRONMENT ISSUES IN DESIGN AND ERING			Tot	al Hrs			9	
liability – Mat	y, Codes erial rec	laws, Contracts, - Liability – Tor s of ethics, solving ethical confli ycling and remanufacture, Desi ety, Design for reliability failure r	cts. E gn fo	Design or safet	for env y – Po	ironmen tential D	t – Li ange	ife C rs a	Cycle as nd Guid	sessment
		be taught				,		- 3	45	
Text b	ook (s)	:					I			
		George E, Engineering Design rnational Edition, Singapore 200		materia	als and	proces	sing	App	roach,".	Mc Graw
2 k	<pre>⟨arl T. ⟩</pre>	Virich and Steven D. Eppinger onal Edition, 2000.	"Pro	oduct o	design	and De	velop	mei	nt", McC	Graw Hill,
	ence(s)									
1 F	Pahlgand	d Beitz W "Engineering Design"	Sprin	ngr – Ve	erlag N	IY- 1984				
2 F	Ray M.S	. "Elements of Engineering Desi	gn", l	Printice	Hall I	nc. 1985				
3	Suh. N. F	P. "The principles of design",. Ox	xford	Univer	sity, P	ress NY	1990.			

K.S.Rangas	samy College of Technology	/ - Autor	nomou	s Reg	julation		R 20	10		
Department	Mechanical Engineering	Progra	mme C Name	Code 8	š 1		1.E. Cor ed Desi			
	S	Semester	I							
Caura Cada	Course Norse	Hou	ırs / We	eek	Credit	Ма	ximum	Marks		
Course Code	Course Name	L	Т	Р	С	CA	ES	Total		
10 PCA 105	ENGINEERING SYSTEM DYNAMICS	3	1	0	4	50	50	100		
Objective(s)	To Impart knowledge on constability of feedback systems				represen	tation p	erforma	ince and		
1 INTRODUCTION Total Hrs 12										
Mathematical r Electromechani degree freedom	Dynamic system classification modeling of Dynamic system cal Systems – Fluid & Therm systems, Review of matrix a CTION TO CONTROL SYSTEM.	ms – ľ al systei lgebra ar	/lechar m, Rev	nical iew o ace T	systems f vibratior	Ele of sin	ctrical	systems,		
Control system control systems	Control systems – Control sy classes – Feedback systems – Control system analysis an REPRESENTATION	- Analys	sis of F	eedba						
	Block Diagrams – Block Diag phs – Signal flow graph alge									
	IANCE AND STABILITY OF	FEEDE	BACK	То	tal Hrs		12			
	Properties of feedback – Tran lity of control systems – Ro									
	OF CONTROL SYSTEMS			То	tal Hrs		12			
	analysis of control systems uist stability criterion – Nichols									
Total hours to b	e taught						60			
Text book (s):						I				
	kipati, 'Engineering system 04.	Dynami	cs', Na	arosa	Publishir	ng Hou	se, Ne	w Delhi.		
2 Benjamin (1995.	C.Kuo, '- Automatic Control :	systems'	, Prent	ice-H	all of Ind	ia Pvt.	Ltd., No	ew Delhi		
Reference(s):										
1 Thomson V Delhi.1990	W.T., 'Theory of Vibration with	Applica	tions',	CBS	Publisher	s and D	Distributo	ors, New		

K.S.Rang	asamy College	of Technolog	gy - Au	itonom	ous	s Regulatio	n	R 2	010			
Department	Mechanical Engineering	Programme	e Code	& Nam	e	PCA : M.E	. Comp	uter Aide	d Design			
			Semes	ster I								
Course	Course Code Course Name Hours / Week Credit Maximum Marks											
Code	Course Name											
10 PCA 106	CAD LABORA (PED, PCA)	TORY	0	0	3	2	50	50	100			
Objective(s)	To develop the mechanical collike pro-E, soli	mponents ar										
2. Part of 3. Part of 4. Part of 5. Part of 6. Part of	ldiagrams of Mecdiagram of screwand Assembly of and Assembly of	threads. Flange Coup Universal Co Bushed Bear Knuckle Join Plummer Blo Connecting Screw Jack Pipe Vice Piston Stuffing box Machine Vic	oupling ring t ock rod									
Total Hrs								45				

K.S.Rang	asamy College (of Technology	/- Auto	onomot	ıs Re	gulation		R 20	10	
Department	Mechanical Engineering	Programme	: Code 8	k Name		PCA : M.E.	. Compu	iter Aideo	l Design	
			Semest	er I						
Course Code	Course Code Course Name Hours / Week Credit Maximum Marks									
oduse code	Course Code L T P C CA ES Total									
10 PCA 107	COMPUTER AI ANALYSIS LAE I (PED, PCA)		0	0	3	2	50	50	100	
Objective(s)	To develop the spring, Steady analysis in pipe	state and tran	sient he	eat tran	sfer a	nalysis of				
2. Analys 3. Analys 4. Analys 5. Analys 6. Analys 7. Stress 8. Analys 9. Heat c 10. Heat c	 Analysis of stepped rod with axial load. Analysis of Plane truss member. Analysis of cantilever beam with point load and UDL. Analysis of simply supported beam with point load and UDL. Analysis of I-section beam. Analysis of spring system. Stress analysis of corner bracket (Plane stress). Analysis of circular pipe (Axi-symmetric). Heat conduction in 2D plate.(steady state) Heat convection in 2D plate. (steady state) Transient heat transfer analysis in slab 									
Total Hrs	12. Flow analysis in 2 channel pipe. Total Hrs 45									

Κ.	S.Rangas	amy College of	Technolog	y - Aut	onomo	ous R	egulatio	n	R	2010	
Dep	partment	Mechanical Engineering	Progran	nme Co Name	de &		PCA : M.	E. Con	nputer A	ided Design	
				Seme	ester II						
(Course	_		Hou	rs / We	eek	Credit	ı	Maximu	m Marks	
	Code	Course N	Name	L	Т	Р	С	CA	ES	Total	
10	PCA 201	MECHANICAL VIBRATIONS PCA)		3	1	0	4	50	50	100	
Obj	ective(s)	To impart know freedom and response, ana	continuous	syster	ms, de	esign	systems	s to a	chieve	the vibratory	
1 FUNDAMENTALS OF VIBRATION Total Hrs 12											
free free	Introduction – Single degree freedom free vibration systems – Damped vibrations – Single degree freedom forced vibration with elastically coupled viscous dampers, System Identification from frequency response, Support motion, Duhamel's Integral – Impulse Response function – Virtual work – Lagrange's equation-– Transient Vibration.										
2	TWO DE	GREE-OF-FRE	EDOM SYS	TEMS		Tot	al Hrs		1	2	
Fre	e vibration dom syste	n of spring-cou em – Forced vib	pled systen ration – Vibr	n – Ma ation Al	ass co osorbe	upled r – Vil	system oration is	Vibition	ation of	two degree	
3	MULTI D	EGREE-OF-FR	EEDOM SY	STEMS	}	Tot	al Hrs		1	2	
– o	rthogonal	of vibration – For properties – Monage in forced vibration	dal matrix-N	Modal A	nalysi	s – Fo	orced Vik	ration	by matr	ix inversion -	
4	VIBRATI	ON OF CONTIN	IUOUS SYS	TEMS		Tot	tal Hrs		1	2	
		erned by wave of								uler Equation	
5	EXPERIM ANALYS	MENTAL MET	HODS IN	VIBRA	TION	Tot	tal Hrs		1	2	
	ration instr	ruments – Vibra ibration tests. E								Tests – Free	
Tota	al hours to	be taught							6	0	
Tex	t book (s)	:						1			
1	Thomson New Dell	n, W.T., "Theory hi, 1990.	y of Vibratio	n with	Applic	ations	s", CBS	Publish	ers and	Distributors,	
2		. and Gupta, K., International (F				Theor	y and Pra	actice N	/lechanio	cal Vibration",	
Ref	erence(s)	:					_				
1	Den Hart	og, J.P, "Mecha	nical Vibrati	ons," D	over P	ublica	tions, Ne	w York	, 1990.		
2	Rao, S.S	., "Mechanical \	/ibrations", A	Addison	Wesle	y Lon	gman, N	ew Yor	k, 1995.		

	K.S	Rangasamy College of Technology	- Autor	nomou	s Regu	ılation		R 20	10
D	epartment	Mechanical Engineering	Progra	amme (Code 8	Name		M.E. Co Aided De	
		Sem	ester II						
			Hou	rs / We	ek	Credit	Ma	aximum N	Marks
Со	urse Code	Course Name	L	Т	Р	С	CA	ES	Total
10) PCA 202	PRODUCT DESIGN AND DEVELOPMENT (PED, PCA)	3	0	0	3	50	50	100
0	bjective(s)	To Impart knowledge on product dev product planning, product specificatio							elopment,
1	INTRODUCT	TION			To	tal Hrs		9	
Dev Dev	elopment- Ch elopment Pro	f Successful Product Development- nallenges of Product Development - cess-Concept Development: The Fron F Development Process-Product Deve	-Develor t-End Pro	oment ocess A	Proces Adaptin	sses and g the Ger	Organi neric Pro	zations- <i>A</i> oduct Dev	Generic
2	PRODUCT F	PLANNING			Tot	al Hrs		9	
Timi Cus	ng- Pre-Proje tomers- Inter	Process- Identifying Opportunities- Evact Planning-Reflect on the Results and preting Raw Data in Terms of Custellative Importance of the Needs-Refle	the Prostomer 1	cess-lo Needs-	lentifyii Organi	ng Custon zing the	ner Need Needs	ds- Raw into a I	Data from
3	PRODUCT S	SPECIFICATIONS			Tot	al Hrs		9	
		ations- Stages of Specifications - ncept Generation-The Activity of Conce							
4	CONCEPT S	SELECTION			Tot	al Hrs		9	
Con	cept Test- C	n- Overview of Methodology-Concept Choosing a Survey Population- Cho mer Response- Interpreting the Results	osing a	Surve	y Forr	nat- Com	nmunica	ting the	
5	PRODUCT A	ARCHITECTURE			Tot	al Hrs		9	
		ure-Implications of the Architecture-Est System-Level Design Issues.	ablishing	the Ar	chitect	ure- Delay	ed Diffe	erentiation	n-Platform
Tota	al hours to be	taught						45	
Text	book (s):								
1	Ulrich, Karl T	Γ. and Eppinger, Steven D., "Product D	esign an	d Deve	lopmer	nt", McGra	w–Hill,	New York	c, 1999.
2	Otto, Kevien	and Wood, Kristin, "Product Design" P	earson F	Publicat	tion, Ne	ew Delhi, 2	2004.		
Refe	erence(s):								
1	Rosenthal, S	Stephen, "Effective Product Design and	Develop	ment",	Busine	ess One O	rwin, Ho	mewood	, 1992.
2		., "Tool Design – Integrated Method New York, 1991.	ls for su	ccessf	ul Prod	duct Engi	neering"	, Addiso	n Wesley
3		Crow., "Concurrent Engineering / Integos Verdes, CA 90274 (310) 377-569, W			Develo	pment", D	RM As	sociates,	26/3, Via

K	í.S.Ranga	samy College of Techno	olog	y - Auto	onomo	us Regu	ılation		R 20	10
Dep	artment	Mechanical Engineering	Pr	ogramm	ne Cod	e & Nam	e P		Л.Е. Con ed Desig	•
			;	Semeste	er II		·			
C	Course			Но	urs / W	eek	Credit	Ма	aximum	Marks
	Code	Course Name		L	Т	Р	С	CA	ES	Total
10 F	PCA 203	INTEGRATED MECHANICAL DESIGN		3	1	0	4	50	50	100
	ective(s)	(Use of Approved Data I To Teach students the solving engineering pro	cond	cepts of			echanica	l Desi		elated to
1	INTROD	UCTION				Tota	l Hrs		12	
from	n process ations – D	sign – Standardization a and function – Individual esign for assembly and m	and	group to	lerance	es – Sele s – Cond	ection of cepts of in	fits for	r differen	
2	SHAFTI	NG				Tota	l Hrs		12	
		Design of shafts for dawings – integrated design								ation of
3	GEARS	AND GEAR BOXES				Tota	l Hrs		12	
		gear tooth action – Gear of design of spur, helical, be								
	gn of spec	ed reducers and multisped								legraleu
4	CLUTCH	IES				Tota	l Hrs		12	
Inte	grated des	sign of - Automobile clutch	nes.					l.		
5	BRAKES	3				Tota	l Hrs		12	
		d thermal aspects of vehice and mechanical handling e			Integra	ated desi	gn of bra	akes fo	or machi	ne tools,
		be taught	-quip	monto.					60	
Text	t book (s)	:								
1	Shigley,	J.E., "Mechanical Engine	ering	Design	", McG	raw Hill,	1986.			
2	Publishe	. K. and Narayana Iyeng rs, Bangalore, 1983.	ar, "	Machine	Desig	n Data I	Hand Bo	ok", V	ol. 1 & 2	2, Suma
Refe	erence(s)	:								
1	Hall, 2 nd	b, T.P. and Spur, R.T., "- Edition, 1975.								man and
2	,	RL.C., "Fundamentals of			•			∕Viley, 	1983.	
3	Maitra G	.M., "Hand Book of Gear l	Desi	gn", Tata	a McGr	aw Hill, 1	1985.			
4	Prasad.	L. V., "Machine Design", T	ata	McGraw	Hill, N	ew Delhi	i, 1992.			
5	Alexandr	ov, M., Materials Handling	g Eq	uipment	s, MIR	Publishe	ers, 1981	-		

K.S.I	Rangas	samy College of Technolog	gy - Au	itonom	ous R	egulatio	า	R 20	10	
Depar	tment	Mechanical Engineering	Progra	amme (Code 8	& Name		: M.E. Co lided Des		
			Semes	ster II						
Cou	ırse		Hou	rs / We	ek	Credit	Ma	aximum I	Marks	
Co		Course Name	L	Т	Р	С	CA	ES	Total	
10 PC	A 204	METALLIC MATERIALS AND MANUFACTURING PROCESS	3	0	0	3	50	50	100	
Object	ive(s)	To impart knowledge on ty components.	pes of r	materia	ls, ma	nufacturir	ng meth	ods& ass	sembly of	
1 IN	NTROD	UCTION			To	tal Hrs		9		
Factors for mechanical, electrical and thermal properties – Dimensional geometrical tolerances – selection of materials.										
2 TYPES OF MATERIALS Total Hrs 9										
		rous Alloys, steel, stainless , Brass, Gun Metal, etc. – Ma						copper, e	tc. – Non	
3 M	1ANUF/	ACTURING METHODS			Tot	tal Hrs		9		
planne less gr parts.	d shap ound, e Sand c	orming methods, turned pa bed and slotted parts, screw electrical discharged, roller fu ast, die cast, investment cas - conventional, non-convention	thread Irnished at and o	ed con parts,	toured electro	and inte	rnal gro	und par vanced i	ts, center machined	
		BLY OF COMPONENTS			Tot	tal Hrs		9		
		riveting – screwing – flange oldering – advanced techniqu			welde	ed parts –	electric	arc – ga	s welding	
5 C	AST S	TUDIES			Tot	tal Hrs		9		
Design	for mir	nimum cost, material and pro	cess							
Total h	ours to	be taught						45		
Text bo	ook (s)	:					I			
1 D	ieter G	.E., "Mechanical Metallurgy",	McGrav	w Hill, 1	987.					
Refere	nce(s)	:								
1 K	enneth	G. Budingski, "Surface Engi	neering	for wea	ar Res	istance", I	Prentice	Hall, 19	38.	
2 Z	2 Zakharove B., "Heat Treatment of Metals", Peace Publications, 1962.									

K.S.Ranga	samy College of ⊺	Гесhnology	r - Auto	onomo	us Re	gulation		R 20	10
Department	Mechanical Engineering	Prograr I	mme Co Name	ode &		PCA : N	I.E. Co Desi	mputer /	∖ided
		S	Semeste	er II	1				
Course Code Course Name Hours / Week Credit Maximum Marks									
Course Code	Course Na	ame	L	Т	Р	С	CA	ES	Total
10 PCA 205	COMPUTER ANALYSIS LABO II (PED, PCA)	AIDED DRATORY	0	0	3	2	50	50	100
Objective(s)		armonic, Ex and fin, Flui	cplicit, 1 d flow	Non lin	ear a	nalysis, H	leat tra	nsfer an	alysis of
2. Solid r 3. Bucklir 4. Modal 5. Transi 6. Harmo 7. Drop t 8. Non lir 9. Heat tr 10. Heat tr	composite wall and fin, Fluid flow analysis in duct and flat plate using analysis software(Ansys, Nastran etc) 1. Design optimization of cantilever beam. 2. Solid model creation. 3. Buckling analysis of gear shift rod. 4. Modal analysis of cantilever beam. 5. Transient analysis of cantilever beam. 6. Harmonic analysis of cantilever beam. 7. Drop test analysis of Aluminum container on steel plate. 8. Non linear contact analysis 9. Heat transfer analysis in composite wall 10. Heat transfer analysis in automobile fin. 11. Air flow in 2D duct.								

K.S.Ranç	gasamy (of Techno	olog	y - Au	tonoi	nous		R 2010	
Department	Mecha Engine	anical	Prograr	nme	Code	& Na	me		. Computer /	Aided
		_		Se	emeste	er II			-	
Course	_				Hours Week		Credi t	Ма	ximum Mark	is.
Code	Co	ourse Nar	me	L	T	Р	С	CA	ES	Total
10 PCA 206	PREPA PRESE	ICAL RE RATION NTATION	AND N	0	0	2	0	100	00	100
Objective(s)	in refer	red jourr	nals and d present	conf ation	erenc skills	e pro	ceeding: student	s and to Imts.	the research prove the	technical
Methodology	•	By mutus subject as The stud collect the The stude published Using Ominutes The student Th	al discussarea to the lents have published in the later has read of the lent has read of the	sions e stu e to ed li expect ast 5 r Po by 10 make e se to w e Ab nclude	s, the fident refer to terature terested to years int, the original mesterite a stract, ling Rebmitted.	he Jore e studites di prese r Techr Revenarled to	y guide voluments a ect at leadent has iscussion intations, nical Repiew of the HC the HC	will assign a and Conference ast 20 such to make propertion one at the coort for about Research propertion Reference as a solution of Reference as a solutio	by the HOD topic in the nee proceed the Research resentation of middle and at 30-50 pages apper under ences). The tek before	general / lings and n Papers for 15-20 the other ges (Title various technical
	Week	Activity								
	I	Allotme	nt of Fac	ulty (Guide	by th	e HoD			
	II	Finalizi	ng the top	oic w	ith the	appr	oval of F	aculty Guide	Э	
Execution	III-IV	Collecti	on of Ted	chnic	al pap	ers				
Excodion	V-VI	Mid ser	nester pr	esen	tation					
	VII-VIII	Report	writing							
	IX	Report	submissi	on						
	X-XI		esentatio							
	12	00% by 02 Hrs/wee	Continuo k	us As	ssessr	nent				
	Compor	nent					Weig	htage		
	Phase -	I Present	ation				25 %)		
Evaluation	Phase -	II Preser	ntation				25 %)		
	Report I	Preparati	on and S	ubmi	ssion		30 %)		
	Final Pr	esentatio	n				20 %)		
	Total						100 9	%		

K.S.Rang	asamy College c	of Technology	- Autor	iomou	s Re	gulation		R 20	10
Department	Mechanica Engineerin	" Drogramm	e Code	& Nam	ie I	PCA : M.E.	Compu	iter Aide	d Design
		Se	emester	III	·				
Course Code	Hours / Week Credit Maximum Marks Code Course Name								Marks
Course Code	Course	ivallie	L	Т	Р	С	CA	ES	Total
10 PCA 301	PROJECT WOI	RK - PHASE I	0	0	12	2	100	00	100
Objective(s)	To import the p the technical pr to refer, read a relevant to their presentation.	ocedures in the nd review the r	ir projed esearch	ct work article	. To p s, jo	provide an urnals and	exposul confere	re to the ence pro	students ceedings
 Three reviews have to be conducted by the committee of minimum of three members one of which should be the guide Problem should be selected Students have to collect about 20 papers related to their work Report has to be prepared by the students as per the format as given below Preliminary implementation can be done if possible Internal evaluation has to be done for 100marks 									

K.S.Rangas	samy College	of Technolog	gy - Aut	onom	ous R	egulation		R 20	010		
Department	Mechanical Engineering	Programme	e Code 8	& Nam	e F	PCA : M.E.	Comp	outer Aide	d Design		
			Semes	ter IV							
Course Code	Hours / Week Credit Maximum Marks ourse Code Course Name										
Course cour	Coulos	rtame	L	Т	Р	С	CA	ES	Total		
10 PCA 401	PROJECT PHASE II	WORK -	0	0	40	10	50	50	100		
Objective(s)	This enables and to impler the hazards global.	ment their inn	ovative	ideas	to fore	front the r	isk iss	ues and t	o retrieve		
Methodology	three Each Atten for so They Final three exter	e reviews had members on review has to dance is composed valid reads should publish review will be members or nal expert exceport should	e of which be evaluated as the part of what aminer when the part of white part of the part of t	ich sho aluated for all e or me aper pr by the nich sh with in	fro 10 review ore chareferal e com ould b	e the guide 00 marks vs. If a stud ance may oly in the journittee that be the guid dllege)	dent fa be giv ournals t cons le(If po	ils to atter en s/conferen ists of mi ossible ind	nd review aces nimum of clude one		

ı	K.S.Ranga	samy College of T	echnology	- Auto	nomo	us Re	gulation		R 20	10
De	partment	Mechanical Engineering	Program	me Cod	le & Na	ame	PCA :		omputei sign	Aided
	Course	Course Na	me	Hou	rs / We	eek	Credit	Ma	aximum l	Marks
	Code	Course Na	ille	L	Т	Р	С	CA	ES	Total
10 F	PCA E01	ADVANCED FINITELEMENT ANALY		3	0	0	3	50	50	100
Obj	ective(s)	To Teach studen engineering probles students with a wand their use in de	ems involvi orking kno	ng fluid	mech	anics,	linear an	d non-l	inear. To	o provide
1	BENDING	G OF PLATES AND	SHELLS			Тс	tal Hrs		9	
Plat	e and She	sticity Equations – ell Elements - Confo polication and Exam	orming and							
2	NON-LIN	EAR PROBLEMS				То	tal Hrs		9	
Plas	sticity - G	Iterative Technique eometric Non line ess and Contact Pro	arity – larg							
3	DYNAMIO	C PROBLEM				То	tal Hrs		9	
		ation – Free, Trans nique – Houbolt, Wi						Proced	dures –S	Subspace
4	FLUID MI	ECHANICS AND H	EAT TRAN	SFER		То	tal Hrs		9	
For	mulations	quations of Fluid - Slow Non-Newteady and Transient	onian Flow							
5	ERROR REFINEN	ESTIMATES	AND	ADAP	TIVE	То	tal Hrs		9	
Erro	or norms ar	nd Convergence rat	es – h-refin	ement	with ad	laptivi	ty – Adap	tive refi	nement.	
Tota	al hours to	be taught							45	
Tex	t book (s) :									
1		D., "Concepts and lition, 2007.	Application	s of Fi	nite El	emen	t Analysis	", Wile	y India	Pvt Ltd.
2		R Chandrupatla, in Engineering", Pr						ı, "Intro	duction	to Finite
Ref	erence(s) :									
1	Bathe, K. 1990.	J., "Finite Element	Procedures	in Eng	ineerin	ıg Ana	alysis", Pro	entice I	Hall, Nev	v Jersey
2	S.S.Rao,	"Finite Element And	alysis", Eles	sevier, F	ourth	Editio	n, 2005.			
3	Logan D. 2002.	L, "A First Course i	n the Finite	Eleme	nt Met	hod",	Third Edit	tion, Th	omson l	_earning

	K C Danas	camy College of Tack	ology	_ 1::40	noma:	ie Ba	aulatian		R 20	10
	epartment	Mechanical Engineering		gramm Nar	e Code		<u> </u>		omputer	
	0	0 0		Hou	rs / We	eek	Credit		ximum I	Marks
	Course Code	Course Name		L	Т	Р	С	CA	ES	Total
10	PCA E02	OPTIMIZATION TECHNIQUES IN DES	SIGN	3	0	0	3	50	50	100
Ob	ojective(s)	To Impart knowledg optimization technique	e on		dyna	mic	constraine	ed and	d uncor	nstrained
1	INTRODU	CTION				To	otal Hrs		9	
opti		cteristics of mechanical formulation of objective								
2	UNCONS	TRAINED OPTIMIZATIO	N			To	otal Hrs		9	
		e and Multivariable op , Pattern and Gradient s							minimi	zation –
3	CONSTRA	AINED OPTIMIZATION				To	otal Hrs		9	
Lag	range multi	ith equality and inequal pliers - Geometric progr Genetic algorithms.								
4		PPLICATIONS				To	tal Hrs		9	
axia	al, transvers	cations – Design of simse loaded members for ed members – Design of	minim	num co						
5	-	APPLICATIONS				To	tal Hrs		9	
		cations - Optimum de dication in Mechanisms								vibration
Tota	al hours to b	pe taught							45	
Tex	t book (s):							I		
1		S.Rao., "Engineering O ublishers 1996.	ptimiza	tion Th	eory a	nd Pr	actice", Ne	ew Age	Internat	ional (P)
2	Johnson F	Ray, C., "Optimum desig	n of me	echanic	al elen	nents	", Wiley, J	ohn & S	Sons, 19	90.
Ref	erence(s):									
1		oy Deb, "Optimization f ia Pvt. 1995.	or Eng	ineerin	g desi	gn alg	gorithms a	nd Exa	mples",	Prentice
2		D.E., "Genetic algorithr lew York, 1989.	ns in s	earch,	optimiz	zation	and mac	hine", E	Barnen, A	Addison-

			2	2				1		
K.S.F	Rangasamy	/ College of Technology	y - Auto	nom	ous R	Regulation	on		R	2010
Dep	artment	Mechanical Engineering	Prog	ramm Nar		de &	PC	CA : M	I.E. Co Des	mputer Aided sign
Cour	se Code	Course Name	Hour	s/W	eek	Credit		N	⁄laximı	um Marks
			L	Т	Р	С		CA	ES	Total
10 P	CA E03	TRIBOLOGY IN DESIGN	3	0	0	3		50	50	100
Obje	ective(s)	To create awareness o machine elements.	f the im	nporta	nce o	f Tribolo	gy i	n des	ign ar	nd selection of
1	SURFACE	ES, FRICTION AND WE	AR		To	otal Hrs				9
Chemi Measu and m Proper mecha modified	Topography of surfaces – Surfaces features – Experimental Determinations of surface structure – Chemical analysis of surface – Surface effects in Tribology – Analysis of surface roughness – Measurement of surface roughness. Friction – Mechanism of friction, measuring friction, equations and models of friction – Friction. Properties of metallic and non metallic materials- friction in extreme conditions- Wear – Types, mechanism, mapping, measurements, wear resistance materials – surface treatment, surface modifications and surface coatings- Computer Simulations of friction, Lubrication and wear. 2 LUBRICATION THEORY Total Hrs 9 Lubricants – Selection criteria – Lubrication regimes – Hydrodynamic, elasto and plasto									
hydrod	dynamic lub	election criteria – Lubri prication - Basic equation dary lubricating films and	ns - R	eynol	d's e	quation -	- En	nergy	equat	ion, boundary
3	DESIGN (OF FLUID FILM BEARIN	GS		To	otal Hrs				9
fixed a	and pivoted oil film thic n.	s of hydrodynamic bearin – Mass flow rate, frictior ckness, stiffness of sque	n, powe eze film	r loss n and	, heat	and ten	nper	ature	differe	ence, dynamic
4	INDUSTR SYSTEMS		S ,	AND	To	otal Hrs				9
Types kinema	, contact m	 Self acting finite bearing nechanics, bearing intern ratings and life prediction analysis. 	al load	distri	bution	i, lubrica	tion	– Be	aring	geometry and
5	SPACE A	ND AUTOMOTIVE TRIB	OLOGY	1	To	otal Hrs				9
testing Tribold load tr oil pro	of space ogy –Importansfer – Co operties. Tr	echanism, components, mechanism. Principles of tance, lubrication regime ontact area and normal pribology in manufacturin machinery diagnosis and	of Aeros es, engi eressure g – Ma	space ne be distri acro a	eccei aring bution	ntric bea s, wheel n, brakes	ring bea s, eff	test arings fects	mecha , tire- of serv	anism. Engine Mechanics of vice on engine
Total h	nours to be	taught								45
Text b	ook (s) :									
1	Cameron,	A. "Basic Lubrication Th	eory", E	Ellis H	erwar	d Ltd., U	IK, 1	981.		
2	Hulling, J.	(Editor) – " Principles of	Tribolog	gy", M	acMill	lan, 1984	1.			
Refere	ence(s):									
1	Williams,	J.A. "Engineering Tribolo	gy", Ox	ford L	Jniver	sity Pres	s, 1	994.		
2	Neale, M.	J. "Tribology Handbook",	Butterv	worth	Heine	mann, 1	995.			
3	Bharat Bh	nushan, "Modern Tribolog	y Hand	book"	Vol.	– I & II.				

ı	K.S.Ranga	samy College of Techn	olog	gy - Aut	tonome	ous Re	gulation		R 20	10
De	partment	Mechanical Engineering	P	Program N	me Co lame	de &	PCA		Compute Design	r Aided
	Course			Hou	rs / We	ek	Credit	M	aximum I	Marks
	Code	Course Name		L	Т	Р	С	CA	ES	Total
10	PCA E04	ADVANCED STRENGT OF MATERIALS	TH	3	0	0	3	50	50	100
Obj	jective(s)	To Analyze, understan bodies using technique basic concepts in med mechanics of materials	es fr hanic	rom en cs of m	gineerii aterials	ng me s to mo	chanics a ore advanc	nd app ced top	lied matl	nematics,
1	ELASTIC	ITY				То	tal Hrs		9	
cool Rep prin	rdinates- [resentatior	in relation and Genera Differential equation of ns of three dimensional s ne strain - Plane stress –	equ stress	iilibrium s of a te	– Co ension	mpact – Gene	ability – eralized Ho	Boun ooke's	dary cor law – St.\	ditions - /ennant's
2	UNSYMM	IETRICAL BENDING				To	tal Hrs		9	
flex	ural membe ined ends -	Deflection in beams subjers - Circumferential and - Closed ring subjected t	Rad	lial stres	sses –	Deflect	tion and ra	dial cu	rved bear	n with re-
3	THICK C	YLINDERS AND ROTAT	ING	DISKS		To	tal Hrs		9	
to ro	otation - R	ylinder subjected to inter adial and tangential stre owable speed. – Rotating	esses	in soli	d disc	and rir				
4	TORSION	OF NON CIRCULAR S	ECT	IONS		To	tal Hrs		9	
		angular cross section – – Torsional stresses in h					stic memb	rane a	nalogy –	Prandtl's
5	STRESSI	ES IN FLAT PLATES				To	tal Hrs		9	
Buc	kling of pl	cular and rectangular plates - Theory of contaction of contaction of the contaction	act s	stresses	s – Me	ethods				
Tota	al hours to l	be taught							45	
Tex	t book (s) :							I		
1	Arthur P. &Sons, In	Boresi and Richard J.S c., 2003.	Schm	nidt, "Ad	dvance	d Med	hanics of	Mater	als", Joh	n, Willey
2		Cook, Wareen.C.Yound	, "Ac	dvanced	d Mech	anics	of Materia	ls", Ma	cmillan P	ublishers
Refe	erence(s):									
1	Srinath.L. 2003.	S., Advanced Mechanic	s of	Solids,	Tata N	/lcGrav	v Hill Publ	ishing	Company	/ Limited,
2		aju, N., Gururaja,D.R., g House, 1997.	Adv	/anced	Mecha	anics o	of Solids	and S	structures	, Narosa
3	U.C.Jinda 1997.	II, "Advanced Topics of	Stre	ength of	f mater	ials", (Galgotia P	ublicat	ions, Firs	t edition,

K	.S.Rangasa	ımy College of Technology	- Auto	nomo	us Re	gulation		R 20	10
De	epartment	Mechanical Engineering	Pro	ogramr Na	ne Co ame	de &		: M.E. Co	omputer sign
Cai	uraa Cada	Course Norse	Hou	rs / We	ek	Credit	Ма	aximum I	Varks
Col	ırse Code	Course Name	L	Т	Р	С	CA	ES	Total
10	PCA E05	PRODUCT DATA MANAGEMENT	3	0	0	3	50	50	100
Ob	jective(s)	To Impart knowledge on components on product date					figuratio	on mana	agement,
1	INTRODUC	CTION			То	tal Hrs		9	
		PDM - Present market co server - Client computing.	onstrain	ts - N	leed	for collal	ooration	- Inte	rnet and
2	COMPONE	ENTS OF PDM			То	tal Hrs		9	
and		a typical PDM setup - Hardv ocuments - Creating parts -							
3	CONFIGUR	RATION MANAGEMENT			То	tal Hrs		9	
Base	e lines - Prod	duct structure - Configuration	manaç	gement	- Cas	se studies			
4	PROJECTS MANAGEM		СНА	NGE	То	tal Hrs		9	
infor Case	mation flow e studies. C	ects and roles - Life cycle -Work flows - Creation of w Change issue - Change red Case studies.	ork flov	temp	lates -	Life cycl	e work	flow inte	gration -
5	GENERIC	PRODUCTS AND VARIANT	S		То	tal Hrs		9	
conf	iguration and	ent Systems for FEA data - d product configuration - Ger or for variant creation - Regis	neric pr	oduct i	nodel	ing in con	figuration	on mode	ler - Use
Tota	Il hours to be	e taught						45	
Text	book (s):								
1	Kevin Otto	, Kristin Wood, "Product Des	sign", Po	earson	, 2001				
2	Daniel Am	or, "The E-Business Revolut	ion", Pr	entice-	Hall, 2	2000.			
Refe	erence(s):								
1		worth. Mark Henderson a ing ". McGraw Hill Inc1991		p Wol	fe. "C	Computer	Integra	ited Des	sign and
2	Terry Quati	rain. "Visual Modeling with R	ational	Rose a	and UI	ML ". Add	ison We	esley19	998.
3	Wind-Chill	R5.0 Reference Manuals 200	00.						

	K.S.Ranga	asamy College of Te	chnology -	Auton	omou	s Reg	gulation		R 20	10
De	partment	Mechanical Engineering			ode &		PCA : M			Aided
(Course			Hou	rs / We	eek	Credit	Ма	ximum l	Marks
Department Engineering Name Design										
10	PCA E06			3	0	0	3	50	50	100
Ob	jective(s)	systems, Hydraulic	& pneumat	ic actu	ators,	their	control ar	nd regu	lation e	
1		RAULIC SYSTEMS A								
Det	ermination	of volumetric, mecha	nical and c	verall e	efficien	cies d	of positive			
2	CONTRO	L AND REGULATION	N ELEMEN	TS		То	tal Hrs		9	
3	HYDRAU	LIC CIRCUITS				То	tal Hrs		9	
circ	uits - pres	s circuits - Hydraulic	milling mad	chine -	Grindi	ng, pl	lanning, c	opying	, - Forkl	
		-			j		_			
Swi met	tching circ hods - Ma	uits - Fringe conditions	s modules	and the	ese inte	gratio	on - Sequ	ential c	ircuits -	Cascade
5		•	NCE AND	SPE	CIAL	То	tal Hrs		9	
find	ing - Hydi	uipments - Selection o pneumatic circuits Robotic circuits.	of compo - Use of	nents microp	- Des rocess	ign c ors fo	alculation or sequer	s – Ap	plicatio PLC, L	n –Fault .ow cost
Tota	al hours to	be taught							45	
Tex	t book (s)	:								
1	Espossito	o, Antony., "Fluid Powe	er with App	lication	s", Pre	ntice	Hall, New	York,	1980.	
2	Pease, D Delhi, 198	udleyt, A. and Pipper 35.	nger, John	J., "In	dustria	l Hyd	raulics", T	Γata M	cGraw-l	Hill, New
Ref	erence(s) :									
1	Parr, And	rew, "Hydraulic and P	neumatics"	, Jaico	Publis	hing l	House, Ne	ew Dell	ni, 2004.	
2	Bolton. W	., "Pneumatic and Hy	draulic Sys	tems",	Butterv	worth	–Heinema	ann, 19	97.	

	(.S.Ranga	samy College of	Technolog	gy - Aut	onom	ous R	egula	ation		R 20	10
Dep	partment	Mechanical Engineering	Progra	mme C	ode & I	Name		PCA		Comput Design	er Aided
C	Course	0 N		Hou	rs / We	ek	Cre	edit	Ma	aximum I	Marks
	Code	Course Na	ame	L	Т	Р	C		CA	ES	Total
10 F	PCA E07	APPLIED ENGI	NEERING	3	0	0	3	3	50	50	100
Obj	ective(s)	To Impart knowl their transmission								ition of s	ound and
1	BASIC C	ONCEPTS OF A	COUSTICS	;		То	tal Hr	rs		9	
mot Inte	ion – Alter	ustics – Sound pr ation of wave pat – Standing wav	hs –Measui	rement (of soun	d wav	es – s	sound	d spectr	ra– Šour	nd fields –
2	CHARAC	CTERISTICS OF	SOUND			To	tal Hr	rs		9	
med way	dium – Ve re in a bul ve equatio	ensional wave e locity of plane pr k of solid – Tran n in two dimensio MISSION PHENO	ogressive s sverse wav n.	ound w	ave thr	ough along	a thir	n solid	d rod –	Velocity	of plane
Cha	nges in m										
inci	dence - R	nedia – Transmis eflection at the s – Transmission th	surface of a	a solid,	norma						
incid way 4	dence - R re pattern - AN INT AND ME	eflection at the s - Transmission the RODUCTION TO ASUREMENT OF	surface of a prough three D THE AS SOUND	a solid, e media. SSESSN	norma MENT	incide To	ence, tal Hr	oblic	que inci	idence-	Standing
incio wav 4 Intro Wei Lou	dence - R re pattern AN INT AND ME aduction - ghted sou dness leve	eflection at the s - Transmission the RODUCTION TO	surface of a prough three O THE AS F SOUND ale for the el – Equal e, perceive	a solid, e media. SSESSM measur Loudne	MENT ement	To of soutours	tal Hr und p	s cower	que inci	9 und leve iness –L	Standing I meter – Loudness,
incio wav 4 Intro Wei Lou	dence - Repattern - AN INT AND ME oduction - ghted soudness level quency an	eflection at the s - Transmission th RODUCTION TO ASUREMENT OF The decibel scand pressure level, perceived nois	surface of a prough three D THE AS F SOUND ale for the el – Equal e, perceived surement.	a solid, e media. SSESSM measur Loudne d noise	MENT ement	To of sou tours Equiv	tal Hr und p	oblic sower rceive soun	que inci	9 und leve iness –L	Standing I meter – Loudness,
incid wav 4 Intro Wei Lou Fred 5	AN INT AND ME oduction - ighted sou dness leve quency an BASIC Cose control se - Types	eflection at the s Transmission the RODUCTION TO ASUREMENT OF The decibel scand pressure level, perceived nois d Amplitude measure	surface of a prough three of the AS SOUND alle for the el – Equal e, perceive surement. OISE CON and received and received ovel – D	a solid, e media. SSESSM measur Loudned d noise TROL er – No	MENT ement ss con level –	To of soutours Equiv	tal Hr und p Per alent tal Hr	oblices oblice	r - Sou ed noisi d level-	gund leve iness -L Identific 9	Standing I meter – Loudness, ed level – Machinery
Intro Wei Lou Free 5 Nois Nois	AN INT AND ME oduction - ighted sou dness leve quency an BASIC C se Control se - Types se reduction	eflection at the s - Transmission th RODUCTION TO ASUREMENT OF - The decibel sca and pressure level, perceived nois d Amplitude measure CONCEPTS OF N at source, path, s of machinery in	surface of a prough three of the AS SOUND alle for the el – Equal e, perceive surement. OISE CON and received and received ovel – D	a solid, e media. SSESSM measur Loudned d noise TROL er – No	MENT ement ss con level –	To of soutours Equiv	tal Hr und p Per alent tal Hr	oblices oblice	r - Sou ed noisi d level-	gund leve iness -L Identific 9	Standing I meter – Loudness, ed level – Machinery
Intro Way 4 Intro Wei Lou Free 5 Nois Nois Tota	AN INT AND ME oduction - ighted sou dness leve quency an BASIC C se Control se - Types se reduction	eflection at the s - Transmission th RODUCTION TO ASUREMENT OF - The decibel sca and pressure level, perceived nois d Amplitude mean CONCEPTS OF N at source, path, s of machinery in on procedures — A be taught	surface of a prough three of the AS SOUND alle for the el – Equal e, perceive surement. OISE CON and received and received ovel – D	a solid, e media. SSESSM measur Loudned d noise TROL er – No	MENT ement ss con level –	To of soutours Equiv	tal Hr und p Per alent tal Hr	oblices oblice	r - Sou ed noisi d level-	gund leve iness -L - Identific 9 ment - N	Standing I meter – Loudness, ed level – Machinery
Intro Wei Lou Free Nois Nois Tota	AN INT AND ME Deduction - Ighted soudness leve quency an BASIC Co se Control se - Types se reduction al hours to t book (s)	eflection at the s Transmission the RODUCTION TO ASUREMENT OF The decibel scaland pressure level, perceived noised Amplitude measures CONCEPTS OF N at source, path, sof machinery in procedures — Ambien proc	surface of a grough three D THE AS SOUND alle for the el – Equal e, perceiver surement. OISE CON and receiver and receive	a solid, e media. SSESSM measur Loudned d noise TROL er – No etermin closures	MENT ement ss con level –	To of soutours Equiv	tal Hr und p Per alent tal Hr y aco	oblices oblice	r - Sou ed noisi d level- al treatr	idence— 9 Ind leve iness –L - Identific 9 ment – N Ind powe	I meter – Loudness, ed level – Machinery er level –
Inclusive August 14 Intro Wei Lou Free 5 Nois Nois Tota Tex	AN INT AND ME Diduction - Ighted soudness leve quency an BASIC Co See Control See - Types See reduction It book (s) Kinsler, I New Yor Bies, Da	eflection at the s Transmission the RODUCTION TO ASUREMENT OF The decibel scaland pressure level, perceived noised Amplitude measures CONCEPTS OF N at source, path, sof machinery in procedures — Ambien proc	surface of a grough three of the AST SOUND alle for the el — Equal e, perceiver surement. OISE CONTACT and receiver and r	a solid, e media. SSESSM measur Loudned noise TROL er – No etermin closures	morma MENT ement ss con level – ise cor ation con	To of soutours Equiv	tal Hr und p Per alent tal Hr y aco	oblices sound soun	r - Soued noisid level-	idence— 9 Ind leve iness —L - Identific 9 ment — N Ind powe 45	Standing I meter – Loudness, ed level – Machinery er level –
Incidented in the incidented i	AN INT AND ME Diduction - Ighted soudness leve quency an BASIC Co See Control See - Types See reduction It book (s) Kinsler, I New Yor Bies, Da	eflection at the s Transmission the RODUCTION TO ASUREMENT OF The decibel scaland pressure level, perceived noised Amplitude measures. CONCEPTS OF N at source, path, s of machinery in procedures — Amplitude measure path, so the source of machinery in procedures — Amplitude measures. Lawrence E. and k, 1986. Lawid A. and Hanse Edition, Chapman	surface of a grough three of the AST SOUND alle for the el — Equal e, perceiver surement. OISE CONTACT and receiver and r	a solid, e media. SSESSM measur Loudned noise TROL er – No etermin closures	morma MENT ement ss con level – ise cor ation con	To of soutours Equiv	tal Hr und p Per alent tal Hr y aco nd po	oblices sound soun	r - Soued noisid level-	idence— 9 Ind leve iness —L - Identific 9 ment — N Ind powe 45	Standing I meter – Loudness, ed level – Machinery er level –

