

# **SHREE DEVI INSTITUTE OF TECHNOLOGY**

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## **Department of Mechanical Engineering**

### Course Outcomes and CO-PO-PSO articulation Matrix

Batch: 2015-2018

Semester-V/VI

Subject: M	IANAG	NAGEMENT AND JRSHIP       Subject Code: 15ME51         Course Outcomes       Examine the meaning, importance, nature of management, its difference between management and administration and role of managers in nanagement. Describe effective communication process, its importance, types and purpose for running an organization.         Examine the meaning characteristics principles and process of organizing.         Explain the importance of engineering economics, Law of demand and supply in engineering decision making.         Describe various interest rate factors and implement the same for economic decision making.														
ENTREPREN	IEURS	HIP														
					(	Cours	e Out	tcome	S							
CO1	Exar	nine	the m	ieani	ng, in	nporta	ance,	natu	re of	mana	agem	ent, i	ts diff	erenc	e	
	betv	veen	mana	agem	ent a	nd ad	minis	stratio	on an	d role	e of m	nanag	gers ir	า		
	man	agen	nent.	Desc	ribe e	ffecti	ve co	ommu	inicat	ion p	roces	s, its	impo	rtance	е,	
	type	es and	d purp	ose f	for ru	nning	; an o	organi	zatio	n.						
CO2	Exar	nine	the m	ieani	ng ch	aracte	eristi	cs pri	nciple	es and	d proo	cess c	of org	anizin	g.	
CO3	Expl	ain tł	ne im	porta	nce o	of eng	ineer	ing e	conoi	nics,	Law o	of dei	mand	and		
	supp	oly in	engir	neerir	ng de	cision	mak	ing.								
CO4	Desc	cribe	vario	us int	erest	rate	facto	rs an	d imp	leme	nt th	e san	ne for			
	ecor	nomio	c deci	sion i	makir	ng.										
CO5	Exar	camine different economic analysis methods-NPW, EAW, IRR, FW for ecision making.														
	deci	amine different economic analysis methods-NPW, EAW, IRR, FW for ecision making.														
CO6	Disc	uss d	iffere	nt co	mpor	nent c	of cos	ts an	d me	thods	s of co	ost es	timat	ion.		
CO7	Expl	ain d	eprec	iatio	n, diff	erent	met	hods	of co	mput	ing d	epred	ciatio	า.		
CO8	Disc	uss ta	axatic	n cor	ncept	s-inco	ome t	ax an	d cor	porat	te tax	es.				
					CC	)-PO-	PSO ]	Mapp	ing							
COs						PC	)s							PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	3	-	-	3	2	-	-	-	-	3	2				
CO2	3	3	-	-	3	2	-	-	-	-	3	2				
CO3	3	3	-	-	3	2	-	-	-	-	3	2				
CO4	3	3	-	-	3	2	-	-	-	-	3	2				
CO5	3	3	-	-	3	2	-	-	-	-	3	2				
CO6	3	3	-	-	3	2	-	-	-	-	3	2			⊢]	
CO7	3	3	-	-	3	2	-	-	-	-	3	2				
CO8	3	3	-	-	3	2	-	-	-	-	3 🥿	2	Op	e t	$\sum$	

Average	3	3	-	-	3	2	-	-	-	-	3	2			
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Subject: E	nergy a	nd Env	ironme	ent							Subj	ect Co	ode: 1	5ME56	52
						Cours	e Out	tcome	es						
CO1	Und	erstar	id ene	ergy so	enari	o, ene	rgy so	ources	and t	heir u	tilizat	ion			
CO2	Lear	n abo	ut me	thods	of en	ergy s	torag	e, ene	rgy m	anage	ement	and e	conor	nic	
	anal	ysis													
CO3	Hav	e prop	oer aw	varene	ess ab	out ei	nviron	ment	and e	co sys	stem.				
CO4	Understand the environment pollution along with social issues and acts.														
	CO-PO-PSO Mapping														
COs						P	Os							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	3	2	2	2	-	-	-	-	3	3			
CO2	3	2	3	2	2	2	-	-	-	-	3	3			
CO3	3	2	3	2	2	2	-	-	-	-	3	3			
CO4	3	2	3	2	2	2	-	-	-	-	3	3			
Average	3	2	3	2	2	2	-	-	-	-	3	3			

Subject: D	ynamic	s of Ma	achiner	у							Subj	ect Co	o <b>de:</b> 1	5ME52	2	
					(	Cours	e Out	tcome	es							
CO1	To ga	ain th	e knov	wledg	e stati	ic and	dyna	mic e	quilib	rium c	onditi	ons o	f mecl	nanisn	าร	
	subj	ected	forces	and	couple	e, with	n and	witho	ut frio	ction.						
CO2	Anal	yze th	e meo	hanis	ms fo	r stati	ic and	dyna	mic eo	quilibr	ium.					
CO3	To u	nders	tand t	he ba	lancin	g prin	ciples	s of ro	tating	; and r	ecipro	ocatin	g mas	ses,		
	gove	rnors	and g	yrosc	opes.											
CO4	Analyze the balancing of rotating and reciprocating masses, governors and gyroscopes.															
	gyroscopes.															
CO5	To u	gyroscopes. To understand vibrations characteristics of single degree of freedom systems.														
CO6	Char	acteri	ze the	singl	e deg	ree fre	eedon	n syste	ems s	ubject	ed to	free a	nd for	ced		
	vibra	ations	with	and w	<b>ithou</b>	t dam	ping.									
					CC	D-PO-	PSO	Mapp	ing							
COs						PC	Os							PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	3	-	3	-	-	-	-	-	-	3	2				
CO2	3	3	-	3	-	-	-	-	-	-	3	2				
CO3	3	3	-	3	-	-	-	-	-	-	3	2				
CO4	3	3	-	3	-	-	-	-	-	-	3	2	Op		1	
													1			

CO5	3	3	-	3	-	-	-	-	-	-	3	2		
CO6	3	3	-	3	-	-	-	-	-	-	3	2		
Average	3	3	-	3	-	-	-	-	-	-	3	2		

Subject: To	Subject Code: 15ME53         Course Outcomes         The course aims at giving an overview of different types of turbomachinery used for energy transformation, such as pumps, fans, compressors, as well as hydraulic and steam turbines.         Explain the working principles of turbomachines and apply it to various types of machines         It will focus on application of turbo machinery in power generation, power absorption and transportation sectors.														
					(	Cours	e Out	tcome	es						
CO1	The for e and	cours nergy steam	e aim trans turbi	s at gi forma nes.	ving a ation,	n ove such a	rview as pur	of dif nps, fa	feren ans, co	t type ompre	s of tu essors,	irbom , as wo	achine ell as l	ery use nydrau	ed Ilic
CO2	Explain the working principles of turbomachines and apply it to various types of machinesIt will focus on application of turbo machinery in power generation, power														
CO3	machines         It will focus on application of turbo machinery in power generation, power absorption and transportation sectors.														
					CC	D-PO-	PSO	Mapp	ing						
COs						P	Os							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	2	3	3	-	-	-	-	-	2	2			
CO2	3	2	2	3	3	-	-	-	-	-	2	2			
CO3	3	2	2	3	3	-	-	-	-	-	2	2			
Average	3	2	2	3	3	-	-	-	-	-	2	2			