ı	K.S.Ranga	samy College of Ted	hnology	- Auto	nomoı	ıs Re	gulation		R 20	10
Dep	artment	Mechanical Engineering	Progra	mme C Name	ode &		PCA : N	I.E. Co Desi		Aided
	Course	Course Nam	Δ.	Hou	rs / We	eek	Credit	Ма	ximum l	Marks
	Code	Course Main		L	Т	Р	С	CA	ES	Total
10	PCA E08	ADVANCED TOOL I	DESIGN	3	0	0	3	50	50	100
Obj	jective(s)	To Impart knowled Treatment design of machine.	ge on To f drill jigs,	ool des design	sign m	nethod tures	ls, Toolir and dies	ng mate and too	erials a ol desig	nd Heat n for NC
1	TOOL-DE	SIGN METHODS				То	tal Hrs		9	
Tec Inst Elec	hniques ir allation of ctro-discha	Ideation – Tentative In Tooling drawings – Drill Bushings – Purge machining for cave	Screws and ity.	and Do	wels – anufac	Hole	location - Electro-	- Jig-b	ooring p	ractice -
2	TOOLING	MATERIALS AND H	EAT TRE	ATMEN	٧T	To	tal Hrs		9	
3 Intro Gaç clar	DESIGN oduction – ges – Auto nping – Dr	- Taps - Tap classific s for carbide tools OF DRILL JIGS Fixed Gages - Gage matic gages - Princip ill jigs - Chip formation - Methods of construct	Tolerance les of loca	es – Thation – I	ne sele Locatir	To- ection ng me onside	tal Hrs of materia thods and	al for G	9 ages –l es – Prir	ndicating
4	DESIGN	OF FIXTURES AND [DIES			To	tal Hrs		9	
Bor con Stri	ing Fixture struction - opers and	Fixtures and econories – Broaching Fixtorian F	ures – La entals –	athe Fi Blankin	ixtures ig and	– G Piero	rinding F cing die	ixtures constru	Typesction –	s of Die
5	TOOL				Strip					
J	CONTRO	DESIGN FOR LLED MACHINE	ving opera			To	tal Hrs		9	
Intro con tool and	oduction – trol system s for nume tool positi		ving opera NUI cal control cure designation of the control cure designation of the control of th	HERICA A base of the formula of the	ALLY sic exp umeric	olanati ally co erical o	on of num ontrolled i	machin Automa	ntrol –N e tools - tic tool (iercing – lumerical - Cutting changers
Intro con tool and mad	oduction – trol system s for nume tool positi	The need for numerical in use today — Fixing in use today — Fixing in the control — Tool had been a Tool presetting for Automatic screen.	ving opera NUI cal control cure designation of the control cure designation of the control of th	HERICA A base of the formula of the	ALLY sic exp umeric	olanati ally co erical o	on of num ontrolled i	machin Automa	ntrol –N e tools - tic tool (iercing – lumerical - Cutting changers
Intro con tool and mad	oduction – trol system s for nume tool positi chine – Too	The need for numerical in use today — Fixturical control — Tool hooners — Tool presetting for Automatic scrube taught	ving opera NUI cal control cure designation of the control cure designation of the control of th	HERICA A base of the formula of the	ALLY sic exp umeric	olanati ally co erical o	on of num ontrolled i	machin Automa	ntrol –N e tools - tic tool o Brown a	iercing – lumerical - Cutting changers
Intro con tool and mad	oduction — trol system s for nume tool positi chine — Too al hours to t book (s)	The need for numerical in use today – Fixing in use today – Tool hold in the interest – Tool presetting in the fixing for Automatic scribe taught	ving opera NUI ral control cure desig olding met g – Introd rew Machi	ntions. MERICA A base n for no hods fo uction - nes	Sic exp umeric or nume - Gene	olanati ally co erical e eral ex	on of num ontrolled i control – i planation	machine Automa of the I	ntrol –Ne tools - tic tool o Brown a	lumerical - Cutting changers nd sharp

	N.S.Raily	asamy College of	Technology - <i>i</i>	Auton	omous	s Reg	ulation		R 20	010
De	partment	Mechanical Engineering	Programme	Code 8	& Nam	е	PCA : N	Л.Е. Co Des	mputer	Aided
C	Course			Hou	ırs / W	eek	Credit	Ма	ximum	Marks
	Code	Course N	vame	L	Т	Р	С	CA	laws and so, micro me gens -Micro anotors-Micro anotors-M	Total
10 I	PCA E09	MICRO ELECTRO MECHANICAL SY DESIGN	STEMS	3	0	0	3	50		100
Obj	ective(s)	To Impart knowle mechanical applimicro system mar	cations, mater	ials a	nd fab	ricati	on proce	ng law ess, m	s and s icro me	scaling in echanics,
1	INTRODU	JCTION				To	tal Hrs		9	
tech Mic	nniques-Mi rogrippers-	cro sensors-Ty- Scaling laws-Scal orces- Scaling in ele	pes-microactua ing in geome	ators-T try-Sca	ypes-laling i	Micro _l n rig	oumpmic id body	romoto dynam	rs-Micro nics- So	o-Valves- caling in
2	MATERIA	ALS AND FABRICA	TION PROCES	SS		Tot	al Hrs		9	
	osition by	ohy - Ion implantat epitaxy - Etching pi ECHANICS		– Oxid	dation		O - Phys al Hrs	ical va		oosition -
edg	es fixed ar elerometer	tatic bending of thin			with 6	edge 1	fixed – R	ectang	ular plat	المادانين
	ture mech	s-design theory ar anics-Stress intensi	nd damping co	efficie	nts- T	herm	o mecha	nics-Th	t vibration	on- Micro stresses-
frac		rs-design theory ar anics-Stress intensi SYSTEM MANUFAC	nd damping co ity factors, Frac	efficie	nts- T	hermess an	o mecha	nics-Th	t vibration	on- Micro stresses-
frac 4 Clea syst	MICRO S an room te em pack	anics-Stress intensics SYSTEM MANUFAC echnology-Bulk Mic aging-materials-Die	nd damping co ity factors, Frac CTURING cro manufacture level-device	efficie ture to ing- S level	nts- T oughne urface	hermess an Tot micro	o mecha d interfactal al Hrs o machin	nics-Th cial frac ing -L	t vibration nermal sture me 9	on- Micro stresses- echanics. GA-Micro
frac 4 Clea syst prep	MICRO S an room to em pack paration-So	anics-Štress intensi SYSTEM MANUFAC echnology-Bulk Mic	nd damping co ity factors, Frac CTURING cro manufacture level-device	efficie ture to ing- S level	nts- T oughne urface	Tot micro m le	o mecha d interfactal al Hrs o machin	nics-Th cial frac ing -L	t vibration nermal sture me 9	on- Micro stresses- echanics. GA-Micro
frac 4 Clea syst prep 5	MICRO S an room to sem pack paration-So MICRO S sign consid	anics-Stress intensions SYSTEM MANUFAC echnology-Bulk Mic aging-materials-Die urface bonding-Wire	nd damping co ity factors, Frac CTURING cro manufacturi e level-device e bonding-seali design-Mask la	ing- S leveling.	nts- T bughne urface -Syste	Tot Tot Tot Tot Tot Tot Tot Tot	o mecha d interfact al Hrs o machin vel pact al Hrs chanical	nics-Theial fractions ing -Likaging design	t vibrationermal seture med 9 IGASLIG technical separations of the second separations of the second	on- Micro stresses- echanics. GA-Micro ques-Die
frac 4 Clea syst prer 5 Des mic	MICRO S an room to sem pack paration-So MICRO S sign consid	anics-Stress intensions SYSTEM MANUFAC echnology-Bulk Mic aging-materials-Die urface bonding-Wire SYSTEM DESIGN derations-Process in -Automotive indu	nd damping co ity factors, Frac CTURING cro manufacturi e level-device e bonding-seali design-Mask la	ing- S leveling.	nts- T bughne urface -Syste	Tot Tot Tot Tot Tot Tot Tot Tot	o mecha d interfact al Hrs o machin vel pact al Hrs chanical	nics-Theial fractions ing -Likaging design	t vibrationermal seture med 9 IGASLIG technical separations of the second separations of the second	on- Micro stresses- echanics. GA-Micro ques-Die
frac 4 Clea syst prep 5 Des mic	MICRO S an room to tem pack paration-S MICRO S sign considers system	anics-Stress intensions SYSTEM MANUFAC echnology-Bulk Mice aging-materials-Die urface bonding-Wire SYSTEM DESIGN derations-Process in -Automotive indu be taught	nd damping co ity factors, Frac CTURING cro manufacturi e level-device e bonding-seali design-Mask la	ing- S leveling.	nts- T bughne urface -Syste	Tot Tot Tot Tot Tot Tot Tot Tot	o mecha d interfact al Hrs o machin vel pact al Hrs chanical	nics-Theial fractions ing -Likaging design	t vibrationermal seture medical setu	on- Micro stresses- echanics. GA-Micro ques-Die
frac 4 Cleasyst prep 5 Des mic Tota Tex	MICRO S an room to tem pack paration-So MICRO S sign consider consider system al hours to t book (s)	anics-Stress intensions SYSTEM MANUFAC echnology-Bulk Mice aging-materials-Die urface bonding-Wire SYSTEM DESIGN derations-Process in -Automotive indu be taught	nd damping co ity factors, Frac CTURING cro manufacturi e level-device e bonding-seali design-Mask la stry-Bio medica	ing- S level ng.	urface -Syste	Total	o mecha dinterfactial Hrs o machin vel pactial Hrs chanical ecommun	nics-Theial fractions ing -Likaging design	t vibrationermal seture medical setu	on- Micro stresses- echanics. GA-Micro ques-Die
frac 4 Cleasyst prer 5 Des mic Tota Tex	MICRO S an room to tem pack paration-So MICRO S sign consider o system al hours to t book (s) Mohamed Julian W.	anics-Stress intensions SYSTEM MANUFAC echnology-Bulk Mice aging-materials-Die urface bonding-Wire SYSTEM DESIGN derations-Process in -Automotive indu be taught	nd damping co ity factors, Frac CTURING cro manufacturi e level-device e bonding-seali design-Mask la stry-Bio medica	ing- S level ng.	nts- Toughne urface -Syste design ro space	Total	o mecha dinterfact al Hrs o machin vel pac al Hrs chanical ecommun	nics-Theial fractions of the control	t vibrationermal seture me 9 IGASLIG technical seture me 19 I applications.	on- Micro stresses- echanics. GA-Micro ques-Die
Cleasyst pres 5 Des mic Tota 1 2	MICRO S an room to tem pack paration-So MICRO S sign consider o system al hours to t book (s) Mohamed Julian W.	anics-Stress intensical system Manufactors of the second o	nd damping co ity factors, Frac CTURING cro manufacturi e level-device e bonding-seali design-Mask la stry-Bio medica	ing- S level ng.	nts- Toughne urface -Syste design ro space	Total	o mecha dinterfact al Hrs o machin vel pac al Hrs chanical ecommun	nics-Theial fractions of the control	t vibrationermal seture me 9 IGASLIG technical seture me 19 I applications.	on- Micro stresses- echanics. GA-Micro ques-Die
frac 4 Cleasyst syst prep 5 Des mic Tota Tex 1 2 Refe	MICRO S an room to tem pack baration-Si MICRO S dign consider or system al hours to t book (s) Mohamed Julian W. Devices, erence(s):	anics-Stress intensics SYSTEM MANUFACE echnology-Bulk Mice aging-materials-Dieurface bonding-Wire SYSTEM DESIGN derations-Process in -Automotive indube taught Gardner, Vijay K. Valohn Wiby & sons I	nd damping control damping con	ing- S level ng.	urface -Syste design ro space	Total	o mecha dinterfactive machin vel pactive pacti	ing -Likaging design ication	t vibrationermal seture medical seture seture medical seture medic	on- Micro stresses- echanics. GA-Micro ques-Die ations of
Cleasyst prep 5 Des mic Tota 1 2	MICRO S an room to tem pack paration-So MICRO S sign consider system al hours to t book (s) Mohamed Julian W. Devices, erence(s): S.Fatikov Heidelbei	anics-Stress intensics SYSTEM MANUFACE echnology-Bulk Mice aging-materials-Dieurface bonding-Wire SYSTEM DESIGN derations-Process in -Automotive indube taught Gardner, Vijay K. Valohn Wiby & sons I	nd damping control damping con	ing- S level ng. ayout al -Ae	nts- Toughneurface -Syste design ro space RC preadel K	Total	o mechand interfact interfact interfact interfact interfact in machine well pactions and the machine well pactions in mac	ing -Likaging design ication	y sper-Verlager	GA-Micro ques-Die ations of Smart

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De	partment	Mechanical Engineering	Progran	nme Co	de & N	ame	PCA		Compute esign	r Aided
(Course			Hou	ırs / We	eek	Credit	Ma	aximum I	Marks
	Code	Course N	ame	L	Т	Р	С	CA	ES	Total
10	PCA E10	MECHANICS O COMPOSITE MATERIALS		3	0	0	3	50	50	100
Ob.	jective(s)	To Impart know composite mate							nics, med	hanics of
1	INTROD	UCTION				То	tal Hrs		9	
Ara fibe	mid fibers	eed – General Cl - Matrices – Po trices - Fiber su	lymer, Grap	ohite, Ċ	eramic	and I	Metal Matr	ices -	Characte	eristics of
2	MECHAI	NICS				То	tal Hrs		9	
mod You Ulti	duli based ing's modi mate strei	re - Volume and I on strength of ulus - transverse ngths of a unidi amination theory,	materials Young's mo rectional la	approac dulus - mina -	h and major Chara	Semi Poiss	 Empirion's ratio - 	cal mod	del - Lo ne shear	ngitudina modulus,
3	PERFOR	RMANCE				То	tal Hrs		9	
		nical Properties – acture Behavior a				erties -	- Environm	nental e	ffects – L	ong term
4	MANUF	ACTURING				То	tal Hrs		9	
Pro		 Compression Quality Inspection ing. 								
5	DESIGN	OF STRUCTUR	ES			То	tal Hrs		9	
guio mei	delines - mber – De	ctions - Laminate Joint design-Bolesign of a compre FEM for design a	ted and Bo ssion mem	nded Jo ber – D	oints - esign d	Desig	n Example am-desigr	es - De	sign of	a tension
Tot	al hours to	be taught							45	
Тех	t book (s)	:						•		
1		P.K., "Fiber Rein nc, 1993.	forced Com	posites	: Mate	rials, N	Manufactu	ring and	d Design	", Marcel
2	Autar K.	Kaw, "Mechanics	of Compos	site Mate	erials" (CRC P	ress, 2006	6.		
Ref	erence(s)	:								
1		B.D., and Brout d Sons, New Yor		Analysis	s and I	Perfor	mance of	Fiber C	Composit	es", John
2	Ronald (Gibson, "Principle	s of Compo	site Mat	terial M	echan	ics", Tata	McGrav	w Hill, 19	94.
3	Chawla I	K.K., "Composite	materials",	Springe	r – Ver	lag, 19	987.			
	l									

	K.S.Ranga	samy College of T	echnolog	gy - Aut	tonom	ous Re	egulation		R 20	10
De	partment	Mechanical Engineering	Progra	ımme C	ode & I	Name	PCA		Compute esign	r Aided
(Course	Course Nan	ne	Hou	rs / We	ek	Credit	Ma	aximum I	Marks
	Code	Course man	ie	L	Т	Р	С	CA	ES	Total
10	PCA E11	RAPID PROTOTY AND TOOLING	/PING	3	0	0	3	50	50	100
Ob	jective(s)	To understand prototyping in mai				ware	for rapid	protot	yping a	nd rapio
1	SYSTEM	_				Total			12	
- G Pro App	rowth of R cess para blications.	ompression in prod P industry and clas meters - Process Selective Laser Sii Data preparation for	sification details - ntering -	of RP : Data p Types	system orepara of mad	s. Stei tion -	reolithogra Data files	phy Sy and I	stems: F Machine	Principle details
2	FUSION	DEPOSITION MOD	DELING			Total	Hrs		6	
		cess parameters - achine details - App		eration ·	- Applio	ations	. Solid Gr	ound Cu	uring - P	rinciple o
3	LAMINA	TED OBJECT MAN	UFACTU	RING		Total	Hrs		8	
Prir	nciple - Th	peration - LOM m ermo jet printer - : Object Quadra Sy	Sander's	model	market	- 3-D	printer -	Genisy	s Xs pri	nter - JF
4	DADID T									
4	RAPID I	OOLING				Total	Hrs		7	
Indi tool	rect Rapid ing etc. Di	OOLING Tooling - Silicone rect Rapid Tooling - ProMetal - Sand	- Direct	AIM - C	Quick c	ninum ast pro	filled epo: ocess - C	opper p	ng - Spi	e - Rapid
Indi tool	rect Rapid ing etc. Di ol – DMILS	Tooling - Silicone rect Rapid Tooling	- Direct casting to	AIM - Cooling -	Quick c	ninum ast pro	filled epo ocess - C ing - Soft	opper p	ng - Spi	e - Rapio
Inditool Too STI soft acc buil Pro	rect Rapiding etc. Did – DMILS SOFTWA files - Overwares - Couracy - Dad orientation	I Tooling - Silicone rect Rapid Tooling - ProMetal - Sand ARE FOR RAPID Prerview of Solid vietollaboration tools - at a preparation error	- Direct casting to ROTOTY w - Magi Rapid M ors - Part	AIM - Cooling - PING cs, mim anufacti buildin igitizing	Quick of Lamina nics, ma uring P g error	Total agics or rocess	filled epococess - Coing - Soft Hrs communics optimizations in fin	opper p tooling ' ator, eto tion - F ishing -	ng - Spi oolyamide Vs Hard 12 c Interractors in Influence	e - Rapid tooling. net based ifluencing ce of par
Inditool Too 5 STI soft acc buil Pro moo	rect Rapiding etc. Did – DMILS SOFTWA files - Overwares - Couracy - Dad orientation	I Tooling - Silicone rect Rapid Tooling - ProMetal - Sand ARE FOR RAPID Prerview of Solid viewollaboration tools - stap reparation error. Allied racuum Casting - Sand data transfer to state of the sta	- Direct casting to ROTOTY w - Magi Rapid M ors - Part	AIM - Cooling - PING cs, mim anufacti buildin igitizing	Quick of Lamina nics, ma uring P g error	Total agics or rocess	filled epococess - Coing - Soft Hrs communics optimizations in fin	opper p tooling ' ator, eto tion - F ishing -	ng - Spi oolyamide Vs Hard 12 c Interractors in Influence	e - Rapid tooling. net based ifluencing ce of par
Inditool Too 5 STI soft acc buil Pro mod Tot	rect Rapiding etc. Did – DMILS SOFTWA files - Over wares - Couracy - Dad orientation cesses - Velification a	I Tooling - Silicone rect Rapid Tooling - ProMetal - Sand ARE FOR RAPID P rerview of Solid vie collaboration tools - ata preparation erro on. Allied racuum Casting - S and data transfer to s be taught	- Direct casting to ROTOTY w - Magi Rapid M ors - Part	AIM - Cooling - PING cs, mim anufacti buildin igitizing	Quick of Lamina nics, ma uring P g error	Total agics or rocess	filled epococess - Coing - Soft Hrs communics optimizations in fin	opper p tooling ' ator, eto tion - F ishing -	ng - Spr polyamido Vs Hard 12 c Interr ractors in Influence int cloud	e - Rapid tooling. net based offluencing ce of par
Inditool Toc 5 STI soft acc buil Pro moo	rect Rapiding etc. Did – DMILS SOFTWA files - Overwares - Couracy - Dad orientation cesses - Volification and I hours to	I Tooling - Silicone rect Rapid Tooling - ProMetal - Sand ARE FOR RAPID P rerview of Solid vie collaboration tools - ata preparation erro on. Allied racuum Casting - S and data transfer to s be taught	- Direct casting to ROTOTY w - Magi Rapid M ors - Part surface D solid mod	AIM - Cooling - PING cs, mimanufaction buildin igitizing lels.	Quick of Lamina	inum ast pro te tool Total agics or rocess s - Er ace Ge	filled epococess - Coing - Soft Hrs communics S Optimizators in fine	ator, etction - Fishing -	ng - Sproolyamide Vs Hard 12 c Interrestactors in Influence int cloud	e - Rapid tooling. net based ifluencing ce of par -Surface
Inditool Too STI soft acc buil Pro mod Tot:	rect Rapiding etc. Did – DMILS SOFTWA files - Overwares - Ouracy - Dad orientation and all hours to extend to book (s): Paul. F. Company - Paul	I Tooling - Siliconerect Rapid Tooling - ProMetal - Sand ARE FOR RAPID Prerview of Solid viewollaboration tools - sta preparation error. Allied acuum Casting - Sind data transfer to sibe taught	- Direct casting to ROTOTY w - Magi Rapid M ors - Part surface D solid mod	AIM - Cooling - PING ICS, mim anufaction building igitizing lels.	Quick of Lamina nics, many uring Figure error - Surfa	Total agics (rocesss - Er	filled epococess - Coing - Soft Hrs communic of Optimizations in fine eneration for the communication for th	opper p tooling ' ator, etc tion - F ishing - from po	ng - Sproolyamide Vs Hard 12 c Interrestactors in Influence int cloud	e - Rapid tooling. net based ifluencing ce of par -Surface
Inditool Toc 5 STI soft acc buil Pro mod Tot:	rect Rapiding etc. Did – DMILS SOFTWA files - Overwares - Ouracy - Dad orientation and all hours to extend to book (s): Paul. F. Company - Paul	Tooling - Siliconerect Rapid Tooling - ProMetal - Sand ARE FOR RAPID Prerview of Solid viewollaboration tools - sta preparation error. Allied racuum Casting - Sind data transfer to sibe taught Jacobs, "Stereo lither. T. & Dimov. S. S.,	- Direct casting to ROTOTY w - Magi Rapid M ors - Part surface D solid mod	AIM - Cooling - PING ICS, mim anufaction building igitizing lels.	Quick of Lamina nics, many uring Figure error - Surfa	Total agics (rocesss - Er	filled epococess - Coing - Soft Hrs communic of Optimizations in fine eneration for the communication for th	opper p tooling ' ator, etc tion - F ishing - from po	ng - Sproolyamide Vs Hard 12 c Interrestactors in Influence int cloud	e - Rapid tooling. net based ifluencing ce of paid -Surface

l	K.S.Rang	asamy College of Tec	hnology	- Auto	nomou	ıs Re	gulation		R 20	10
Dep	partment	Mechanical Engineering	Progra	nmme C Name	ode &		PCA: N	1.E. Coı Desi		Aided
C	ourse	Course Name		Hou	rs / We	eek	Credit	Ма	ximum l	Marks
•	Code	Course Marile	,	L	Т	Р	С	CA	ES	Total
10 F	PCA E12	MECHANICS FRACTURE	OF	3	0	0	3	50	50	100
Obj	ective(s)	To prove in depth s growth. To Analyse of scale.								
1	ELEMEN	ITS OF SOLID MECH	ANICS			To	tal Hrs		9	
	geometry it analysis	of stress and strain -	Elastic d	leforma	tion - I	Plasti	and elas	sto-plas	tic defor	mation
2	STATION	NARY CRACK UNDER	STATIC	LOADII	NG	То	tal Hrs		9	
арр		onal elastic fields – n - Plastic zone size –								
3	ENERGY	/ BALANCE AND CRA	CK GRO	WTH		То	tal Hrs		9	
		sis – Linear Fracture I ack arrest.	Mechanic	s - Cra	ck Ope	ening	displacen	nent –	Dynami	c energy
4	FATIGUI	E CRACK GROWTH C	URVE			То	tal Hrs		9	
		ation describing crack nanging the load spect						r a give	n load a	mplitude
5	ELEMEN		JED	FRACT	URE	То	tal Hrs		9	
larg		crack-growth Analysis elding – Thickness as s.								
Tota	al hours to	be taught							45	
Tex	t book (s)	:								
1	Broek, Internation	David. "Elementary onal Publisher, 1978.	Engineer	ing Fr	acture	Me	chanics",	Fifthof	f & N	loerdhof
2	Hellan, K	are., "Introduction of F	racture M	lechanio	cs", Mo	Graw	-Hill, New	York, 1	1985.	
Ref	erence(s)	:								
1	Preshant	: Kumar., "Elements of	Fracture	Mechar	nics", V	Vheel	er Publish	ing, Alla	ahabad,	1999.

K.S.Ran	gasamy College of Tec	hnology	- Auto	nomou	ıs Re	gulation		R 20	10
Department	Mechanical Engineering	Progra	amme (Name		:	PCA: N	I.E. Co Des	mputer /	Aided
Course	Course Name		Hou	rs / We	eek	Credit	Ma	aximum I	Marks
Code	Course Name	;	L	Т	Р	С	CA	ES	Total
10 PCA E13	APPLIED OBJECT ORIENTED PROGRAMMING		3	0	0	3	50	50	100
Objective(s)	To Impart some fund C++ classes, class de						nming,	C++ dat	ta types,
1 1 -	MENTALS OF OR RAMMING	BJECT	ORIE	NTED	То	tal Hrs		9	
	OOP, classes, subjectedural paradigm, object-				tance,	polymor	phism,	OOP p	aradigm
2 C++ DA	TA TYPES				То	tal Hrs		9	
	and statements, oper rgument passing, refere						, flow	control	, Arrays
3 C++ CL	ASS				То	tal Hrs		9	
bit-fields, cla	ass objects, member fu ss argument and ellises conversions.								
4 CLASS	DERIVATION				То	tal Hrs		9	
	pecification, Information proventions under deriventions								
5 APPLIC	ATION				То	tal Hrs		9	
OOP's applic	cations in linear program	nming, inte	eger pr	ogrami	ming,	simulatior	n, etc.		
Total hours t	o be taught							45	
Text book (s):						I		
	Richard, S. and Pnming and C++ ", 1999.	inson, L	ewis,	J. "Ar	n intr	oduction	to ob	jective	oriented
2 Stanley	B.Lippman, "C++ prime	er ", Addis	on - We	esley P	ub. C	o., 1989.			
Reference(s):								
1 Robert	Lafore, "Object Oriented	l program	ming in	Turbo	C++	", Galgotia	a Public	cation, 1	992.
2 Strouss	trup, Bjarne, The "C++ μ	orogramm	ning lan	guages	s ", Ac	ldison We	esley, 1	986.	

	K.S.Ranga	samy College of Tech	nnology	- Auto	nomou	ıs Re	gulation		R 20	10
De	partment	Mechanical Engineering	Progra	amme (Name		ŧ.	PCA : N	I.E. Co Des	mputer <i>i</i> ign	Aided
(Course	0 1		Hou	rs / We	eek	Credit	Ma	aximum l	Marks
	Code	Course Name		L	Т	Р	С	CA	ES	Total
10	PCA E14	DESIGN OF MATHANDLING EQUIPM	TERIAL ENTS	3	0	0	3	50	50	100
Ob	jective(s)	To give a comprehen Elevators.	sive insiç	ght on o	design	of hoi	sts, Hoisti	ing gea	r, conve	yors and
1	MATERIA	LS HANDLING EQUIF	PMENT			То	tal Hrs		6	
Тур	es of mate	rial handling equipmen	ts - Sele	ction ar	nd appl	ication	ns.			
2	DESIGN (OF HOISTS				To	tal Hrs		12	
pull hoo	eys, pulley ks and eye	ting elements - Welder systems, sprockets a hooks - Crane grabs - shoe, band and cone t	and drur · Lifting n	ns, Loa	ad han	dling	attachme	ents - I	Design o	of forged
3	DRIVES (OF HOISTING GEAR				To	tal Hrs		9	
		ver drives - Traveling ng, jib and luffing gear								monorai
4	CONVEY	ORS				To	tal Hrs		12	
		ption - Design and app oveyors - Screw convey					apron cor	veyors	and esc	calators -
5	ELEVATO	DRS				To	tal Hrs		9	
		ors: design - Loading a or weights, hoisting mad								ay,
Tota	al hours to	be taught							45	
Tex	t book (s):									
1	Rudenko	N., "Materials Handling	g Equipm	ent", E	Lnvee	Publis	hers, 197	' 0.		
2	Spivakovs Publisher	sy A.O. and Dyachko s, 1985.	ov, V.K.	, "Con	veying	Macl	hines", V	olumes	s I and	II, MIR
Ref	erence(s) :									
1	Alexandro	ov M., "Materials Handl	ing Equip	oments	", MIR	Publis	hers, 198	31.		
2	Boltzharo	I A., "Materials Handlin	g Handb	ook", T	he Ror	nald P	ress Com	ıpany,	1958.	
3	P.S.G. Te	ech "Design Data Book'	", Kalaika	athir Ac	hchaga	am, Co	oimbatore	e, 2003		
	Linggich	K. and Narayana Iyen	var "Ma	chino	Docian	Doto	Lland D	۱۰ " ۱۰	al 1 0	2 C

K.S.R	anga	samy College of	Γechnolo	gy - Aut	onom	ous R	egulation		R 20)10
Departm	nent	Mechanical Engineering	Progra	amme C Name	ode &	F	PCA : M.E.	Compu	ıter Aide	d Design
Cours	Ď			Hou	rs / We	ek	Credit	Ма	aximum	Marks
Code	-	Course Na	me	L	Т	Р	С	CA	ES	Total
10 PCA	E15	MEASUREMENT TECHNIQUES	-	3	0	0	3	50	50	100
Objective	e(s)	To prove in de measurements, destructive testing	principles	of Acc						
1 FOI	RCES	AND STRAIN ME	ASUREM	ENT		Тс	tal Hrs		9	
- Moire I	Fringe	principle, types, pe e - Hydraulic jacks Testing Machines								
2 VIB	RATI	ON MEASUREME	NTS			То	tal Hrs		9	
Transduc Vibration	cers Anal	s of Structural V for velocity and a yzer – Display and – Digital data Acq	cceleratio	n meas g of sigr	sureme	nts. V	ibration m	neter –	Seismo	graphs –
3 ACC	OUST	TICS AND WIND F	LOW MEA	SURES	3	То	tal Hrs		9	
Venturim	neter	Pressure and flow and flow meters rect and indirect m	- Wind t	unnel a						
4 DIS	TRES	SS MEASUREMEN	NTS			То	tal Hrs		9	
	ment	distress in struct in concrete – Hal molition.								
5 NO	N DE	STRUCTIVE TEST	TING MET	HODS		То	tal Hrs		9	
	onic te	n structures, buildi esting principles ar								
Total hou	urs to	be taught							45	
Text boo	. ,									
1 Dal 199		V and Riley WF, "	Experimer	ntal Stre	ss Ana	ılysis",	McGraw	Hill Boo	ok Comp	any, N.Y.
2 Srin	nath L	.S., "Experimental	Stress An	alysis",	Tata M	cGrav	v Hill Com	pany, N	lew Delh	i, 1984.
Reference	- , ,									
1 Sac	dhu Si	ingh "Experimental	Stress Ar	nalysis",	Khann	a Pub	lishers, Ne	ew Delh	i, 1996.	
2 Sirc 199		S., Radhakrishna	HC, "Mecl	hanical	Measu	remen	ts", New A	Age Inte	ernationa	al (P) Ltd.
3 Gar 198		.K,. Clarke J.L ar	nd Armer	GST, "	Structu	ral As	ssessment	.", Butte	erworths,	London,
	y D.E ′.1989	. & Stanley R. K.,	"Non-des	structive	Evalua	ation",	McGraw	Hill Pub	olishing (Company,

	N.S.Nanga	samy College of Tech	nology	- Auto	nomou	us Re	gulation		R 20	10
De	partment	Mechanical Engineering	Prog	gramme Nam		&	PCA:		omputei sign	r Aided
(Course	0 N		Hou	rs / We	eek	Credit	Ма	ximum I	Marks
	Code	Course Name		L	Т	Р	С	CA	ES	Total
10	PCA E16	VIBRATION CONDITION MONITORING	ION	3	0	0	3	50	50	100
Ob	jective(s)	At the end of the cou control in design and of machinery.								
1	INTRODU	JCTION				То	tal Hrs		7	
Mu	lti Degree I	damentals of Single D Freedom System - Cor - Numerical methods in	ntinuous	systen	n - De					
2	PASSIVE	VIBRATION CONTRO	L			To	tal Hrs		11	
Ma - R	terial Selec	Reduction of Vibration tion – Localized additio ation – Vibration isolati bers.	ns – Art	ificial da	amping	g – Dif	ferent typ	es of Is	olation I	Dampers
3	ACTIVE \	/IBRATION CONTROL				To	tal Hrs		9	
		Concepts and applicati nart structures – Chara								cteristic
4	AND APP	ON BASED MAINTEN. PLICATIONS					tal Hrs		9	
me Ma	thods of mo chine mair	Condition Monitoring onitoring – Machine cor ntenance techniques hniques – Instrumentati	ndition m – Mach	onitorir nine co	ng and ondition	diagn n mo	osis – Vit nitoring t	ration : echniqu	severity ues –	criteria -
5		BALANCING AND					tal Hrs		9	
		ERY	ALIGI			10	iai i ii o		-	
sev	eral Planes	ERY Dynamic Balancing of Bal	Rotors	- Field	d Balai gnmen	ncing t Meth	in one Pl	Face	o Plane	
sev Ind	eral Planes	Dynamic Balancing of s- Machinery Alignment od – Reverse Indicator	Rotors	- Field	d Balai gnmen	ncing t Meth	in one Pl	Face	o Plane	
sev Ind Tot	eral Planes icator Meth	Dynamic Balancing of s- Machinery Alignment od – Reverse Indicator	Rotors	- Field	d Balai gnmen	ncing t Meth	in one Pl	Face	o Plane - Periph	
sev Ind Tot	reral Planes icator Method al hours to t book (s): Bathe K.J	Dynamic Balancing of s- Machinery Alignment od – Reverse Indicator	Rotors "Roug Method	- Field gh" Aliq – Shaft	d Balai gnmen :-to-coi	ncing t Meth upling	in one PI nods -The spool me	e Face thod.	o Plane – Periph 45	ieral Dia
sev Ind Tot	reral Planes icator Methodal hours to at book (s) : Bathe K.J India, Nev	Dynamic Balancing of s- Machinery Alignment od – Reverse Indicator be taught	Rotors - "Roug Method merical I	- Field gh" Aliq - Shaft	d Balar gnmen :-to-cou	ncing t Meth upling	in one Pl nods -The spool me ement Ar	e Face thod.	o Plane – Periph 45	neral Dia
Tot Tex 1	reral Planes icator Methodal hours to at book (s) : Bathe K.J India, Nev	Dynamic Balancing of B- Machinery Alignment od – Reverse Indicator be taught J. and Wilson, F.I., "Number Delhi, 1978.	Rotors - "Roug Method merical I	- Field gh" Aliq - Shaft	d Balar gnmen :-to-cou	ncing t Meth upling	in one Pl nods -The spool me ement Ar	e Face thod.	o Plane – Periph 45	neral Dia
Tot Tex 1	reral Planes icator Method al hours to tt book (s) : Bathe K.J. India, New Hartog J. ference(s) :	Dynamic Balancing of B- Machinery Alignment od – Reverse Indicator be taught J. and Wilson, F.I., "Number Delhi, 1978.	Rotors - "Roug Method merical I	- Field gh" Aliq - Shaft Method	d Balar gnmen -to-cou s in Fir	ncing t Meth upling	in one Pl nods –The spool me ement Ar v York, 19	e Face thod.	vo Plane – Periph 45	neral Dia
Total Text	reral Planes icator Method al hours to t book (s): Bathe K.J India, Nev Hartog J.6 ference(s): Rao J.S.,	Dynamic Balancing of S- Machinery Alignment od – Reverse Indicator be taught J. and Wilson, F.I., "Nui w Delhi, 1978. D. Den., "Mechanical V	Rotors — "Rouge Method Method I ibrations onitoring	- Field gh" Aliq - Shaft Method ", McG	d Balar gnmen -to-cou s in Fir raw-Hi	ncing t Meth upling	in one Pl nods –The spool me ement Ar v York, 19	e Face thod. nalysis" 985.	vo Plane – Periph 45	neral Dia
Tot Tex 1 Ref	reral Planes icator Method al hours to tt book (s): Bathe K.J India, Nev Hartog J.6 ference(s): Rao J.S., "Hand Bo	Dynamic Balancing of S- Machinery Alignment od – Reverse Indicator be taught J. and Wilson, F.I., "Nur v Delhi, 1978. D. Den., "Mechanical V "Vibratory Condition M	Rotors - "Roug Method merical I ibrations onitoring	- Field gh" Alig - Shaft Method s", McG	d Balar gnmen :-to-con s in Fil raw-Hi	ncing t Meth upling nite El	in one Pl nods –The spool me ement Ar v York, 19 C Press, L terdam, 1	e Face thod. nalysis" 985. ondon,	vo Plane – Periph 45 , Prentice	e Hall c

	K.S.Rang	gasamy College o	f Technolog	gy - Auto	nomou	s Regi	ulation			R 20	10
De	partment	Mechanical Engineering	Progr	amme C	ode & N	ame		PCA :		. Compute Design	er Aided
Col	ırse Code	Course N	ame	Hou	ırs / We	ek	Credi	t	М	aximum N	/larks
Cot	ilse code	Oduise N	ame	L	Т	Р	С		CA	ES	Total
10	PCA E17	COMPOSITE MA		3	0	0	3	,	50	50	100
Ob	jective(s)	To understand behavior. Under Combinations of and study of resi	standing the plies with d	e analysi ifferent o	is of fil orientatio	oer rei	nforced the fiber	Lamin . Ther	ate (design fo	r different
1	LAMINA C	ONSTITUTIVE RE	ELATIONS			Тс	tal Hrs			12	
Matr Filar 2 Defii anis Lam Prop	FLAT PLA nition of stre otropic plate inates, Angle	rcial material properties. Note that the stiffness. Note that the stiffness of the stiffnes	Manufacturing Cturing Proce DNSTITUTIVI esultants. So titutive Equa Cross Ply L	g: Bag I sses. E RELAT train Disp tions – C aminate	TIONS Diaceme	To Interaction	tal Hrs tions. Ba	asic Asalance	Ssumped La	10 ptions of minates, valuation	Laminated Symmetric of Lamina
Lam 3		TRENGTH ANALY	/SIS			То	tal Hrs			5	
Gen	eralized Hill	Maximum Stress 's Criterion for Ar i-Wu) Failure criter	nisotropic ma	aterials.	Tsai-Hil	l's Fail					
4	,	OF LAMINATED					tal Hrs			10	
		ations of Motion. Eural Frequencies.	Energy Form	ulations.	Static E	Bendin	g An	alysis.	Buc	kling Ana	ysis. Free
5	EFFECT C	F THERMAL PRO	PERTIES			То	tal Hrs			8	
Orth	otropic Lan	Hooke's Law due nina - special La o C.T.E laminates,	aminate Cor	figuratio	ns – l	Inidired	tional, (
Tota	l hours to be	e taught								45	
Text	book (s):										
1	Gibson R.I press.	F., "Principles of C	Composite M	aterial M	echanic	s", Mc	Graw-Hil	l, 1994	4, Se	cond Edit	ion - CRC
2	Hyer M.W.	, "Stress Analysis	of Fiber – Re	einforced	Compo	site Ma	aterials",	McGra	aw-H	ill, 1998.	
Refe	erence(s):										
1	Press-2006	Daniel and Ori Is 6, First Indian Edit	ion - 2007.				•				_
2	Mallick P.k 1993	K.,"Fiber–Reinforce	ed Composite	es: Mate	rials, Ma	anufact	uring an	d Des	ign",	Maneel D	ekker Inc,
3	Halpin J.C	., "Primer on Comp	oosite Materi	als, Anal	ysis", Te	echomi	c Publisl	ning C	o., 19	984	
4	Hansen Pu	K. and Newman, Sublisher, Munish, 1	990								
5		lukhopadhyay, "M lyderabad, 2004 (I			ite Mate	rials a	nd Struc	tures",	Univ	ersity Pre	ess (India)

	K.S.Ranga	samy College of	Technolog	gy - Au	tonom	ous R	egulation		R 20	010	
De	partment	Mechanical Engineering	Progra	mme C	ode & I	Name	PC/		Comput Design	ter Aided	
(Course	Course N	omo	Hou	ırs / We	ek	Credit	Ma	aximum	Marks	
	Code	Course N	ame	L	Т	Р	С	CA	ES	Total	
10	MODAL ANALYSIS OF MECHANICAL SYSTEMS To understand the concept of meaning the concept of m						3	50	50	100	
Ob	To understand the concept of motective(s) techniques, to know the extraction met										
1	OVERVIE	ΞW		То	tal Hrs		6				
Sun		o Modal Testing ⁻heory – Summa e.									
2	THEORE	TICAL BASIS				То	tal Hrs		12		
sını 3	atroduction – Single Degree of Freedom (SDOF) Syste RF Data for SDOP System – Undamped Multi-degree amping – Hysteretic Damping – General Case haracteristics and presentation of MDOF – FRF Data nusoidal vibration and FRF Properties MOBILITY MEASUREMENT TECHNIQUES atroduction – Basic Measurement System – Structure ransducers and Amplifiers – Analyzers – Digital Sign										
Trai	duction – nsducers a	Basic Measurem	nent System Analyzers -	n – Stru - Digital	Signal	repara Proce	essing – U	lse of D	Different	Excitation	
Trai	oduction – nsducers a es – Calibra hods.	Basic Measurem	nent System Analyzers - ncellation -	n – Stru - Digital Rotatioi	Signal nal Mol	repara Proce pility M	ation – Exc essing – U	lse of D	of the S	Excitation	
Traitype met 4 Intro SDO Res	oduction – nsducers a es – Calibra hods. MODAL F oduction – DF Modal iduals – M	Basic Measurem and Amplifiers – A ation – Mass Car	nent System Analyzers - Incellation - ITRACTION ICKS of FRETCLE Fit Me Top procedure	n – Stru - Digital Rotation 	Signal Mol	Procedure To	ation – Exi essing – U leasureme tal Hrs dal Analysi	Ise of E ent – Mu sis-I – s III – I	of the S Different ulti point 11 Peak-am	Excitation excitation pplitude - Method -	
Traitype met 4 Intro SDO Res Mul	oduction — nsducers a es — Calibra hods. MODAL F oduction — DF Modal iduals — M ti-Curve fitt	Basic Measurem and Amplifiers – Aletion – Mass Care PARAMETER EXPEDITION PROPERTY CHECK PROPERTY CHECK PROPERTY CHECK PROPERTY CHECK PARAMETER EXPEDITION PROPERTY CHECK PARAMETER EXPEDITION PROPERTY PR	TRACTION cks of FRI rcle Fit Me g procedure systems.	n – Stru - Digital Rotation I METH - Data thod – ss – MD	Signal nal Mol ODS - SDO SDOF OF cui	Procedulity Moda	ation – Exi essing – U leasureme tal Hrs dal Analysi	Ise of E ent – Mu sis-I – s III – I	of the S Different ulti point 11 Peak-am	Excitation excitation pplitude - Method -	
Traitype met 4 Intro SDO Res Mul 5	oduction – nsducers a es – Calibra hods. MODAL F oduction – DF Modal iduals – M ti-Curve fitt DERIVAT	Basic Measurem and Amplifiers — Andrews Care PARAMETER EXPENDING TO THE PAR	TRACTION cks of FRIccle Fit Meg procedures systems. MATICAL N	n – Stru - Digital Rotation I METH - Data thod – s – MD	Signal nal Mol ODS - SDC SDOF OF cui	To OF Modarve fitti	ation – Exi essing – U leasurement tal Hrs dal Analysis I Analysis ng in the	Ise of E ent – Mu sis-I – s III – I Time D	of the S Different ulti point 11 Peak-am Inverse I omain —	Excitation excitation nplitude - Method - Global o	
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K.	S.Ranga	samy College of To	nomo	us Re	gulation		R 20	10		
Depa	artment	Mechanical Engineering	•	mme Co Name	ode &		PCA : N	I.E. Co Desi	mputer /	Aided
Co	ourse			Hou	rs / We	eek	Credit	Ма	ximum l	Marks
	ode	Course Nar	ne	L	Т	Р	С	CA	ES	Total
10 P(CA E19	INTEGRATED MANUFACTURING SYSTEMS		3	0	0	3	50	50	100
Obje	ctive(s)		and c	ontrol	, ways a	computer aided proces nd means of compute				
1 IN	NTRODU	CTION				То	tal Hrs		6	
classi	ification Ifacturing	f a manufacturing production system operations.	is-linking	manufa	cturing					
2 G	ROUP 1	ECHNOLOGY AND PLANNING	O COMPU	TER A	IDED	То	tal Hrs		9	
	fits of gr	art families-parts c oup technology. I								
3 C	OMPUTE	ER AIDED PLANNIN	NG AND C	ONTRO	L	To	tal Hrs		9	
requir	rements	anning and contro planning (MRP)-s ystem-barcode tech	hop floor	contro	I-Facto	ry da	ata colle	ction s		
4 C	OMPUT	ER MONITORING				To	tal Hrs		9	
contro	ol & strat	duction monitoring egies- direct digital thods non-contact in 1.	control-su	perviso	ry com	puter	control-co	omputei	in QC	- contact
5 IN	NTEGRA	TED MANUFACTUR	RING SYS	ГЕМ		To	tal Hrs		12	
handl manu head the	ling systen Ifacturing changing manufac	pplication - feature em- computer contr cell. Flexible manu g FMS - variable mis turing system-com d Expert system in	ol system Ifacturing s Ifact	 Introduces systems facturin 	duction (FMS) g syste	to C) - the em - C	NC Progr	rammin ncept-tr system	g, DNC ansfer s	systems -
Total	hours to	be taught							45	
Text l	book (s) :							•		
1 G	roover M	I.P., "Automation, Pi	roduction S	System a	and CII	M", Pr	entice-Ha	ll of Ind	ia, 2005	
2 David Bedworth, "Computer Integrated Design and Manufacturing", TMH, New Delhi						v Delhi	, 1998			
Refer	Reference(s):									
1 Y	orem Koren, "Computer Integrated Manufacturing Systems", McGraw Hill, 1983.									
2 R	Ranky Paul G., "Computer Integrated Manufacturing", Prentice Hall International 1986.						S			
	Yeomamas R.W., Choudry A. and Ten Hagen P.J.W., "Design Rules for a CIM system", North Holland Amsterdam, 1985.									

l	K.S.Ranga	samy College of Tec	hnology -	Auton	omou	ıs Re	gulation		R 20	10
De	partment	Mechanical Engineering	Prograr	nme Co Name	ode &		PCA : N	I.E. Co Desi	mputer / ign	Aided
Cor	ırse Code	Course Nam	e	Hour	s/W	eek	Credit	Ма	ximum l	Marks
	inse code	Course Harri		L	Т	Р	С	CA	ES	Total
10	PCA E20	THEORY OF PLATE SHELLS		3	0	0	3	50	50	100
Ob	jective(s)	To Impart some fund equations, Energy rand space frames.								
1	EQUATIO						tal Hrs		9	
		th small deflection - I ary conditions.	_aterally lo	aded th	nin pla	ates -	Governir	ng diffe	rential e	quation -
2	BENDING PLATES	OF RECTANGUL	_AR & (CIRCUL	_AR	То	tal Hrs		9	
Red	tangular p	lates - Simply suppor lates with various ec ular plates.								
3	ANALYSI	S OF PLATES				То	tal Hrs		9	
Ene	rgy method	ds - Finite difference a	ınd Finite e	element	meth	ods.				
4	SHELLS	& FOLDED PLATES S	STRUCTU	RE		То	tal Hrs		9	
and	shells of to	of shells - Types of she ranslation, examples, avior, types, design by	and limitat	ions of	mem	brane	theory - I	Folded		
5	SPACE F	RAMES				То	tal Hrs		9	
	ce frames avior.	- Configuration - T	ypes of no	odes -	Gene	eral p	rinciples	of desi	ign Phil	osophy -
Tota	al hours to	be taught							45	
Tex	t book (s) :									
1	Szilard, R	., Theory and Analysi	s of Plates	, Prenti	ce Ha	all Inc	., 1995.			
2	Timosher New York	nko, S. and Krieger S. 1990.	W. Theory	of Pla	tes ar	nd Sh	ells, McG	raw Hill	Book C	ompany,
Ref	erence(s) :									
1	Wilhelm F	Flügge,"Stresses in sh	ells", Sprin	iger – ∖	/erlag	-				
2	Timosher	nko S., "Theory of Plat	es and Sh	ells", 4 ^{tl}	h Editi	ion, M	lcGraw Hi	II, 1990		
3	Subrama	nian N., "Principles of	Space Str	uctures	", Wh	eeler	Publishin	g Co. 19	999.	

	K.S.Ranga	samy College of Tech	nology ·	- Autor	nomou	ıs Re	gulation		R 20	10	
De	partment	Mechanical Engineering	Prog	ramme Nam		&	PCA :		Compute esign	r Aided	
0 -	0 - 1 -	Ossessa Nassas		Hou	rs / We	eek	Credit	Ma	aximum	Marks	
Col	urse Code	Course Name		L	Т	Р	С	CA	ES	Total	
10	PCA E21	DESIGN OF HEAT EXCHANGERS		3	0	0	3	50	50	100	
Ob	To educate the ways and means of flow distributions of the constructional details of Heat Exchangers, Design a condensers, evaporators and cooling towers.										
1	CONSTRU TRANSFE	JCTIONAL DETAIL			HEAT		tal Hrs		9		
		and Tube Heat Exchan istribution and its Impli						s Indus	trial App	olications	
2	FLOW DIS	STRIBUTION AND ST	RESS AN	IALYSI	S	То	tal Hrs		9		
		llence - Friction Factor and Pressure Vessels									
3	DESIGN A	ASPECTS				То	tal Hrs		9		
		and Pressure Loss - Design of Typical Liqui							ect of D	eviations	
4	CONDEN	SERS AND EVAPORA	TORS D	ESIGN		То	tal Hrs		9		
	sign of Sur aporators	face and Evaporative	Conde	nsers -	Desi	gn of	Shell a	nd Tuk	oe - Pla	ate Type	
5	COOLING	TOWERS				То	tal Hrs		9		
Pac Exp	cking - Spra perimental M	ay Design - Selection Methods.	of Pump	s - Fa	ns and	d Pipe	es - Test	ing and	d Mainte	enance –	
Tota	al hours to b	oe taught							45		
Tex	t book (s):							I			
1	Taborek T Book Co.,	., Hewitt G.F. and Afga	an, N. "H	eat Exc	hange	rs - T	heory and	d Practi	ice", Mc	Graw Hill	
2	Walker "Industrial Heat Exchangers - A Basic Guide", McGraw Hill Book Co., 1980.										
Ref	Reference(s):										
1	Nicholas Cheremisioff "Cooling Tower", Ann Arbor Science Publishers, 1981.										
2	Arthur P. Fraas "Heat Exchanger Design", John Wiley & Sons, 1988.										

	K.S.Rangas	samy College o	f Technolo	gy - Aut	onom	ous Re	gulation		R 20	10
De	partment	Mechanical Engineering	Progra	ımme C	ode & I	Name	PC		Comput Design	er Aided
(Course	Course N	la ma a	Hou	rs / We	ek	Credit	Ma	aximum I	Marks
	Code	Course N	iame	L	Т	Р	С	CA	ES	Total
10	PCA E22	BEARING DES ROTOR DYNA	MICS	3	0	0	3	50	50	100
Ob	jective(s)	To study the se under dynamic	conditions.		of diffe	rent be	arings an	d to ana	alyze the	bearings
1	CLASSIF BEARING	TICATION AN SS	D SELE	CTION	OF	Tot	tal Hrs		6	
bea Pre	rings- Ele cision App	eria-Dry and I ctro Magnetic Ilications-Foil Be on metallic beari	bearings-D earings-Spe	ry bear	ings-R	olling	Element	bearing	gs- Bea	rings for
2	DESIGN	OF FLUID FILM	BEARINGS	6		Tot	al Hrs		10	
jour loss Exp	nal bearing s, Heat an erimental o Journal be	erformance analy gs design proced d temperature curves-Design of earings- Stiffness	dure-Minimodistribution f Foil bearir s considerat	um film calculat ngs-Air E ion - flov	thickne ions- I Bearing w regul	ess – lü Design Js- Des	ubricant fl based o sign of Hy	ow and on Char drostati	delivery ts & Ta	– power bles and
3	SELECTI BEARING		ESIGN OF	ROL	LING	Tot	al Hrs		10	
Mar 4 Hyd and cen	rnal cleara nufacturing DYNAMIO Irodynamic thrust bea tre Trajecto	alculations- Bea nce – Shaft and methods- Cerar CS OF HYDROD Lubrication equalings -Rotating	housing fit- nic bearings DYNAMIC B ation for dy	Mound -Rolling EARING namic Id	ting arr bearin	angem ng cage Tot	ents-Mates-bearing al Hrs	erials fo g seals s	r rolling selection 10	ubricants- bearings-
	dynamic co	ory- Analysis of			and im	pulse l	oads in jo	ournal b	earings -	Journal
5	dynamic co ROTOR [ory- Analysis of			and im	pulse la amic co	oads in jo	ournal b	earings -	Journal
5 Rote dam coe	ROTOR In the ROTOR In the Rotor Inc. ROTOR IN	ory- Analysis of anditions	short bearing tical speed nal bearing dro dynamic	s- supp s-compu	and im er dyna oort stil	pulse I amic co Tot ffness and r	oads in journal on ditions- al Hrs on criticates	purnal b Finite of al speed nents o	earings difference 9 ds- Stiffr	- Journal e solution ness and bearing
Rote dam coe Des	ROTOR In the ROTOR In the Rotor Inc. ROTOR IN	ory- Analysis of onditions DYNAMICS In and Rotor crificients of journ lechanics of Hydrations of stable	short bearing tical speed nal bearing dro dynamic	s- supp s-compu	and im er dyna oort stil	pulse I amic co Tot ffness and r	oads in journal in jou	purnal b Finite of al speed nents o	earings difference 9 ds- Stiffr	- Journal e solution ness and bearing
Rote dam coe Des	ROTOR I or vibration pping coef fficients -M sign configu	ory- Analysis of onditions DYNAMICS In and Rotor crificients of journ lechanics of Hydrations of stable be taught	short bearing tical speed nal bearing dro dynamic	s- supp s-compu	and im er dyna oort stil	pulse I amic co Tot ffness and r	oads in journal in jou	purnal b Finite of al speed nents o	earings - difference 9 ds- Stiffr f journal Resonar	- Journal e solution ness and bearing
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K.S.Ra	angasamy College	of Technolog	Programme Code & Name					R 20	10
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Course	9 0	Nama	Hou	rs / We	eek	Credit	M	aximum I	Marks
Code	Course	e Name	L	Т	Р	С	CA	ES	Total
10 PCA E	FLUID DYN	AMICS	3	0	0	3	50	50	100
Objective	e(s) heat transfer	nd the concept problems.	t of bou	ndary (conditi	ons and	to study	tne fluid	tiow and
1	/ERNING DIFFER TE DIFFERENCE		ATION	AND	То	tal Hrs		10	
difference	ition, Initial and Bo e method, Central Il Errors, Grid Inder	, Forward, B	ackward						
2 CON	NDUCTION HEAT	TRANSFER			То	tal Hrs		10	
	ne-dimensional cor nsional problem, T						state pr	oblems,	Transien
3 INC	OMPRESSIBLE FL	UID FLOW			То	tal Hrs		10	
	g Equations, Strea						on of pre	essure fo	r viscou
4 CONVECTION HEAT TRANSFER AND FEM Total Hrs 10 Steady One-Dimensional and Two-Dimensional Convection – diffusion, Unsteady one-dimensional convection – diffusion, Unsteady two-dimensional convection – Diffusion									
Steady (dimension Introduction	One-Dimensional nal convection – on to finite elem	and Two-Dir diffusion, U nent method	nension nsteady	al Co	nvecti dimens	on – c	onvectio	Unstea n – Dit	fusion -
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Steady of dimension Introduction Incompres of TUR Algebraic number in Total hou Text Book 1 Mura Public Reference 1 Ghopuble 2 Suba Corpus 3 Taylong T	One-Dimensional nal convection — on to finite elem ssible flow — simular BULENCE MODE Models — One econodels, Prediction of the store to be taught (s): alidhar, K., and Surishing House, New e(s): shdasdidar P.S., "Clishing Company Light as V.Patankar "	and Two-Dir diffusion, Unent method ation by FEM. S puation model, of fluid flow and adararajan, T., or Delhi, 1995. Computer Simulation, 1998. Numerical Heading Simulation, 1998.	mension nsteady - solu K - d heat tr "Compu	al Co two- tion o Models ansfer utationa	To T	on – cosional condy heat tal Hrs dard and standard	d Heat T	Unstean — Ditection by 5 nd Low 45 Tata Moonhere F	Reynold Narosa Graw-Hi
Steady Odimension Introduction Incompres of TUR Algebraic number in Total hou Text Book 1 Mura Public Reference 1 Ghopublic 2 Suba Corpus 3 Taylon Andrew Andrew 1 An	One-Dimensional nal convection — on to finite elem ssible flow — simula BULENCE MODE Models — One ed nodels, Prediction or to be taught (s): alidhar, K., and Surishing House, New e(s): shdasdidar P.S., "Olishing Company Life as V.Patankar "oration, 1980. or, C and Hughes eridge Press Limited erson, D.A., Tann	and Two-Dir diffusion, Unent method ation by FEM. S quation model, of fluid flow and adararajan, T., or Delhi, 1995. Computer Simid., 1998. Numerical Head, U.K., 1981. ehill, J.I., and	mension nsteady - solu K - d heat tr "Computation of the computation	al Cor two-tion of Models ansfer ansfer t Progreer, R.H.	To s, Star using v and Fluid rammir	on — cosional condy heat tal Hrs indard and standard I Flow an Heat Transfer Transfe	d Heat Tansfer", Hemis	Unstean — Diffection by 5 nd Low 45 Transfer", Tata Moon phere F Stokes E	Reynold Narosa Graw-Hi Publishing
Steady of dimension Introduction Introduction Introduction Incompre of the Inc	One-Dimensional nal convection — on to finite elem ssible flow — simula BULENCE MODE Models — One econodels, Prediction or to be taught (s): alidhar, K., and Surishing House, New e(s): shdasdidar P.S., "Olishing Company Litas V.Patankar "coration, 1980. or, C and Hughes bridge Press Limitederson, D.A., Tann	and Two-Dir diffusion, Unent method ation by FEM. S puation model, of fluid flow and adararajan, T., or Delhi, 1995. Computer Simulation, 1998. Numerical Heal, U.K., 1981. ehill, J.I., and isphere Publis atational Technical Technica	mension nsteady - solu K - d heat tr "Computation of the computation	Models ansfer t Programmer, R.H. rporational	To To S, Star using V and Fluid Fluid rammir	on — cosional condy heat tal Hrs dard and standard I Flow an Heat Transport	d Heat Tansfer", Hemis Navier- nal Fluid	Unstean — Ditection by 5 nd Low 45 Tata Modern Formula Stokes Edd Mechala	Reynold: Narosa Graw-Hi Publishing Equation'

ŀ	K.S.Rang	asamy College of Tech	nology ·	- Autor	omou	s Re	gulation		R 20	10
Dep	partment	Mechanical Engineering	Progra	amme C Name	ode &		PCA : M	1.E. Co Des		Aided
С	ourse	Course Name		Hou	rs / We	eek	Credit	Ма	ıximum I	Marks
(Code	Course Name		L	Т	Р	С	CA	ES	Total
10 F	PCA E24	PRODUCTIVITY MANAGEMENT AND ENGINEERING		3	0	0	3	50	50	100
Obj	ective(s)	To Integrate the cond Re-engineering proces						izational transformation entation.		
1	1 INTRODUCTION Total Hrs								9	
	ductivity o	concepts - Macro and cle.	Micro f	actors	of pro	ducti	vity, Prod	luctivity	benefi	model,
2	PRODUC	CTIVITY MODELS				То	tal Hrs		9	
mod	dels. Prod	neasurement at Interna uctivity management ir uctivity improvement mo	n manufa	cturing	and s					
3	ORGANI	ZATIONAL TRANSFOR	RMATION	I		То	tal Hrs		9	
reer	ngineering	organizational transf , preparing the workf SMCQ and PMP model								
4	RE-ENG MODELS	INEERING PROCES	S IMPF	ROVEN	IENT	То	tal Hrs		9	
		Edosomwan model, M C model.	oen and	Nolan	strate	gy fo	r process	impro	vement,	LMICIP
5		INEERING TO ENTATION	DOLS		AND	То	tal Hrs		9	
Ena	bling role	d process tools and t of IT, RE-opportunitie of BP, case study - Orde	s, proce	ss rede	esign -	- case	es. Softwa	are me	thods in	n BPR -
Tota	al hours to	be taught							45	
Tex	t book (s)	:								
1	Sumanth 1990.	D.J., "Productivity Eng	jineering	and M	anage	ment"	, Tata Mo	Graw	Hill, Ne	w Delhi,
2 Edosomwan J.A., "Organizational Transformation and Process Re-Engineering", British Library cataloging in pub. Data, 1996.										
Reference(s):										
1 Rastogi P.N. "Re-Engineering and Re-inventing the Enterprise ", Wheeler pub. New Delhi, 1995.										
Premvrat Sardana G.D. and Sahay B.S, "Productivity Management - A Systems Approach", Narosa Publishers, New Delhi, 1998.										

	K.S.Kang	asamy College of Tec	hnology	- Auto	nomou	ıs Re	gulation		R 20	10
De	partment	Mechanical Engineering	Progra	amme C Name	Code &		PCA : M	1.E. Co Desi	•	Aided
(Course	Course Name		Hou	rs / We	eek	Credit	Ма	ximum l	Marks
	Code	Course Marrie		L	Т	Р	С	CA	ES	Total
1	0 PCA E25	MECHATRONICS IN MANUFACTURING SYSTEMS		3	0	0	3	50 50 100		
Obj	Dbjective(s) To understand the functions of mech microprocessor in mechatronics, progra									
1	INTROD	UCTION				То	tal Hrs		9	
Intr Cor	oduction t	o Mechatronics - Syst ms - Traditional design	ems - M and Med	echatro hatroni	nics ir	n Prod sign.	ducts - M	leasure	ment S	ystems -
2	SENSOF	RS AND TRANSDUCE	RS			То	tal Hrs		9	
Mo	tion - Flui	Performance Termino d pressure - Temperat Servo systems.								
3	MICROF	PROCESSORS IN MEC	HATRO	NICS		To	tal Hrs		9	
usir	ng 8105 in	Architecture - Pin constructions - Interfacing								
cor	iverters – <i>P</i>	Applications - Temperati								
		Applications - Temperati AMMABLE LOGIC CON	ure contr	ol - Štej		otor c				
4 Intr	PROGR.	•	ure contro NTROLLE ut / Outp	ol - Step ERS out prod	oper m	otor c To	ontrol - Tr tal Hrs ogrammir	raffic lig	ht control 9 emonics	oller.
4 Intr Inte	PROGRA oduction - ernal relays	AMMABLE LOGIC CON Basic structure - Input	ure contro NTROLLE ut / Outp andling -	ol - Step ERS out prod	oper m	To To - Pr outpo	ontrol - Tr tal Hrs ogrammir	raffic lig	ht control 9 emonics	oller.
4 Intr Inte	PROGRA oduction - ernal relays DESIGN	AMMABLE LOGIC CON Basic structure - Inpose and counters - Data h	ure control NTROLLE ut / Outp andling -	ol - Step ERS out prod Analog	cessing input	To To 9 - Pr outpo To	ontrol - Tr tal Hrs ogrammir ut - Select tal Hrs	raffic lig ng -Mno tion of F	ht contr 9 emonics PLC	oller.
Intr Inte 5 Des	PROGR. oduction - ernal relays DESIGN signing - P	AMMABLE LOGIC CON Basic structure - Inpose and counters - Data h AND MECHATRONIC	ure control NTROLLE ut / Outp andling -	ol - Step ERS out prod Analog	cessing input	To To 9 - Pr outpo To	ontrol - Tr tal Hrs ogrammir ut - Select tal Hrs	raffic lig ng -Mno tion of F	ht contr 9 emonics PLC	oller.
4 Intrinte	PROGR. oduction - ernal relays DESIGN signing - P	AMMABLE LOGIC CON Basic structure - Inpose and counters - Data h AND MECHATRONIC Cossible design solutions be taught	ure control NTROLLE ut / Outp andling -	ol - Step ERS out prod Analog	cessing input	To To 9 - Pr outpo To	ontrol - Tr tal Hrs ogrammir ut - Select tal Hrs	raffic lig ng -Mno tion of F	emonics PLC 9	oller.
4 Intrinte	PROGR. oduction - ernal relays DESIGN signing - P al hours to tt book (s) Michael	AMMABLE LOGIC CON Basic structure - Inpose and counters - Data h AND MECHATRONIC Cossible design solutions be taught B.Histand and David Con	ure control NTROLLE ut / Outp andling - S s - Case	ol - Štej ERS out proc Analog studies	cessing input /	To To y - Pr outpo To chatro	ontrol - Tr tal Hrs ogrammir ut - Select tal Hrs nics syste	raffic lig	emonics PLC 9 45	oller.
4 Intr Inte 5 Des Tot 1	PROGR. oduction - ernal relays DESIGN al hours to t book (s) Michael Systems Bradley,	AMMABLE LOGIC CON Basic structure - Inpose and counters - Data h AND MECHATRONIC Cossible design solutions be taught	ure control NTROLLE ut / Outp andling - S s - Case G. Alciato ional Edit	ol - Štep ERS out prod Analog studies	cessing input a of Med	To To To To To To Chatro	ontrol - Tr tal Hrs ogrammir ut - Select tal Hrs nics syste	ng -Mntion of F	emonics PLC 9 45	oller. Timers,
4 Intrinted 5 Des	PROGR. oduction - ernal relays DESIGN al hours to t book (s) Michael Systems Bradley,	AMMABLE LOGIC CON Basic structure - Inpose and counters - Data h AND MECHATRONIC Cossible design solutions be taught B.Histand and David Coordinate of the counters of the co	ure control NTROLLE ut / Outp andling - S s - Case G. Alciato ional Edit	ol - Štep ERS out prod Analog studies	cessing input a of Med	To To To To To To Chatro	ontrol - Tr tal Hrs ogrammir ut - Select tal Hrs nics syste	ng -Mntion of F	emonics PLC 9 45	oller. Timers,
4 Intrinted 5 Des Tot 1 2	PROGR. oduction - ernal relays DESIGN al hours to t book (s) Michael Systems Bradley, Hall, 19	AMMABLE LOGIC CON Basic structure - Inpress and counters - Data h AND MECHATRONIC Cossible design solutions be taught B.Histand and David Coordinate of the company of the counters of the coordinate of the coor	ure control NTROLLE ut / Outp andling - S s - Case G. Alciato ional Edit u, N.C. a	ol - Step ERS out prod Analog studies ore, "Intri ions, 19 and Loa	of Med	otor c To J - Pr Outpu To Chatro On to J., " N	ontrol - Tr tal Hrs ogrammir ut - Select tal Hrs nics syste	raffic lig	emonics PLC 9 45 Add Meas	oller. Timers surement
4 Intr Inte 5 Des 1 1 2 Ref 1	PROGRATION OF THE PROGRATION O	AMMABLE LOGIC CON Basic structure - Inpress and counters - Data h AND MECHATRONIC Cossible design solutions be taught B.Histand and David Coordinate of the company of the counters of the coordinate of the coor	ure control NTROLLE ut / Outpandling - S s - Case G. Alciato conal Edit u, N.C. a	ol - Step ERS out proo Analog studies ore, "Intrions, 19 and Loa	of Med	To Progra	ontrol - Tr tal Hrs ogrammir ut - Select tal Hrs nics syste Mechatror	raffic lig	emonics PLC 9 45 Abd Meas Chapma	surement n and
Intrinte 5 Des Tot Tex 1 Ref	PROGRA oduction - ernal relays DESIGN signing - P al hours to t book (s) Michael Systems Bradley, Hall, 19 ference(s) Ramesh Eastern, Lawrenc Mechatro Ghosh F	AMMABLE LOGIC CON Basic structure - Inpression of the counters - Data h AND MECHATRONIC Cossible design solutions be taught B.Histand and David Coordinate of the counters of	ure control NTROLLE ut / Outpandling - S s - Case G. Alciato ional Edit u, N.C. a pocessor / anding E 000. "Introduc	ol - Štep ERS out prod Analog studies ore, "Intri ions, 19 and Loa	of Med	otor c To G - Pr / outpi To chatro on to J., " N	ontrol - Tr tal Hrs ogrammir ut - Select tal Hrs nics syste Mechatror Mechatror	raffic lig	emonics PLC 9 45 Abd Meas Chapma Introdu	surement n and

K.S	.Ranga	samy College of Tec	hnology	- Auto	nomo	ıs Re	gulation		R 20)10	
Depart	ment	Mechanical Engineering	Progra	amme (Name		ı	PCA : N	I.E. Co Des	mputer <i>i</i> ign	Aided	
Cou	rse	Ossans Name		Hou	rs / We	eek	Credit	Ма	aximum	Marks	
Cod	de	Course Name		L	Т	Р	С	CA	ES	Total	
10 PC	A E26	INDUSTRIAL ROBOT	ΓICS	3	0	0	3	50			
Objecti	Objective(s) To understand the functions of Robot Drives Application								and Control, Cell Design		
1 INTRODUCTION AND ROBOT KINEMATICS Total Hrs 1 Definition need and scope of Industrial robots – Robot anatomy – Work volume								10			
movem	ient – E pries –	End effectors - Sensor Control of robot man	s.Robot	Kinema	atics –	Direc	t and inve	erse kin	ematics	Robot	
2 R0	ОВОТ [DRIVES AND CONTRO	DL			То	tal Hrs		9		
Hydrau hydraul	lic and lic serv	e Robot motion – Posit I Pneumatic drives – o valves, electric drive ed grippers	Linear a	and rot	tary a	ctuato	rs and c	ontrol v	valves -	- Electro	
3 R0	овот 9	SENSORS				То	tal Hrs		9		
Robotic – Edge	vision Enhai	and Sensors – Tactile s system – Image Repr ncement – Contrast S Fraining of vision syste	esentatio tretching	n - Ima	ige Gra	abbing	-Image	process	sing and	analysis	
4 R0	овот (CELL DESIGN AND AF	PPLICAT	ION		То	tal Hrs		9		
		ell design and control – erence – Robot cycle t								bots and	
5 IN		PROGRAMMING SENCE AND EXPERT	SYSTEM				tal Hrs		8		
prograr intellige	mming ence –	Robot Programming methods – Motion into Al techniques – prob pplication of Al and KE	erpolation lem repr	n. Artifi esenta	icial in	tellige	nce – Ba	sics –	Goals of	f artificial	
Total h	ours to	be taught							45		
Text bo	ook (s)	:									
		, Gonzalez, R.C. an ce", Mc Graw Hill, 1987		C.S.G.,	"Ro	botics	Control	, Sens	ing, Vis	sion and	
	Biohard D Klaffer Thomas A Chmiolawski Michael Negin "Debetics Engineering An										
Refere	nce(s) :										
1 Yo	oram Ko	oren, "Robotics for Eng	ineers" N	lc Grav	v-Hill, ′	1987.					
2 Kc	zyrey `	Yu. "Industrial Robots",	MIR Pub	olishers	Mosco	ow, 19	985.				
3 De	eb S.R.	"Robotics Technology	and Flex	ible Au	tomati	on", T	ata Mc Gr	aw-Hill	, 1994.		
4 Tir	mothy .	Jordanides, "Expert Sy	stems an	d Robo	tic", Sp	oringe	r –Verlag	,New Y	ork, May	/ 1991.	

K	.S.Rangas	samy College of	f Technolog	gy - Aut	onom	ous R	egulation		R 20	10
De	partment	Mechanical Engineering	Progra	mme Co	de & 1	Name	PC.		Comput Design	er Aided
	Course	Course N	ame	Hou	rs / We	ek	Credit	Ма	aximum I	Marks
	Code	Oddisc N	anic	L	Т	Р	С	CA	ES	Total
10	PCA E27	CREATIVITY IN		3	0	0	3	50	50	100
Ob	ective(s)	This course will creativity. Add tools, and tec competitive adv	litionally, st hniques to	udents	will be	prep	ared to a	apply re	levant p	rinciples,
1	INTRODU	JCTION				То	tal Hrs		4	
Nee	d for desig	n creativity – cre	ative thinkir	ng for qu	uality –	essen	tial theory	about o	directed of	creativity.
2	MECHAN VISUALIZ		THINKING		AND	To	tal Hrs		11	
plar com – Ai data	ne, shape, apositions in nimation as a managem	upport creative to form, pattern, note and 3 dimenterodynamics — volument for scientific Visualization ber	texture g sional spac irtual enviro visualizatio	radation e - proc nments	, colo edure f in scie	r sym for ger entific '	mmetry.S nuine grap Visualizat	Spatial of Sphical co Sion – Ur	relations imputer a nifying pi	hips and animation inciple of
3	CREATIV	'ITY				To	tal Hrs		11	
that Prod Incu	prepare th cesses in c lbation - (ools for Directed e mind for creati creativity ICEDIP Creativity and M s – Applying Dire	ve thought - – Inspiration TI	- stimula n, Clarit ne Brido	ation of fication ge bety	f new i , Distil ween i	deas – Do lation, Pe man crea	evelopm rspiratio tivity an	ent and n, Evalu d the re	Actions: - ation and
4	DESIGN					To	tal Hrs		9	
Rec	ycling and	n, Emotional Dellavailability-Cres, future direction	ativity and	custon	ner ne	eds a	nalysis –	Innova	tive pro	duct and
5	INNOVAT	TION				To	tal Hrs		10	
esse Inno com	ential facto ovation mo imoditation	ativity – Introdunts – Innovator's del – Segmenti – Managing the Growth – Passing	solution – ive Models Strategy D	creating – New evelopr	and s mark	sustain et disi	ing succe ruption -	ssful gr Commo	owth – [oditation	Disruptive and DE-
Tota	al hours to	be taught							45	
Ref	erence(s) :							•		
1	Rousing (Creativity: Think	New NowFl	oyd Hur	r, Crisp	Publi	cations In	c. 1999		
2	Geoffrey	Petty," how to be	better at C	reativity	", The	Indust	rial Societ	y 1999.		
3		. Norman," Emot	-				•			
4 Clayton M. Christensen Michael E. Raynor," The Innovator's Solution", Harvard Business School Press Boston, USA, 2003.										

r	.S.Ranga	samy College of	Technolog	gy - Au	tonom	ous R	egulation		R 20	10
Dep	partment	Mechanical Engineering	Progra	ımme C	ode & I	Name	PC		Comput Design	er Aided
C	Course	Causa N		Hou	ırs / We	ek	Credit	Ма	aximum N	Marks
	Code	Course Na	ame	L	Т	Р	С	CA	ES	Total
10 F	PCA E28	ENTERPRISE RESOURCE PLANNING		3	0	0	3	50	50	100
Obj	ective(s)	To know the batto know the bust and to apprecia	ERP, to	be av	vare of pro					
1	INTROD						tal Hrs		10	
Re-l	Engineerir	RP framework – ng – Tools – Lar nanagement – Dy	nguages -	Value o	chain -	Supp	ly and De			
2	TECHNO	DLOGY AND ARC	CHITECTU	RE		То	tal Hrs		10	
		architecture – Te oricing – chain sa					lirection -	Evalua	tion fran	nework
3	ERP SYS	STEM PACKAGE	S			То	tal Hrs		10	
ERF	as sales	soft, Baan and C force automation nal and social issu	- Integration							
4	APPLICA	ATION AND TRAI	NING			То	tal Hrs		7	
арр	lications -l	rchitecture – AIN Before and after tle ERP and MAX	Y2k – critic	cal issue	es – Tr	aining	on variou			
5	ERP PR	OCUREMENT IS	SUES			То	tal Hrs		8	
		s – Outsourcing E n Companies.	RP – Ecor	nomics -	– Hidde	en Cos	st Issues -	ROI –	Analysis	of case
Tota	al hours to	be taught							45	
Refe	erence(s) :									
	Sadagop	an.S , "ERP-A M	anagerial P	erspect	ive", Ta	ata Mc	graw Hill,	1999.		
1							M 1 1			
	Jose Ant	onio Fernandez,	"The SAP F	R/3 Han	dbook"	, Tata	Mcgraw H	III, 1990). 	
2	Vinod Ku	onio Fernandez, in onio Fernandez,	enkitakrishn	an N.K.						ncepts
1 2 3 4	Vinod Ku and Prac	ımar Crag and Ve	enkitakrishn all of India,	an N.K. 1998.	, "Ente	rprise	Resource	Plannin	g – Co	•

	K.S.Rangasamy	College of Techi	nolog	y, Tirı	ıchen	gode - 63	7 215		
	Curriculum fo	or the Programmes	s unde	r Auto	nomo	us Schem	ne		
Regulation		R 2010							
Department		Department of M	echan	ical E	ngine	ering			
Program Code	e & Name	PED : M.E. Engir	neerin	g Des	ign				
		Semes	ster I						
Course Code	Course	e Name		Hours Week		Credit	Max	kimum I	Marks
			L	Т	Р	С	CA	ES	Total
	THEORY								
10 PED 101	Advanced Mathe	ematics (PED,	3	1	0	4	50	50	100
10 PED102	Computer Applic (PED, PCA)	cations in Design	3	0	0	3	50	50	100
10 PED 103	Finite Element A PCA)	nalysis (PED,	3	1	0	4	50	50	100
10 PED 104	Concepts of Eng (PED, PCA)	ineering Design	3	0	0	3	50	50	100
10 PED 105	Advanced Mater	ial Technology	3	0	0	3	50	50	100
10 PED E**	Elective I		3	0	0	3	50	50	100
	PRACTICAL								
10 PED 106	CAD Laboratory	(PED, PCA)	0	0	3	2	50	50	100
10 PED 107	Computer Aided Laboratory I PEI		0	0	3	2	50	50	100
		Total	18	2	6	24		800	
		Semes	ter II						
Course Code	Course	e Name		Hours Week		Credit	Max	kimum I	Marks
			L	Т	Р	С	CA	ES	Total
	THEORY								
10 PED 201	Mechanical Vibra PCA)	ations (PED,	3	1	0	4	50	50	100
10 PED 202	Product Design Development (P	ED, PCA)	3	0	0	3	50	50	100
10 PED 203	Advanced Mech Synthesis	anisms and	3	1	0	4	50	50	100
10 PED 204	Design for Manu Assembly	facture and	3	0	0	3	50	50	100
10 PED E**	Elective II		3	0	0	3	50	50	100
10 PED E**	Elective III		3	0	0	3	50	50	100
	PRACTICAL								
10 PED 205	Computer Aided Laboratory II (PE	ED, PCA)	0	0	3	2	50	50	100
10 PED 206	Technical Reportant and Presentation		0	0	2	0	100	00	100
		Total	18	2	5	22		800	

	K.S.Rangasamy College of Technology, Tiruchengode - 637 215										
	Curriculu	m for the Programn	nes un	der Aı	utonon	nous Sche	me				
Regulation		R 2010									
Department		Department of Me	chanic	al Enç	gineeri	ng					
Program Cod	e & Name	PED : M.E. Engine	eering	Desig	n						
Semester III											
Course Code Course Name Hours/ Week Credit Maximum Marks									Marks		
			L	Т	Р	С	CA	ES	Total		
	THEORY										
10 PED E**	Elective IV		3	0	0	3	50	50	100		
10 PED E**	Elective V		3	0	0	3	50	50	100		
10 PED E**	Elective VI		3	0	0	3	50	50	100		
	PRACTICAL										
10 PED 301	Project Work	- Phase I	0	0	12	2	100	00	100		
		Total	9	0	12	11		400			
		Sem	ester I	V							
Course Code	Cou	rse Name		Hours Week		Credit	Ма	aximum	Marks		
	L T P C CA ES Total								Total		
10 PED 401 Project Work - Phase II 0 0 40 10 50 50 100											
	Total 0 0 40 10 100										

K.S.Rangasamy College of Technology, Tiruchengode - 637 215									
	Curriculur	m for the programmes u	nder A	Autono	omous	Schem	е		
Regulation		R 2010							
Department		Department of Mechar			ering				
Program Code	& Name	PED : M.E. Engineerin	g Des	ign					
	T	List of Elec			,	- ·			
Course Code	С	ourse Name		Hours Week		Credi t	Max	imum I	Marks
			L	Т	Р	С	CA	ES	Total
10 PED E01		inite Element Analysis	3	0	0	3	50	50	100
10 PED E02	Optimization Design	Techniques in	3	0	0	3	50	50	100
10 PED E03	Tribology in	Design	3	0	0	3	50	50	100
10 PED E04	Advanced S	trength of Materials	3	0	0	3	50	50	100
10 PED E05		a Management	3	0	0	3	50	50	100
10 PED E06	Design of Hy Pneumatic S		3	0	0	3	50	50	100
10 PED E07	Applied Eng	ineering Acoustics	3	0	0	3	50	50	100
10 PED E08	Advanced T	•	3	0	0	3	50	50	100
10 PED E09	Micro Electro Systems De	o Mechanical sign	3	0	0	3	50	50	100
10 PED E10	Mechanics of Materials	of Composite	3	0	0	3	50	50	100
10 PED E11	Rapid Proto	typing and Tooling	3	0	0	3	50	50	100
10 PED E12	Mechanics of	of Fracture	3	0	0	3	50	50	100
10 PED E13	Applied Objection Programmin	g	3	0	0	3	50	50	100
10 PED E14	Design of M Equipments	aterial Handling	3	0	0	3	50	50	100
10 PED E15	Measureme	nt Techniques	3	0	0	3	50	50	100
10 PED E16		ndition Monitoring	3	0	0	3	50	50	100
10 PED E17	Composite Mechanics	Materials and its	3	0	0	3	50	50	100
10 PED E18	Modal Analy Systems	rsis of Mechanical	3	0	0	3	50	50	100
10 PED E19	Integrated M	lanufacturing Systems	3	0	0	3	50	50	100
10 PED E20		ates and Shells	3	0	0	3	50	50	100
10 PED E21		eat Exchangers	3	0	0	3	50	50	100
10 PED E22	Bearing Des Dynamics	sign and Rotor	3	0	0	3	50	50	100
10 PED E23	· .	nal Fluid Dynamics	3	0	0	3	50	50	100
10 PED E24	Engineering		3	0	0	3	50	50	100
10 PED E25	Mechatronic Systems	s in Manufacturing	3	0	0	3	50	50	100
10 PED E26	Industrial Ro	obotics	3	0	0	3	50	50	100
10 PED E27	Creativity in	Design	3	0	0	3	50	50	100
10 PED E28	Enterprise F	3	0	0	3	50	50	100	
10 PED E29	Advanced M processing	laterials and their	3	0	0	3	50	50	100
10 PED E30	Special expe	erimental techniques	3	0	0	3	50	50	100

	K.S.Rangasa	ımy College of Techno	logy,	Tirucl	hengo	de - 637	7 215		
	Curriculu	m for the programmes u	nder A	utono	mous	Scheme	е		
Regulation		R 2010							
Department	Department of Mechanical Engineering								
Program Code	m Code & Name PED : M.E. Engineering Design								
		List of Elec	tives						
10 PED E31	Measureme	nts and control	3	0	0	3	50	50	100
10 PED E32	Microcontro applications	ller system design and	3	0	0	3	50	50	100
10 PED E33	Advanced ir engines	ternal combustion	3	0	0	3	50	50	100
10 PED E34	Advanced h	eat and mass transfer	3	0	0	3	50	50	100
10 PED E35		ethodology - and Management	3	0	0	3	50	50	100
10 PED E36	Experimental	stress analysis	3	0	0	3	50	50	100
10 PED E37	Fuels and cor	mbustion	3	0	0	3	50	50	100
10 PED E38	Advances in o	casting and welding	3	0	0	3	50	50	100
10 PED E39	Quality conce	epts in design	3	0	0	3	50	50	100
10 PED E40 Maintenance Management 3 0 0 3 50 50 100						100			
10 PED E41	Special Opti	mization	3	0	0	3	50	50	100

K.S.Ranga	asamy College of To				us Re	gulation		R 2	010	
Department	Mechanical Engineering		Name			PED : M	l.E. Eng	gineering	g Design	
		;	Semest	erı						
Course Code	Course Na	me	Hou	rs / We	eek	Credit	М	aximum	Marks	
			L	Т	Р	С	CA	ES	Total	
10 PED 101	ADVANCED MATHEMATICS (F PCA)	·	3	1	0	4	50			
Objective(s)	At the end of the study of the paper Advanced Mathematics, the student will be abl to solve linear systems by methods of elimination, triangularisation and iteration									
1 INTEGR	-					tal Hrs		12		
Simultaneous Relaxation m Weddle's rule	s Equations: Gauss nethod- Numerical Ir e.	elimination ntegration-	on met Trapez	hod-C oidal r	holesl ule a	ki schem nd Simps	ie-Gaus son's 1/	ss seide 3 and 3	el method /8 th rules	
PROBLE						tal Hrs		12		
	n through finite diffe eigen values / vecto									
3 CALCUL	LUS OF VARIATION	S			То	tal Hrs		12		
	functional involving n higher order deriv method.									
4 ELLIPTI	C PARTIAL DIFFER	ENTIAL EC	OITAUQ	ONS	То	tal Hrs		12		
	nce expressions for undary conditions- F			s – La	place	's equation	on – Li	ebmann	method	
h	OLIC AND HYPERB ENTIAL EQUATION		ΓIAL		To	tal Hrs		12		
	PE- Explicit method - bolic PDE - Solution									
Total hours to								60		
Text book (s)							A/I :	D		
Second										
2 M.K.Ven	ıkatraman, Higher r y, 2000	nathematic	s for e	engine	ering	and Scie	ence; N	lational	Publishin	
Reference(s)										
	J Faires and Ric y, 1998, second edi		en, "Nu	ımerica	al Me	thods" B	rooks	/ Cole	Publishin	
2 John H	Mathews and Kurtis	D Fink, "Nu	merica	l Metho	ods us	sing MAT	LAB", F	Prentice	Hall, 1998	
	heney and David king Company, Fourth			al Mati	hemat	ics and	Compu	ting", B	rooks/Col	

K.S.Rangasamy College of Technology - Autonomous Regulation R 2010 Department Mechanical Programme Code & PED : M.E. Engineering Design										
Department	Engineering	_	mme Co Name	oae &		PED : M.	E. Engir	neering	Design	
		S	Semeste	er I						
Course			Hou	rs / We	eek	Credit	Ма	ximum I	Marks	
Code	Course Na	me	L	Т	Р	С	CA	ES	Total	
10 PED 102	DESIGN (PED, PC	CA)	3	0	0	3	50	50	100	
Objective(s)	To Impart knowledge on parametric sketching, data exchange f computers in design, to learn softwares like Lisp, visual basi mechanical components and to develop the students ability to utilize for managing product design data.									
1 1	DUCTION TO COMP PRODUCT DESIGN	_	LICATIO	ONS	То	tal Hrs		9		
Concept de	sign – Parametric on, Scaling, Rotation	sketching								
2 COMPL	JTERS IN DESIGN				То	tal Hrs		9		
Nesting and	ing of Mechanical co d development – P of components –	lastic parts	with	draft	and s	shrinkage	allowa	ince -	Reverse	
	JTERS IN TOOLING					tal Hrs		9		
Mould desig analysis – R	n – Jigs and fixture apid tooling	s design –	Check	for ir	nterfer	ences –	Mechar	nism de	sign and	
4 COMPL	JTERS IN DESIGN P	RODUCTIV	/ITY		То	tal Hrs		9		
			sual ba	asic, p	oro/pro	gram, so	ript, LI	SP etc	to write	
Customizing various software by using visual basic, pro/program, script, LISP etc to write applications like design of shafts, gears etc.,										
5 MANAC	MANAGING PRODUCT DESIGN DATA Total Hrs 9 /ersion control – Library creation – Catalog making – Standardization for design –Collaborative design among peer groups – Design optimization for geometry – Design check, approval and									
Version con	trol – Library creatior	SIGN DATA	makin		andar	dization fo		n –Colla	aborative	
Version condesign amo	trol – Library creation ng peer groups – De	SIGN DATA	makin		andar	dization fo		n –Colla	aborative	
Version con design amo validation.	trol – Library creation ng peer groups – De to be taught	SIGN DATA	makin		andar	dization fo		n –Colla ck, appr	aborative	
Version condesign amovalidation. Total hours to the total t	trol – Library creation ng peer groups – De to be taught	SIGN DATA — Catalogesign optim	makin	for ge	andare	dization fo	gn ched	n –Colla ck, appr 45	aborative oval and	
Version condesign amore validation. Total hours to the total hours to	trol – Library creation ng peer groups – De to be taught): M. Neumann and Ro	SIGN DATA — Catalogesign optime	makin ization	for ge	andare cometr	dization for display – Designation	gn chec	n –Colla ck, appr 45 IcGraw	aborative oval and Hill Book	
Version condesign amovalidation. Total hours to the total hours to th	trol – Library creation ng peer groups – De to be taught): M. Neumann and Rogapore, 1989. Zeid, "CAD/CAM – T	SIGN DATA — Catalogesign optime	makin ization	for ge	andare cometr	dization for display – Designation	gn chec	n –Colla ck, appr 45 IcGraw	aborative oval and Hill Book	
Version condesign amore validation. Total hours to the text book (some conditions) William Co. Sin and the text book (some conditions) Reference(some conditions)	trol – Library creation ng peer groups – De to be taught): M. Neumann and Rogapore, 1989. Zeid, "CAD/CAM – T	SIGN DATA — Catalogesign optime bert Sproul heory and F	makingization "Princip	ples of	Comp	dization for display – Designation for displaying displ	phics" M	n –Collack, appr 45 46 1cGraw	aborative oval and Hill Book 1998.	
Version condesign amore validation. Total hours to the text book (so the text book (so the text book) William Co. Sin to the text book (so the text book) Reference(so the text book)	trol – Library creation ng peer groups – De to be taught): M. Neumann and Rogapore, 1989. Zeid, "CAD/CAM – T	SIGN DATA — Catalog esign optim bert Sproul heory and F	"Principoractice	ples of " – Mc	Comp Graw	dization for y - Designation for Designation f	phics" Martional	n –Collack, appr 45 IcGraw Edition	aborative oval and Hill Book 1998.	