Subject: N	on-Trac	ditiona	l Mach	ining							Subj	ect Co	ode: 1	5ME55	54
					(	Cours	e Out	tcome	s						
CO1	Unde	erstan	d the o	compa	re trac	ditiona	al and	non-tr	aditio	nal ma	nchinin	ig prod	cess ar	nd	
	reco	gnize t	he ne	ed for	Non-t	raditic	nal m	achini	ng pro	cess.					
CO2	Unde	erstan	d the c	onstru	uction	al feat	ures, J	perfor	mance	paran	neters	, proc	ess		
	chara	acteris	tics, a	pplicat	tions,	advan	tages a	and lin	nitatio	ns of l	JSM, A	AJM ar	nd WJI	И.	
CO3	Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications,														
	constructional features, process parameters, process characteristics, applications, advantages and limitations														
	constructional features, process parameters, process characteristics, applications, advantages and limitations.														
CO4	Unde	erstan	d the c	onstru	uction	al feat	ure of	the e	quipm	ent, pr	rocess	paran	neters	, proce	:SS
	chara	acteris	tics, a	pplicat	tions,	advan	tages	and lin	nitatio	ns EDI	VI & P/	AM.			
CO5	Unde	erstan	d the L	.BM eq	quipm	ent, LE	ЗМ ра	ramet	ers, ar	d char	racteri	stics. I	EBM e	quipm	ent
	and r	necha	nism d	of met	al rem	ioval, a	applica	ations,	advar	ntages	and li	mitatio	ons LB	M & El	BM.
					CC	D-PO-	PSO	Mapp	ing						
COs						P	Os							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	2	3	3	-	-	3	-	-	2	X	Op	27	5
		1	1	I	1			1	ı	1			•		

CO2	3	2	2	3	3	-	-	3	-	-	2	-		
CO3	3	2	2	3	3	-	-	3	-	-	2	-		
CO4	3	2	2	3	3	-	-	3	-	-	2	-		
CO5	3	2	2	3	3	-	-	3	-	-	2	-		
Average	3	2	2	3	3	-	-	3	-	-	2	-		

Subject: De	esign o	f Mach	ine Ele	ments	- 1		Sul	bject	Code	: 15M	E54				
					(	Cours	e Out	tcome	s						
CO1	Able	to un	dersta	and m	echar	nical d	esign	proce	dure,	mate	rials, c	odes	and u	se of	
	stan	dards													
CO2	Able	to des	sign m	achine	comp	onent	s for s	tatic, i	impac	t and f	atigue	stren	gth.		
CO3	Able	to des	sign fa	stener	s, shaf	fts, joi	nts, co	upling	s, key	s, thre	aded f	astene	ers riv	eted jo	ints,
	welded joints and power screws. CO-PO-PSO Mapping														
	welded joints and power screws. CO-PO-PSO Mapping														
COs						PO	Os							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	2	3	3	-	1	-	-	-	3	-			
CO2	3	3	2	3	3	-	1	-	-	-	3	-			
CO3	3	3	2	3	3	-	1	-	-	-	3	-			
Average	3	3	2	3	3	-	1	-	-	-	3	-			

Subject: FI	uid Me	chanic	s & Ma	chiner	y Lab		Sul	bject	Code	: 15M	EL57				
					(	Cours	e Out	tcome	es						
CO1	This of flo	course w me	e will p asurin	rovide g devi	e a bas ces, ca	ic und Ilibrati	erstar on an	nding c d losse	of flow es asso	meas nciated	ureme l with	ents us these	ing va device	rious ty s.	ypes
CO2	Energy conversion principles, analysis and understanding of hydraulic turbines and pumps will be discussed. Application of these concepts for these machines will be demonstrated. Performance analysis will be carried out using characteristic curves. CO-PO-PSO Mapping														
COs						P	Os							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	-	3	3	-	-	3	-	-	-	-			
CO2	3	3	-	3	3	-	-	3	-	-	-	-			
Average	3	3	-	3	3	-	-	3	-	-	-	-			

Subject:	Energy Lab	Subject Code: 15MEL58
	Course Outcomes	
CO1	This course will provide a basic understanding of fuel using various types of measuring devices	properties and its measurements
CO2	Energy conversion principles, analysis and understand Application of these concepts for these machines will analysis will be carried out using characteristic curves	ling of I C Engines will be discussed. be demonstrated. Performance