K.S.Rang	asamy College of	Technolog	y - Auto	onomo	us Re	gulation		R 20	10
Department	Mechanical Engineering	_	mme Co Name	ode &		PED : M.	E. Engi	neering	Design
			Semes	ter I					
Course	Course N		Hou	rs / We	eek	Credit	Ma	aximum l	Marks
Code	Course N	ame	L	Т	Р	С	CA	ES	Total
10 PED 103	FINITE ELEMEI ANALYSIS (PE		3	1	0	4	50	50	100
Objective(s)	analysis tools a	oblems and nd their use	l workir in desig	ng kno					
1 INTRO PROBL	DUCTION & ONE-I FMS	DIMENSION	1AL		To	tal Hrs		12	
Integral state Applications energy applications mechanics a	of finite element and tements — Weak of FEA - Finite etroach — Galerkin's and Heat transfer —	formulation lement mod approach Finite eleme	s – Ri deling – – One	tz me Co-or e-dime	thod dinate nsiona eams	 Methods and sh I finite e 	d of w ape fur	eighted actions - models	residuals Potential
	IMENSIONAL PRO					tal Hrs		12	
rectangular Applications Transient an	uation – Laplace elements – Eval – Conduction ar alysis - Theory of e rirtual displacemen	uation of indication of indica	ntegrals on hea	s – A t trans	ssemb sfer –	oly – Ax Torsiona	i-symm al cylin	etric pro drical m	bblems – nember –
3 ISOPA	RAMETRIC ELEMI	ENTS			То	tal Hrs		12	
Numerical in	 Bilinear quadrila tegration – Gauss Examples of 2D a 	quadrature	- Static	cond					
	TURAL DYNAMIC				То	tal Hrs		12	
of number of – Harmonic response sp	uations – Mass an DOF-response his response – Direct ectra – Example pr	story – Mode integration to oblems	el metho echniqu	ods – F	Ritz ve	ctors -Co	mponei	nt mode	synthesis
5 ESTIM						tal Hrs		12	
non-linearity	Material non-lineLarge displaceadaptive refinemen	ment – Err	sto Plas or norm	ticity - ns and	- Plast conv	icity – Visergence	sco pla: rates-	sticity –C H-refiner	Geometric nent with
Total hours t	o be taught							60	
Text book (s):								
¹ Edition									
2 Logan 2002.	D.L, "A First Cours	e in the Fin	ite Elem	ent Me	ethod"	, Third Ed	lition, T	nomson	Learning,
Reference(s									
1 Cook, F & Sons	Robert Davis et al " , 1999.	Concepts a	nd Appli	cations	s of Fir	nite Eleme	ent Ana	lysis", W	iley, John
2 Segerli	nd L.J., "Applied Fi	nite Elemen	t Analys	sis", Jo	hn Wil	ey, 1984.			
3 S.S.Ra	o, "Finite Element /	Analysis", 20	002 Edit	ion.					
	wicz, O.C. and Tag Graw Hill Internation						ourth E	dition, V	olumes 1
5 Bathe I	K.J., "Finite Elemen	t Procedure	s in Eng	gineerii	ng Ana	alysis", Pro	entice F	Iall, 1990).

K.S.Rang	gasamy College of Techno							2010		
Department	Mechanical Engineering	Progra	amme (Name		Š F	PED : N	I.E. Engi Design	neering		
		Semes	ter I							
Course	_	Hours	s / Wee	ek	Credit	M	aximum l	Marks		
Code	Course Name	L	Т	Р	С	CA	ES	Total		
10 PED 104	CONCEPTS OF ENGINEERING DESIGN (PED, PCA)	3	0	0	3	50	50	100		
Objective(s) To impart knowledge on design process, and its requirements, mathematical modeling, geometric modeling, material selection for design process, material processing, Environmental and safety issues.										
1 THE DE	SIGN PROCESS			To	tal Hrs		9			
Morphology of	Process - need identific of Design steps of Produ gn – Concurrent Engineerir	ict Design	ı – Co	ncept	ual Desig	gn, Em	bodimen			
2 TOOLS	IN ENGINEERING DESIGN	٧		Tot	al Hrs		9			
Design, Mathe – Simulation Geometric pro	d problem solving, Decision ematical modeling, Geome Finite Difference method, ogramming, Structural and	tric modeli Monte Ca Shape Op	ing, Fin ırlo me timizati	ite ele thod -	ment mo	deling,	Rapid Pi	rototyping		
3	AL SELECTION AND MAT	ERIALS IN	N	Tot	al Hrs		9			
The Classification - Methods of	ation and properties of Eng f material selection – Ash	nby Chart	and M	1ethod	terial star	tht fact	and Spectors- Der	ivation of		
The Classifica Methods o material indicaided databa resistance- De	ation and properties of Eng f material selection – Ash es- Use of material selection ses – Design for brittle fr esigning with plastics.	nby Chart on Chart-P racture- D	and M ugh se	lethod lection for fat	terial star of Weig method-	ht fac Selec	and Spectors- Der	ivation of computed		
The Classifica Methods of material indicated databates resistance- Do a MATERI Classification process selemanufacturing Machining, W	ation and properties of Eng f material selection – Ash es- Use of material selection ses – Design for brittle from esigning with plastics. AL PROCESSING AND DE of manufacturing processiction- use of process sel or Design for forging an elding and Assembly- Desi	aby Chart on Chart-Practure- D ESIGN ses and the ection chart of sheet gn for resident charts.	and Manual Rugh se design of their roant and metal	Method lection for fat Tot ble in d com formin	terial star of Weig method- igue failu al Hrs design- puterized ng-Design	Selectore De	and Spectors- Dertion with esign for 9 s determase - Deasting-D	ivation of computed corrosion hining the design for		
The Classifica - Methods o material indicaided databa resistance- Do 4 MATERI Classification process selemanufacturing Machining, W LEGAL, SAFETY ENGINE	ation and properties of Eng f material selection — Ash es- Use of material selection ses — Design for brittle from esigning with plastics. AL PROCESSING AND DE of manufacturing processiction- use of process sellong- Design for forging and elding and Assembly- Designer ETHICAL ENVIRONMENT ISSUES IN DESIGN AND ERING	ection charton charton Chart-Practure- D Ses and section charton chart	and Mugh se lesign their roart and metal dual str	Method lection for fat Tot Dile in d com formir resses	terial star of Weig method- igue failu al Hrs design- puterized ig-Design and heat	sht factor De Factor databa for caterature	and Spectors- Der tion with design for 9 s determase - Decasting-Denent.	ivation of computed corrosion mining the design for esign for		
The Classifica Methods of material indicated databates resistance- Do a material indicated databates and material indicated databates and material indicated databates and material indicated databates and material recommendates and material indicates and material indic	ation and properties of Eng f material selection — Ash es- Use of material selection ses — Design for brittle from esigning with plastics. AL PROCESSING AND DE of manufacturing processication- use of process sellong- Design for forging and elding and Assembly- Designer Insulation and Assembly- Designer Insulation and I	ection chard and sheet and sheet and sheet and and sheet and	and Manager and Ma	Totole in Totole	terial star of Weig method- igue failu al Hrs design- puterized ng-Design and heat al Hrs	Factor datab	and Spectors- Deretion with esign for 9 s determase - Deasting-Denent. 9 aspects of Cycle as and Guid	ivation of computed corrosion wining the design for esign for product sessment		
The Classifica Methods of material indicated databates resistance- Do a material indicated databates and material indicated databates and material indicated databates and material recommends and material indicated and material indicate	ation and properties of Eng f material selection — Ash es- Use of material selection ses — Design for brittle fresigning with plastics. AL PROCESSING AND DE of manufacturing procescition- use of process selection- use of process selection and Assembly- Design for forging an elding and Assembly- Design ETHICAL ENVIRONMENT ISSUES IN DESIGN AND ERING laws- Contracts - Liability sof ethics- Solving ethical etycling and remanufacture-ety-Design for reliability fail	ection chard and sheet and sheet and sheet and and sheet and	and Manager and Ma	Totole in Totole	terial star of Weig method- igue failu al Hrs design- puterized ng-Design and heat al Hrs	Factor datab	and Spectors- Deretion with esign for 9 s determase - Deasting-Denent. 9 aspects of Cycle as and Guid	ivation of computed corrosion wining the design for esign for product sessment		
The Classifica - Methods o material indicated databa resistance- Do Material indicated databa resistance- Do Material record design for safety.	ation and properties of Eng f material selection — Ash es- Use of material selection ses — Design for brittle fresigning with plastics. AL PROCESSING AND DE of manufacturing procescition- use of process selection- use of process selection- use of process selection and Assembly- Design for forging an elding and Assembly- Design ETHICAL ENVIRONMENT ISSUES IN DESIGN AND ERING laws- Contracts - Liability sof ethics- Solving ethical expelies and remanufacture-ety-Design for reliability fail to be taught	ection chard and sheet and sheet and sheet and and sheet and	and Manager and Ma	Totole in Totole	terial star of Weig method- igue failu al Hrs design- puterized ng-Design and heat al Hrs	Factor datab	and Spectors- Derition with design for 9 s determase - Decasting-Deent. 9 aspects of Cycle as and Guid.	ivation of computed corrosion wining the design for esign for product sessment		
The Classification process selemanufacturing Machining, W EGAL, SAFETY ENGINE The origin of liability- Code — Material recidesign for saf Total hours to Text book (s) The Classification process selemanufacturing Machining, W ENGINE The origin of liability- Code — Material recidesign for saf Total hours to Text book (s) Dieter, C Hill, Inter	ation and properties of Eng f material selection — Ash es- Use of material selection ses — Design for brittle fresigning with plastics. AL PROCESSING AND DE of manufacturing process ction- use of process selection and Assembly-Design for forging an elding and Assembly-Design ETHICAL ENVIRONMENT ISSUES IN DESIGN AND ERING laws- Contracts - Liability sof ethics- Solving ethical expeling and remanufacture-ety-Design for reliability fail be taught Seorge E, Engineering Demantional Edition, Singapore	aby Chart on Chart-Practure- Design for resign for Law conflicts- Design foure mode sign - "A 1 2 2000.	and Manager and Ma	Totole in the complete of the	terial star of Weig method- igue failu cal Hrs design- puterized ng-Design and heaf cal Hrs design- puterized serial Hrs design- puterized serial Hrs design- puterized ng-Design and heaf cal Hrs design- puterized ng-Design and heaf	Factor datab for catreatm	and Spectors- Derition with a sign for 9 s determase - Determase - Determase - Determase - Determation of the sign for 1 state of 1 state of the sign for 1 state of 1 state	ivation of computed corrosion uining the lesign for esign for for product sessment lelines for		
The Classification material indicated databases resistance- Defended MATERI Classification process selemanufacturing Machining, Wachining, Walley Code – Material recipied design for safi Total hours to Text book (s) 1 Dieter, Chill, Intellation, Walley Chill, Walley Child C	ation and properties of Eng f material selection — Ash es- Use of material selection ses — Design for brittle fresigning with plastics. AL PROCESSING AND DE of manufacturing process ction- use of process selection and Assembly-Design for forging an elding and Assembly-Design ETHICAL ENVIRONMENT ISSUES IN DESIGN AND ERING laws- Contracts - Liability sof ethics- Solving ethical expeling and remanufacture-ety-Design for reliability fail be taught Seorge E, Engineering De	aby Chart on Chart-Practure- Design for resign for Law conflicts- Design foure mode sign - "A 1 2 2000.	and Manager and Ma	Totole in the complete of the	terial star of Weig method- igue failu cal Hrs design- puterized ng-Design and heat cal Hrs design- puterized serial Hrs design- puterized serial Hrs design- puterized ng-Design and heat cal Hrs design- puterized ng-Design and heat	Factor datab for catreatm	and Spectors- Derition with a sign for 9 s determase - Determase - Determase - Determase - Determation of the sign for 1 state of 1 state of the sign for 1 state of 1 state	ivation of computed corrosion uining the lesign for esign for for product sessment lelines for		
The Classification material indicated databases resistance- Defended MATERI Classification process selemanufacturing Machining, Wachining, Walley Code – Material recipied design for safi Total hours to Text book (s) 1 Dieter, Chill, Intellation, Walley Chill, Walley Child C	ation and properties of Eng f material selection — Ash es- Use of material selection ses — Design for brittle fresigning with plastics. AL PROCESSING AND DE of manufacturing process cition- use of process selection- use of pr	aby Chart on Chart-Practure- Design for resign for Law conflicts- Design foure mode sign - "A 1 2 2000.	and Manager and Ma	Totole in the complete of the	terial star of Weig method- igue failu cal Hrs design- puterized ng-Design and heat cal Hrs design- puterized serial Hrs design- puterized serial Hrs design- puterized ng-Design and heat cal Hrs design- puterized ng-Design and heat	Factor datab for catreatm	and Spectors- Derition with a sign for 9 s determase - Determase - Determase - Determase - Determation of the sign for 1 state of 1 state of the sign for 1 state of 1 state	ivation of computed corrosion uining the lesign for esign for for product sessment lelines for		
The Classification material indicated databases tance- Do de MATERI Classification process selemanufacturing Machining, W LEGAL, SAFETY ENGINE The origin of liability- Code – Material recodesign for safe Total hours to Text book (s) 1 Dieter, Chill, Internation Reference(s)	ation and properties of Eng f material selection — Ash es- Use of material selection ses — Design for brittle fresigning with plastics. AL PROCESSING AND DE of manufacturing process cition- use of process selection- use of pr	aby Chart on Chart-Practure- Design for resign for Law conflicts- Design foure mode	and Manager and Ma	Totole in description of the community o	terial star of Weig method- igue failu cal Hrs design- puterized ng-Design and heat cal Hrs debility – E vironment tential Da s-robust d process and Dev	Factor databa for data	and Spectors- Derition with a sign for 9 s determase - Determase - Determase - Determase - Determation of the sign for 1 state of 1 state of the sign for 1 state of 1 state	ivation of computed corrosion uining the lesign for esign for for product sessment lelines for		
The Classification material indicated databases resistance- Do Material manufacturing Machining, W ENGINE The origin of liability- Code – Material recidesign for saft Total hours to Text book (s) 1 Dieter, C Hill, Interest Reference(s) 1 Pahlgane	ation and properties of Eng f material selection — Ash es- Use of material selection ses — Design for brittle fresigning with plastics. AL PROCESSING AND DE of manufacturing process cition- use of process selection- use of process selection and Assembly- Design ETHICAL ENVIRONMENT ISSUES IN DESIGN AND ERING laws- Contracts - Liability selection and remanufacture- ety-Design for reliability fail be taught EGEORGE E, Engineering Demational Edition, Singapore Virich and Steven D. Epponal Edition, 2000.	aby Chart on Chart-Practure- Design for resign for Law conflicts- Design foure mode	their roart and metal dual structure of the safety of the	Totole in description of the community o	terial star of Weig method- igue failu cal Hrs design- puterized ig-Design and heat cal Hrs debility – Evironment tential Da s-robust d process and Dev	Factor databa for data	and Spectors- Derition with a sign for 9 s determase - Determase - Determase - Determase - Determation of the sign for 1 state of	ivation of computed corrosion uining the lesign for esign for for product sessment lelines for		

K.	S.Ranga:	samy College of Techn	ology - A	Autono	mous	Reg	ulation		R 20	10
Depa	artment	Mechanical Engineering	Progra	amme C Name	Code 8	k F	PED : M.I	E. Engi	neering	Design
			Sem	ester I						
Cours	se Code	Course Name		Hou	s/We	eek	Credit	Ma	ximum I	Marks
				L	Т	Р	С	CA	ES	Total
10 P	ED 105	ADVANCED MATERIA TECHNOLOGY	L	3	0	0	3	50	50	100
Obje	ctive(s)	To understand the inter	disciplin	ary app	licatio	ns of	materials	in the	industry	/.
1		CED FERROUS ALLOYS	S AND			To	tal Hrs		10	
Mara	ging steel,	TRIP steels, HSLA Stee	els, Stain	less st	eels, C	Condu	ctive poly	mers a	and app	lications
2	ADVAN	CED NON FERROUS AI	LOYS			Tot	al Hrs		8	
Al, Ti	alloys; me	etallurgical aspects, prop	erties, h	eat trea	ıtment	and a	applicatio	n		
3		EMPERATURE ALLOYS OROUS MATERIALS	AND C	ONITAC	3,	Tot	al Hrs		9	
applic	cation The	el base and cobalt base ermal barrier coating f and Alumina, properties a	or high	tempe	rature					
4	ALLOYS	S AND MATERIALS FOR ATIONS				Tot	al Hrs		9	
		shape memory alloys, lart materials.	Function	ally gra	adient	mate	erials, hi	gh tem	peratur	e super
5	NANO N	MATERIALS & NANO CO	DMPOSI	TES		Tot	al Hrs		9	
on va	arious pro	omaterials – scale / dim perties, advantages and mer based CNT compos	l limitation							
Total	hours to b	pe taught							45	
Text b	oook (s) :									
1		Singh ,Physical Metallu Alloys and Conductive p				ers D	istributor	s, 2005	. For A	dvanced
2		tion to physical metallul anced Ferrous Alloys and						(India)	Pvt Ltd	d, 1997.
3		.l.J, Light alloys: metaed Non Ferrous Alloys ch		f the li	ght m	etals	J. Wile	y & So	ons, 19	95. For
Roger C. Reed, The super alloys: fundamentals and applications, Cambridge University Press. For High temperature Alloys and coating, Mesoporous materials chapter										
Refer	ence(s):									
1	Information regarding "Chapters for "Alloys and Materials for special applications, Nano materials & Nano composites" and Topics "Conductive polymers and applications									

K.S.Rang	asamy College	1	R 2010								
Department	Mechanical Engineering	Programme	e Code a	& Nam	е	PED : M.	E. Engii	neering [Design		
,			Semes	ster I							
Hours / Week Credit Maximum Marks Course Course Name											
Code	Course	Name	L	Т	Р	С	CA	ES	Total		
10 PED 106	CAD LABORA (PED, PCA)	TORY	0	0	3	2	50	50	100		
Objective(s)	To develop the mechanical collike pro-E, soli	mponents ar									
16. Part of 17. Part of 18. Part of 19. Part of 20. Part of 22. Part of 23. Part of 24. Part of 25. Part of 26. Part of 27. Part of 27. Part of 17.		threads. Flange Coup Universal Co Bushed Bear Knuckle Join Plummer Blo Connecting Screw Jack Pipe Vice Piston Stuffing box Machine Vic	oupling ring t ock rod								
	27. Part and Assembly of Machine Vice 28. Part and Assembly of Swivel bearing Total Hrs 45										

K.S.Ranga	asamy College	of Technolog	gy - Aut	onomo	ous R	egulation		R 20	10	
Department	Mechanical Engineering	Programme	e Code (& Name	е	PED : M.	E. Engi	neering [Design	
	Semester I									
Hours / Week Credit Maximum Marks Course Course Name										
Code	Course	Course Name L T P C						ES	Total	
10 PED 107	COMPUTER A ANALYSIS LABORATOR' PCA)		0	0	3	2	50	50	100	
Objective(s)	To develop th and spring, St flow analysis in	eady state an	nd transi	ent hea	at tran	sfer analy	sis of pl			
13. Analysis of stepped rod with axial load. 14. Analysis of Plane truss member. 15. Analysis of cantilever beam with point load and UDL. 16. Analysis of simply supported beam with point load and UDL. 17. Analysis of I-section beam. 18. Analysis of spring system. 19. Stress analysis of corner bracket (Plane stress). 20. Analysis of circular pipe (Axi-symmetric). 21. Heat conduction in 2D plate.(steady state) 22. Heat convection in 2D plate. (steady state) 23. Transient heat transfer analysis in slab										
24. Flow analysis in 2 channel pipe. Total Hrs 45										

к.	K.S.Rangasamy College of Technology - Autonomous Regulation R 2010										
De	partment	Mechanical Engineering	Progran N	nme Co Name	de &		PED:	M.E. Er	ngineerii	ng Design	
				Seme	ster II						
		_		Hou	rs / We	ek	Credit	ı	Maximur	m Marks	
Cou	rse Code	Course	Name	L	Т	Р	С	CA	ES	Total	
10	PED 201	MECHANICA VIBRATIONS PCA)		3	1	0	4	50	50	100	
Objective(s) To impart knowledge on mechanical vibrations of single, multiple degrees of freedom and continuous systems, design systems to achieve the vibratory response, analyze and predict vibratory behavior of mechanical systems.									the vibratory		
1	FUNDAM	ENTALS OF VI	BRATION			To	tal Hrs		1	2	
free freq	dom force uency resp	Single degree for the desired size of the desi	h elastically motion, Du	couple hamel's	d visc Integ	ous c	dampers,	Syste	m Ident	ification from	
2	TWO DEC	GREE-OF-FRE	EDOM SYS	TEMS		Tot	tal Hrs		1	2	
		of spring-cou m – Forced vibi							ation of	two degree	
3	MULTI DE	GREE-OF-FR	EEDOM SYS	STEMS		Tot	tal Hrs		1	2	
vec	ors - orth	of vibration – logonal proper lodal damping in	ties – Moda	al matri	x-Moda	al Ana	alysis –	Forced	Vibrati	on by matrix	
4	VIBRATIO	ON OF CONTIN	IUOUS SYS	TEMS		Tot	tal Hrs		1.	2	
		rned by wave of ffect of Rotary i								uler Equation	
5	EXPERIM ANALYSI	IENTAL METH	ODS IN VIBI	RATION	1	Tot	tal Hrs		1.	2	
		uments – Vibra oration tests. Ex								Tests – Free	
Tota	al hours to	be taught							6	0	
Tex	t book (s) :							l			
1	Thomson New Delh	, W.T., "Theory i, 1990.	of Vibratio	n with	Applic	ations	s", CBS	Publish	ers and	Distributors,	
Rao, J.S. and Gupta, K., "Introductory Course on Theory and Practice Mechanical Vibration", New Age International (P) Ltd., New Delhi, 1999.											
Reference(s):											
Den Hartog, J.P, "Mechanical Vibrations," Dover Publications, New York, 1990.											
2	Rao, S.S.	, "Mechanical \	ibrations", A	ddison	Wesle	y Lon	gman, N	ew Yor	k, 1995.		

K.S.Rangas	samy College of Te	echnolog	y - Aut	onomo	us R	egulatio	n	R	2010	
Department	Mechanical Engineering	Progra	amme (Name	Code &		PED : I	M.E. Er	ngineerir	ng Design	
			Seme	ester II						
Course	O N		Hou	ırs / We	eek	Credit	ı	Maximur	n Marks	
Code	Course Nar	ne	L	Т	Р	С	CA	ES	Total	
10 PED 202	PRODUCT DESIGN DEVELOPMENT PCA)	(PED,	3	0	0	3	50	50	100	
Objective(s)	Objective(s) To Impart knowledge on product development process and challenges in product development, product planning, product specifications, concept selection and product architecture.									
1 INTRODUCTION Total Hrs 9										
Product Dev Organizations Adapting the	cs of Successful Pro- relopment- Challer s-A Generic Develo Generic Product I Organizations-The	iges of opment P Developm	Produc Process ent Pr	t Deve -Conce ocess-	elopm pt De	ent –De evelopme	velopment: The	nent Pro e Front-	ocesses and End Process	
2 PRODU	CT PLANNING				Tot	tal Hrs		9)	
Identifying C Customer Ne the Needs-Re	esources and Timin ustomer Needs- Reeds-Organizing the eflecting on the Res	aw Data Needs in ults and t	from (nto a H	Custom ierarch	ners- y- Es	Interpreti	ing Ra	w Data	in Terms of mportance of	
Product spec	cifications- Stages	of Specifi								
Final Specific generation m	ations-Concept Ge ethod.	neration-	The Act	tivity of	Conc	ept Gene	eration-	·The ste	ps in concept	
4 CONCE	PT SELECTION				Tot	tal Hrs		S)	
Purpose of Communicati	ection- Overview of the Concept Test- ng the Concept- Me s and the Process.	Choosin	g a S	urvey	Popul	lation- C	hoosin	g a Sui	rvey Format-	
5 PRODU	CT ARCHITECTUR	ξΕ.			Tot	tal Hrs		9)	
	nitecture-Implicatior n-Platform Planning							rchitectu	ire- Delayed	
Total hours to	be taught							4	5	
Text book (s)	:									
1 Ulrich, K New You	Carl T. and Eppinge k, 1999.	er, Stever	n D., "F	roduct	Desi	gn and [Develop	ment", I	McGraw–Hill,	
2 Otto, Ke	vien and Wood, Kri	stin, "Prod	duct De	sign" P	earso	n Publica	ation, N	lew Delh	ni, 2004.	
Reference(s)	:									
	al, Stephen, "Effectood, 1992.	ctive Prod	duct De	esign a	and D	evelopm	ent", E	Business	One Orwin,	
2 Stuart F Addison	Stuart Pugh., "Tool Design – Integrated Methods for successful Product Engineering", Addison Wesley Publishing, New York, 1991. Kemnneth Crow., "Concurrent Engineering / Integrated Product Development", DRM									
₃ Kemnne	th Crow., "Concu es, 26/3, Via Oliver	rrent En	gineerii	ng / I						

Der	o.rtarigas	amy College of Tec					gulation	ו	R	2010
	partment	Mechanical Engineering		mme C Name Semest			PED:	M.E. Eı	ngineeri	ng Design
C	Course	Course Nam	۵	Hou	rs / W	eek	Credi t	ľ	Maximu	m Marks
	Code	Oddide Nam		L	Т	Р	С	CA	ES	Total
10 F	PED 203	ADVANCED MECHANISMS ANI SYNTHESIS		3	1	0	4	50	50	100
Obj	ective(s)	To Impart knowledgmechanisms, static								
1	INTRODU	JCTION				To	tal Hrs		1	2
		idamentals of kinemains, Network formula					Formatio	on of o	ne D.O.	F. Multi loop
2	KINEMA	TIC ANALYSIS				Tot	al Hrs		1	2
		 Velocity and acc alysis of complex me 								
3	PATH CL	JRVATURE THEORY	/			Tot	al Hrs		1	2
cons	struction-T	t and inflection circles The cubic of stationar esimally close position	y curvatu	re or B	Burmes	ster's				
4	SYNTHE	SIS OF MECHANISM	/IS			Tot	al Hrs		1	2
Fun	ction gene pler curve	is – Number synthe eration- Path generat e synthesis- Design of	ion- Motic	on gene	eration	- Ğra	phical m	ethods	- Cogna	ate linkages
	ici iii iii iika									
	DYNAMI	ge design- Cam Mec CS OF MECHANISM IISMS AND ROBOTI	hanisms - S AND S	Deter	minati	on of			of Cams	
5 Stat ana linka	DYNAMIO MECHAN ic force a lysis- Sha ages- Kine ward and	ge design- Cam Mec CS OF MECHANISM	hanisms - S AND SI CS – Inertia atic analy patial RS	PATIAL force /sis- In SR me	minati - analy: troducechanis	Totosis – stion s	optimuntal Hrs Combinato force Denavit	ed sta and m	of Cams 1 tic and noment tenberg	inertia force balancing o Parameters
5 Stat ana linka Forv Sim	DYNAMION MECHANIC Force and Indian Service And Indian Indi	ge design- Cam Mec CS OF MECHANISM IISMS AND ROBOTI Inalysis with friction king force- Kinetosta ematic Analysis of Si inverse Kinematics	hanisms - S AND SI CS – Inertia atic analy patial RS	PATIAL force /sis- In SR me	minati - analy: troducechanis	Totosis – stion s	optimuntal Hrs Combinato force Denavit	ed sta and m	of Cams 1 tic and noment tenberg	inertia force balancing of Parameters nanism using
5 Stat ana linka Forv Sim	DYNAMION MECHANIC Force and Indian Service And Indian Indi	ge design- Cam Mec CS OF MECHANISM IISMS AND ROBOTI inalysis with friction king force- Kinetosta ematic Analysis of S inverse Kinematics ftware packages.	hanisms - S AND SI CS – Inertia atic analy patial RS	PATIAL force /sis- In SR me	minati - analy: troducechanis	Totosis – stion s	optimuntal Hrs Combinato force Denavit	ed sta and m	tic and noment tenberg of Mech	inertia force balancing o Parameters nanism using
5 Stat ana linka Forv Sim	DYNAMION MECHANIC force allysis- Shate ages- Kineward and ulation Solal hours to book (s) Sandor C	ge design- Cam Mec CS OF MECHANISM IISMS AND ROBOTI inalysis with friction king force- Kinetosta ematic Analysis of S inverse Kinematics ftware packages.	hanisms - S AND SI CS - Inertia atic analy patial RS of Roboti	- Deter PATIAL force /sis- In SR me c Mani	minati - analy: troducechanisi pulato	Totosis – etion fism – sm – srs- S	cal Hrs Combin to force Denavit tudy and	ed sta and m - Hari d use	of Cams 1 tic and noment tenberg of Mech	inertia force balancing o Parameters nanism using
Stat ana linka Forv Sim Tota	DYNAMIO MECHAN ic force a lysis- Sha ages- Kine ward and ulation So al hours to t book (s) Sandor (Prentice	ge design- Cam Mec CS OF MECHANISM IISMS AND ROBOTI Inalysis with friction Iking force- Kinetosta Inverse Kinematics Inverse Kinematics Inverse Kinematics Itware packages. be taught E.N., and Erdman A	hanisms - S AND SI CS — Inertia atic analy patial RS of Roboti	Deter PATIAL force /sis- In SR me c Mani	analy: troducechanisipulate	Toton of Toton of Stiern o	cal Hrs Combinato force Denavitatudy and	ed sta and m - Hari d use	tic and noment tenberg of Mech	inertia force balancing o Parameters nanism using
State ana slinka For Sim Tota 1	DYNAMIO MECHAN ic force a lysis- Sha ages- Kine ward and ulation So al hours to t book (s) Sandor (Prentice	ge design- Cam Mec CS OF MECHANISM IISMS AND ROBOTI Inalysis with friction king force- Kinetosta ematic Analysis of S inverse Kinematics ftware packages. be taught G.N., and Erdman A Hall, 1984. J.E., and Uicker, J.J.,	hanisms - S AND SI CS — Inertia atic analy patial RS of Roboti	Deter PATIAL force /sis- In SR me c Mani	analy: troducechanisipulate	Toton of Toton of Stiern o	cal Hrs Combinato force Denavitatudy and	ed sta and m - Hari d use	tic and noment tenberg of Mech	inertia force balancing o Parameters nanism using
State ana slinka For Sim Tota 1	DYNAMION MECHANIC force allysis- Sha ages- Kineward and ulation Solal hours to Sandor (Sandor Carentice) Shigley, Carence(s)	ge design- Cam Mec CS OF MECHANISM IISMS AND ROBOTI Inalysis with friction king force- Kinetosta ematic Analysis of S inverse Kinematics ftware packages. be taught : G.N., and Erdman A Hall, 1984. J.E., and Uicker, J.J., : amitabha and Mallik,	hanisms - S AND SI CS Inertia atic analy patial RS of Roboti	- Deter PATIAL force ysis- In SR me c Mani	analy: troducechanisipulato Mech	ion of Toto sis - ction from the sis - ors- S manism	cal Hrs Combinate force Denavite tudy and	ed sta and m - Hari d use	of Cams 1 tic and noment tenberg of Mech	inertia force balancing o Parameters nanism using
Statana ana linka Fort Sim Tota 1 2 Reference	DYNAMION MECHANIC FORCE A PROPERTY OF THE PROP	ge design- Cam Mec CS OF MECHANISM IISMS AND ROBOTI Inalysis with friction king force- Kinetosta ematic Analysis of S inverse Kinematics ftware packages. be taught : G.N., and Erdman A Hall, 1984. J.E., and Uicker, J.J., : amitabha and Mallik,	hanisms - S AND SI CS Inertia atic analy patial RS of Roboti G., "Adv "Theory of	- Deter PATIAL force /sis- In SR me c Mani /anced of Mach	minati analyatroducechanisipulato Mechanines a	ion of Toto sis - ction for sm - ors- S manism and M y of I	cal Hrs Combinate force Denavite tudy and the dechanis	ed sta and m - Hari d use of	of Cams 1 tic and noment tenberg of Mech 6 cGraw I	inertia force balancing o Parameters nanism using 0 d Synthesis"

K	.S.Rangas	samy College of	Technology	y - Aut	onomou	ıs Reç	gulation		R	2010
De	partment	Mechanical Engineering	Programm	e Cod	e & Nam	е	PED : N	1.E. Er	ngineeri	ng Design
				Seme	ster II					
(Course	Course N	ame	Но	urs / We	ek	Credi t	Ŋ	Maximu	m Marks
	Code			L	Т	Р	С	CA	ES	Total
10	PED 204	DESIGN FOR MANUFACTUR ASSEMBLY		3	0	0	3	50	50	100
Ob	jective(s)	To Impart kno component des design and desi	ign machini	ng cor	nsideratio					
1		S CAPABILITY A					al Hrs			9
sel	ection- Eva	gn principles for aluation method ethod - Assembly	- Process ca	apabilit	y - Featı	ure tol	erances	- Geo		
2		S INFLUENCING					al Hrs			9
		materials on for stings - Form des						Malle	able irc	n-Steel and
3	COMPO	NENT DESIGN - ERATION					al Hrs		(9
Co by	unter sunk amalgama	es to facilitate ma screws - Reduc ation - Design fo cessibility - Desig	tion of mach r machinabi	nined a lity - [area- Sim	nplifica	ation by	separa	ation - S	Simplification
4	COMPO	NENT DESIGN - ERATION	CASTING	- ,		Tot	al Hrs		(9
ma	chined hole	castings based es, redesign of ca e design - group	ast members	to obv	viate core	es- Ide	entificatio	on of u		
5	DESIGN	FOR THE ENVIR	RONMENT			Tot	al Hrs		(9
Me AT Life ma De:	thods – De &T's enviro ecycle asse terial usag sign for ene	Environmental cesign guide lines onmentally responsesment method e – Design for dergy efficiency –	– Example nsible produ – Technique isassembly	applic ict ass s to re Desi	ation – I essment duce en gn for re	ifecyo - We vironm cyclab	cle asse: ighted si nental im pility – D	ssmen um as pact –	t – Bas sessme Desigr for rem	sic method – nt method – n to minimize anufacture –
lot	al hours to	be taught							4	5
Tex	t book (s)									
1		rry, "Designing fo								
2	Bralla., "[Design for Manufa	acture Handl	book",	McGraw	-Hill, N	New York	k, 1999	9.	
Re	erence(s)									
1	Dekker İr	d, G, Heartz and nc., London, 2002	2.							
2		rien and Wood, K								i, 2004.
3	Matousel London,	k, "Engineering D 1974.	esign- A Sys	stemati	ic Approa	ach", E	Blackie &	Son L	_td.,	
4	Allen, Gra	aedel T., "Design	for the Envi	ronme	nt", Pren	tice H	all, New	Jersey	/, 1996.	
5	Fixel, J.,	"Design for the E	nvironment",	, McGr	aw-Hill, I	New D	elhi, 199	96.		

K.S.Ranga	samy College of ⅂	Гесhnology	/ - Auto	nomo	us Re	gulation		R 20	10
Department	Mechanical Engineering	Prograr I	mme Co Name	ode &		PED : M.	E. Engi	neering l	Design
		S	Semeste	er II	1				
Cauraa Cada	Course Na	ame	Hou	rs / We	eek	Credit	Ma	aximum l	Marks
Course Code			L	Т	Р	С	CA	ES	Total
10 PED 205	COMPUTER ANALYSIS LABO II (PED, PCA)	AIDED DRATORY	0	0	3	2	50	50	100
Objective(s)	To develop the Transient and Hocomposite wall a software(Ansys	armonic, Ex and fin, Flui	cplicit, Note that	Non lin	ear a	nalysis ,H	leat tra	nsfer an	alysis of
14. Solid n 15. Bucklir 16. Modal 17. Transic 18. Harmo 19. Drop to 20. Non lir 21. Heat tr 22. Heat tr 23. Air flov	n optimization of camodel creation. In analysis of gear analysis of cantilement analysis of cantilement analysis of cantilement analysis of Alumear contact analysis in ransfer analysis in ansfer analysis in the contact analysis in anafer analysis in an analysis analysis in analysis in analysis in analysis in analysis	shift rod. ver beam. tilever bean tilever bear minum conta sis composite v	n. n. ainer on wall	ı steel į	olate.				
						Total Hrs		45	

K.S.Ranga	samy Colle	ege of Tec	hnology	/ - Au	tonor	nous	Regulation	n		R 20	10
Department	Mecha Engine		Progra	mme Name		&	PED : N	1.E. E	ngi	neering D	esign
				Seme	ster II						
Course				Ηοι	ırs / V	/eek	Credit		Ma	aximum M	arks
Code	Coi	urse Name	9	L	Т	Р	С	CA	١	ES	Total
10 PED 206	TECHNIC PREPARA PRESENT	ATION AN FATION	D	0	0	2	0	100		00	100
Objective(s)		l journals a	and confe	erence	proc	eedin	read and r gs and to li				
Methodolog y	By Sul	y mutual dubject area ne student bllect the present ublished in sing OHP/inutes follone student ear the ender the ender the ender the student age, One ubheadings port has	iscussion to the si s have to ublished is expect the last Power Powed by has make d of the si page As, Concluto be si	ns, the tudent or refer literate ted to 5 year oint, the two emes write abstraction graph and the two literates are two	the James the James to the James the students of the James the Jam	ty gui ourna ct at le dent l discu entation hnica eview arks a co the	the departicle will assist and Connect 20 such as to make assion ons, one at I Report for of Research List of I will be HOD or faculty gui	gn a terminate for the manner of the manner	topii ce sea sen nido ut ; pap	ic in the groceeding arch Paper tation for the and the 30-50 pager under tes). The	gs and rs 15-20 e other ges (Title various technical
	Week	Activity									
	I	Allotment	of Facul	ty Gui	de by	the F	loD				
	II	Finalizing	the topic	with	the a	prov	al of Facult	y Guid	de		
Execution	III-IV	Collection	of Tech	nical p	paper	3					
Excodion	V-VI	Mid seme	ster pres	sentati	ion						
	VII-VIII	Report wr	riting								
	IX	Report su	bmissior	າ							
	X-XI	Final pres	entation								
)% by Con Irs/week	tinuous <i>i</i>	Asses	smen	t					
		Coi	mponent					V	/eig	ghtage	
	Phase -I F	resentatio	n						25	5 %	
Evaluation	Phase - II	Presentati	ion						25	5 %	
	Report Pre	eparation a	and Subr	nissio	n				30) %	
	Final Pres	entation							20) %	
						Total			10	0 %	

K.S.Rangas	samy College of Techno	blogy - Aut	onom	ous Ro	egulation		R 20	10
Department	Mechanical Engineering	rogramme (Code &	k Nam	e PE		E. Engine Jesign	eering
		Semes	ter III					
0		Hou	rs / We	eek	Credit	Ma	aximum l	Marks
Course Code	Course Name	L	Т	Р	С	CA	ES	Total
10 PED 301	PROJECT WORK - PHASE I	0	0	12	2	100	00	100
Objective(s)	To import the practical out the technical proce students to refer, read proceedings relevant to for their final presentation	dures in th and review their proje	eir pro	ject wo esearc	ork. To proh	ovide ai journal	n exposi s and co	ure to the onference
Methodology	 Three reviews three members Problem should Students have Report has to below Preliminary imp Internal evaluate 	one of which the selected to collect all the prepare of the prepar	ch sho ed bout 20 ed by t n can b	uld be) pape the stu	the guide rs related udents as e if possib	to their per the	work	

K.S.Rangas	samy College o	of Technolog	gy - Aut	onom	ous R	egulation		R 20	10
Department	Mechanical Engineering	Programme	e Code	& Nam	е	PED : M.	E. Engi	neering [Design
			Semest	ter IV					
Course Code	Course	Namo	Hou	rs / We	eek	Credit	Ma	aximum l	Marks
Course Code	Course	Course Name		Т	Р	С	CA	ES	Total
10 PED 401	PROJECT WO	DRK -	0	0	40	10	50	50	100
Objective(s)	This enables a to implement hazards by ad	their innovati	ive idea	s to fo	refront	the risk is	ssues a	ind to ret	trieve the
Methodology	three Each Attender for so They Final three extern	reviews have members one dance is comme valid reasonable members on the members on the port should lexpert examples.	e of which be evaluated by the evaluation of the parties of whaminer which is a simple of which is a miner which which is a miner which which is a miner which is a miner which	ch shouluated for all a cormor aper proby the sich shoulth in the	uld be fro 10 review ore cha eferab e comr ould b he col	the guide 0 marks is. If a stud ance may ily in the journittee that the the guid lege)	dent fail be giver urnals/c consis e(If pos	s to attern conferen sts of min	nd review ces nimum of clude one

_	K.S.Ranga	samy College of T	echnology	- Auto	nomo	us Re	gulation		R 20	10
De	partment	Mechanical Engineering	Program	me Cod	le & Na	ame	PED : M	1.E. Enç	gineering	g Design
				Electiv	е					
(Course	_		Hou	rs / We	eek	Credit	Ма	ximum I	Marks
	Code	Course Na	me	L	Т	Р	С	CA	ES	Total
10	PED E01	ADVANCED FINITELEMENT ANALY		3	0	0	3	50	50	100
Obj	ective(s)	To teach student engineering prob provide students analysis tools and	lems involv with a w	ving flu vorking	id med know	chanic	s, linear	and n	on-linea	r and to
1	BENDING	G OF PLATES AND	SHELLS			То	tal Hrs		9	
Plat	e and She	esticity Equations – Ell Elements - Conf oplication and Exam	orming and							
2	NON-LIN	EAR PROBLEMS				То	tal Hrs		9	
Plas	sticity - G	Iterative Technique eometric Non line ess and Contact Pro	arity – larg							
3	DYNAMI	C PROBLEM				To	tal Hrs		9	
		ation – Free, Tran nique – Houbolt, Wi						Proced	lures -S	Subspace
4	FLUID M	ECHANICS AND H	EAT TRAN	SFER		To	tal Hrs		9	
For	mulations	quations of Fluid – Slow Non-Newt eady and Transient	onian Flow							
5	ERROR REFINE	ESTIMATES AND A MENT	ADAPTIVE			To	tal Hrs		9	
Erro	or norms a	nd Convergence ra	tes – h-refin	ement	with ac	daptivi	ty – Adapt	tive refi	nement.	
Tota	al hours to	be taught							45	
Tex	t book (s)									
1		D., "Concepts and dition, 2007.	Application	ns of Fi	nite El	emen	t Analysis	", Wile	y India	Pvt Ltd.,
2		R Chandrupatla, in Engineering", P						, "Intro	duction	to Finite
Ref	erence(s) :									
1	Bathe, K. 1990.	J., "Finite Element	Procedures	in Eng	ineerir	ng Ana	alysis", Pre	entice F	Hall, Nev	v Jersey,
2	S.S.Rao,	"Finite Element An	alysis", Eles	sevier, F	ourth	Editio	n, 2005.			

	K.S.Ranga	samy College of Teo	hnology	- Autoi	nomou	ıs Re	egulation		R 20	10
De	partment	Mechanical Engineering	Progra	amme C Name	ode &		PED : M.	E. Engii	neering	Design
				Elective)					
				Hou	rs / We	eek	Credit	Ма	ximum I	Marks
Cou	ırse Code	Course Nam	e	L	Т	Р	С	CA	ES	Total
10	PED E02	OPTIMIZATION TECHNIQUES IN D	ESIGN	3	0	0	3	50	50	100
Ob	jective(s)	To Impart knowle optimization technique			dyna	mic	constraine	ed and	uncor	nstrained
1	INTRODU	ICTION				Т	otal Hrs		9	
opti		acteristics of mechani Formulation of objective								
2	UNCONS	TRAINED OPTIMIZA	TION			T	otal Hrs		9	
		e and Multivariable n, Pattern and Gradier							minimi	zation –
3	CONSTR	AINED OPTIMIZATIO	N			T	otal Hrs		9	
Lag	range mult	rith equality and ineq ipliers - Geometric pro Genetic algorithms.								
4	STATIC A	PPLICATIONS				T	otal Hrs		9	
axia	al, transver	ications – Design of s se loaded members led members – Desig	for minim	num cos						
5	DYNAMIC	APPLICATIONS				T	otal Hrs		9	
		ications – Optimum olication in Mechanisn								vibration
Tota	al hours to	be taught							45	
Tex	t book (s):									
1		S.Rao., "Engineering Jublishers 1996.	Optimiza	tion Th	eory ar	nd Pi	ractice", Ne	w Age	Internat	ional (P)
2	Johnson F	Ray, C., "Optimum de:	sign of me	echanic	al elem	nents	s", Wiley, Jo	ohn & S	Sons, 19	90.
Ref	erence(s):									
1		oy Deb, "Optimization lia Pvt. 1995.	n for Eng	ineerinç	g desig	n al	gorithms a	nd Exa	mples",	Prentice
2		D.E., "Genetic algori lew York, 1989.	thms in s	earch,	optimiz	zatior	n and macl	nine", E	Barnen, <i>i</i>	Addison-

Department Mechanical Engineering Programme Code & Name PED : M.E. Engineering Elective Course Code Hours / Week Credit Maximum L T P C CA ES 10 PED E03 TRIBOLOGY IN DESIGN 3 0 0 3 50 50	· · ·
Course Code Course Name Hours / Week Credit Maximum L T P C CA ES	Morles
Code Course Name L T P C CA ES	Morles
L T P C CA ES	iwarks
10 PED E03 TPIROLOGY IN DESIGN 2 0 0 3 50 50	Total
	100
Objective(s) To create awareness of the importance of Tribology in design and s machine elements.	election of
1 SURFACES, FRICTION AND WEAR Total Hrs 9 Topography of surfaces – Surfaces features – Experimental Determinations of surface	
Chemical analysis of surface – Surface effects in Tribology – Analysis of surface ro Measurement of surface roughness. Friction – Mechanism of friction, measuring friction, and models of friction – Friction. Properties of metallic and non metallic materials- friction in extreme conditions- Wea mechanism, mapping, measurements, wear resistance materials – surface treatment modifications and surface coatings- Computer Simulations of friction, Lubrication and we	equations - Types, at, surface
2 LUBRICATION THEORY Total Hrs 7	
Lubricants – Selection criteria – Lubrication regimes – Hydrodynamic, elasto a hydrodynamic lubrication - Basic equations - Reynold's equation - Energy equation, lubrication, boundary lubricating films and its properties- Hydrostatic lubrication – Gas lu	boundary
3 DESIGN OF FLUID FILM BEARINGS Total Hrs 9	
Dynamic analysis of hydrodynamic bearing performance, trust and journal bearings—F fixed and pivoted — Mass flow rate, friction, power loss, heat and temperature difference loads, oil film thickness, stiffness of squeeze film and dynamic co-efficient — Hydrosta design.	e, dynamic
4 INDUSTRIAL COMPONENTS AND SYSTEMS Total Hrs 9	
Slider bearings – Self acting finite bearings, failure modes, materials rolling element Types, contact mechanics, bearing internal load distribution, lubrication – Bearing geokinematics, load ratings and life prediction, torque calculation, temperature analysis, testing and failure analysis.	metry and
5 SPACE AND AUTOMOTIVE TRIBOLOGY Total Hrs 1	
Introduction – Mechanism, components, liquid and solid lubricants, accelerated testin testing of space mechanism. Principles of Aerospace eccentric bearing test mechanism. Tribology –Importance, lubrication regimes, engine bearings, wheel bearings, tire- Meload transfer – Contact area and normal pressure distribution, brakes, effects of service oil properties. Tribology in manufacturing – Macro and micro tribology of MEMS in Technologies for machinery diagnosis and prognosis.	m. Engine chanics of on engine
Total hours to be taught 45	
Text book (s):	
1 Cameron, A. "Basic Lubrication Theory", Ellis Herward Ltd., UK, 1981.	
2 Hulling, J.(Editor) – " Principles of Tribology", MacMillan, 1984.	
Poteronace(s):	
Reference(s):	
1 Williams, J.A. "Engineering Tribology", Oxford University Press, 1994.	

K.S.Ranga	samy College of T	echnolog	gy - Aut	onom	ous R	egulation		R 20	10		
Department	Mechanical Engineering	Progr	amme C Name	Code &		PED : M.	E. Engi	neering [Design		
			Elect	tive							
Course	O a surra a Na a		Hou	rs / We	ek	Credit	Ма	aximum N	Marks		
Code	Course Nan	ne	L	Т	Р	С	CA	ES	Total		
10 PED E04	ADVANCED STRENGTH OF MATERIALS		3	0	0	3	50	50 50 10			
Objective(s)	To Analyze, under bodies using tech basic concepts in mechanics of mat	nniques f mechan	rom en	gineeri aterials	ng me s to m	echanics a ore advan	nd app ced top	lied math ics and a	nematics,		
1 ELASTIC	CITY				То	tal Hrs		9			
coordinates- I Representation St.Vennant's p	in relation and Ge Differential equations of three dime orinciple – Plane st ns – Shear flow.	n of equencion	uilibrium stress	n – Co of a t	ompac tensio	t ability - n – Gene	- Boun eralized	dary cor Hooke'	nditions - 's law –		
2 UNSYMN	METRICAL BENDIN	lG			То	tal Hrs		9			
flexural memb	Deflection in beams ers - Circumferenti ds – Closed ring si	al and Ra	adial str	esses	Defl	ection and	l radial	curved b	eam with		
3 THICK C	YLINDERS AND R	OTATING	DISKS	6	То	tal Hrs		9			
to rotation - R	ylinder subjected to adial and tangentia lowable speed. – R	al stresse	s in soli	d disc	and rir						
	N OF NON CIRCUL			j		tal Hrs		9			
	tangular cross secti – Torsional stress						orane a	nalogy –	Prandtl's		
5 STRESS	ES IN FLAT PLATE	ES			То	tal Hrs		9			
Buckling of p	rcular and rectangulates - Theory of odies in point and I	contact	stresses	s – Me	ethods						
Total hours to	be taught							45			
Text book (s) :											
	Boresi and Omar Nonal Education, 198		rttom, "A	Advanc	ed Me	echanics o	f Mater	ials", Joh	nn, Willey		
2 Robert,D Company	.Cook, Wareen.C.Y /, 1985.	ound, "A	dvance	d Mech	anics	of Materia	ıls", Mad	cmillan P	ublishers		
Reference(s):											
1 Srinath.L 2003	.S., Advanced Mec	hanics of	Solids,	Tata N	/lcGra	w Hill Pub	lishing (Company	/ Limited,		
² Publishin	aju, N., Gururaja, g House, 1997.										
3 U.C.Jinda 1997.	al, "Advanced Topi	cs of Str	ength of	f mater	ials",	Galgotia F	Publicati	ons, Firs	st edition,		

K	K.S.Ranga	samy College of Technol	logy - Auto	nomo	us Re	gulation		R 20	10		
Dep	artment	Mechanical Engineering	Progra	mme C Name	ode &	P		E. Engin Design	eering		
			Electiv	e							
С	ourse	O N	Hou	rs / We	eek	Credit	Ма	ximum I	Marks		
(Code	Course Name	L	Т	Р	С	CA	ES	Total		
10 F	PED E05	PRODUCT DATA MANAGEMENT	3	0	0	3	50	50 50			
Obje	ective(s)	To Impart knowledge components on product d					figuratio	n mana	agement		
1	INTROD	UCTION			То	tal Hrs		9			
		o PDM - Present marke in server - Client computin		nts - N	Veed	for colla	boration	- Inte	rnet and		
2	СОМРО	NENTS OF PDM			То	tal Hrs		9			
and		of a typical PDM setup - H f documents - Creating par s.									
3	CONFIG	URATION MANAGEMENT			То	tal Hrs		9			
Base	e lines - P	roduct structure - Configura	ation mana	gement	t - Cas	se studies					
4	PROJEC MANAGI		& CHA	NGE	То	tal Hrs		9			
infor Case	mation flo e studies.	rojects and roles - Life c ow -Work flows - Creation of Change issue - Change ty - Case studies.	of work flow	v temp	lates ·	- Life cycl	e work	flow inte	gration		
5		C PRODUCTS AND VARIA	ANTS		То	tal Hrs		9			
conf	iguration a	ment Systems for FEA da and product configuration - ator for variant creation - R	Generic pi	oduct i	model	ing in con	ifiguratio	on mode	ler - Use		
Tota	I hours to	be taught						45			
Text	book (s)	:									
1	Kevin Ot	to, Kristin Wood, "Product l	Design", Pe	earson,	2001	•					
2	Daniel A	mor, "The E-Business Rev	olution", Pr	entice-l	Hall, 2	000.					
Refe	erence(s) :	:									
1		ed worth. Mark Henderseturing ". McGraw Hill Inc1		ip Wol	lfe. "C	Computer	Integra	ted Des	sign and		
2	Terry Qu	atrain. "Visual Modeling wi	th Rational	Rose a	and Ul	ML ". Add	ison We	esley19	998.		
3	Wind-Ch	ill R5.0 Reference Manuals	s 2000.								

ŀ	K.S.Rang	asamy College of Te	echnology -	Auton	omou	s Reg	julation		R 20	10
Dep	artment	Mechanical Engineering	Program N	nme Co lame	de &		PED : M.E	E. Engi	neering	Design
			Е	lective						
С	ourse	Course Nar	mo.	Hou	rs / We	eek	Credit	Ма	ximum l	Marks
(Code	Course Mai		L	Т	Р	С	CA	ES	Total
	PED E06	DESIGN OF HYDRA AND PNEUMATIC S	SYSTEMS	3	0	0	3	50	50	100
Obje	ective(s)	To Impart knowledg systems, Hydraulic hydraulic & pneuma	& pneumati	c actua	ators, t	heir c	control an	ıd regu	lation e	
1	ACTUAT						tal Hrs		9	
Dete	ermination	wer Generators – S n of volumetric, mech otary Actuators – Sele	anical and o	verall e	efficien	cies c	of positive			
2	CONTRO	OL AND REGULATIO	N ELEMEN	TS		То	tal Hrs		9	
		irection and flow cotems. Electrical control								
3	HYDRAU	JLIC CIRCUITS				To	tal Hrs		9	
circu	its - pres	- Quick return, seques circuits - Hydraulices Design and selectices	milling mad	chine -	Grindi	ng, pl	anning, c	opying	, - Forkl	
4	PNEUM	ATIC SYSTEMS AND	CIRCUITS			To	tal Hrs		9	
Swit meth	ching circ	ndamentals - Contro cuits - Fringe condition apping methods - S	ns modules a	and the	se inte	gratic	n - Sequ	ential c	ircuits -(Cascade
5	INSTALL CIRCUIT	ATION, MAINTENAN S	ICE AND SF	PECIAL		To	tal Hrs		9	
findi	ng - Hyd	quipments - Selectio ro pneumatic circuits Robotic circuits.								
Tota	l hours to	be taught							45	
Text	book (s)	:								
1	Espossit	o, Antony., "Fluid Pov	ver with App	lication	s", Pre	ntice	Hall, New	York,	1980.	
2	Pease, Delhi, 19	Dudleyt, A. and Pippe 85.	enger, John	J., "Ind	dustria	l Hyd	raulics", T	Tata Mo	cGraw-l	Hill, New
Refe	erence(s)	:								
1	Parr, And	drew, "Hydraulic and l	Pneumatics"	, Jaico	Publis	hing H	House, Ne	ew Dell	ni, 2004.	
2	Bolton. V	V., "Pneumatic and H	ydraulic Sys	tems", l	Butterv	vorth	-Heinema	ann, 19	97.	

K	.S.Ranga	samy College of	Technolog	gy - Aut	onom	ous R	egulation		R 20	10
Dep	artment	Mechanical Engineering	Progra	ımme Co	ode & 1	Name	Р		E. Engin Design	eering
				Elect	ive					
C	ourse			Hou	rs / We	ek	Credit	Ma	aximum I	Marks
	Code	Course Na	ame	L	Т	Р	С	CA	ES	Total
10 F	PED E07	APPLIED ENGII ACOUSTICS	NEERING	3	0	0	3	50	50	100
Obj	ective(s)	To Impart knowletheir transmission							ition of s	ound an
1	BASIC C	CONCEPTS OF A	COUSTICS	;		То	tal Hrs		9	
mot Inte	ion – Alter	ustics – Sound pro ration of wave pat – Standing wave	hs –Measu	rement o	of soun	d wav	es – soun	d specti	a– Sour	d fields
2	CHARAC	CTERISTICS OF	SOUND			То	tal Hrs		9	
med wav	lium – Ve e in a bul	ensional wave e locity of plane pro lk of solid – Trans n in two dimensio	ogressive s sverse wav	ound w	ave thr	ough	a thin soli	d rod –	Velocity	of plan
3	TRANSI	MISSION PHENO	MENA			То	tal Hrs		9	
incid	dence - R	nedia – Transmis leflection at the s – Transmission th	surface of a	a solid,	normal					
4		RODUCTION TO TAIL		SSMEN	Т	То	tal Hrs		9	
Wei Lou	ghted sou dness leve	 The decibel sca and pressure levels el, perceived noise d Amplitude meas 	el – Equal e, perceive	Loudnes	ss con	tours	 Perceive 	ed nois	iness –L	oudness.
5	BASIC C	ONCEPTS OF N	OISE CON	TROL		То	tal Hrs		9	
nois	е – Туре	l at source, path, s of machinery in on procedures – A	volved - D	etermin	ation o					
Tota	al hours to	be taught							45	
Tex	t book (s)	:								
1	Kinsler, New Yor	Lawrence E. and k, 1986.	Frey, Aust	in R., "F	undam	entals	of Acous	tics", Jo	hn Wile	y & Son
2		avid A. and Hans Edition, Chapman				ng Noi	ise Contro	ol: Thec	ory and	Practice'
2										
	erence(s)	:								

	asamy College of Te	chnology	- Auto	nomoı	ıs Re	gulation		R 20)10
Department	Mechanical Engineering	Progra	amme C Name	ode &		PED : M.I	E. Engi	neering	Design
			Elective	e					
Course			Hou	rs / We	eek	Credit	Ма	ximum	Marks
Code	Course Nam	ie	L	Т	Р	С	CA	ES	Total
10 PED E08	ADVANCED TOOL	DESIGN	3	0	0	3	50	50	100
Objective(s)	To Impart knowled Treatment design o machine.								
1 TOOL-D	ESIGN METHODS				То	tal Hrs		9	
Techniques in Installation of Electro-dischar	d Ideation – Tentative n Tooling drawings – f Drill Bushings – Pour arge machining for cave	Screws aunch and vity.	and Do	wels – anufac	Hole	location - Electro-	- Jig-b	ooring p	ractice -
	G MATERIALS AND I					tal Hrs		9	
classification	– Taps – Tap classifi					Drills ale cutting			
insert thickness 3 DESIGN Introduction – Gages – Autoclamping – Di	- Taps - Tap classifies for carbide tools OF DRILL JIGS - Fixed Gages - Gage matic gages - Principili jigs - Chip formatic	e Tolerand bles of location in drilling	e selecti es – Thation – g – Ger	ne sele	To ection ng me onside	tal Hrs of materia thods and	tools – al for G d device	Determ 9 ages –I	ndicating
insert thicknes 3 DESIGN Introduction – Gages – Autoclamping – Didli bushings	 Taps – Tap classifiss for carbide tools OF DRILL JIGS Fixed Gages – Gagematic gages – Princip 	e Tolerand bles of loca on in drilling ction – Dri	e selecti es – Thation – g – Ger	ne sele	To ection ng me onsided	tal Hrs of materia thods and	tools – al for G d device	Determ 9 ages –I	ndicating
insert thickness 3 DESIGN Introduction – Gages – Autoclamping – Did Drill bushings 4 DESIGN Introduction – Boring Fixtur construction Strippers and	- Taps - Tap classifies for carbide tools OF DRILL JIGS - Fixed Gages - Gage matic gages - Principili jigs - Chip formatic - Methods of constru	e Tolerance Dies of location – Dries DIES mics – Tytures – Lenentals – swork mat	e selections are sele	ne sele Locatir neral cond mod	To ection ng me onsidedern no es - \ - G	tal Hrs of materia thods and erations in nanufactur tal Hrs /ise Fixtur rinding F	al for G I device the de ring res – M ixtures constru	9 ages –I es – Prir sign of 6 9 Milling F —Type ction –	ndicating nciples of drill jigs -
insert thickness 3 DESIGN Introduction – Gages – Autoclamping – Did Drill bushings 4 DESIGN Introduction – Boring Fixtur construction – Strippers and Bending dies 5 TOOL Did	- Taps - Tap classifies for carbide tools OF DRILL JIGS Fixed Gages - Gage matic gages - Principili jigs - Chip formatic - Methods of construition of FIXTURES AND Fixtures and economics - Broaching Fixtures and pressure pads- Pres	e Tolerandoles of location – Dri DIES mics – Tytures – Lanentals – swork matwing opera	e selections are sele	ne sele Locatir neral cond mod	To ection mg me considering To es – \ Pierolayout	tal Hrs of materia thods and erations in nanufactur tal Hrs /ise Fixtur rinding F	al for G I device the de ring res – M ixtures constru	9 ages –I es – Prir sign of 6 9 Milling F —Type ction –	ndicating nciples of drill jigs -
insert thickness 3 DESIGN Introduction – Gages – Autoclamping – Did Design 4 DESIGN Introduction – Boring Fixtur construction – Strippers and Bending dies 5 TOOL Did CONTRO Introduction – control system tools for numerican discolars in the control of the	- Taps - Tap classifies for carbide tools OF DRILL JIGS Fixed Gages - Gage omatic gages - Principili jigs - Chip formatic - Methods of construit OF FIXTURES AND Fixtures and economes - Broaching Fixed - Die-design fundam pressure pads - Presenting dies - Drawes - Forming dies - Forming dies - Drawes - Forming dies - Drawes - Forming dies - Drawes - Forming dies - For	e Tolerandoles of location – Dries mics – Ty tures – L nentals – swork mat wing opera CALLY cal control ture desig olding met	eselections selections are selections are selections are selections. The selections are selections are selections are selections.	ne sele Locatir neral cond mode Fixtures ixtures ixtures or Strip	To ection ng me onsidedern no es – \ Gerelayout Iayout ally cerical	tal Hrs of materia thods and erations in nanufactur tal Hrs /ise Fixtur rinding Fixing die	tools – al for G d device the de ring res – M ixtures constru un tooli neric co machine	9 ages –I es – Pririsign of of formal for F 9 ntrol –Ne tools tic tool	ndicating nciples of drill jigs – ixtures – s of Die Pilots – Piercing – Jumerical – Cutting changers
insert thickness 3 DESIGN Introduction – Gages – Autoclamping – Did Did Did Did Did CONTRO Introduction – Boring Fixtur construction – Strippers and Bending dies 5 TOOL Did CONTRO Introduction – control system tools for numerican did Did Did Did Did Control system tools for numericand tool positions.	- Taps - Tap classifications - Taps - Tap classifications - Tap cl	e Tolerandoles of location – Dries mics – Tytures – Luentals – swork matwing operators – CALLY cal controlature designolding metals – Introdesignoles of the calculature designolding metals – Introdesignolding – Introdesignolding – Introdesignolding – Introdesignolding – Introdesignolding – Introdesignolding metals – Introdesignolding metals – Introdesignolding – Intr	eselections selections are selections are selections are selections. The selections are selections are selections are selections.	ne sele Locatir neral cond mode Fixtures ixtures ixtures or Strip	To ection ng me onsidedern no es – \ Gerelayout Iayout ally cerical	tal Hrs of materia thods and erations in nanufactur tal Hrs /ise Fixtur rinding Fixing die	tools – al for G d device the de ring res – M ixtures constru un tooli neric co machine	9 ages –I es – Pririsign of of formal for F 9 ntrol –Ne tools tic tool	ndicating nciples of drill jigs – ixtures – s of Die Pilots – Piercing – Jumerical – Cutting changers
insert thickness Introduction - Gages - Autoclamping - Did bushings Untroduction - Boring Fixtur Construction - Strippers and Bending dies TOOL Did CONTRO Introduction - control syster tools for nume and tool posit machine - To	- Taps - Tap classifications for carbide tools OF DRILL JIGS - Fixed Gages - Gage matic gages - Principal fill jigs - Chip formatic - Methods of constructions - Methods of constructions - Broaching Fixtures and economes - Forming dies - Drawessure pads - Present Forming dies - Drawessure pads	e Tolerandoles of location – Dries mics – Tytures – Luentals – swork matwing operators – CALLY cal controlature designolding metals – Introdesignoles of the calculature designolding metals – Introdesignolding – Introdesignolding – Introdesignolding – Introdesignolding – Introdesignolding – Introdesignolding metals – Introdesignolding metals – Introdesignolding – Intr	eselections selections are selections are selections are selections. The selections are selections are selections are selections.	ne sele Locatir neral cond mode Fixtures ixtures ixtures or Strip	To ection ng me onsidedern no es – \ Gerelayout Iayout ally cerical	tal Hrs of materia thods and erations in nanufactur tal Hrs /ise Fixtur rinding Fixing die	tools – al for G d device the de ring res – M ixtures constru un tooli neric co machine	9 ages –l es – Prir sign of of 9 Milling F –Type ction – ng for F 9 ntrol –N e tools tic tool Brown a	ndicating nciples of drill jigs – ixtures – s of Die Pilots – Piercing – Jumerical – Cutting changers
insert thickness DESIGN	Taps – Tap classifics for carbide tools OF DRILL JIGS Fixed Gages – Gage omatic gages – Princip rill jigs – Chip formatic – Methods of constru OF FIXTURES AND Fixtures and economes – Broaching Fixt – Die-design fundam pressure pads- Prese – Forming dies – Dray ESIGN FOR NUMERI DLLED MACHINE The need for numerions in use today – Fixerical control – Tool heioners – Tool presetting oling for Automatic score be taught con, Cyrll., LeCain, George	e Tolerandoles of location - Dries mics - Ty tures - L nentals - swork mat wing opera CALLY cal control ture desig olding met ag - Introd	e selections essentially and the Fations. - A bain for no hods fouction in essentials.	re selection of the sel	To ection ng me onsidedern no es – \ Gerelayout To ollanatially coerical examples ally coerical examples all exam	tal Hrs of materia thods and erations in nanufactur tal Hrs /ise Fixtur rinding Fixing die	tools – al for G d device the de ring res – N ixtures constru un tooli neric co machine Automa of the I	9 ages –l es – Prir sign of o 9 Milling F –Type ction – ng for F 9 ntrol –N e tools tic tool Brown a	ndicating nciples of drill jigs - s of Die Pilots - Piercing - Ummerical Cutting changers and sharp

	K.S.Ranga	asamy College of T	echnology - A	utono	mous	Reg	ulation		R 20	10
Dep	partment	Mechanical Engineering	Programme (Code 8	& Nam	e l	PED : M.	E. Engi	neering	Design
			Ele	ctive						
C	Course			Hou	rs / W	eek	Credit	Ма	ximum l	Marks
	Code	Course Na	ame	L	Т	Р	С	CA	ES	Total
10 F	PED E09	MICRO ELECTRO MECHANICAL SYS DESIGN		3	0	0	3	50	50	100
Obj	ective(s)	To Impart knowled mechanical applic micro system manu	ations, materi	als ar	nd fab	ricati	on proce			
1	INTRODU	JCTION				Tot	tal Hrs		9	
Mici	trostatic fo	-Scaling laws-Scaling orces- Scaling in elect	ctricity- Scaling	ry-Sca ı in flui	iling i	n rigi hanic	id body	dynam	nics- So	caling in
silicare Pho Dep	on compor senside, tolithograp osition by	d wafer-single crysta unds - Sio2, SiC, SiC Quartz-piezoelectr ohy - Ion implantation epitaxy - Etching pro	3N4 and polyc ic crystals p on -Diffusion -	rystalli olyme	ne sili rs fo	con - r ME –CVE	Silicon p EMS -co) - Phys	iezo re Inductiv	sistors - /e poly por dep	· Gallium /mers –
3		ECHANICS	-1-1				al Hrs	1	9	201 11
edg acce	es fixed ar elerometer	tatic bending of thin nd square plate with rs-design theory and anics-Stress intensit	all edges fixed damping co	j – Me	chani	cal vil	oration-re	sonant	vibratio	e willi ali
4	MICRO S		y factors, Frac							stresses-
Clea		SYSTEM MANUFAC				ss an				stresses-
syst	em pack	SYSTEM MANUFAC echnology-Bulk Micr aging-materials-Die urface bonding-Wire	TURING o manufacturi level-device	ng- Su level-	ughne urface	ss an Tot micro	d interfact al Hrs machin	ial frac	ture me 9 GASLIC	stresses- chanics.
syst prep	em pack paration-Su	echnology-Bulk Micr aging-materials-Die	TURING o manufacturi level-device	ng- Su level-	ughne urface	Tot micro m le	d interfact al Hrs machin	ial frac	ture me 9 GASLIC	stresses- chanics.
syst prer 5 Des	em pack paration-So MICRO S ign consid	echnology-Bulk Micr aging-materials-Die urface bonding-Wire	TURING o manufacturi level-device bonding-sealii esign-Mask la	ng- Su level- ng.	ughne urface Syster	Tot micro m le Tot	d interfactal Hrs o machinovel pactal Hrs chanical	ing -L kaging	GASLIC technic	stresses- chanics. GA-Micro ques-Die
syst prer 5 Des micr	em pack paration-Su MICRO S ign consider o system	echnology-Bulk Micr aging-materials-Die urface bonding-Wire SYSTEM DESIGN derations-Process d	TURING o manufacturi level-device bonding-sealii esign-Mask la	ng- Su level- ng.	ughne urface Syster	Tot micro m le Tot	d interfactal Hrs o machinovel pactal Hrs chanical	ing -L kaging	GASLIC technic	stresses- chanics. GA-Micro ques-Die
5 Des micr	em pack paration-Su MICRO S ign consider o system	echnology-Bulk Micr aging-materials-Die urface bonding-Wire SYSTEM DESIGN derations-Process d in -Automotive indus be taught	TURING o manufacturi level-device bonding-sealii esign-Mask la	ng- Su level- ng.	ughne urface Syster	Tot micro m le Tot	d interfactal Hrs o machinovel pactal Hrs chanical	ing -L kaging	GASLIC technic 9 applica s.	stresses- chanics. GA-Micro ques-Die
5 Des micr	em packs paration-Si MICRO S ign consider o system in the	echnology-Bulk Micr aging-materials-Die urface bonding-Wire SYSTEM DESIGN derations-Process d in -Automotive indus be taught	TURING To manufacturi level-device bonding-sealid esign-Mask la stry-Bio medica	ng- Su level- ng. yout (urface Syster design o space	Tot Tot Tot Mecce tele	d interfact al Hrs o machin vel pact al Hrs chanical ecommur	ing -L kaging	GASLIC technic 9 applica s.	stresses- chanics. GA-Micro ques-Die
5 Des micr Tota	em packs paration-Si MICRO S ign considero system al hours to t book (s): Mohamed Julian W.	echnology-Bulk Micr aging-materials-Die urface bonding-Wire SYSTEM DESIGN derations-Process d in -Automotive indus be taught	TURING TO manufacturi level-device bonding-sealin esign-Mask la etry-Bio medica	ng- Su level- ng. yout o	urface System design o space	Tot microm le Tot - Mecce tele	d interfactal Hrs o machinivel pactal Hrs chanical ecommun	ing -L kaging design ication	GASLIC technic 9 applicas.	GA-Micro ques-Die
5 Des micr Tota Tex 1	em packs paration-Si MICRO S ign considero system al hours to t book (s): Mohamed Julian W.	echnology-Bulk Micraging-materials-Die urface bonding-Wire SYSTEM DESIGN derations-Process din -Automotive indus be taught: d Gad-el-Hak, The Materials Gardner, Vijay K. Var John Wiby & sons L	TURING TO manufacturi level-device bonding-sealin esign-Mask la etry-Bio medica	ng- Su level- ng. yout o	urface System design o space	Tot microm le Tot - Mecce tele	d interfactal Hrs o machinivel pactal Hrs chanical ecommun	ing -L kaging design ication	GASLIC technic 9 applicas.	GA-Micro ques-Die
5 Des micr Tota Tex 1	em packs paration-Si MICRO Sign considers system all hours to t book (s): Mohamed Julian W. Devices, erence(s):	echnology-Bulk Micraging-materials-Die urface bonding-Wire SYSTEM DESIGN derations-Process din -Automotive indus be taught: d Gad-el-Hak, The Mardon Wiby & sons Lie w, U.Rembold, Micro	TURING To manufacturi level-device bonding-sealin esign-Mask la stry-Bio medica	ng- Si level- ng. yout oil –Aer	urface Syster design o space	Tot microm le Tot - Merce tele	d interfactal Hrs o machinevel pack al Hrs chanical ecommun	ing -Li kaging design nication	GASLIC technic 9 applicas. 45	GA-Micro ques-Die
syst prer 5 Des micr Tota Tex 1 2 Refe	em packs paration-Si MICRO S ign consider o system in all hours to the book (s): Mohamed Julian W. Devices, erence(s): S.Fatikow Heidelber	echnology-Bulk Micraging-materials-Die urface bonding-Wire SYSTEM DESIGN derations-Process din -Automotive indus be taught: d Gad-el-Hak, The Mardon Wiby & sons Lie w, U.Rembold, Micro	TURING TO manufacturi level-device bonding-sealin esign-Mask la stry-Bio medica MEMS Hand bottadan, Osama td.,2001.	ng- Su level- ng. yout ou I -Aer	urface Syster design o space	Tot Tot - Mecce tele	d interfact cal Hrs o machin vel pack cal Hrs chanical ecommur	ing -L kaging design design ication	GASLIC technic 9 applicas. 45	GA-Micro ques-Die ations of Smart

K	.S.Ranga	samy College of	Technolog	gy - Aut	tonom	ous R	egulation		R 20	10
De	partment	Mechanical Engineering	Progran	nme Co	de & N	ame	PED:	M.E. En	gineerin	g Design
				Elect	tive					
	Course	Course N		Hou	rs / We	ek	Credit	Ma	aximum I	Marks
	Code	Course N	ame	L	Т	Р	С	CA	ES	Total
10 I	PED E10	MECHANICS C COMPOSITE MATERIALS		3	0	0	3	50	50	100
Obj	ective(s)	To Impart know of composite m								chanics
1	INTROD	UCTION				То	tal Hrs		8	
Araı fibe	mid fibers	eed – General Ch - Matrices – Po trices - Fiber sur	lymer, Grap	ohite, C	eramic	and N	Metal Mati	rices -	Characte	eristics of
2	MECHAN	NICS				То	tal Hrs		12	
mod You Ultir	luli based ng's modu nate strer	e - Volume and on strength of ilus - transverse ogths of a unidinamination theory,	materials a Young's mo rectional la	approac dulus – mina -	h and major Chara	Semi Poisso	 Empirion's ratio 	cal mod In-plar	del - Lo ne shear	ngitudinal modulus,
3	PERFOR						tal Hrs		5	
		ical Properties – acture Behavior a				erties –	- Environm	nental e	ffects – L	ong term
4	MANUFA	ACTURING				To	tal Hrs		8	
Pro		 Compression Quality Inspection ng. 								
5	DESIGN	OF STRUCTUR	ES			To	tal Hrs		12	
guio mer	lelines - nber – De	tions - Laminate Joint design-Bolt sign of a compre FEM for design a	ed and Bo	nded Jo ber – D	oints - esign d	Designof a be	n Example am-desigr	es - De	sign of	a tension
Tota	al hours to	be taught							45	
Tex	t book (s)									
1	Mallick, I Dekker Ir	P.K., "Fiber Rein nc, 1993.	forced Com	nposites	: Mate	rials, N	//anufactu	ring and	d Design	", Marcel
2	Autar K.	Kaw, "Mechanics	of Compos	site Mate	erials" (CRC P	ress, 2006	6.		
Ref	erence(s) :									
1		B.D., and Brout d Sons, New Yor		Analysis	s and l	Perforr	mance of	Fiber C	omposit	es", John
2	Ronald G	Gibson, "Principle	s of Compo	site Mat	erial M	lechan	ics", Tata	McGrav	w Hill, 19	94.
3	Chawla k	K.K., "Composite	materials",	Springe	r – Ver	lag, 19)87.			

	k.S.Ranga	samy College of T	echnolog	jy - Aut	onom	ous R	egulation		R 20	10
De	partment	Mechanical Engineering	Prograi	mme Co	ode & I	Name	PED : I	M.E. En	gineerin	g Design
				Elect	ive					
(Course			Hou	rs / We	ek	Credit	Ma	ximum I	Marks
	Code	Course Nar	ne	L	Т	Р	С	CA	ES	Total
10	PED E11	RAPID PROTOTY AND TOOLING	YPING	3	0	0	3	50	50	100
Ob	jective(s)	To understand prototyping in ma				ware	for rapid	protot	yping a	nd rapid
1	INTRODU SYSTEM	JCTION AND ST S	EREOLIT	HOGR	APHY	Tota	l Hrs		12	
App	lications. S ameters - D	meters - Process Selective Laser Sin Data preparation for DEPOSITION MOD	ntering - SLS - Ap	Types	of mad		- Principle			
		cess parameters -		eration -	Applic		_	ound Cu		rinciple of
ope	ration - Ma	chine details - App	lications.							
3 Drin		TED OBJECT MAN peration - LOM m			an date	Total		oc Cor	8	ndoloro
Prin syst	ciple - Th	ermo jet printer - : Object Quadra Sy	Sander's	model i	market	- 3-D	printer -	Genisy	s Xs pri	nter - JP
4	RAPID T	OOLING				Total	Hrs		7	
tool	ing etc. Di	Tooling - Silicone rect Rapid Tooling – ProMetal - Sand	- Direct	AIM - C	uick c	ast pro	ocess - Co	opper p	olyamide	
5	SOFTWA	RE FOR RAPID P			_a!!!!!!				· · · · · · · ·	e - Rapid
	l			PING	<u>-amma</u>	Total		J	12	e - Rapid
soft acci build Prod	wares - C uracy - Da d orientatio cesses - V	erview of Solid vie ollaboration tools - ta preparation erro on. Allied acuum Casting - S and data transfer to s	ROTOTYF w - Magid Rapid Ma ors - Part	cs, mim anufactu building	ics, ma uring P g error	Total agics of rocess s - Er	Hrs communica of Optimiza rors in fini	ator, etc tion - F shing -	12 c Interractors in Influence	e - Rapid tooling. net based ifluencing te of part
soft acci build Prod mod	wares - C uracy - Da d orientatio cesses - V	ollaboration tools - ta preparation erro n. Allied acuum Casting - S nd data transfer to	ROTOTYF w - Magid Rapid Ma ors - Part	cs, mim anufactu building	ics, ma uring P g error	Total agics of rocess s - Er	Hrs communica of Optimiza rors in fini	ator, etc tion - F shing -	12 c Interractors in Influence	e - Rapid tooling. net based ifluencing te of part
soft acco build Prod mod Tota	wares - C uracy - Da d orientatic cesses - V dification a	ollaboration tools - ta preparation erro n. Allied facuum Casting - S nd data transfer to s be taught	ROTOTYF w - Magid Rapid Ma ors - Part	cs, mim anufactu building	ics, ma uring P g error	Total agics of rocess s - Er	Hrs communica of Optimiza rors in fini	ator, etc tion - F shing -	12 c Internactors in Influence	e - Rapid tooling. net based ifluencing te of part
soft acco build Prod mod Tota	wares - C uracy - Da d orientation cesses - V dification and all hours to t book (s):	ollaboration tools - ta preparation erro n. Allied facuum Casting - S nd data transfer to s be taught	ROTOTYI w - Magid Rapid Ma ors - Part Surface Di solid mode	cs, mim anufactu building gitizing els.	ics, ma uring P g error - Surfa	Total agics or rocess s - Er ace Ge	Hrs communica s Optimiza rors in fini eneration f	ator, etc tion - F shing - rom poi	12 c Internactors in Influence Int cloud	e - Rapid tooling. net based fluencing te of part -Surface
soft acci build Prod mod Tota	wares - Curacy - Dad orientation cesses - Volification and hours to the book (s):	ollaboration tools - ta preparation erro on. Allied acuum Casting - S nd data transfer to s be taught	ROTOTYI w - Magid Rapid Ma ors - Part Surface Di solid mode	cs, mim anufactu building gitizing els.	ics, ma uring P g error - Surfa r RP &	Total agics or rocess s - Er ace Ge	Hrs communicates Optimizations in finiteneration f	ator, etc tion - F shing - rom poi	12 c Internactors in Influence Int cloud	e - Rapid tooling. net based fluencing te of part -Surface
soft according build Produced Total	wares - Curacy - Dad orientation cesses - Volification and hours to the book (s):	ollaboration tools - Ita preparation erro Ita preparation erro	ROTOTYI w - Magid Rapid Ma ors - Part Surface Di solid mode	cs, mim anufactu building gitizing els.	ics, ma uring P g error - Surfa r RP &	Total agics or rocess s - Er ace Ge	Hrs communicates Optimizations in finiteneration f	ator, etc tion - F shing - rom poi	12 c Internactors in Influence Int cloud	e - Rapid tooling. net based fluencing te of part -Surface

K.S.Ran	gasamy College of Ted	chnology	- Auto	nomoı	ıs Re	gulation		R	2010
Department	Mechanical Engineering	Progra	mme C Name	ode &		PED : M.	E. Engii	neerin	g Design
			Elective)					
Course			Hou	rs / We	eek	Credit	Ма	ximun	n Marks
Code	Course Name	е	L	Т	Р	С	CA	ES	Total
10 PED E12	MECHANICS OF FRACTURE		3	0	0	3	50	50	100
Objective(s)	To prove in depth stuand to analyze crac scale.								
1 ELEME	NTS OF SOLID MECH	ANICS			То	tal Hrs		9	
The geome	etry of stress and strain		eforma		Plastic	and elas	to-plast	ic defo	ormation -
2 STATIC	NARY CRACK UNDER	R STATIC	LOADI	NG	То	tal Hrs		9	
	ional elastic fields – Ana on - Plastic zone size – it.								opening
3 ENERG	SY BALANCE AND CRA	ACK GRO	WTH		То	tal Hrs		9	
Griffith analy	ysis – Linear Fracture rack arrest.	Mechanic	s - Cra	ck Op	ening	displacer	nent –	Dynar	mic energy
4 FATIGU	JE CRACK GROWTH (CURVE			То	tal Hrs		9	
	elation describing crack changing the load spect						r a give	n load	amplitude
5 ELEME	NTS OF APPLIED FRA	CTURE			То	tal Hrs		9	
Examples of	crack-growth Analysis								
Total hours								45	5
Text book (s):						l		
1 Broek, Internat	David. "Elementary ional Publisher, 1978.	Engineer	ing Fr	acture	Med	chanics",	Fifthof	f &	Noerdhoff
2 Hellan,	Kare., "Introduction of F	racture M	lechani	cs", Mo	Graw	-Hill, New	York,	1985.	
Reference(s):								
1 Presha	nt Kumar., "Elements of	Fracture	Mechar	nics", V	Vheele	er Publish	ing, Alla	ahaba	d, 1999.