CO3	Exha	ust en	nission	s of I (	C Engir	nes wi	ll be m	neasur	ed and	d com	bared	with tl	ne star	ndards.		
					CC	D-PO-	PSO ]	Mapp	ing							
COs		POs PSOs PSOs														
	1	2	3	12	1	2	3									
CO1	3	3	-	2	3	-	-	-	2	-	-	1				
CO2	3	3	-	2	3	-	-	-	2	-	-	1				
CO3	3	3	-	2	3	-	-	-	2	-	-	1				
Average	3	3	-	2	3	-	-	-	2	-	-	1				

#### Semester-VI

Subject: Fi	nite Ele	ement /	Analysi	S			Sul	bject	Code	: 15M	E61				
					(	Cours	e Out	tcome	s						
CO1	To le	arn ba	isic pri	nciple	s of fir	nite ele	ement	analy	sis pro	cedur	e.				
CO2	To le struc	arn th tures.	e thec	ory and	d chara	acteris	tics of	finite	eleme	ents th	at rep	resent	engin	eering	
CO3	To le deve	arn ar lop th	id app e knov	ly finit vledge	e elen and s	hent so kills n	olutior eeded	ns to s to eff	tructu ective	ral, the ly eval	ermal, uate fi	dynar inite e	nic pro lemen	blem t t analy	to ses.
		CO-PO-PSO Mapping													
COs						P	Os							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	-	2	3	-	-	-	2	-	-	1			
CO2	3	3	-	2	3	-	-	-	2	-	-	1			
CO3	3	3	-	2	3	-	-	-	2	-	-	1			
Average	3	3	-	2	3	-	-	-	2	-	-	1			

Subject: II	ndustria	l Safet	y				Sul	bject	Code	<b>:</b> 15MI	E662				
					(	Cours	e Out	tcome	s						
CO1	Stude the v cont	ents w vorkpl rols.	vill be a ace, a	able to nd to o	o recog detern	gnize a nine ap	nd eva opropr	aluate riate h	occup azard	oationa contro	al safe Is follo	ty and owing	health the hie	hazar erarchy	ds in / of
CO2	Stud and i	ents w llnesse	vill furt es, fata	hermo alities	ore be and th	able t ne met	o anal hods t	yze th to prev	e effe vent	cts of v	workp	lace ex	kposur	es, inju	uries
CO3	incidents using the hierarchy of controls, effective safety and health management systems and task-oriented training. CO-PO-PSO Mapping														
COs						P(	Ds	mapp						PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	2	3	3	-	-	-	_	-	2	2			
CO2	3	2	2	3	3	-	-	-	-	-	2	2			
CO3	3	2	2	3	3	-	-	-	-	-	2	2	Op		5