K.S.Ranga	asamy College of Tec	hnology	- Auto	nomo	us Re	gulation		R 20	10
partment	Mechanical Engineering	Progra	amme C Name	Code &		PED : M.	E. Engi	neering	Design
			Elective)					
Course	Course Name		Hou	rs / We	eek	Credit	Ма	ıximum l	Marks
Code	Course Name)	L	Т	Р	С	CA	ES	Total
PED E13	APPLIED OBJECT ORIENTED PROGRAMMING		3	0	0	3	50	50	100
ective(s)							nming,	C++ da	ta types,
		ORIENT	ΓED		То	tal Hrs		5	
					tance	, polymoi	phism,	OOP p	oaradigm
C++ DAT	A TYPES				То	tal Hrs		15	
							, flow	control	, Arrays
C++ CLA	SS				То	tal Hrs		5	
ields, clas	s argument and ellises								
CLASS D	DERIVATION				То	tal Hrs		10	
ndard con									
APPLICA	TION				То	tal Hrs		10	
P's applica	itions in linear program	ıming, int	eger pr	ogrami	ming,	simulation	n, etc.		
al hours to	be taught							45	
t book (s)	:								
		, Lewis,	J. "An ir	ntroduc	ction t	o objectiv	e orient	ted prog	ramming
Stanley E	B.Lippman, "C++ prime	r ", Addis	son - We	esley F	Pub. C	o., 1989.			
erence(s)									
Robert La	afore, "Object Oriented	program	ıming in	Turbo	C++	", Galgoti	a Public	cation, 1	992.
Strousstr	up, Bjarne, The "C++ p	orogramn	ning lan	guage	s ", Ad	ddison We	esley, 1	986.	
	partment Course Code PED E13 Jective(s) FUNDAN PROGRA ments of sus Procect C++ DAT Jectives, argo C++ CLA Inition, classicated convation, classicated convation. APPLICA P's applicated to the convation of	Course Code Course Name Code APPLIED OBJECT ORIENTED PROGRAMMING To Impart some functions of OOP, classes, class do on the control of the	Course Code Course Name Code Course Name Code Course Name APPLIED OBJECT ORIENTED PROGRAMMING To Impart some fundamental C++ classes, class derivation FUNDAMENTALS OF OBJECT ORIENT PROGRAMMING ments of OOP, classes, subjects, messus Procedural paradigm, object-oriented C++ DATA TYPES ression and statements, operators, proctures, argument passing, reference arguing class argument and ellises - Class in defined conversions. CLASS DERIVATION CLASS DERIVATION CAPPLICATION P's applications in linear programming, interpretation in the conversion of the co	Partment Engineering Programme Course Code Course Name Course Code Course Name Course Code Course Name Course Code Course Name Code Code Course Name Code Code Code Code Code Code Code Code	Partment Mechanical Engineering Programme Code & Name	Partment Engineering Programme Code & Name Elective Course Code Course Name Code Course Name Code Course Name Code Course Name Code Code Course Name Code Course Name Code Course Name Code Code Course Name Code Code Course Name Code Code Code Course Name Code Code Course Name Code Code Code Code Course Name Code Code Code Code Code Code Course Name Code Elective Course Code Code Course Name Course Code PED: M.E. Engineriment Programme Code & Name	PED: M.E. Engineering Programme Code & Name		

	K.S.Ranga	samy College of Tech	nology	- Autor	nomou	ıs Re	gulation		R 20	10
De	partment	Mechanical Engineering	Progra	amme (Name			PED : M.I	E. Engii	neering	Design
			E	Elective						
_				Hou	rs / We	ek	Credit	Ма	ximum I	Marks
Cou	ırse Code	Course Name		L	Т	Р	С	CA	ES	Total
10	PED E14	DESIGN OF MATERI HANDLING EQUIPMI		3	0	0	3	50	50	100
Ob	jective(s)	To give a comprehens Elevators.	sive insig	ht on d	lesign	of hoi	sts, Hoisti	ng gea	r, conve	yors and
1	MATERIA	LS HANDLING EQUIP	MENT			То	tal Hrs		6	
Тур	es of mate	rial handling equipment	ts - Selec	ction an	d appl	icatio	ns.			
2	DESIGN (OF HOISTS				То	tal Hrs		12	
pull hoo	eys, pulley ks and eye	ting elements - Welded systems, sprockets a hooks - Crane grabs - shoe, band and cone t	and drun Lifting m	ns, Loa	id han	dling	attachme	nts - D	Design o	of forged
3	DRIVES (OF HOISTING GEAR				То	tal Hrs		9	
		ver drives - Traveling ng, jib and luffing gear								monorai
4	CONVEY	ORS				То	tal Hrs		12	
		ption - Design and app veyors - Screw convey					apron con	veyors	and esc	alators
5	ELEVATO	DRS			-	То	tal Hrs		9	
		ors: design - Loading r weights, hoisting mad								aft way
	al hours to		•				<u>'</u>		45	
Tex	t book (s):									
1	Rudenko,	N., "Materials Handling	g Equipm	nent", E	Lnvee	Publi	shers, 197	70.		
2	Spivakovs Publishers	sy, A.O. and Dyachkos, 1985.	ov, V.K.	, "Con	veying	Mac	hines", V	olumes	l and	II, MIR
Ref	erence(s) :									
1	Alexandro	ov, M., "Materials Handl	ling Equi	pments	", MIR	Publi	shers, 198	81.		
2	Boltzharol	l, A., "Materials Handlin	ng Handb	ook", T	he Ro	nald F	Press Con	npany,	1958.	
3	P.S.G. Te	ch, "Design Data Book	", Kalaika	athir Ac	hchag	am, C	oimbatore	e, 2003		
4		K. and Narayana Iyen s, Bangalore, 1983.	ngar, "Ma	achine	Design	Data	Hand Bo	ook", V	ol. 1 &	2, Suma

K	.S.Rangas	samy College of	Technolog	gy - Au	tonom	ous R	egulation		R 20	10
Dep	partment	Mechanical Engineering	Progra	mme C Name	ode &		PED : M.	E. Engi	neering [Design
				Elec	tive					
C	Course	O a surra a Na		Hou	rs / We	ek	Credit	Ма	aximum I	Marks
	Code	Course Na	me	L	Т	Р	С	CA	ES	Total
10 F	PED E15	MEASUREMEN ^T TECHNIQUES	Т	3	0	0	3	50	50	100
Obj	ective(s)	To prove in de measurements, destructive testin	principles	of Ac						
1	FORCES	AND STRAIN ME				То	tal Hrs		9	
- Mo	oire Fringe	principle, types, po - Hydraulic jacks Testing Machines								
2	VIBRATIO	ON MEASUREME	NTS			То	tal Hrs		9	
Trar Vibr	sducers f ation Anal	s of Structural V or velocity and a yzer – Display and – Digital data Acq	acceleratio d recordin	n meas g of sig	sureme	nts. V	ibration n	neter –	Seismo	graphs -
3	ACOUST	ICS AND WIND F	LOW MEA	ASURE	S	То	tal Hrs		9	
Ven	turimeter	Pressure and flow and flow meters rect and indirect m	- Wind	tunnel a						
4	DISTRES	S MEASUREMEN	NTS			То	tal Hrs		9	
reinf		distress in struct in concrete – Ha molition.								
5		STRUCTIVE TES	TING MET	HODS		То	tal Hrs		9	
– UI		n structures, build esting principles ar								
	I hours to	be taught							45	
Text	book (s) :									
1	•	V and Riley WF, " 991.	Experime	ntal Stre	ess Ana	alysis"	, McGraw	Hill Boo	ok Comp	any, N.Y.
2	Srinath L	S., "Experimental	Stress An	alysis",	Tata M	1cGrav	w Hill Com	pany, N	lew Delh	i, 1984.
Refe	erence(s) :									
1		ngh "Experimenta								
2	1997.	S., Radhakrishna								
3	1987.	K,. Clarke J.L ar								
4	Bray D.E N.Y.1989	. & Stanley R. K.,	, "Non-des	structive	Evalu	ation",	McGraw	Hill Puk	olishing (Company,

	K.S.Ranga	samy College of Techn	ology	- Auto	nomou	ıs Reg	julation		R 20	10
De	partment	Mechanical Engineering	Pro	ogramm Na		e &	PE		Engine sign	ering
				Elective)					
_				Hou	ırs / We	eek	Credit	Ма	ximum	Marks
Cou	irse Code	Course Name		L	Т	Р	С	CA	ES	Total
10	PED E16	VIBRATION CONDITION MONITORING	N	3	0	0	3	50	50	100
Ob	jective(s)	At the end of the cours control in design and p of machinery.								
1	INTRODU	JCTION				Tot	al Hrs		9	
Mul	ti Degree F	damentals of Single Deg Freedom System - Conti Numerical methods in V	nuous	systen	n - Det					
2	VIBRATIO	ON CONTROL				Tot	al Hrs		9	
Mat	erial Selec	Reduction of Vibration a ction – Localized addition ation absorbers.								
3	ACTIVE V	/IBRATION CONTROL				Tot	al Hrs		9	
		Concepts and application art structures – Characte								cteristics
4		ON BASED MAINTENAM	NCE F	PRINCIF	PLES	Tot	al Hrs		9	
met Mac	hods of mo hine mair	Condition Monitoring Monitoring - Machine condintenance techniques – Instrumentation	tion m Mach	onitorin	g and ondition	diagno n mor	osis – Vib nitoring t	ration s echniqu	severity ues –	criteria –
5		BALANCING AND					al Hrs		9	
sev	oduction - eral Planes	Dynamic Balancing of F - Machinery Alignment - od - Reverse Indicator Me	· "Rou	gh" Ali	gnmen	it Meth	ods -The	Face		
Tota	al hours to l	be taught							45	
Tex	t book (s) :							1		
1		l. and Wilson, F.I., "Numo v Delhi, 1978.	erical I	Method	s in Fii	nite Ele	ement Ar	nalysis"	Prentic	e Hall of
2	Hartog, J.	O. Den., "Mechanical Vib	oration	s", McG	3raw-H	lill, Nev	w York, 1	985.		
Ref	erence(s) :									
1	Rao, J.S.,	"Vibratory Condition Mo	nitorin	g of Ma	chines	", CRC	Press, I	_ondon	2000.	

K.S.Ranga	asamy College o	f Technolog	gy - Aut	tonom	ous R	egulation		R 20)10
Department	Mechanical Engineering	Progra	mme C	ode & I	Name	P		.E. Engin Design	eering
			Elect	tive					
Course	Course N	lomo	Hou	rs / We	eek	Credit	M	aximum	Marks
Code	Course N	lame	L	Т	Р	С	CA	ES	Total
10 PED E17	MECHANICS		3	0	0	3	50	50	100
Objective(s)	To understand behavior. Und different Comb mechanical be processing	erstanding inations of	the ana	alysis (ith diff	of fibe erent	er reinforc orientation	ed Lar	ninate d he fiber.	esign for Thermo-
1 LAMINA	CONSTITUTIVE	RELATION	IS		To	tal Hrs		12	
Stiffness ma Orthotropic L - Compression 2 FLAT RELATI	ONS	I Commeronation Matri trusion – Fil IATE CO	cial mat x, Trans ament \ NSTITU	terial p sforme <u>Winding</u> JTIVE	oroperi d Stiffr g – Oth To	ties, Rule ness. Man ner Manufa tal Hrs	of Mi ufacturi acturing	xtures. ing: Bag y Process 10	Generally Moulding ses.
Laminated ar Laminates, S Moduli. Eval Determination	stress and Mome nisotropic plates. symmetric Lamina luation of Lamin n of Lamina stress	Laminate C tes, Angle P a Propertie ses within La	onstituti Ily Lami es from	ve Equ nates, Lami	iations Cross	s – Couplir Ply Lamin	ng Inter ates. La	actions, aminate	Balanced Structural
	STRENGTH AN					tal Hrs		5	
Materials. Go	 Maximum Stre eneralized Hill's (Tensor Polynomi 	Criterion for	Anisot	ropic r	nateria	als. Tsai-F	lill's Fa	ailure Cri	terion for
	SIS OF LAMINAT		_		_	tal Hrs		10	
	Equations of Moti e Vibrations – Na			lations.	Statio	Bending	,	Analysis.	Buckling
5 EFFEC	T OF THERMAL F	ROPERTIE	S		То	tal Hrs		8	
Equations. C	of Hooke's Law Orthotropic Lamir alanced Laminate	ia - specia	l Lamir	nate C	onfigu	rations -	Unidir	ectional,	Off-axis,
Total hours to	o be taught							45	
Text book (s)	:								
	R.F., "Principles - CRC press.	of Compo	site Ma	terial I	Mecha	nics", Mc	Graw-H	lill, 1994	, Second
2 Hyer, M	.W., "Stress Analy	sis of Fiber	– Reinf	orced (Compo	site Mate	rials", N	lcGraw-l	Hill, 1998.
Reference(s)	:								
¹ Universi	1. Daniel and Ority Press-2006, Fi	rst Indian Ed	dition - 2	2007.					
	P.K.,"Fiber-Reinfo Inc, 1993	orced Comp	osites:	Materi	als, M	anufacturi	ng and	Design'	', Maneel
• •	J.C., "Primer on C	•							
4 Properti	P.K. and Newma	sher, Munis	h, 1990				_		
	t Mukhopadhyay, ndia) Pvt. Ltd., Hy						d Struc	ctures",	University

K.S.Rang	asamy College of	Technolo	gy - Au	tonom	ous R	egulation		R 20	10
Department	Mechanical Engineering	Progra	ımme C	ode & I	Name	Р		E. Engin Design	eering
			Elec	tive					
Course			Hou	rs / We	ek	Credit	Ma	aximum N	Marks
Code	Course N	ame	L	Т	Р	С	CA	ES	Total
10 PED E18	MODAL ANALY MECHANICAL SYSTEMS	SIS OF	3	0	0	3	50	50	100
Objective(s)	To understand techniques, to k								
1 OVERV	TEW .				То	tal Hrs		6	
	to Modal Testing Theory – Summa ıre.								
2 THEOR	ETICAL BASIS				То	tal Hrs		12	
Damping – Characteristi sinusoidal vil 3 MOBILI Introduction	SDOP System – Hysteretic Damp cs and presentatio pration and FRF Pl TY MEASUREME - Basic Measurem	ing – Ger on of MDOF roperties NT TECHN	neral C - FRF IIQUES n - Stru	ase – Data –	Visco Comp To repara	ous Damp plete and in tal Hrs ation – Ex	ping – ncomple	General ete mode 10 of the St	Case – ls - Non-
	and Amplifiers – A Pration – Mass Car								
4 MODAL	. PARAMETER EX	(TRACTION	N METH	ODS	То	tal Hrs		11	
SDOF Moda Residuals –	– Preliminary che I Analysis-II – Ci MDOF curve-fitting itting – Non linear	rcle Fit Me g procedure	thod -	SDOF	Moda	al Analysis	s III – I	nverse I	Method -
5 DERIVA	ATION OF MATHE	MATICAL I	MODEL	S	То	tal Hrs		6	
	 Modal Models - etons and System 		f Modal	Model	– Re	sponse M	odels –	Spatial	Models –
Total hours t	o be taught							45	
Reference(s)	:								
1 Ewins [J, "Modal Testing	g: Theory ar	nd Pract	ice ", J	ohn W	/iley & Sor	ns Inc., ²	1988.	
2 Nuno M	lanuel Mendes Ma 1997.	ia et al," Th	neoretica	al and I	xperi	mental Mo	dal Ana	alysis", W	iley John

K.S.Ranga	samy College of Tec	hnology	- Auto	nomo	us Re	gulation		R 20	10
Department	Mechanical Engineering	Progra	amme (Code 8	Name	PE		. Engine esign	eering
			Electiv	е					
Course	O a series a Nasasa		Hou	rs / We	eek	Credit	Ма	ximum I	Marks
Code	Course Name	•	L	Т	Р	С	CA	ES	Total
10 PED E19	INTEGRATED MANUFACTURING SYSTEMS		3	0	0	3	50	50	100
Objective(s)	To enlighten the bas planning, computer monitoring and integr	aided pl	anning	and d	control				
1 INTRODU	ICTION				To	tal Hrs		6	
classification manufacturing		linking n	nanufad	cturing					
7	TECHNOLOGY AND S PLANNING	COMPU	TER A	IDED	To	tal Hrs		9	
Introduction-pa	art families-parts cla roup technology. Pr								
3 COMPUT	ER AIDED PLANNING	AND C	ONTRO)L	Tot	al Hrs		9	
requirements	lanning and control- planning (MRP)-sho system-barcode techno	p floor	contro	I-Facto	ory da	ata colle	ction s		
4 COMPUT	ER MONITORING				Tot	al Hrs		9	
control & strat	duction monitoring stegies- direct digital control in AD/CAM.	ntrol-sup	ervisor	y com	puter (control-co	mputer	in QC -	contact
5 INTEGRA	TED MANUFACTURII	NG SYS	ГЕМ		Tot	al Hrs		12	
handling systemanufacturing head changing the manufac	ipplication - features em- computer control g cell. Flexible manufa g FMS - variable missi turing system-compund Expert system in Cl	system acturing son manu uter inte	Intro systems facturin	duction (FMS g syst	n to C) - the em - C	NC Prog	rammin ncept-tr system	g, DNC ansfer s	systems
Total hours to	be taught							45	
Text book (s)	:								
1 Groover, I	M.P., "Automation, Pro	duction S	System	and C	IM", P	rentice-Ha	all of Ind	dia, 2005	5.
2 David Bed	dworth, "Computer Inte	egrated D	esign a	ınd Ma	nufact	uring", TN	лH, Nev	v Delhi	, 1998
Reference(s)	:								
1 Yorem Ko	ren, "Computer Integra	ated Man	ufactur	ing Sy	stems'	', McGrav	/ Hill, 19	983.	
2 Ranky, Pa	aul G., "Computer Integ	grated Ma	anufact	uring",	Prenti	ce Hall In	ternatio	nal 1986	ô.
	mamas, A. Choudry a msterdam, 1985.	nd P.J.W	. Ten H	lagen,	"Desig	n Rules f	or a CII	M syster	n", Nort

ľ	K.S.Ranga	samy College of Tec	hnology -	Auton	omo	us Re	gulation		R 20	10	
De	partment	Mechanical Engineering	Prograr I	nme Co Name	de &		PED : M.	E. Engir	neering	Design	
			E	lective							
		_		Hours	s/W	eek	Credit	Ма	ximum I	Marks	
Cou	rse Code	Course Nam	е	L	Т	Р	С	CA	ES	Total	
10 I	PED E20	THEORY OF PLATE	S AND	3	0	0	3	50	50	100	
Obj	ective(s)	To Impart some fund equations, Energy rand space frames.									
1	THIN PL EQUATION	ATES & GOVERNI	NG DIFF	ERENT	IAL	То	tal Hrs		9		
	Thin Plates with small deflection - Laterally loaded thin plates - Governing differential equation - Various boundary conditions.										
2	BENDING PLATES	OF RECTANGUL	AR & (CIRCUL	AR	То	tal Hrs		9		
Rec	tangular p	ates - Simply suppor lates with various ec ular plates.									
3	ANALYSI	S OF PLATES				То	tal Hrs		9		
Ene	rgy method	ds - Finite difference a	ınd Finite e	element	meth	nods.					
4	SHELLS &	% FOLDED PLATES S	STRUCTU	RE		То	tal Hrs		9		
and	shells of tr	of shells - Types of she anslation, examples, a vior, types, design by	and limitat	ions of	mem	brane	theory - I	Folded			
5	SPACE F						tal Hrs		9		
	ce frames avior.	- Configuration - Ty	ypes of n	odes -	Gen	eral p	rinciples	of desi	gn Phil	osophy -	
Tota	I hours to l	be taught							45		
Text	book (s) :										
1	Szilard, R	., Theory and Analysi	s of Plates	, Prenti	ce Ha	all Inc	, 1995.				
2	Timoshen New York	ko, S. and Krieger S. 1990.	W. Theory	of Plat	es ar	nd Sh	ells, McG	raw Hill	Book C	ompany,	
Refe	erence(s):										
1	Wilhelm F	lügge,"Stresses in sh	ells", Sprin	nger – V	erlag	J					
2	Timoshen	ko, S., "Theory of Pla	tes and Sh	nells", 4 ^t	h Edi	tion, N	лсGraw H	ill, 1990).		
	Subramanian.N, "Principles of Space Structures", Wheeler Publishing Co. 1999.										

	K.S.Ranga	samy College of Tech	nology -	Auton	omou	s Reg	julation		R 20	10
De	partment	Mechanical Engineering	Prog	ramme Nam		&	PEC		Engine sign	ering
			Е	lective						
0 -	0	Ossers News		Hou	rs / We	eek	Credit	Ма	ximum	Marks
Col	urse Code	Course Name	•	L	Т	Р	С	СА	ES	Total
10	PED E21	DESIGN OF HEAT EXCHANGERS		3	0	0	3	50	50	100
Ob	jective(s)	To educate the wa constructional details condensers, evaporate	of Heat	Excha	ngers,	Desi				
1	CONSTRU TRANSFE	JCTIONAL DETAIL R	.S AN	ID H	HEAT	То	tal Hrs		9	
		nd Tube Heat Exchang						Indus	trial App	lications
2	FLOW DIS	STRIBUTION AND STR	RESS AN	ALYSIS	3	То	tal Hrs		9	
		lence - Friction Factor and Pressure Vessels -								
3	DESIGN A	SPECTS				То	tal Hrs		9	
		and Pressure Loss - F Design of Typical Liquid						s - Effe	ct of De	eviations
4	CONDENS	SERS AND EVAPORA	TORS DE	ESIGN		То	tal Hrs		9	
	sign of Sur porators	face and Evaporative	Conden	sers -	Desig	gn of	Shell ar	nd Tub	e - Pla	te Type
5	COOLING	TOWERS				To	tal Hrs		9	
	king - Spra erimental M	ay Design - Selection lethods.	of Pump	s - Far	ns and	l Pipe	s - Testi	ng and	Mainte	nance -
Tota	al hours to b	pe taught							45	
Tex	t book (s):									
1	Taborek, Tab	Γ., Hewitt G.F. and Αfα Co., 1980.	gan, N. "	Heat E	xchan	gers -	Theory	and Pr	actice",	McGraw
2	Walker, "Ir	ndustrial Heat Exchang	ers - A B	asic Gu	ıide", N	/lcGra	w Hill Bo	ok Co.,	1980.	
Ref	erence(s) :									
1	Nicholas C	Cheremisioff, "Cooling T	Гower", А	nn Arbo	or Scie	nce F	Publishers	s, 1981.		
2	Arthur P. F	Fraas, "Heat Exchange	r Design"	, John \	Wiley 8	& Son	s, 1988.			

	K.S.Rangas	samy College o	f Technolog	gy - Aut	tonom	ous R			R 20	
De	partment	Mechanical Engineering	Progra	mme C	ode & I	Name	Р		E. Engin Design	eering
				Elect	tive					
Col	ırse Code	Course N	lame	Hou	rs / We	ek	Credit	Ma	aximum l	Marks
	arse oode	0001301	varric	L	Т	Р	С	CA	ES	Total
10	PED E22	BEARING DES	MICS	3	0	0	3	50	50	100
Ob	jective(s)	To study the bearings under				differ	ent bearir	ngs and	d to an	alyze the
1	CLASSIF BEARING	ICATION AN		CTION	OF	То	tal Hrs		6	
bea Pre	rings- Electision App callic and No	eria-Dry and loctro Magnetic lications-Foil Be on metallic beari	bearings-Di earings-Spe ings	ry bear cial bea	ings-R	olling Selec	Element tion of pl	bearing	gs- Bea	rings fo
2		OF FLUID FILM rformance analy					tal Hrs		10	
loss Exp and	s, Heat and perimental o	gs design proced d temperature curves-Design o earings- Stiffness ON AND DE	distribution f Foil bearin	calculat gs-Air E ion - flov	ions- I Bearing	Desigr ps- Des ators a	based of Hy and pump	n Chai drostati	rts & Ta	ıbles and
3	BEARING	SS					tal Hrs		10	
Fati Inte	que life ca rnal cleara	ses in Rolling alculations- Bea nce – Shaft and	ring operati	ng tem	peratur	e- Lul	orication-	Selection	on of l	ubricants
1			nic bearings	-Rolling) bearin	ig cag	es-bearing		selection	
	DYNAMIC	CS OF HYDROD	YNAMIC B	-Rolling EARING	bearir SS	ng cag To	es-bearing tal Hrs	seals s	selection 10	
and cen	DYNAMIC Irodynamic thrust bea tre Trajecto	CS OF HYDROD Lubrication equirings -Rotating ory- Analysis of	OYNAMIC Blation for dylloads, alter	EARING namic lo	bearings badings and im	ng cag To s-Sque pulse	es-bearing tal Hrs eeze film e loads in jo	seals	10 n journal earings	bearing:
Hyd and cen	DYNAMIC trodynamic thrust bea tre Trajecto dynamic co	CS OF HYDROD Lubrication equirings -Rotating ory- Analysis of	OYNAMIC Blation for dylloads, alter	EARING namic lo	bearings badings and im	To Tos-Sque pulse amic c	es-bearing tal Hrs eeze film e loads in jo	seals	10 n journal earings	bearings
Hyd and cen for 6 5 Rot dan coe	DYNAMIC drodynamic thrust beater Trajector dynamic con ROTOR In or vibration or ping coefficients -M	CS OF HYDROD Lubrication equalings -Rotating ory- Analysis of nditions	DYNAMIC Bi ation for dy loads, alter short bearing itical speed hal bearings dro dynamic	E-Rolling EARING namic lo rnating a gs unde s- supp s-compute Instabi	bearings and imper dyna oort stii	To s-Sque pulse amic co	es-bearing tal Hrs eze film e loads in jo onditions- tal Hrs on critica measurem	effects in burnal speed	selection 10 n journal earings difference 9 ds- Stifff f journa	bearing: - Journal e solution ness and
Hyden and cen for of 5 Rot dan coe Des	DYNAMIC drodynamic thrust beater Trajector dynamic con ROTOR In or vibration or ping coefficients -M	Lubrication equalings -Rotating ory- Analysis of Inditions DYNAMICS In and Rotor criticients of Journations of Hydrations of stable	DYNAMIC Bi ation for dy loads, alter short bearing itical speed hal bearings dro dynamic	E-Rolling EARING namic lo rnating a gs unde s- supp s-compute Instabi	bearings and imper dyna oort stii	To s-Sque pulse amic co	es-bearing tal Hrs eze film e loads in jo onditions- tal Hrs on critica measurem	effects in burnal speed	selection 10 n journal earings difference 9 ds- Stifff f journa	bearing: - Journal e solution ness and
Hyden and cen for c 5 Rot dan coe Des	DYNAMIC drodynamic thrust bea tre Trajecto dynamic co ROTOR I or vibration hping coeff fficients -M sign configu	Lubrication equarings -Rotating ory- Analysis of nditions DYNAMICS and Rotor crificients of journechanics of Hydrations of stable be taught	DYNAMIC Bi ation for dy loads, alter short bearin itical speed hal bearings dro dynamic	E-Rolling EARING namic lo rnating a gs unde s- supp s-compute Instabi	bearings and imper dyna oort stii	To s-Sque pulse amic co	es-bearing tal Hrs eze film e loads in jo onditions- tal Hrs on critica measurem	effects in burnal speed	selection 10 n journal nearings difference 9 ds- Stiff f journa Resonar	bearing: - Journal e solution ness and
Hycoand cen for coed dan coed Des	DYNAMIC drodynamic thrust beatere Trajectedynamic composition repring coefficients - Misign configural hours to the temporal temporal properties and the temporal propert	Lubrication equarings -Rotating ory- Analysis of nditions DYNAMICS and Rotor crificients of journechanics of Hydrations of stable be taught	DYNAMIC Bi ation for dy loads , alter short bearin itical speed hal bearings dro dynamic i journal bea	E-Rolling EARING namic lo rnating a gs unde	bearings and imper dyna port still utation ility- Ha	To s-Sque pulse amic co	es-bearing tal Hrs eze film e loads in jo onditions- tal Hrs on critica measurem quency wh	g seals suffects in purnal by Finite of the control	selection 10 n journal nearings difference 9 ds- Stiff f journa Resonar	bearing - Journa e solution ness and
Hycoand cenfor of 5 Rot dan coe Des Tota Tex	DYNAMIC drodynamic thrust beatere Trajectedynamic composition repring coefficients - Misign configural hours to the temporal temporal properties and the temporal propert	Lubrication equarings -Rotating ory- Analysis of and titions DYNAMICS and Rotor criticients of journechanics of Hydrations of stable the taught	DYNAMIC Bi ation for dy loads , alter short bearin itical speed hal bearings dro dynamic i journal bea	E-Rolling EARING namic lo rnating a gs unde	bearings and imper dyna port still utation ility- Ha	To s-Sque pulse amic co	es-bearing tal Hrs eze film e loads in jo onditions- tal Hrs on critica measurem quency wh	g seals suffects in purnal by Finite of the control	selection 10 n journal nearings difference 9 ds- Stiff f journa Resonar	bearing - Journa e solutio ness an
Hydrand cenfor of 5 Rott dan coe Des Tota 1 Ref	DYNAMIC Irrodynamic thrust bea tre Trajecte dynamic co ROTOR I or vibration pping coeff fficients -M sign configu al hours to t Book (s): Cameron, erence(s):	Lubrication equarings -Rotating ory- Analysis of and titions DYNAMICS and Rotor criticients of journechanics of Hydrations of stable the taught	OYNAMIC Bi ation for dy loads , alter short bearing itical speed hal bearings dro dynamic s journal bear	E-Rolling EARING namic lo rnating a rgs unde s- supp s-compute Instabil rings	bearings boadings and im er dyna bort stil utation dility- Ha	To s-Sque pulse amic confirmess and all freconfirmed Ltd.	es-bearing tal Hrs eze film e loads in jo onditions- tal Hrs on critica measurem juency wh	g seals suffects in purnal by Finite of all speed ents of a suit and and a suit a	selection 10 n journal earings difference 9 ds- Stiff f journa Resonar	bearing – Journa e solution ness and I bearing nce whip
Hyden and cenfor of 5 Rott dann coe Des Tota 1 Ref	DYNAMIC drodynamic thrust bea tre Trajecte dynamic co ROTOR I or vibration pping coeff fficients -M sign configu al hours to t Book (s): Cameron, erence(s):	Lubrication equarings -Rotating ory- Analysis of anditions DYNAMICS In and Rotor crificients of journations of stable be taught A. "Basic Lubrical and a control of the co	ation for dy loads, alter short bearing itical speed hal bearings dro dynamic journal bear cation Theorem.	E-Rolling EARING namic lo rnating a ags unde s- supp s-compute Instabil rings y", Ellis	bearings badings and im er dyna bort stil utation dility- Ha Herwa	To s-Sque pulse amic confiness and all free free free free free free free fr	es-bearing tal Hrs eze film e loads in jo onditions- tal Hrs on critica measurem juency wh	g seals suffects in purnal by Finite of all speed ents of a suit and and a suit a	selection 10 n journal earings difference 9 ds- Stiff f journa Resonar	bearing – Journa e solutio ness an I bearing
Hydrand cenfor of 5 Rot dann coe Des Tota 1 Ref 1	DYNAMIC Irrodynamic thrust beater Trajectedynamic co ROTOR I or vibration ping coefficients -M sign configural al hours to the Book (s): Cameron, erence(s): Neale, M. Halling, J. Williams	Lubrication equarings -Rotating ory- Analysis of nditions DYNAMICS In and Rotor crificients of journations of stable be taught J. "Tribology Hama" J. (Editor) — "Pringle."	ation for dy loads, alter short bearing dro dynamic journal bear and Book", aciples of Trion of Tribology".	E-Rolling EARING namic lo rnating a gs unde s- supp s-compu c Instabi urings y", Ellis Butterw bology '	bearings boadings and im er dyna bort stir utation ility- Ha Herwa vorth Herwa d Univ.	To s-Sque pulse amic confiness and alf fred alf fred millian Press	es-bearing tal Hrs eeze film e loads in journal tal Hrs on criticameasurem quency when the control of the contr	g seals so affects in purnal by Finite of all speed nents of a speed nents	selection 10 n journal learings difference 9 ds- Stiff f journa Resonar 45	bearing Journa e solutio ness an bearin nce whip
Hydrand cen for 6 5 Rot dan coe Des Tot: 1 Ref 1 2 3	DYNAMIC drodynamic thrust bea tre Trajecte dynamic co ROTOR I or vibration ping coeff fficients -M sign configu al hours to t Book (s): Cameron, erence(s): Neale, M. Halling, J. Williams Basu S.K India Pvt	Lubrication equarings -Rotating ory- Analysis of nditions DYNAMICS In and Rotor criticients of journed and stable of stable of the taught A. "Basic Lubrications of the taught J. "Tribology Haw (Editor) — "Pringular Constructions of the taught of taught of the taught of taught of the taught of	ation for dy loads, alter short bearing dro dynamic journal bear gard Book", aciples of Tri Tribology". N. and Ahu 2005.	E-Rolling EARING namic lo nating a gs unde s- supp s-compu c Instabi urings Butterw bology ' Oxford ja, B.B.	bearings and imper dynamics ort stitutation illity- Hawa worth Herwald Univ.	To s-Sque pulse amic confiness and alf free millian Press aments	es-bearing tal Hrs eeze film e loads in journal tal Hrs on critica measurem quency when the control of the cont	g seals so affects in purnal by Finite of all speed nents of a speed nents	selection 10 n journal learings difference 9 ds- Stiffi f journa Resonar 45	bearing Journa e solutio ness an l bearin nce whip
Hycoand cenfor of 5 Rot dan coe Des Tota Tex	DYNAMIC drodynamic thrust bea tre Trajecte dynamic co ROTOR I or vibration ping coeff fficients -M sign configu al hours to t Book (s): Cameron, erence(s): Neale, M. Halling, J. Williams Basu S.K India Pvt	Lubrication equarings -Rotating ory- Analysis of nditions DYNAMICS In and Rotor criticients of journed articles of Hydrations of stables be taught J. "Tribology Ha. (Editor) – "Pringle., Sengupta, S.	ation for dy loads, alter short bearing dro dynamic journal bear gard Book", aciples of Tri Tribology". N. and Ahu 2005.	E-Rolling EARING namic lo nating a gs unde s- supp s-compu c Instabi urings Butterw bology ' Oxford ja, B.B.	bearings and imper dynamics ort stitutation illity- Hawa worth Herwald Univ.	To s-Sque pulse amic confiness and alf free millian Press aments	es-bearing tal Hrs eeze film e loads in journal tal Hrs on critica measurem quency when the control of the cont	g seals so affects in purnal by Finite of all speed nents of a speed nents	selection 10 n journal learings difference 9 ds- Stiffi f journa Resonar 45	bearing Journa e solutio ness and bearing nce whip

K.S	S.Rangas	samy College o	f Technolog	gy - Aut	onom	ous R	egulation		R 20	10
Depa	ırtment	Mechanical Engineering	Progra	ımme C	ode & I	Name	Р		E. Engin Design	eering
				Elect	ive					
Co	urse			Hou	rs / We	ek	Credit	Ма	aximum I	Marks
Co	ode	Course N	lame	L	Т	Р	С	CA	ES	Total
10 PE	ED E23	COMPUTATIO FLUID DYNAM		3	0	0	3	50	50	100
Objec	ctive(s)	To understand heat transfer p		t of bou	ndary	conditi	ons and to	o study	the fluid	flow and
1		IING DIFFEREN IFFERENCE ME	NTIAL EQU	ATION	AND	То	tal Hrs		10	
Classi	ification,	Initial and Bour	ndary condit							
		thod, Central, ors, Grid Indeper			a alliei	ence,	Unilorm	and no	on-uniior	m Gnas,
		CTION HEAT T					tal Hrs		10	
		mensional condu al problem, Two						state pr	oblems,	Transient
3 I	NCOMP	RESSIBLE FLUI	D FLOW			To	tal Hrs		10	
		uations, Stream tion of Boundary						n of pre	essure fo	r viscous
4 (CONVEC	TION HEAT TR	ANSFER AN	ND FEM		To	tal Hrs		10	
dimen Introd	sional duction to	Dimensional ar convection – c o finite elemer e flow – simulatio	diffusion, U nt method	nsteady	two-	dimens	sional co	nvection	n – Dif	fusion –
5 1	ΓURBULI	ENCE MODELS				To	tal Hrs		5	
		lels – One equa s, Prediction of f							nd Low	Reynolds
Total I	hours to	be taught							45	
Text E	Book (s) :									
		r, K., and Sunda g House, New D		"Compu	utationa	al Fluic	I Flow and	l Heat T	ransfer",	Narosa
Refere	ence(s) :									
		sdidar, P.S.,"Co g Company Ltd.,		ulation	of Flov	w and	Heat Tra	nsfer",	Tata Mo	Graw-Hill
2	Subas,	V.Patankar "Nu on, 1980.		eat Tra	ansfer	Fluid	Flow",	Hemis	ohere F	Publishing
3 1	Γaylor, C	and Hughes, J Press Limited, I		Elemen	t Progr	ammir	ng of the	Navier-	Stokes E	quation",
4 A	Anderson	, D.A., Tanneh ansfer ", Hemisp	ill, J.I., and							anics and
_ F	-letcher,	C.A.J. "Computa es, Springer – V	ational Tech	niques f						d General
6 F	-letcher,	C.A.J. "Comput Flow Categories	tational Tec	hniques		iid Dyi	namics 2"	Specif	ic Techn	iques for

K.S.Ran	gasamy College of Tec	hnology	- Autor	nomou	ıs Re	gulation		R 20	10
Department	Mechanical Engineering	Progra	amme (Name	Code &	ı	PED : M.I	E. Engi	neering	Design
		E	Elective						
Course	- N		Hou	rs / We	eek	Credit	Ма	ximum	Marks
Code	Course Name)	L	Т	Р	С	CA	ES	Total
10 PED E24	ENGINEERING	ID RE-	3	0	0	3	50	50	100
Objective(s)	To Integrate the conceeding engineering process,							nsforma	ition, Re-
1 INTRO	DUCTION				Тс	tal Hrs		9	
Productivity productivity	concepts - Macro and cycle.	d Micro f	factors	of pro	ducti	vity, Proc	luctivity	benefi	t model,
2 PRODI	JCTIVITY MODELS				То	tal Hrs		9	
models. Pro	measurement at Internated and intern	n manufa	acturing	and					
3 ORGAI	NIZATIONAL TRANSFOI	RMATION	1		То	tal Hrs		9	
reengineerir	of organizational trans ng, preparing the work DSMCQ and PMP model	force for							
4 RE-EN	GINEERING PROCES LS	SS IMPI	ROVEN	IENT	То	tal Hrs		9	
	s, Edosomwan model, N PDC model.	loen and	Nolan	strate	gy fo	r process	impro	vement,	LMICIP
h	GINEERING T MENTATION	OOLS		AND	То	tal Hrs		9	
Enabling ro	and process tools and le of IT, RE-opportunition of BP, case study - Ord	es, proce	ss rede	esign -	- cas	es. Softw	are me	thods i	n BPR -
Total hours	to be taught							45	
Text book (s	s) :								
1 Suman 1990.	th, D.J., "Productivity En	ngineering	and M	lanage	ment	", Tata M	c Graw	Hill, Ne	ew Delhi,
	nwan, J.A.,"Organization cataloging in pub. Data,		sformat	ion a	nd P	rocess R	e-Engi	neering'	, British
Reference(s	s):								
1 Rastog 1995.	i, P.N. "Re-Engineering	and Re-ii	nventing	g the I	Enterp	orise ", W	heeler	pub. Ne	w Delhi
	rat, Sardana, G.D. and Sa Publishers, New Delhi, 1		, "Prod	uctivity	Man	agement -	- A Sys	tems Ap	proach",