Average	3	2	2	3	3	-	_	-	_	-	2	2			
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Subject: Co	ompute	er integ	grated I	Manufa	acturin	g	Su	bject	Code	: 15M	E62				
					(	Cours	e Ou	tcome	es						
CO1	To in	npart l	knowle	edge o	f CIM	and A	utoma	tion a	nd diff	ferent	conce	pts of	autom	ation l	by
	deve	loping	math	ematio	cal mo	dels.									
CO2	To m	ake st	udent	s to ur	nderst	and th	e Com	puter	Appli	cations	s in De	sign a	nd Ma	nufact	uring
	[CAD	) / CAN	Л) leac	ling to	Comp	outer i	ntegra	ited							
CO3	syste	ems. Ei	nable t	hem t	o perf	orm v	arious	transf	format	tions o	of entit	ies on	displa	y devi	ces.
CO4	To ex	kpose	studer	nts to a	autom	ated f	low lir	nes, as	sembl	y lines	, Line	Balanc	ing Te	chniqu	ies,
	and I	Flexibl	e Man	ufactu	iring S	ystem	s.								
CO5	To ex	kpose	studer	nts to o	compu	iter aid	ded pr	ocess	planni	ing, m	aterial	requi	remen	t planr	ning,
	сара	city pl	anning	g etc.											
CO6	To ex	kpose	the stu	udents	to CN	IC Mad	chine 1	lools,	NC pa	rt prog	gramm	ing, ar	nd indu	ustrial	
	<b>T</b>	robots.													
CO7	lo in	o introduce the students to concepts of Additive Manufacturing, Internet of Things, and													
	muu	Stry 4.	oleaul	ing to s			$\frac{y}{DSO}$	Mann	ina						
<u> </u>						J-rU-	<u>rsu</u>	wapp	ing						
COS	-	2	2		-		JS 	•	•	10		12	1	P305	2
	1	2	3	4	5	6	/	ð	9	10	11	12	L	2	3
<u>CO1</u>	3	3	2	2	1	-	-	-	-	-	-	1			
CO2	3	3	2	2	1	-	-	-	-	-	-	1			
CO3	3	3	2	2	1	-	-	-	-	-	-	1			
CO4	3	3	2	2	1	-	-	-	-	-	-	1			
CO5	3	3	2	2	1	-	-	-	-	-	-	1			
CO6	3	3	2	2	1	-	-	-	-	-	-	1			
CO7	3	3	2	2	1	-	-	-	-	-	-	1			
Average	3	3	2	2	1	-	-	-	-	-	-	1			

Subject: He	eat Tra	nsfer					Sul	bject	Code	: 15MI	E63				
					(	Cours	e Out	tcome	s						
CO1	Study	y the r	nodes	of hea	at tran	sfer.									
CO2	Lear	n how	v to fo	rmula	ate an	d solv	'e 1-D	stead	ly and	lunste	eady l	neat c	ondu	ction	
	prob	lems.													
CO3	Apply	y emp	irical c	orrela	tions	for full	y deve	eloped	lamin	ar, tur	bulen	t inter	nal flo	ws and	
	exter	ternal boundary layer convective flow problems.													
CO4	Study	udy the basic principles of heat exchanger analysis and thermal design.													
CO5	Unde	erstan	d the p	orincip	les of	boiling	g and o	conde	nsatio	n inclu	ding r	adiatio	on hea	t transfer	
	relat	ed eng	gineeri	ng pro	blems	s.									
					CC	D-PO-	PSO	Mapp	ing						
COs						PC	Os							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2 3	
CO1	2	2	-	3	3	-	-	-	1	-	- 0	X	Op	e to	

CO2	2	2	-	3	3	-	-	-	1	-	-	1		
CO3	2	2	-	3	3	-	-	-	1	-	-	1		
CO4	2	2	-	3	3	-	-	-	1	-	-	1		
CO5	2	2	-	3	3	-	-	-	1	-	-	1		
Average	2	2	-	3	3	-	-	-	1	-	-	1		

Subject: D	esign o	f Mach	ine Ele	ments	-11					Sub	ject C	Code:	15ME6	54	
					(	Cours	e Ou	tcome	s						
CO1	To u	nderst	and va	arious	eleme	nts inv	volved	in a m	nechar	nical sy	/stem.				
CO2	To ar them	nalyze n using	variou gappro	is forc opriate	es acti e techr	ing on niques	the el , code	ement s, and	s of a stand	mecha ards.	anical	systen	n and o	design	
CO3	To se man	elect tr ufactu	ransmi rers" d	ssion ( atalog	eleme gue.	nts lik	e gear	s, belt	s, pull	eys, be	earings	s from	the		
CO4	To de	esign o	comple	etely a	mech	anical	syster	n inte	gratin	g macł	nine el	ement	ts.		
CO5	To pi macł	o produce assembly and working drawings of various mechanical systems involving nachine elements like belts, pulleys, gears, springs, bearings, clutches and brakes.													
		achine elements like belts, pulleys, gears, springs, bearings, clutches and brakes. CO-PO-PSO Mapping													
COs						P	Os							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	2	3	3	-	-	-	-	-	-	1			
CO2	3	2	2	3	3	-	-	-	-	-	-	1			
CO3	3	2	2	3	3	-	-	-	-	-	-	1			
CO4	3	2	2	3	3	-	-	-	-	-	-	1			
CO5	3	2	2	3	3	-	-	-	_	-	-	1			
Average	3	2	2	3	3	-	-	-	-	-	-	1			