	K.S.Ranga	asamy College of Tec	hnology	- Auto	nomou	ıs Re	gulation		R 20	10
Dep	artment	Mechanical Engineering	Progra	amme C Name	ode &		PED : M.I	E. Engir	neering	Design
			1	Elective)					
C	ourse			Hou	rs / We	eek	Credit	Ма	ximum l	Marks
_	Code	Course Name		L	Т	Р	С	CA	ES	Total
10 F	PED E25	MECHATRONICS IN MANUFACTURING SYSTEMS		3	0	0	3	50	50	100
Obj	ective(s)	To understand the furmicroprocessor in Me								
1	INTROD	UCTION				То	tal Hrs		9	
Introduction to Mechatronics - Systems - Mechatronics in Products - Measurement Systems - Control Systems - Traditional design and Mechatronics Design.										
2	SENSOR	RS AND TRANSDUCE	RS			То	tal Hrs		9	
Mot	ion - Fluid	Performance Termino d pressure - Temperat Servo systems.								
3	<u>-</u>	ROCESSORS IN MEC	HATRON	NICS		То	tal Hrs		9	
usin	g 8105 in:	Architecture - Pin constructions - Interfacing pplications - Temperations	input and	l output	device	es - In	terfacing	D/A cor	nverters	and A/D
4		AMMABLE LOGIC CON			•		tal Hrs		9	
Intro	oduction - rnal relays	Basic structure - Inputs and counters - Data h	ut / Outp andling -	out prod Analog	essing input	g - Pr / outp	ogrammir ut - Select	ng -Mne tion of F	emonics PLC	Timers,
5		AND MECHATRONIC					tal Hrs		9	
Des	igning - Po	ossible design solutions	s - Case :	studies	of Med	chatro	nics syste	ems.		
Tota	al hours to	be taught							45	
Tex	t book (s)	:								
1		B.Histand and David G ', McGraw-Hill Internati				ion to	Mechatro	nics ar	nd Meas	surement
2	Bradley, Hall, 19	D.A., Dawson, D, Bure 1993.	u, N.C. a	ind Loa	ider, A	J., " N	Mechatror	nics ", (Chapma	n and
Refe	erence(s)									
1	Ramesh. Eastern,	S, Gaonkar, "Micropro 1998.	ocessor A	Archited	ture, F	Progra	mming a	nd App	lications	s", Wiley
2	Lawrence	e J.Kamm, "Understa		lectro-l	Mecha	nical	Engineer	ing:An	Introdu	ction to
3	Ghosh, F	P.K. and Sridhar, P.R., tion, Prentice Hall, 199	"Introduc	tion to	Microp	roces	sors for E	nginee	rs and S	Scientists

	K.S.Rangas	samy College of Tec	hnology	- Auto	nomou	ıs Re	gulation		R 20	10
De	partment	Mechanical Engineering	Progra	amme C Name	Code &		PED : M.I	E. Engi	neering	Design
				Elective)					
0	0	Ossara Nasa	_	Hou	rs / We	eek	Credit	Ма	ximum I	Marks
Cot	ırse Code	Course Name	е	L	Т	Р	С	CA	ES	Total
10	PCA E26	INDUSTRIAL ROBO	OTICS	3	0	0	3	50	50	100
Ob	jective(s)	To understand the Application	function	s of I	Robot	Drives	and Co	ontrol, (Cell Des	sign and
1	INTRODU	CTION AND ROBOT	KINEMA	TICS		То	tal Hrs		10	
traje loca 2 Con Hyd hydr	ectories — (tion of obje ROBOT D trolling the raulic and raulic servo	RIVES AND CONTRO Robot motion – Posit Pneumatic drives – valves, electric drive	DL tion and	- Rob velocity and rot	sensir	To ng dev	tal Hrs rices – Ders and co	esign of	orienta 9 drive sy	vstems –
and 3	air operate ROBOT S	<u> </u>				To	tal Hrs		9	
Rob – Ed	otic vision s dge Enhan	nd Sensors – Tactile s system – Image Repr cement – Contrast S raining of vision syste	esentatio Stretching	n - Ima	ge Gra	abbing	ا –Image ا	orocess	sing and	analysis
4		ELL DESIGN AND AI					tal Hrs		9	
	hine interfe ROBOT	design and control – rence – Robot cycle t PROGRAMMING ENCE AND EXPERT	time anal G,	ysis. In ARTIFI	dustria	al appl			Itiple Ro	bots and
prog intel	hods of R gramming n ligence – /	cobot Programming nethods – Motion into Al techniques – prob pplication of Al and KE	 Chara erpolation olem repole 	acteristi n. Artifi resenta	icial int	tellige	nce – Bas	sics – (Goals of	artificial
Tota	al hours to b	e taught							45	
	t book (s):									
Text										
Text	Intelligence Richard. D	Gonzalez, R.C. an e", Mc Graw Hill, 198 D, Klafter, Thomas, A Approach". Prentice-	7 A, Chmie	lewski,	Micha	el Ne	Gin, "Rob			
1 2	Intelligence Richard. D	e", Mc Graw Hill, 198	7 A, Chmie	lewski,	Micha	el Ne				
1 2 Refe	Intelligence Richard. Integrated Perence(s):	e", Mc Graw Hill, 198 D, Klafter, Thomas, <i>F</i>	7 A, Chmie Hall of In	lewski, dia Pvt.	Micha Ltd., 1	el Ne 1984.				
1 2 Refe	Intelligence Richard. E Integrated erence(s):	e", Mc Graw Hill, 198), Klafter, Thomas, <i>F</i> Approach", Prentice-	7 A, Chmie Hall of In gineers" N	lewski, dia Pvt. dc Grav	Micha Ltd., 1	el Ne 1984. 1987.	gin, "Rob			
1 2 Refe	Intelligence Richard. E Integrated erence(s): Yoram Kol Kozyrey, Y	e", Mc Graw Hill, 198 D, Klafter, Thomas, A Approach", Prentice- ren, "Robotics for Eng	7 A, Chmie Hall of In gineers" N	lewski, dia Pvt. dc Grav	Micha Ltd., 1 v-Hill, 2	el Ne 1984. 1987.	gin, "Rob 985.	otics E	ngineeri	

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Depa	artment	Mechanical Engineering	Progra	mme Co	ode & I	Name	Р	ED : I	M.E. Engir Design	neering
				Elect	ive					
Co	urse	Cauraa N		Hou	rs / We	eek	Credit		Maximum	Marks
C	ode	Course N	ame	L	Т	Р	С	CA	ES	Total
10 PE	ED E27	CREATIVITY IN		3	0	0	3	50		100
Objed	ctive(s)	This course will creativity. Add tools, and tec competitive adv	litionally, st hniques to	udents	will be	prep	ared to a	apply	relevant	principles,
1 I	NTRODI	JCTION				То	tal Hrs		4	
Need	for desig	n creativity – cre	ative thinkin	ng for qu	ıality –	essen	tial theory	abou	ıt directed	creativity.
٠,	MECHAN /ISUALIZ		THINKING		AND	То	tal Hrs		11	
compo – Anir data r	ositions i mation a managen	form, pattern, n 2 and 3 dimen erodynamics – vnent for scientific Visualization ber	sional space irtual enviro visualizatio	e - proc nments	edure in scie	for ger entific '	nuine grap Visualizat	hical on –	computer Unifying p	animation rinciple of
3 CREATIVITY Total Hrs 11 Methods and tools for Directed Creativity – Basic Principles – Tools of Directed Creativity – Tools that prepare the mind for creative thought – stimulation of new ideas – Development and Actions: - Processes in creativity ICEDIP – Inspiration, Clarification, Distillation, Perspiration, Evaluation and Incubation – Creativity and Motivation The Bridge between man creativity and the rewards of										
Method that popular Proce Incuba	ods and the repare the sses in contact the state of the s	ools for Directed e mind for creati creativity ICEDIP	ve thought - – Inspiratio otivation Th	- stimula n, Clarif ne Bridg	ation of fication ge bety	l bles – f new i , Distil ween i	Tools of Deas – Delation, Pe	evelop rspira tivity	ed Creativi oment and tion, Evalu and the re	Actions: - uation and
Methor that proce Incubation	ods and trepare the sses in cation — Cativeness	ools for Directed the mind for creati creativity ICEDIP Creativity and M S – Applying Dire	ve thought - — Inspiratio otivation The	- stimulan, Clarit ne Brido rity to th	ation of fication ge between the second of t	oles – f f new i , Distil ween i enge c	Tools of Edeas — Delation, Peman creasef quality rall Hrs	evelop rspira tivity nanaç	ed Creativi oment and tion, Evalu and the re gement.	Actions: - uation and ewards of
Method that p Proce Incubation ova 4	ods and to repare the esses in contract of attiveness DESIGN are selected and another the essential part of th	cools for Directed be mind for creati creativity ICEDIP Creativity and M	ve thought - Inspiratio otivation The cted Creativ esign – Thre eativity and	- stimula n, Clarif ne Bridg rity to th ee levels custom	ation of fication ge between the chall so of Dener ne	ples – f f new i , Distil ween i enge c To sign – eds a	Tools of Edeas – Dolation, Peman crea of quality ratal Hrs Viceral, Enalysis –	evelop rspira tivity nanag Behav Inno	ed Creativionment and tion, Evaluand the regement. 9 ioral and Fevative produces the produces t	Actions: - uation and ewards of Reflective- oduct and
Method that p Proce Incubation innoval 4 [Proce Recycles	ods and to repare the esses in contract of attiveness DESIGN are selected and another the essential part of th	ools for Directed the mind for creativity ICEDIP Creativity and Manager Applying Director, Emotional Dear availability-Crest, future direction	ve thought - Inspiratio otivation The cted Creativ esign – Thre eativity and	- stimula n, Clarif ne Bridg rity to th ee levels custom	ation of fication ge between the chall so of Dener ne	lles – f new i new i nem i new i nem	Tools of Edeas – Dolation, Peman crea of quality ratal Hrs Viceral, Enalysis –	evelop rspira tivity nanag Behav Inno	ed Creativionment and tion, Evaluand the regement. 9 ioral and Fevative produces the produces t	Actions: - uation and ewards of Reflective- oduct and
Method that p Proce Incubation ova 4	ods and the reparent the session of ativeness DESIGN and the design NNOVATIVING Creation monoditation monoditation monoditation and the reparent the session of the session	ools for Directed the mind for creativity ICEDIP Creativity and Manager Applying Director, Emotional Dear availability-Crest, future direction	ve thought - — Inspiratio otivation The cted Creativ esign — Thre eativity and as in this ap uction to The solution — ive Models e Strategy D	- stimular, Clarifore Bridgerity to the elevelse custom plication RIZ merocreating — New eevelopre	ation of fication of fication of chall so of De her ne hof creathodology and so mark	oles — f new i i, Distil ween i enge consistent To sign — eds a sativity To ogy of sustain et disi	Tools of Edeas – Dolation, Peman crea of quality retal Hrs Viceral, Enalysis – thinking intal Hrs Inventive ing succestruption –	evelop rspira tivity nanaç Behav Inno n qual e Pro ssful Comr	ed Creativionment and tion, Evaluand the regement. 9 ioral and fivative prolity manag 10 blem Solv growth — moditation	Actions: - uation and ewards of Reflective- oduct and ement. ving - the Disruptive and DE-
Method that p Proce Incubation ova 4	ods and the reparent the session of attiveness DESIGN and the session of the sess	ools for Directed the mind for creativity ICEDIP Creativity and Managing Direction ICEDIP Creativity and Managing the mind of availability-Creativity — Introduction Introduction — Managing the mind of the managing the mind of the mind	ve thought - — Inspiratio otivation The cted Creativ esign — Thre eativity and as in this ap uction to The solution — ive Models e Strategy D	- stimular, Clarifore Bridgerity to the elevelse custom plication RIZ merocreating — New eevelopre	ation of fication of fication of chall so of De her ne hof creathodology and so mark	oles — f new i i, Distil ween i enge consistent To sign — eds a sativity To ogy of sustain et disi	Tools of Edeas – Dolation, Peman crea of quality retal Hrs Viceral, Enalysis – thinking intal Hrs Inventive ing succestruption –	evelop rspira tivity nanaç Behav Inno n qual e Pro ssful Comr	ed Creativionment and tion, Evaluand the regement. 9 ioral and fivative prolity manag 10 blem Solv growth — moditation	Actions: - uation and ewards of Reflective- oduct and ement. ving - the Disruptive and DE-
Method that p Proce Incubation ova 4	ods and the reparent the session of attiveness DESIGN and the session of the sess	cools for Directed the mind for creativity ICEDIP Creativity ICEDIP Creativity and Managing Direction ICEDIP Creativity and Managing the Growth – Passing the taught	ve thought - — Inspiratio otivation The cted Creativ esign — Thre eativity and as in this ap uction to The solution — ive Models e Strategy D	- stimular, Clarifore Bridgerity to the elevelse custom plication RIZ merocreating — New eevelopre	ation of fication of fication of chall so of De her ne hof creathodology and so mark	oles — f new i i, Distil ween i enge consistent To sign — eds a sativity To ogy of sustain et disi	Tools of Edeas – Dolation, Peman crea of quality retal Hrs Viceral, Enalysis – thinking intal Hrs Inventive ing succestruption –	evelop rspira tivity nanaç Behav Inno n qual e Pro ssful Comr	ed Creativionment and tion, Evaluand the regement. 9 ioral and Frontier productive productive productive management and Frontier Sologrowth — moditation Senior Experience and the senior Experience an	Actions: - uation and ewards of Reflective- oduct and ement. ving - the Disruptive and DE-
Method that p Proce Incubation ova 4	ods and the repare the session of attiveness DESIGN and the design and the design and the design attiveness Design and the design and the design attiveness Design attiv	cools for Directed the mind for creativity ICEDIP Creativity ICEDIP Creativity and Managing Direction ICEDIP Creativity and Managing the Growth – Passing the taught	ve thought - — Inspiratio otivation The cted Creativ esign — Thre eativity and ns in this ap uction to The solution — ive Models e Strategy D g the Baton.	- stimula n, Clarif ne Bridg rity to th ee levels custom plication RIZ me creating - New revelopr	ation of fication of fication of chall so of De ner ne nof cree thodology and so mark ment P	rocess	Tools of Edeas – Dolation, Peman crease full three tal Hrs Viceral, Enalysis – thinking in tal Hrs Inventive ing successing succession successi	Behav Innon qual	ed Creativionment and tion, Evaluand the regement. 9 ioral and F vative prolity manag 10 blem Solv growth — moditation Senior Ex	Actions: - uation and ewards of Reflective- oduct and ement. ving - the Disruptive and DE-
Method that p Proce Incubation ova 4	ods and the repare the session of attiveness DESIGN and the design attiveness Design and the design attiveness Design and the design and the design attiveness Design and the design and the design attivities Design attiv	ools for Directed the mind for creativity ICEDIP Creativity ICEDIP Creativity and Managing the Creativity and Managing the Growth – Passing the taught	ve thought - Inspiration of the cted Creative esign — Three eativity and estivity and estimate e	- stimular, Clarifine Bridge et levels custom plication RIZ meroreating - New evelopr	ation of fication of fication of fication of the chall of	rocess	Tools of Edeas – Dolation, Peman crease full Hrs Viceral, Enalysis – thinking intal Hrs Inventive ing successing successions in the succession	Behave Inno n qual	ed Creativionment and tion, Evaluand the regement. 9 ioral and F vative prolity manag 10 blem Solv growth – moditation Senior Ex	Actions: - uation and ewards of Reflective- oduct and ement. ving - the Disruptive and DE-
Method that p Proce Incubation innovation of the Incubation of the	ods and the repare the repare the repare the repare the repare the repare the research of the repare the repar	ools for Directed the mind for creativity ICEDIP Creativity ICEDIP Creativity and Mis — Applying Directory of the mind of availability-Crestivity — Introducts — Innovator's odel — Segmentin — Managing the Growth — Passing the taught Creativity: Think Petty," how to be detailed. Norman," Emot	ve thought - Inspiration of the continuous of t	- stimular, Clarifine Bridgity to the Bridgity	ation of fication of fication of fication of the chall of	rocess Description To sign — eds a sativity To ogy of sustain et disprocess Description Description Publication Indust	Tools of Edeas – Dolation, Peman crea of quality retailed Hrs Viceral, Enalysis – thinking intal Hrs Inventive ing successfuption – The Recations Increased From the Recation of the Recation	Behave Inno n qual Compole of Compole of York,	ed Creativionment and tion, Evaluand the regement. 9 ioral and fivative prolity manag 10 blem Solv growth — moditation Senior Ex 45 99. 9.	Actions: - uation and ewards of Reflective- oduct and ement. Ving - the Disruptive and DE- secutive in
Method that p Proce Incubation innovation of the Incubation of the	ods and the repare the research of the repare the repar	ools for Directed the mind for creativity ICEDIP Creativity ICEDIP Creativity and Management of availability-Creativity — Introductors — Innovator's pidel — Segment of a Managing the Growth — Passing the taught Creativity: Think Petty," how to be	ve thought - Inspiration otivation The cted Creative esign - Three eativity and estimated to the control of th	- stimular, Clarifine Bridgity to the Bridgity	ation of fication of fication of fication of the chall of	rocess Description To sign — eds a sativity To ogy of sustain et disprocess Description Description Publication Indust	Tools of Edeas – Dolation, Peman crea of quality retailed Hrs Viceral, Enalysis – thinking intal Hrs Inventive ing successfuption – The Recations Increased From the Recation of the Recation	Behave Inno n qual Compole of Compole of York,	ed Creativionment and tion, Evaluand the regement. 9 ioral and fivative prolity manag 10 blem Solv growth — moditation Senior Ex 45 99. 9.	Actions: - uation and ewards of Reflective- oduct and ement. Ving - the Disruptive and DE- secutive in

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De	partment	Mechanical Engineering	Progra	ımme C	ode & 1	Name	Р		E. Engin Design	eering
				Elect	tive					
(Course	_		Hou	rs / We	ek	Credit	Ma	aximum I	Marks
	Code	Course N	ame	L	Т	Р	С	CA	ES	Total
10	PED E28	ENTERPRISE RESOURCE PLANNING		3	0	0	3	50	50	100
Obj	jective(s)	To know the bate to know the bust and to apprecia	siness mod	ules of E	ERP, to	be av	ware of pro			
1	INTRODU	JCTION				To	tal Hrs		10	
Re-	Engineerin	RP framework – I g – Tools – Lar nanagement – Dy	iguages -	Value o	hain –	Supp	ly and De	ing vs emand	Business chain –	process Extended
2	TECHNO	LOGY AND ARC	HITECTUR	RE		То	tal Hrs		10	
		architecture – Te pricing – chain sa					lirection -	Evalua	tion fran	nework -
3	ERP SYS	STEM PACKAGE	S			То	tal Hrs		10	
ERF	as sales	soft, Baan and C force automation al and social issu	- Integration							
4	APPLICA	TION AND TRAI	NING			То	tal Hrs		7	
арр	lications -E	rchitecture – AIN Before and after Ile ERP and MAX	Y2k - critic	al issue	es – Tr	aining	on variou			
5	ERP PRO	OCUREMENT IS:	SUES			То	tal Hrs		8	
		s – Outsourcing E n Companies.	RP – Ecor	nomics -	- Hidde	n Cos	st Issues –	ROI –	Analysis	of cases
Tota	al hours to	be taught							45	
Ref	erence(s) :									
1	Sadagop	an.S , "ERP-A Ma	anagerial P	erspecti	ve", Ta	ta Mc	graw Hill, ′	1999.		
2	Jose Anto	onio Fernandez, '	'The SAP F	R/3 Hand	dbook",	Tata	Mcgraw H	ill, 1998		
3		mar Crag and Ve tice", Prentice Ha			, "Ente	rprise	Resource	Plannir	ng – Co	ncepts
4	Garg & 1999.	Venkitakrishnan	"ERPWAR	RE ERF	P Imple	ementa	ation Fran	nework"	, , Pren	tice Hall,
5		E Vollmann and ons, 1998.	Bery Whyb	oark , "N	/lanufa	cturing	and Cor	ntrol Sy	stems",	Galgothia

ADVANCED THEIR PROCESSING Their PROCESSING	K.S.Ranga	asamy College o	f Technolo	gy - Aut	tonom	ous R	egulation		R 20	10		
Course Code Course Name Hours / Week Credit Maximum Marks L T P C CA ES Tota ADVANCED MATERIALS AND 3 0 0 3 50 50 100 THEIR PROCESSING To impact in the materials and applications of modern metallic and non metallic materials so as identity and select suitable materials for various applications. BEHAVIOUR OF MATERIALS Total Hrs 10 Elasticity in metals and polymers - Mechanism of plastic deformation, role of dislocations, yie stress, shear strength of perfect and real crystals - Strengthening mechanisms, work hardening solid solution hardening, grain boundary strengthening, poly phase mixture, precipitation, aprilicition and dispersion strengthening. Effect of temperature, strain and strain rate on plast behaviors - Super plasticity - Deformation of non crystalline material. FRACTURE BEHAVIOUR Total Hrs 10 Griffith's theory, stress intensity factor and fracture toughness - Toughening mechanisms - Ductil brittle transition in steel - High temperature fracture, creep - Larson-Miller parameter - Deformation and fracture mechanism maps - Faigue, low and high cycle fatigue test, crack initiation are propagation mechanisms and Paris law - Effect of surface and metallurgical parameters on fatigue - Fracture of non metallic materials - Failure analysis, sources of failure, procedure of failuranlysis. SELECTION OF MATERIALS Total Hrs 10 Motivation for selection, cost basis and service requirements - Selection for mechanical propertie strength, toughness, fatigue and creep - Selection for surface durability corrosion and we resistance - Relationship between materials selection and processing - Case studies in material selection with relevance to aero, auto, marine, machinery and nuclear applications. MODERN METALLIC MATERIALS Total Hrs 7 Dual phase steels, Micro alloyed, High strength low alloy (HSLA) steel, Transformation induce plasticity (TRIP) steel, Maraging steel - Intermetallics, Ni and Ti aluminides - Smart material shape memory alloys - Metallic glass - Quasi crystal and nano crystalline materials. Fo	Department		Progra	ımme C	ode & I	Name	Р		-	eering		
Course Code Course Name L T P C CA ES Tota ADVANCED ADVANCED MATERIALS AND To impart knowledge on the structure, properties, fracture behavior, selection materials and applications of modern metallic and non metallic materials so as identity and select suitable materials for various applications. BEHAVIOUR OF MATERIALS Total Hrs ID Elasticity in metals and polymers - Mechanism of plastic deformation, role of dislocations, yie stress, shear strength of perfect and real crystals - Strengthening mechanisms, work hardenin solid solution hardening, grain boundary strengthening, poly phase mixture, precipitation, participier and dispersion strengthening. Effect of temperature, strain and strain rate on plast behaviors - Super plasticity - Deformation of non crystalline material. FracTURE BEHAVIOUR Total Hrs Oriffith's theory, stress intensity factor and fracture toughness - Toughening mechanisms - Ductil brittle transition in steel - High temperature fracture, creep - Larson-Miller parameter - Deformatic and fracture mechanism maps - Faitgue, low and high cycle fatigue test, crack initiation arpropagation mechanisms and Paris law - Effect of surface and metallurgical parameters on fatigue. Fracture of non metallic materials - Failure analysis, sources of failure, procedure of failu analysis. SELECTION OF MATERIALS Total Hrs 10 Motivation for selection, cost basis and service requirements - Selection for mechanical propertie strength, toughness, fatigue and creep - Selection and processing - Case studies in material selection with relevance to aero, auto, marine, machinery and nuclear applications. MOERN METALLIC MATERIALS Total Hrs 7 Dual phase steels, Micro alloyed, High strength low alloy (HSLA) steel, Transformation induce plasticity (TRIP) steel, Maraging steel - Intermetallics, Ni and Ti aluminides - Smart material shape memory alloys - Metallic glass - Quasic systems and applications of engineering polymers - Advanced structural ceramics, WC, TiC, TaC, Al2O3, SiC, Si3N4, CBN and diamond - p				Elect	tive							
ADVANCED MATERIALS AND THEIR PROCESSING To impart knowledge on the structure, properties, fracture behavior, selection materials and applications of modern metallic and non metallic materials so as identity and select suitable materials for various applications. Total Hrs BEHAVIOUR OF MATERIALS Total Hrs 10 BEHAVIOUR OF MATERIALS Total Hrs 11 BEHAVIOUR OF MATERIALS Total Hrs 12 FRACTURE BEHAVIOUR FRACTURE BEHAVIOUR Total Hrs 13 FINA SELECTION OF MATERIALS Total Hrs 14 BESELECTION OF MATERIALS Total Hrs 15 Motivation for selection, cost basis and service requirements - Selection for mechanical properties strength or selection, mainly and vision and we resistance - Relationship between materials selection and processing - Case studies in material selection (TRIP) steel, Maraging steel - Intermetallics, Ni and Ti aluminides - Smart material shape memory alloys - Maraging steel - Intermetallics, Ni and Ti aluminides - Smart material shape memory alloys - Structure, properties and applications. Total Hrs 10 Motivation for selection, cost basis and service requirements - Selection for mechanical properties strength, toughness, faitigue and creep - Selection for surface durability corrosion and we resistance - Relationship between materials selection and processing - Case studies in material selection with relevance to aero, auto, marine, machinery and nuclear applications. 4 MODERN METALLIC MATERIALS Total Hrs 7 Dual phase steels, Micro alloyed, High strength low alloy (HSLA) steel, Transformation induce plasticity (TRIP) steel, Maraging steel - Intermetallics, Ni and Ti aluminides - Smart material shape memory alloys - Metallic glass - Quasi crystal and nano crystalline materials. 5 NON METALLIC MATERIALS Total Hrs 8 Polymeric materials - Formation of polymer structure - Production techniques of fibres, foams, adhesives and coatings - Structure, properties and applications of engineering polymers - Advanced structural ceramics, WC, TiC, TaC, Al2O3, SiC, Si3N4, CBN and diamond - properties processing	0	Cause A	la	Hou	rs / We	ek	Credit	Ma	aximum l	Marks		
10 PED E29	Course Code		vame	L	Т	Р	С	CA	ES	Total		
Objective(s) materials and applications of modern metallic and non metallic materials so as identity and select suitable materials for various applications. BEHAVIOUR OF MATERIALS Total Hrs 10	10 PED E29	MATERIALS A	ESSING			_				100		
Elasticity in metals and polymers - Mechanism of plastic deformation, role of dislocations, yie stress, shear strength of perfect and real crystals - Strengthening mechanisms, work hardenin solid solution hardening, grain boundary strengthening, poly phase mixture, precipitation, particl fiber and dispersion strengthening. Effect of temperature, strain and strain rate on plast behaviors - Super plasticity - Deformation of non crystalline material. 2 FRACTURE BEHAVIOUR Total Hrs 10 Griffith's theory, stress intensity factor and fracture toughness - Toughening mechanisms - Ductil brittle transition in steel - High temperature fracture, creep - Larson-Miller parameter - Deformatic and fracture mechanism maps - Fatigue, low and high cycle fatigue test, crack initiation are propagation mechanisms and Paris law - Effect of surface and metallurgical parameters on fatigue. Fracture of non metallic materials - Failure analysis, sources of failure, procedure of failu analysis. 3 SELECTION OF MATERIALS Total Hrs 10 Motivation for selection, cost basis and service requirements - Selection for mechanical propertie strength, toughness, fatigue and creep - Selection for surface durability corrosion and we resistance - Relationship between materials selection and processing - Case studies in materia selection with relevance to aero, auto, marine, machinery and nuclear applications. 4 MODERN METALLIC MATERIALS Total Hrs 7 Dual phase steels, Micro alloyed, High strength low alloy (HSLA) steel, Transformation induce plasticity (TRIP) steel, Maraging steel - Intermetallics, Ni and Ti aluminides - Smart material shape memory alloys - Metallic glass - Quasi crystal and nano crystalline materials. 5 NON METALLIC MATERIALS Total Hrs 8 Polymeric materials - Formation of polymer structure - Production techniques of fibres, foams, adhesives and coatings - Structure, properties and applications of engineering polymers - Advanced structural ceramics, WC, TiC, TaC, Al2O3, SiC, Si3N4, CBN and diamond - properties processing a	Objective(s)	Objective(s) materials and applications of modern metallic and non metallic materials so as to identity and select suitable materials for various applications.										
stress, shear strength of perfect and real crystals - Strengthening mechanisms, work hardenin solid solution hardening, grain boundary strengthening, poly phase mixture, precipitation, particl fiber and dispersion strengthening. Effect of temperature, strain and strain rate on plast behaviors - Super plasticity - Deformation of non crystalline material. 2 FRACTURE BEHAVIOUR Total Hrs 10 Griffith's theory, stress intensity factor and fracture toughness - Toughening mechanisms - Ductil brittle transition in steel - High temperature fracture, creep - Larson-Miller parameter - Deformatic and fracture mechanism maps - Fatigue, low and high cycle fatigue test, crack initiation ar propagation mechanisms and Paris law - Effect of surface and metallurgical parameters on fatigue - Fracture of non metallic materials - Failure analysis, sources of failure, procedure of failunalysis. 3 SELECTION OF MATERIALS Total Hrs 10 Motivation for selection, cost basis and service requirements - Selection for mechanical propertie strength, toughness, fatigue and creep - Selection for surface durability corrosion and we resistance - Relationship between materials selection and processing - Case studies in materia selection with relevance to aero, auto, marine, machinery and nuclear applications. 4 MODERN METALLIC MATERIALS Total Hrs 7 Dual phase steels, Micro alloyed, High strength low alloy (HSLA) steel, Transformation induce plasticity (TRIP) steel, Maraging steel - Intermetallics, Ni and Ti aluminides - Smart material shape memory alloys - Metallic glass - Quasi crystal and nano crystalline materials. 5 NON METALLIC MATERIALS Total Hrs 8 Polymeric materials - Formation of polymer structure - Production techniques of fibres, foams, adhesives and coatings - Structure, properties and applications of engineering polymers - Advanced structural ceramics, WC, TiC, TaC, Al2O3, SiC, Si3N4, CBN and diamond - properties processing and applications Total hours to be taught 45 Charles J.A., Crane, F.A.A and Furness, J.A.G., "Selection a	1 BEHAV	OUR OF MATER	IALS			То	tal Hrs		10			
brittle transition in steel - High temperature fracture, creep - Larson-Miller parameter - Deformatic and fracture mechanism maps - Fatigue, low and high cycle fatigue test, crack initiation ar propagation mechanisms and Paris law - Effect of surface and metallurgical parameters on fatigu - Fracture of non metallic materials - Failure analysis, sources of failure, procedure of failu analysis. 3 SELECTION OF MATERIALS Total Hrs 10 Motivation for selection, cost basis and service requirements - Selection for mechanical propertie strength, toughness, fatigue and creep - Selection for surface durability corrosion and we resistance - Relationship between materials selection and processing - Case studies in materia selection with relevance to aero, auto, marine, machinery and nuclear applications. 4 MODERN METALLIC MATERIALS Total Hrs 7 Dual phase steels, Micro alloyed, High strength low alloy (HSLA) steel, Transformation induce plasticity (TRIP) steel, Maraging steel - Intermetallics, Ni and Ti aluminides - Smart material shape memory alloys - Metallic glass - Quasi crystal and nano crystalline materials. 5 NON METALLIC MATERIALS Total Hrs 8 Polymeric materials - Formation of polymer structure - Production techniques of fibres, foams, adhesives and coatings - Structure, properties and applications of engineering polymers - Advanced structural ceramics, WC, TiC, TaC, Al2O3, SiC, Si3N4, CBN and diamond - properties processing and applications Total hours to be taught 45 Reference(s): 1 Thomas H.Courtney, "Mechanical Behaviour of Materials ", McGraw-Hill, 2000 2 Charles J.A., Crane, F.A.A and Furness, J.A.G., " Selection and use of Engineerin Materials" (3rd Edition), Butterworth- Heiremann, 1977. 3 Filmn, R.A. and Trojan, P.K., " Engineering Materials and their Applications ", (4th Edition Jaico, 1999) 4 George E.Dieter, "Mechanical Metallurgy ", McGraw Hill, 1988.	fiber and dis	spersion strengthuper plasticity - D	nening. Effe Deformation	ect of t	empera	ature, ne ma	strain an terial.		rate o			
Motivation for selection, cost basis and service requirements - Selection for mechanical properties strength, toughness, fatigue and creep - Selection for surface durability corrosion and we resistance — Relationship between materials selection and processing - Case studies in material selection with relevance to aero, auto, marine, machinery and nuclear applications. 4 MODERN METALLIC MATERIALS Total Hrs 7 Dual phase steels, Micro alloyed, High strength low alloy (HSLA) steel, Transformation induce plasticity (TRIP) steel, Maraging steel - Intermetallics, Ni and Ti aluminides - Smart material shape memory alloys - Metallic glass - Quasi crystal and nano crystalline materials. 5 NON METALLIC MATERIALS Total Hrs 8 Polymeric materials - Formation of polymer structure - Production techniques of fibres, foams, adhesives and coatings - Structure, properties and applications of engineering polymers - Advanced structural ceramics, WC, TiC, TaC, Al2O3, SiC, Si3N4, CBN and diamond - properties processing and applications Total hours to be taught 45 Reference(s): 1 Thomas H.Courtney, "Mechanical Behaviour of Materials ", McGraw-Hill, 2000 2 Charles J.A., Crane, F.A.A and Furness, J.A.G., " Selection and use of Engineerin Materials" (3rd Edition), Butterworth- Heiremann, 1977. 3 Flinn, R.A. and Trojan, P.K., " Engineering Materials and their Applications ", (4th Edition Jaico, 1999) 4 George E.Dieter, "Mechanical Metallurgy ", McGraw Hill, 1988.	brittle transition and fracture propagation repropagation of the fracture of	on in steel - High mechanism map mechanisms and	temperature s - Fatigue Paris law - I	e fracture, low a Effect of	e, cree nd hig surfac	p - Laı h cycl e and	son-Miller e fatigue metallurgi	parametest, cr cal para	eter - De ack initia ameters o	formation ation and on fatigue		
strength, toughness, fatigue and creep - Selection for surface durability corrosion and we resistance — Relationship between materials selection and processing - Case studies in materia selection with relevance to aero, auto, marine, machinery and nuclear applications. 4 MODERN METALLIC MATERIALS Total Hrs 7 Dual phase steels, Micro alloyed, High strength low alloy (HSLA) steel, Transformation induce plasticity (TRIP) steel, Maraging steel - Intermetallics, Ni and Ti aluminides - Smart material shape memory alloys - Metallic glass - Quasi crystal and nano crystalline materials. 5 NON METALLIC MATERIALS Total Hrs 8 Polymeric materials - Formation of polymer structure - Production techniques of fibres, foams, adhesives and coatings - Structure, properties and applications of engineering polymers - Advanced structural ceramics, WC, TiC, TaC, Al2O3, SiC, Si3N4, CBN and diamond - properties processing and applications Total hours to be taught 45 Reference(s): 1 Thomas H.Courtney, "Mechanical Behaviour of Materials ", McGraw-Hill, 2000 2 Charles J.A., Crane, F.A.A and Furness, J.A.G., " Selection and use of Engineerin Materials" (3rd Edition), Butterworth- Heiremann, 1977. 3 Flinn, R.A. and Trojan, P.K., " Engineering Materials and their Applications ", (4th Edition Jaico, 1999) 4 George E.Dieter, "Mechanical Metallurgy ", McGraw Hill, 1988.												
4 MODERN METALLIC MATERIALS Total Hrs 7 Dual phase steels, Micro alloyed, High strength low alloy (HSLA) steel, Transformation induce plasticity (TRIP) steel, Maraging steel - Intermetallics, Ni and Ti aluminides - Smart material shape memory alloys - Metallic glass - Quasi crystal and nano crystalline materials. 5 NON METALLIC MATERIALS Polymeric materials - Formation of polymer structure - Production techniques of fibres, foams, adhesives and coatings - Structure, properties and applications of engineering polymers - Advanced structural ceramics, WC, TiC, TaC, Al2O3, SiC, Si3N4, CBN and diamond - properties processing and applications Total hours to be taught 45 Reference(s): 1 Thomas H.Courtney, "Mechanical Behaviour of Materials ", McGraw-Hill, 2000 2 Charles J.A., Crane, F.A.A and Furness, J.A.G., " Selection and use of Engineerin Materials" (3rd Edition), Butterworth- Heiremann, 1977. 3 Flinn, R.A. and Trojan, P.K., " Engineering Materials and their Applications ", (4th Edition Jaico, 1999 4 George E.Dieter, "Mechanical Metallurgy ", McGraw Hill, 1988.	strength, tou resistance -	ghness, fatigue Relationship betw	and creep veen materia	- Selec als selec	tion fo	r surfand pro	ace durab cessing -	oility co Case st	rrosion a tudies in	and wear		
plasticity (TRIP) steel, Maraging steel - Intermetallics, Ni and Ti aluminides - Smart material shape memory alloys - Metallic glass - Quasi crystal and nano crystalline materials. 5 NON METALLIC MATERIALS Total Hrs 8 Polymeric materials - Formation of polymer structure - Production techniques of fibres, foams, adhesives and coatings - Structure, properties and applications of engineering polymers - Advanced structural ceramics, WC, TiC, TaC, Al2O3, SiC, Si3N4, CBN and diamond - properties processing and applications Total hours to be taught 45 Reference(s): 1 Thomas H.Courtney, "Mechanical Behaviour of Materials ", McGraw-Hill, 2000 2 Charles J.A., Crane, F.A.A and Furness, J.A.G., " Selection and use of Engineerin Materials" (3rd Edition), Butterworth- Heiremann, 1977. 3 Flinn, R.A. and Trojan, P.K., " Engineering Materials and their Applications ", (4th Edition Jaico, 1999) 4 George E.Dieter, "Mechanical Metallurgy ", McGraw Hill, 1988.												
Polymeric materials - Formation of polymer structure - Production techniques of fibres, foams, adhesives and coatings - Structure, properties and applications of engineering polymers - Advanced structural ceramics, WC, TiC, TaC, Al2O3, SiC, Si3N4, CBN and diamond - properties processing and applications Total hours to be taught 45 Reference(s): 1 Thomas H.Courtney, "Mechanical Behaviour of Materials ", McGraw-Hill, 2000 2 Charles J.A., Crane, F.A.A and Furness, J.A.G., " Selection and use of Engineering Materials" (3rd Edition), Butterworth- Heiremann, 1977. 3 Flinn, R.A. and Trojan, P.K., " Engineering Materials and their Applications ", (4th Edition Jaico, 1999) 4 George E.Dieter, "Mechanical Metallurgy ", McGraw Hill, 1988.	plasticity (TR	IP) steel, Marag	ing steel -	Intermet	tallics,	Ni and	d Ti alumi	inides -	Smart ı			
adhesives and coatings - Structure, properties and applications of engineering polymers - Advanced structural ceramics, WC, TiC, TaC, Al2O3, SiC, Si3N4, CBN and diamond - properties processing and applications Total hours to be taught 45 Reference(s): 1 Thomas H.Courtney, "Mechanical Behaviour of Materials ", McGraw-Hill, 2000 2 Charles J.A., Crane, F.A.A and Furness, J.A.G., " Selection and use of Engineering Materials" (3rd Edition), Butterworth- Heiremann, 1977. 3 Flinn, R.A. and Trojan, P.K., " Engineering Materials and their Applications ", (4th Edition Jaico, 1999 4 George E.Dieter, "Mechanical Metallurgy ", McGraw Hill, 1988.	5 NON MI	ETALLIC MATER	IALS			To	tal Hrs		8			
Reference(s): 1 Thomas H.Courtney, "Mechanical Behaviour of Materials ", McGraw-Hill, 2000 2 Charles J.A., Crane, F.A.A and Furness, J.A.G., " Selection and use of Engineering Materials" (3rd Edition), Butterworth- Heiremann, 1977. 3 Flinn, R.A. and Trojan, P.K., " Engineering Materials and their Applications ", (4th Edition Jaico, 1999) 4 George E.Dieter, "Mechanical Metallurgy ", McGraw Hill, 1988.	adhesives an Advanced str	d coatings - Structural ceramics,	cture, prope	rties and	d applic	ations	of engine	ering po	olymers -			
 Thomas H.Courtney, "Mechanical Behaviour of Materials ", McGraw-Hill, 2000 Charles J.A., Crane, F.A.A and Furness, J.A.G., " Selection and use of Engineering Materials" (3rd Edition), Butterworth- Heiremann, 1977. Flinn, R.A. and Trojan, P.K., " Engineering Materials and their Applications ", (4th Edition Jaico, 1999) George E.Dieter, "Mechanical Metallurgy ", McGraw Hill, 1988. 	Total hours to	be taught							45			
Charles J.A., Crane, F.A.A and Furness, J.A.G., "Selection and use of Engineering Materials" (3rd Edition), Butterworth- Heiremann, 1977. Flinn, R.A. and Trojan, P.K., "Engineering Materials and their Applications ", (4th Edition Jaico, 1999) George E.Dieter, "Mechanical Metallurgy", McGraw Hill, 1988.	Reference(s)	:										
Materials" (3rd Edition), Butterworth- Heiremann, 1977. Flinn, R.A. and Trojan, P.K., " Engineering Materials and their Applications ", (4th Edition Jaico, 1999) George E.Dieter, "Mechanical Metallurgy ", McGraw Hill, 1988.	1 Thomas	H.Courtney, "Me	chanical Be	haviour	of Mat	erials "	, McGraw	-Hill, 20	000			
Jaico, 1999 George E.Dieter, "Mechanical Metallurgy ", McGraw Hill, 1988.	Material	s" (3rd Edition),	Butterworth	- Heiren	nann, 1	977.						
			P.K., " Engir	neering	Materia	als and	d their App	olication	ns ", (4th	Edition)		
5 Motols Hand Book Val 10 "Egilure Analysis and Brayantian " (40th Edition) 1004	4 George	E.Dieter, "Mecha	nical Metallu	urgy ", N	1cGraw	Hill, 1	988.					
Metals Hand Book, Vol.10, "Failure Analysis and Prevention", (10th Edition), 1994.	5 Metals I	Hand Book, Vol.10	0, "Failure A	nalysis	and Pr	eventio	on ", (10th	Edition), 1994.			

K	.S.Rangas	samy College of	Technolog	gy - Aut	tonom	ous R	egulation		R 20	10	
De	partment	Mechanical Engineering	Progra	mme C	ode & I	Name	Р		E. Engin Design	eering	
				Elect	tive						
		_		Hou	rs / We	ek	Credit	Ma	aximum I	Marks	
Cou	ırse Code	Course N	ame	L	Т	Р	С	CA	ES	Total	
10	PED E30	SPECIAL EXPERIMENTA TECHNIQUES		3	0	0	3	50	50	100	
Ob.	jective(s)	To impart know and to know ab							action te	chniques	
1	1 METALLOGRAPHIC TECHNIQUES Total Hrs 10 Resolution, depth of focus and components of microscope, polarized light, plane contrast,										
inte		ot stage and qua									
2	X-RAY D	IFFRACTION TE	CHNIQUES	3		То	tal Hrs		10		
		spectrum – Brag sity of diffracted						ating ci	rystal an	d powder	
3		GRAPHIC PROJ DCAL LATTICE	IECTION AI	ND		То	tal Hrs		10		
diffr	action appl	 general featur lication in determase estimation. 									
4	ELECTRO	ON MICROSCO	PY (9)			То	tal Hrs		7		
prep syst	paration te	and operation of chniques, elemonstruction and operation of the context of th	ental analy	sis by	wavele	ength	dispersive	and e	energy c	Iispersive	
5		ED CHEMICAL A S METHODS	AND THER	MAL		То	tal Hrs		8		
		opy, spectromet , high temperatur									
Tota	al hours to	be taught							45		
Ref	erence(s) :										
1	Philips V. 1971.	A. "Modern Meta	allographic	Technic	ques ar	nd the	ir Applicat	ions", W	Viley Inte	rscience,	
2	2 Cullity B.D. "Elements of X- ray Diffraction", 4th Edition, Addison Wiley, 1978.										
3	Thomas. G. "Transmission Electron Microscopy of Metals". John Wiley. 1961.										
4	Smallmar	n R.E. "Modern P	hysical Met	allurgy"	, 4th E	dition,	Butterwor	ths. 198	35.		
5	Loretto. M	/I.H. "Electron Be	am Analysi	s of Mat	terials",	Chap	man and I	Hall, 198	34.		

	K.S.Rar	ngasamy College	of Technolog	y - Au	tonor	nous I	Regulati	on		R 2010
Dep	partment	Mechanical Engineering	Programme C	ode &	Name	e P	ED : M.E	E. Eng	jineerin	g Design
			Ele	ective						
				Hou	ırs / W	/eek	Credit	N	laximun	n Marks
Coui	rse Code	Course	Name	L	Т	Р	С	CA	ES	Total
10 F	PED E31	MEASUREMEN CONTROL	TS AND	3	0	0	3	50	50	100
Obje	ective(s)	To provide soun	d knowledge in	the ba	sic co	ncepts	s Measu	remer	nts and	Control
1	FUNDAM	ENTALS OF INS	TRUMENTATIO	ON		Tot	al Hrs.			9
analy	/sis, Syste	ssification, Charac matic and randor measuring instru	n errors, Statis	tical a	nalysi	s, Unc				
2	INTELLIG	SENT INSTRUME	NTATION			Tot	al Hrs.			9
		d acquisition, use			ent for	error	reduction	n, eler	nents of	f micro-
3	APPLICA	TION OF INTELL	IGENT INSTRU	JMEN	ΓS	Tot	al Hrs.			9
flow, optica	use of inte al gas ar	of thermo-physical elligent instrumer nalyzers, measur neasurement pf pl	nts for the physement of smo	sical va oke, o	ariable lust a	es. Chand m	emical. oisture,	Therm gas	nal, mag	gnetic and
4		N, HEAT FLUX M					al Hrs.			9
		nadow graph, So Telemetry in engir		romet	er, La	ser D	oppler a	anemo	ometer,	hear flux
5		QUISITION SYS					al Hrs.			9
contr boile base	ols (CAMA) r houses - d temperat	cers – Interface s AC) standards – I - D-DAC (Distrib ture control syste rol systems	EEE 488 stand uted Data acq	lard in Juisitio	terface	e – Re Contr	mote mote moteral	onitori ems)	ing and – Micro	control of processor
	hours to b								•	45
Refe	rence(s):									
1.	Holman,	J.P., Experimenta	I methods for e	nginee	rs, Mo	Graw	Hill, 195	8		
2.	Barney, Ir	ntelligent Instrume	entation, Prentic	ce Hall	of Inc	lia, 198	38			
3.	Publisher						_	_		
4.	McGraw-l	C.S. Sharma, G. Hill, New Delhi, 19	983.							ems, Tata
5.		Measurement Sys								
6.	Morris. A.	S, Principles of M	leasurements a	ınd Ins	trume	ntation	Prentic	e Hall	of India	a, 1998.
7.		C barney, Inte nents and Contro					ocessor	and	Applic	ations in

	K.S.Rar	ngasamy College	of Technolog	y - Au	tono	mous I	Regulati	on		R 2010
Dep	partment	Mechanical Engineering	Programme C	ode &	Nam	ne P	ED : M.E	E. Eng	gineerin	g Design
			Ele	ective						
				Hou	ırs / V	Neek	Credit	N	laximun	n Marks
Cou	rse Code	Course	Name	L	Т	Р	С	CA	ES	Total
10 F	PED E32	MICROCONTRO SYSTEM DESIGNAPPLICATIONS	SN AND	3	0	0	3	50	50	100
Obj	ective(s)	To provide soun and applications		the b	asıc	•		rocon	itroller a	and design
1	8051 ARC	CHITECTURE				Tot	tal Hrs.			9
		ion – 8051 CPU s - Timing diagram -								
2	PERIPHE	RALS AND INTE	RFACING			Tot	tal Hrs.			9
Mem	ory Interfac	ucture – Bus – Me cing – Polling – In eration – Serial po	terfacing Basic							
3	8096 ARC	CHITECTURE				Tot	al Hrs.			9
Statu	ıs registers	 Interrupt structu Instruction Set tack Memories – I 	- Addressing N	/lodes						
4	PERIPHE	RALS AND INTE	RFACING			Tot	al Hrs.			9
		e – Serial Ports – ory Timing – Exter								
5	CASE ST	UDY FOR 8051 A	ND 8096			Tot	al Hrs.			9
		c – DC Motor Spe quency Measurem					Signals	for C	onverte	rs and
Tota	I hours to b	e taught								45
Refe	rence(s):									
1.	John B.F Singapore	Peatman, "Desigr e, 1989.	n with Micro	contro	llers"	', McG	raw Hill	inte	nationa	l Limited,
2.		later, "Microproce rentice Hall, New		sign A	com	prehens	sive guid	le to e	ffective	Hardware
3.	Ayala, Ke 2000.	nneth, "The 8051	Microcontrolle	r" Upp	er Sa	addle R	liver, Ne	w Jer	sey Pre	entice Hall,
4.	Intel Man	ual on 16 bit embe	edded controlle	rs, Sar	nta C	lara, 19	91.			
5.		ad Ali Mazidi, Ja Person Educatio		nazidi.	"The	e 8051	Microco	ntrolle	er and I	Embedded

	K.S.Rar	ngasamy College	of Technolog	y - Au	tono	mous F	Regulati	on		R 2010
De	partment	Mechanical Engineering	Programme C	ode &	Nam	ie P	ED : M.	E. Eng	gineering	Design
			Ele	ctive						
				Hou	ırs / V	Veek	Credit	N	laximum	Marks
Cou	irse Code	Course	Name	L	Т	Р	С	CA	ES	Total
10	PED E33	ADVANCED INT		3	0	0	3	50	50	100
Obj	jective(s)	To provide so Combustion Eng		je in	the	basic	concep	ts A	dvanced	Internal
1	FUNDAMI	ENTALS OF I.C E	NGINE			Tot	al Hrs.		!	9
injed	tion, Direct	Engines, mixture	es of combusti							
2		 Combustion char TION TECHNIQU 		NE		Tot	al Hrs.		!	9
syste	ems – Com	nition engines, Sobustion chambers ir motion – Introdu	s – Fuel spray b	ehavi	our –	spray	structure	, spra		
3		TS OF ENGINE S					al Hrs.		,	9
	ous engine	odeling, Basic co processes for S								
4	ALTERNA	TIVE FUELS				Tot	al Hrs.		,	9
Liqu	efied Petro	s, Alcohol, Hydro oleum Gas- Pro Oual fuel operation	perties, Suita							
5		TRENDS IN IC E				Tot	al Hrs.		!	9
com appl	pression igr ications – M	Lean Burn Engine nition engines – P Iining, Defence, C le fuel systems. S	lasma Ignition - Off-highway -Tra	- Zero	Emis	sion Ve	ehicles, I	Engin	es for sp	
Tota	l hours to b	e taught							4	15
Refe	erence(s):							•		
1.	K.K. Rama	alingam, Internal (Combustion En	gine F	unda	mentals	s, Scitec	h Pub	lications	, 2002.
2.	John B He	eywood, Internal C	Combustion Eng	gine Fu	ındar	nentals	, McGra	w Hill	1988.	
3.	Publication	ur and R.P.Sharn ns, New Delhi.					_		·	
4.		ur and R.P. Sharm					Dhanpat	Rai a	nd Sons	, 1998.
5.		an, Int. Combustic								
6.	•	th, Auto fuel Syste V. Computer simu								erahad
7.	1993.	V. Computer simu	•							
8.	Ganesan	v. Computer simt	nadon of compr	CSSION	igriil	ion eng	mie. One	ziil LO	ng man,	2 000.

K.S.	Rangasamy College	e of Technolog	ıy - Au	tonor	nous F	Regulati	on		R 2010
Departmen	Mechanical Engineering	Programme C	Code &	Name	e P	ED : M.I	E. Eng	ineerin	g Design
		Ele	ective						
			Нос	ırs / W	/eek	Credit	М	aximun	n Marks
Course Cod	le Course	Name	L	Т	Р	С	CA	ES	Total
10 PED E3	4 ADVANCED HE MASS TRANSF		3	0	0	3	50	50	100
Objective(s	To provide soul Transfer.	nd knowledge	in the	basic	conce	epts Adv	/anced	Heat	and Mass
1 FUNDA	AMENTALS OF CON SFER	IDUCTION HEA	AT		Tot	al Hrs.			9
conduction Lumped An function.	ional study and trans equations-varying that alysis-Heisler's char TION HEAT TRANF	hermal conduc t, extended si	ctivity-A	\nalyti	cal ar etric n	nd semi	-analy	tical so	olutions,
heat transfer conduction a 3 MOME LAYEF	with moving boundar r in enclosures contain and convection. ENTUM AND TURBU R HEAT TRANSFER and Energy Equation bulence Model – K	ning absorbing LENT BOUNDA s, Turbulent Bo	and er	nitting	Tot r Heat	a – intera al Hrs. Transfei	r, Mixir	of radia	9 th
Reynolds, C	olburn, Prandtl Turbu EXCHANGER AND I	lent flow in a T			eed flo		ntum	ransie	9
	on with shear edge or bach and design proc					flow boi	ling, H	eat exc	hanger,
5 MASS	TRANSFER				Tot	al Hrs.			9
	er, Vaporization of dr in various application							ransfer	-
Total hours t	to be taught								45
Reference(s):								
1. Incrope	era F.P. and DeWitt.	D.P., Fundame	ntals o	f Heat	& Mas	ss Trans	fer, Jo	hn Wile	y & Sons,
2. Ozisik.	M.N., Heat Transfer	– Basic Approa	ach, Mo	Graw	-Hill C	o., 1985			
3. Schlich	nting, Gersten, Bound	dary layer Theo	ry, Spr	inger,	2000				
4. P.K. N	ag, Heat Transfer, Ta	ata McGraw-Hill	l, 2002						
5. McGra	now. W.M., Harnett w-Hill, NY1985						ansfer	Applica	ations,
6. Anthor	ny F. Mills, Basic Hea	t and Mass Tra	nsfer,	Prenti	ce Hall	, 1999.			

	K.S.Rar	ngasamy College	of Technolog	y - Au	tono	omous	Regulati	on		R 2010
Dep	artment	Mechanical Engineering	Programme C	ode &	Nar	me F	PED : M.I	E. Eng	gineering	g Design
			Ele	ctive		•				
				Hou	ırs /	Week	Credit	N	laximum	n Marks
Cour	se Code	Course	Name	L	Т	Р	С	CA	ES	Total
10 P	PED E35	RESEARCH METHODOLOG ENGINEERING MANAGEMENT	AND	3	0	0	3	50	50	100
1	RESEAR	CH METHODOLO	OGY			To	tal Hrs.			9
explo proce telepl	ratory resess.	nodology – defi earch, conclusive Data collection n view, mail survey s of data.	e research, mo nethods- Prima	deling ry data	res a – d	earch, observa	algorithm tion meth	nic res	search, ersonal	Research interview,
2	SCALES	AND MEASURE	MENTS			To	tal Hrs.			9
Differ simpl stratif	ential scal e random fied sampl	urement, Types on e, Likert scale, Quart sampling with ing, cluster sampling, quota sampli	 sort scale. Sa replacement, ling. Non-proba 	ampline simple	g me	ethods- ndom	Probabil sampling	ity saı with	mpling rout rep	methods – lacement,
3	НҮРОТН	ESES TESTING				To	tal Hrs.			9
		sting – Testing eans -one tailed a								
4	SAMPLE	TESTS				To	tal Hrs.			9
for ra	ndomness	tests- One sample , Two sample tes est (H-Test)								
5	ANALYSI	S AND REPORT				To	tal Hrs.			9
conjo		Disciminant analys. Report writing-								
	hours to b								4	45
Refer	ence(s):									
1.	Kothari, (New Delh	C.R., Research M i, 2009.	Methodology –N	Method	ls a	nd tech	niques,	New	Age Pu	blications,
2.	Panneers	elvam, R., Resea	rch Methodolog	jy, Pre	ntice	e-Hall o	India, N	ew De	elhi, 200)4.

K	.S.Ranga	samy College of	Technolog	gy - Aut	tonom	ous R	egulation		R 20	10
Dep	artment	Mechanical Engineering	Progra	ımme C	ode & I	Name	Р		E. Engin Design	eering
				Elect	tive					
C	Course			Hou	rs / We	ek	Credit	Ма	aximum l	Marks
	Code	Course Na	ame	L	Т	Р	С	CA	ES	Total
10 F	PED E36	EXPERIMENTA STRESS ANAL		3	0	0	3	50	50	100
Obj	ective(s)	To impart know destructive testing			meas	sureme	ent techni	ques a	nd to k	now non
1	FORCES	S AND STRAIN M	EASUREM	IENT		То	tal Hrs		9	
- M	oire Fring	principle, types, μ e - Hydraulic jacl Testing Machines	ks and pres							
2	VIBRATI	ON MEASUREM	ENTS			То	tal Hrs		9	
Trar Vibr	nsducers ation Ana	s of Structural ' for velocity and lyzer – Display ar –Digital data Acc	accelerationd recordin	n meas g of sigr	sureme	nts. V	ibration n	neter –	Seismo	graphs -
3	ACOUST	TICS AND WIND	FLOW ME	ASURES	3	То	tal Hrs		9	
Ven	turimeter	Pressure and flo and flow meters - idirect model ana	wind tunn							
4	DISTRES	SS MEASUREME	NTS			То	tal Hrs		9	
rein		distress in stru in concrete – H emolition.								
5	NON DE	STRUCTIVE TES	STING MET	HODS		То	tal Hrs		9	
– ul		on structures, buile esting principles a								
Tota	al hours to	be taught							45	
Refe	erence(s)	:								
1	L.S.Srina 1991	ath et al, Experime	ental Stress	Analys	is, Tata	a McG	raw Hill Co	ompany	, New De	elhi,
2	JW Dalle 1991	ey and WF Riley, '	'Experimen	tal Stres	ss Anal	ysis",	McGraw H	lill Book	Compa	ny, N.Y.
3	Sadhu S	ingh, "Experimen	tal Stress A	nalysis"	, Khan	na Pul	olishers, N	ew Del	hi, 1996.	
4	R.S.Sirol Ltd. 1997	ni and HC Radhal	krishna, "M	echanic	al Mea	surem	ents", Nev	v Age Ir	iternation	nal (P)

K	X.S.Ranga	samy College of Tech	nolog	gy - Aut	onomo	ous Re	egul	ation		R 20	10
De	partment	Mechanical Engineering	Pro	gramme	Code	& Nan	ne	Pl		E. Engin Design	eering
				Elect	ive						
(Course	Cauraa Nama		Hou	rs / We	ek	Cr	edit	Ma	ximum I	Marks
	Code	Course Name		L	Т	Р	(O	CA	ES	Total
10	PED E37	FUELS AND COMBUSTION		3	0	0		3	50	50	100
Ob	jective(s)	To impart knowledge system.	on v	arious t	ypes o	f fuels	s, coi	mbust	ion and	coal pr	eparation
1	INTRODU	JCTION				То	tal H	Irs		9	
Proz Valu Fue	ximate And ues – Calo I & Ash Sto	and Characteristics Of d Ultimate Analysis-Marimetry - Dulong's Forr prage & Handling – Spor	oisture nula F	e Deteri For Cv E	minatio Estimat	n-Caldion-Flu emper	orific ue G rature	Value as An es.	e- Gros	s & Net Orsat A	Calorific
2	SOLID AI	ND LIQUID FUELS				To	tal H	rs		9	
Liqu Liqu	iid Fuels 1 iid Fuels -	Solid Fuels – Biomas Types – Sources – Pe - Calorific Value, Spe Alcohols – Tar Sand C	etrole: ecific	um Frac Gravity,	tions-0 Flash	Classif & Fir	icatio	on – I	Refining	j – Prop	erties Of
		US FUELS		•		To	tal H	rs	0	9	oton Diale
& Le NG Gas	ssification - ean Gas – – LPG – sification –	- Composition & Prope Wobbe Index - Natura CNG - Methane - Gasification Efficiency	al Gas Produ	– Estima s – Dry a ucer Ga	ation C & Wet	To of Calo Natura sifiers	tal H orific al Ga Wat	rs Value s Stri er Ga	pped No as – To	Calorime G – Foul	& Sweet s – Coal
Clas & Le NG Gas	ssification - ean Gas – – LPG –	- Composition & Prope Wobbe Index - Natura CNG - Methane - Gasification Efficiency nomics.	al Gas Produ	– Estima s – Dry a ucer Ga	ation C & Wet	To Of Calo Natura sifiers oute -	tal H orific al Ga Wat	rs Value is Stri er Ga gas –	pped No as – To	Calorime G – Foul	& Sweet s – Coal
Clas & Le NG Gas Viab 4 Stoi Con Spo Flar	chiometry npositions nbustion E ntaneous me Temper	- Composition & Prope Wobbe Index - Natura CNG - Methane - Gasification Efficiency nomics. STION - Mass Basis & Vo - Calculations - Rap explosive Combustion. Combustion- Flame Prature - Theoretical, Ac	al Gas Produ - No lume pid M Mech Propag	– Estima s – Dry de ucer Ga n – The Basis – ethods nanism jation –	ation C & Wet I as Gas rmal R - Exce - Con Of Col Solid,	Too of Calo Natura sifiers oute - Too ess Ain nbustion Liquid nition I	tal H prific al Ga Wat - Bio tal H r Ca on P ion -	Value Is Stri Ier Ga gas – Irs Ilculat Proces Igni Gased Is – Li	pped No as - To Digesto ion - F ses - tion & l bus Fue	Calorime G – Foul own Gas ers – Re 9 Fuel & F Stationa Ignition	& Sweets - Coal actions -
Clas & Le NG Gas Viab 4 Stoi Con Con Spo Flar 5	compositions of the control of the c	- Composition & Prope Wobbe Index - Natura CNG - Methane - Gasification Efficiency nomics. STION - Mass Basis & Vo - Calculations - Rap explosive Combustion. Combustion- Flame Propertical, Ac REPARATION SYST	al Gas Produ - No Iume pid M Mech Propag diabat ΓΕΜ	– Estimas – Dry & ucer Gan – The Basis – ethods nanism pation – ic & Act	ation C & Wet I as Gas rmal R - Exce - Con Of Col Solid, ual -Ig	Too Of Calo Natura sifiers oute – Too ess Ain nbustion mbustion Liquio nition I	tal H orific al Ga Wat - Bio tal H r Ca on P ion - d & Limit	rs Value s Stri er Ga gas – rs Ilculat Proces – Igni Gasec s – Li rs	ion - Fises - tion & lous Fue mits Of	Calorime G – Foul own Gas ers – Re 9 Fuel & F Stationa Ignition Inflamma	& Sweets – Coa actions – Flue Gas ry Flame Energy – bustion – ability.
Class & Le NG Gass Vial 4 Stoi Con Con Spo Flar 5 Coa Rec Trav	compositions of the control of the c	- Composition & Prope Wobbe Index - Natura CNG - Methane - Gasification Efficiency nomics. STION - Mass Basis & Vo - Calculations - Rap explosive Combustion. Combustion- Flame Prature - Theoretical, Ac	Iume pid M Mech ropag diabat FEM Pulve preade Va	- Estima s - Dry ducer Ga n - The Basis - ethods nanism pation - ic & Act	ation C & Wet I as Gas rmal R - Exce - Con Of Cor Solid, ual -lg coal Firers - V Burne	Too of Calo Natura sifiers oute - Too ess Ain nbustic mbusti Liquic nition I Too ibratin rs -Ain	orific Gal Gal Water Bio Hall Hall Hall Hall Hall Hall Hall Hal	rs Value s Striper Ga gas — rs Ilculat Proces - Igni Gase s — Li rs Iized E rate S biration	pped No as - To Digesto ion - F ses - tion & I ous Fue mits Of Bed Firi tokers S n Gas E	Calorime G – Foul own Gas ers – Re 9 Fuel & F Stationa Inflamma 9 ng – Fix Sprinkler Burners -	& Sweets — Coa actions — Flue Gas ry Flame Energy — bustion — ability.
Class & Le NG Gas Viat 4 Stoi Con Spo Flar 5 Coa Rec Trav Class	compositions of the control of the c	- Composition & Prope Wobbe Index - Natura CNG - Methane - Gasification Efficiency nomics. STION - Mass Basis & Vol - Calculations - Rap explosive Combustion. Combustion- Flame Prature - Theoretical, Ac REPARATION SYST Equipments - Types - - Cyclone Firing - Spe e Stokers. Oil Burners According To Flame St	Iume pid M Mech ropag diabat FEM Pulve preade Va	- Estima s - Dry ducer Ga n - The Basis - ethods nanism pation - ic & Act	ation C & Wet I as Gas rmal R - Exce - Con Of Cor Solid, ual -lg coal Firers - V Burne	Too of Calo Natura sifiers oute - Too ess Ain nbustic mbusti Liquic nition I Too ibratin rs -Ain	orific Gal Gal Water Bio Hall Hall Hall Hall Hall Hall Hall Hal	rs Value s Striper Ga gas — rs Ilculat Proces - Igni Gase s — Li rs Iized E rate S biration	pped No as - To Digesto ion - F ses - tion & I ous Fue mits Of Bed Firi tokers S n Gas E	Calorime G – Foul own Gas ers – Re 9 Fuel & F Stationa Inflamma 9 ng – Fix Sprinkler Burners -	& Sweets — Coa actions — Flue Gas ry Flame Energy — bustion — ability.
Class & Le NG Gas Viat Stoi Con Spo Flar Coa Rec Class Tota	combustions of the control of the co	- Composition & Prope Wobbe Index - Natura CNG - Methane - Gasification Efficiency nomics. STION - Mass Basis & Vol - Calculations - Rap Explosive Combustion. Combustion- Flame Prature - Theoretical, Active - Theoretical, Active - Types - Cyclone Firing - Spe Stokers. Oil Burners According To Flame State - S	Iume pid M Mech ropag diabat FEM Pulve preade Va	- Estima s - Dry ducer Ga n - The Basis - ethods nanism pation - ic & Act	ation C & Wet I as Gas rmal R - Exce - Con Of Cor Solid, ual -lg coal Firers - V Burne	Too of Calo Natura sifiers oute - Too ess Ain nbustic mbusti Liquic nition I Too ibratin rs -Ain	orific Gal Gal Water Bio Hall Hall Hall Hall Hall Hall Hall Hal	rs Value s Striper Ga gas — rs Ilculat Proces - Igni Gase s — Li rs Iized E rate S biration	pped No as - To Digesto ion - F ses - tion & I ous Fue mits Of Bed Firi tokers S n Gas E	Calorime G – Foul own Gas ers – Re 9 Fuel & F Stationa Ignition els Coml Inflamm 9 ng – Fix Sprinkler Burners - oustion.	& Sweets — Coa actions — Flue Gas ry Flame Energy — bustion — ability.
Class & Le Stoi Con Spo Flar Coa Class Tota	combustions of the combustion	- Composition & Prope Wobbe Index - Natura CNG - Methane - Gasification Efficiency nomics. STION - Mass Basis & Vol - Calculations - Rap Explosive Combustion. Combustion- Flame Prature - Theoretical, Active - Theoretical, Active - Types - Cyclone Firing - Spe Stokers. Oil Burners According To Flame State - S	Iume pid M Mech ropag diabat ΓΕΜ Pulve oreade - Val	- Estima s - Dry a ucer Ga n - The Basis - ethods nanism jation - ic & Act	ation C & Wet I as Gas rmal R - Exce - Con Of Col Solid, ual -lg coal Fir ers - V Burne ctors Af	Too of Calo Natura sifiers oute - Too ess Air nbustic mbustic mition I Too ing - I ibratin rs -Air fecting	tal H prific prific All Ga Wat Bio Tal H Cal Fluid Ga Gr Gr Gr Gr Gr Gr Gr Gr Gr	Value s Stri er Ga gas – rs Ilculat Proces – Igni Gased is – Li rs lized E rate S piration	ion - F ses - tion & I bus Fue mits Of	Calorime G – Foul own Gas ers – Re 9 Fuel & F Stationa Ignition els Coml Inflamms 9 ng – Fix Sprinkler Burners - oustion. 45	& Sweets — Coa actions — Flue Gas ry Flame Energy — bustion — ability.
Class & Le NG Gass Viat 4 Stoi Con Spo Flar 5 Coa Rec Class Tota Refe	ssification - ean Gas -	- Composition & Prope Wobbe Index - Natura CNG - Methane - Gasification Efficiency nomics. STION - Mass Basis & Vol - Calculations - Rap Explosive Combustion. Combustion- Flame Prature - Theoretical, Active - Theoretical, Active - Theoretical, Active - Types - Cyclone Firing - Specific e Stokers. Oil Burners According To Flame State - Description - State - Cyclone Firing - Specific e Stokers. Oil Burners - Cyclone Firing - Specific e Stokers. Oil Burners - Cyclone Flame State - Cyclone - Cyclone Flame State - Cyclone -	lume pid M Mech ropag diabat ΓΕΜ Pulve oreade - Val cructur	- Estima - Dry Gucer Gan - The Basis - ethods nanism pation - ic & Act - erized Cer Stoke porizing es - Fac	ation C & Wet as Gas rmal R - Exce - Con Of Col Solid, ual -lg coal Fir ers - V Burne ctors Af	Too of Calo Natura sifiers oute - Too ess Air nbustic mbustic mition I Too ing - I ibratin rs -Air fecting	tal H prific prific All Ga Wat T Ca T	Value s Stri er Ga gas – rs Ilculat Proces – Igni Gased is – Li rs lized E rate S piration	ion - F ses - tion & I bus Fue mits Of	Calorime G – Foul own Gas ers – Re 9 Fuel & F Stationa Ignition els Coml Inflamms 9 ng – Fix Sprinkler Burners - oustion. 45	& Sweets — Coa actions — Flue Gas ry Flame Energy — bustion — ability.
Class & Le NG Gas Viat 4 Stoi Con Spo Flar Trav Class Tota Reference 1	combustion - COMBUS chiometry positions intaneous me Temper COAL Pul Burning I bycled Bed reling Gratesification val hours to erence(s): Samir Sa Bhatt, Vor	- Composition & Prope Wobbe Index - Natura CNG - Methane - Gasification Efficiency nomics. STION - Mass Basis & Vol - Calculations - Rap Explosive Combustion. Combustion- Flame Prature - Theoretical, Active - Theoretical, Active - Types - Cyclone Firing - Spe Stokers. Oil Burners According To Flame State the Burners of the State - Cyclone Firing - Spe Stokers. Oil Burners of the State - Cyclone Flame - Cyclone Flame State - Cyclone Flame - Cyclone Flame State - Cyclone Flame State - Cyclone - Cyc	Iume pid M Mech ropag diabat ΓΕΜ Pulve oreade - Val cructur ion, 2 dition,	- Estima - Dry Gucer Gan - The Basis - ethods hanism pation - ic & Activer Stoke por Stoke por Stoke por Stoke hand Edition tata Month of the Basis - Factor of the Basis - Eactor of the Basis - ethods - Eactor of the Basis - ethods - Eactor of the Basis - ethods - ethod	ation C Wet I as Gas rmal R - Exce - Con Of Con Solid, ual -lg coal Fir Burne ctors Af	Too of Calo Natura sifiers oute - Too ess Ain nbustic mbustic Liquic nition I Too ing - I ibratin rs -Ain fecting ent Log	tal H prific Gal Gal Wat - Bio tal H r Ca fion - Fion P fion - Fluid g Gr r Asp g Bu gma 84	Value s Striper Gaser Igas – Ignir Gaser Spiration rners	ion - F ses - tion & bus Fue mits Of Bed Firi tokers S n Gas E & Comb	Calorime G – Foul own Gas ers – Re 9 Fuel & F Stationa Ignition els Coml Inflamms 9 ng – Fix Sprinkler Burners - oustion. 45	& Sweets — Coa actions — Flue Gas ry Flame Energy — oustion — ability. ed Bed & Stokers. - Burners
Class & Le NG Gas Vial 4 Stoi Con Spo Flar Tota Tota Reference 1 2	ssification - ean Gas -	- Composition & Proper Wobbe Index - Natural CNG - Methane - Gasification Efficiency nomics. STION - Mass Basis & Vol Calculations - Rapitations - Rapitations - Combustion - Flame Prature - Theoretical, Active - Cyclone Firing - Special Equipments - Types - Cyclone Firing - Special Education - State - Cyclone Firing - Special Education - State - Cyclone Firing - Special Education - State - Cyclone - Cyclone Firing - Special Education - State - Cyclone - Cyclone - Cyclone - State - Cyclone - Cycl	lume pid M Mech ropag diabat FEM Pulve oreade - Val cructur dition, am Bo	- Estima s - Dry a ucer Ga n - The Basis - ethods nanism jation - ic & Act erized Ca erized Ca eriz	ation C Wet I as Gas rmal R - Exce - Con Of Con Solid, ual -lg Coal Fir Burne ctors Af con, Orion cgraw F	Too of Calo Natura sifiers oute - Too ess Ain nbustic mbustic Liquic nition I Too ing - I ibratin rs -Ain fecting ent Log lemisp	orific Gal Gal Water Bion - Bi	Value s Striper Gaser Gaser Spiration rners Publice Pu	ion – For See Firitokers See Comb	Calorime G – Foul Dwn Gas ers – Re 9 Fuel & F Stationa Inflamms 9 Ing – Fix Sprinkler Burners - Sustion. 45 Corpn,1	& Sweets — Coal actions — Flue Gas ry Flame Energy — oustion — ability. ed Bed & Stokers, — Burners

	K.S.Ranga	asamy College of Te	chnology - Auton	omo	ıs Re	gulatio	on	I	R 201	0
De	partment	Mechanical Engineering	Programme (Name		&	Pl	ED : M.I	E. Eng Design	ineeri	ng
		<u> </u>	Elective			1				
		_		Hou	ırs / \	Veek	Cred it	Maxi	mum	Marks
Cou	urse Code	Course N	Name	L	Т	Р	С	CA	ES	Tota I
10	PED E38	ADVANCES IN CAS WELDING PROCES	_	3	0	0	3	50	50	100
Ob	jective(s)	To study the meta process. To acquire process.								
1	CASTING	DESIGN		Т	otal I	Hrs			8	
		between metal and								ng for
dire 2		dification and minimur METALLURGY	n stresses - princip	oles ai		esign of al Hrs.	gating a		ering 8	
		f pure metal and allo	ovs – shrinkage in	cast			ogressi			rtional
soli	dification —	 Degasification of that alloy and Cu alloy. 								
3	RECENT LAYOUT	TRÉNDS IN CASTINO	G AND FOUNDRY		Tota	al Hrs.			8	
Cor pro	ell moulding ntinuous ca cesses. Lay	g, precision investmentsting, Counter gravityout of mechanized	ity low pressure foundry – sand re	castir eclam	ng, S ation	Squeeze	castir	ng and	d sen	nisolid
4		ol in foundry – Compu METALLURGY AND		Casii		al Hrs.		1	0	
alur Hyd tran	minum, Mg Irogen emb Isfer and sc	Zone and its character, Cu, Zirconium and rittlement – Lamellar blidification - Analysis eld joint design – welch	titanium alloys – tearing – Residua of stresses in wel	Carbo al stre ded s	n Eq ss – tructu	uivalent Distort ıres – p	t of Plai ion and	n and its co	alloy ntrol	steels Heat
5	RECENT	TRENDS IN WELDIN	G		Tota	al Hrs.		1	1	
indu wel braz and	uction weldi ding – Elec zing and so I vapour ph	g, friction stir welding ng – ultrasonic weldi troslag welding- narro ldering techniques – i ase soldering. Overviles and under water w	ng – electron bea bw gap, hybrid twi induction, dip resis view of automatior	m wel n wire tance	lding activ , diffu	LaseVe TIGJustion pr	r beam - Tand ocesse	weldir em Ml s – Ho	ng –P G- m t gas,	lasma odern wave
	al hours to b		.					4	15	
Tex	t book(s):									
1.	Parmer R.	S., Welding Engineer	ing and Technolog	y, Kha	anna	Publish	ners, 20	02.		
2.	Carrry B.,	Modern Welding Tech	nnology, Prentice I	Hall P	√t Ltd	., 2002				
3.	CORNU.J.	. Advanced welding sy	ystems – Volumes	I, II a	nd III	, JAICC) Publis	hers, 1	994.	
Ref	erence (s):									
1.	ASM Hand	dbook, Vol 15, Casting	g, 2004.							
2.	ASM Hand	dbook vol.6, welding E	Brazing & Soldering	g, 200	3.					
3.	Srinivasan	N.K., Welding Techn	ology, Khanna Te	ch Pul	blishe	ers, 200)2.			
4.	Heinelope	r & Rosenthal, Princip	les of Metal Castir	ng, Ta	ta Mo	Graw I	Hill, 200	0.		
5.	Jain P.L., I	Principles of Foundry	Technology,Tata I	McGra	wHil	Publis	hers, 20	003.		
6.	lotrowski - Engineers	- Robotic welding – A	A guide to selection	n and	d app	lication	- Soci	ety of	mech	anical
7.	Schwariz,	M.M. – Source boo HIO), 1981.	k on innovative w	/eldin	g pro	cesses	– Ame	erican	Socie	ety for

	K.S.Ranga	asamy College of	Technology - Autono	mou	s Re	gulat	ion		R 20	10
De	partment	Mechanical Engineering	Programme Code Name	&		PED :	M.E. E	ingine	ering [Design
			Elective							
	Course	Cour	se Name		Hours Wee		Credi t	Ма	ximun	n Marks
	Code			L	T	Р	С	CA	ES	Total
10	PED E39		EPTS IN DESIGN	3	0	0	3	50	50	100
Ob	jective(s)		bust design, embodim ability charts and histog							iesign oi
1	DESIGN	FOR QUALITY			Tota	al Hrs			8	
Sel 2 Bas Em prin	Ecting and FAILURE sic methods bodiment of properties.	conforming factor- MODE EFFECT A s: Refining geomet checklist- Advanced	ise factors- Running to Set points-reflecting and INALYSIS ry and layout, general of methods: systems mand fault states to systems	nd re proce	Tota ess c	ng. I Hrs. If prod necha	luct em	bodime	9 ent- nent	
3		OF EXPERIMENTS	S		Tota	l Hrs.			9	
fact star DO	orial desig ndard error E method t nel display	n-Statistical analys of the residual t-te or product testing- evaluation, coffee	orthogonality, base de is of experiments: Deg est, ANOVA-ratio test, or Product applications or grinder experimental or	ree o other f phys	of fre indic sical	edom cators mode	, correla -residua eling an	ation co al plots d DOE	oefficie , Adva	ent, anced
4	RELIABIL					l Hrs.			9	
and	l Effect o grams –Mu	diagrams-Box plo ıltivariable charts -	ograms- Run charts –s			tistica		ess o	control	
and			Matrix plots and 3-D	olots.	-Reli	ability ion	-Surviv	al and	Failur	-Scatte
and 5	DESIGN	FOR SIX SIGMA		olots. Il dist	ribut	ability ion I Hrs.		al and	Failur 9	-Scatter
5 Bas	sis of SIX S service and	FOR SIX SIGMA SIGMA -Project se	Matrix plots and 3-D	olots. Il dist	ribut Tota	ion I Hrs. BMA p	oroblem	solvin	9 g- SIX	–Scatter re-Series
Bas in s serv	sis of SIX Service and vices al hours to	FOR SIX SIGMA SIGMA -Project se d small organization	-Matrix plots and 3-D pletween failure-Weibu	olots. Il dist	ribut Tota	ion I Hrs. BMA p	oroblem	solvin	9 g- SIX	–Scatter re-Series
Bas in s ser Tota	sis of SIX service and vices al hours to the book(s):	FOR SIX SIGMA SIGMA –Project se d small organization be taught	-Matrix plots and 3-D p between failure-Weibu election for SIX SIGMA ons - SIX SIGMA and	olots. Il dist	Tota (SIC n pr	ion I Hrs. GMA p oduct	problem ion –Le	solvin ean Sl	9 g- SIX X SIG	–Scatter e-Series (SIGMA MA and
Bassin sin sin service Total	sis of SIX Service and vices all hours to to book(s): Fundame Education	FOR SIX SIGMA SIGMA —Project sed small organization be taught Intals of Quality core of Asia, 2002.	-Matrix plots and 3-D p between failure-Weibu election for SIX SIGMA ons - SIX SIGMA and	olots. Il disi	Tota (SIC n pr	I Hrs. GMA poduct	oroblemion –Le	solvin ean Sl	9 g- SIX X SIG 45	Scatter re-Series SIGMA MA and
Bassin sen Tota Tex 1.	sis of SIX Service and vices al hours to to book(s): Fundame Education Product E GRAW-H	FOR SIX SIGMA SIGMA —Project sed small organization be taught Intals of Quality corn Asia, 2002. Design And Develop ILL- 3 rd Edition, 20	-Matrix plots and 3-D posture of the second	olots. Il disi	Tota (SIC n pr	I Hrs. GMA poduct	oroblemion –Le	solvin ean Sl	9 g- SIX X SIG 45	Scatter re-Series SIGMA MA and
Bassin sen Tota Tex 1.	sis of SIX Service and vices all hours to to book(s): Fundame Education Product D	FOR SIX SIGMA SIGMA —Project sed small organization be taught Intals of Quality corn Asia, 2002. Design And Develop ILL- 3 rd Edition, 20	-Matrix plots and 3-D posture of the second	olots. Il disi	Tota (SIC n pr	I Hrs. GMA poduct	oroblemion –Le	solvin ean Sl	9 g- SIX X SIG 45	Scatter e-Series SIGMA MA and
Bassin sen Tota Tex 1.	sis of SIX Service and vices al hours to the book(s): Fundame Education Product E GRAW-Herence (s):	FOR SIX SIGMA SIGMA —Project sed small organization be taught Intals of Quality corn Asia, 2002. Design And Develop ILL- 3 rd Edition, 2000 Design Techniques	-Matrix plots and 3-D plots an	blots. Il diss	Tota C SIC n pr	I Hrs. BMA poduct	oroblemion –Le	solvin ean SI	9 g- SIX X SIG 45 ., Pear	Scattere-Series (SIGMA and sima and si

ı	K.S.Rangas	amy College of Tech	nology - A	Autor	nomou	ıs Re	gulation		R 20	010
De	epartment	Mechanical Engineering	Programm	ne C	ode &	Name	PED : N	л.Е. Er	ngineerii	ng Design
			Ele	ctive			l			
				Но	urs / V	Veek	Credit	Ma	aximum	Marks
Co	urse Code	Course Nan	ne	L	Т	Р	С	CA	ES	Total
10	PED E40	MAINTENANCE MAN	AGEMENT	3	0	0	3	50	50	100
0	bjective(s)	The objectives of t maintenance manage						ents th	e conte	emporary
1	INTRODU	CTION				Тс	tal Hrs		9	
	ntenance fu anese conc	ınctions – Tero techno ept.	ology – Ma	inten	ance	costs	– Organi	zation	for mair	itenance -
2	RELIABILI	TY ANALYSIS				To	otal Hrs		9	
		tion – useful life – Itainability and availabi			stributi	ion –	Weibull	applic	ation –	Standby
3	MAINTENA	ANCE POLICIES				To	otal Hrs		9	
sca		ypes – Preventive m – repair policy – PM odels.								
4	LOGISTIC	S				To	otal Hrs		9	
		ontrol – overall/optim affing – UMS –Mainter			– Ma	ainten	ance pla	nning	– priori	ty rules -
5	ADVANCE	D TECHNIQUES				To	otal Hrs		9	
		toring – WDM, SPM, V e equipment effectiver		onitor	ing – I	Mainte	enance in	formati	on syste	em –
Tot	al hours to b	pe taught							4 5	
Тех	t book (s):									
1	Edward Ha	artman, "Maintenance	Manageme	ent",	Produ	ctivity	and Qua	lity Pul	blishing	Pvt. Ltd.,
Ref	erence(s):									
1	Smith D.J.	. "Reliability and Mair	ntainability	in p	erspe	ctive",	Mac Mi	llan Lt	d., 1985	
2	Seiichi Na Ltd., 1993	kagrima, "Introduction	to Total	Proc	luctive	Mair	itenance"	, Prod	uctivity	press Pvt.

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			ı	Electi	ve		 			
(Course	Course Name		Hou	rs / We	ek	Credit	Ma	aximum I	Marks
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10	PED E41	SPECIAL OPTIMIZATION	N	3	0	0	3	50	50	100
Obj	jective(s)	To provide knowledge a	bout	Optimiz	ation 7	Γechni	ques an	d their ap	plication	S.
1	OPTIMIZ	L ATION PROBLEMS						Tot	al Hrs	9
	I ssification erentiable f	of Optimization problem unctions.	ns, C	Classica	l optin	nizatio	n techn	iques fo	r continu	uous an
2	NON-LIN	IEAR PROGRAMMING						Tot	al Hrs	9
		o non-linear programming optimization; multi-object					nization	methods	, constra	nined an
3	PROGRA	AMMING IN OPTIMIZATION	ON					Tot	al Hrs	9
		mming methods, Dynami and Stochastic Programm		ogramm	ing in I	Marko	v Decision	on Proce	sses, Int	roductio
			·							
4	GENETI	C ALGORITHM AND THE	IR A	PPLICA	TIONS	6		Tot	al Hrs	9
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