Subject: Au	utomol	oile Eng	gineerii	ng						Sul	bject	Code:	15ME	655	
					(	Cours	e Out	tcome	es						
CO1	Expla	ain the	funda	ament	als of o	operat	ing sy	stem							
CO2	Com	prehe	nd pro	cess n	nanage	ement	, mem	ory m	anage	ment	and st	orage	manag	gement	t.
CO3	Fami	liar wi	th var	ious ty	pes of	fopera	ating s	ystem	S						
		CO-PO-PSO Mapping													
COs		POs PSOs													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	-	-	2	-	2	-	-	-	-	-	1	1			
CO2	-	-	2	-	2	-	-	-	-	-	1	1			
CO3	-	-	2	-	2	-	-	-	-	-	1	1			
Average	-	-	2	-	2	-	-	-	-	-	1	1			

Subject: Heat Transfer Lab	Subject Code: 15	MEL67
	<b>Course Outcomes</b>	KODAT
		Principal

CO1	The p to ur	orimar ndersta	y obje and th	ctive o e beha	of this avior o	course f ther	e is to mal sy	provid stems	le the	fundaı	menta	l know	/ledge	necess	sary
CO2	This trans trans	course fer th fer in	e provi rough one ar	des a ( solids, nd two	detaile , fluids o dime	ed exp , and v nsiona	erimei vacuur al stea	ntal ar n. Cor dy anc	nalysis, nvectic l unste	, inclue on, cor eady sy	ding th nductio ystems	ne app on, and s are e	lication d radia xamine	n and h tion he ed.	neat eat
		CO-PO-PSO Mapping													
COs		POs PSOs													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3				3			3	3	3	3			
CO2	3	3				3			3	3	3	3			
Average	3	3				3			3	3	3	3			

Subject: M	lodelin	g and A	nalysis	: Lab (F	EA)		Su	bject	Code	: 15M	EL68				
					(	Cours	e Ou	tcome	es						
CO1	To ac	cquire	basic	unders	standi	ng of N	Лodel	ing an	d Anal	ysis so	oftware	9			
CO2	To u the s	nderst tress a	and th and ot	e diffe her re	erent k lated p	kinds o Daram	f anal eters o	ysis ar of bars	nd app s, bean	ly the ns load	basic ı ded wi	orincip th load	les to ding co	find οι onditio	ıt ns.
CO3	To le	an to	apply	the ba	sic pri	nciples	s to ca	rry ou	t dyna	mic ar	nalysis	to kno	ow the	natura	al
	freqι	lency	of diff	erent l	kind of	f beam	ıs.								
		CO-PO-PSO Mapping													
COs						PC	Ds							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	-	-	-	I	-	3	-	-	-			
CO2	3	3	3	-	-	-	I	-	3	-	-	-			
CO3	3	3	3	-	-	-	-	-	3	-	-	-			
Average	3	3	3	-	-	-	-	-	3	-	-	-			

## Semester-VII/VIII

Subject: C	ONTROL ENGINEERING	Subject Code: 15ME71								
	Course	Outcomes								
CO1	Summarize the basic concepts of	thermal energy systems,								
CO2	Identify renewable energy source	s and their utilization.								
CO3	Understand the basic concepts of	solar radiation and analyze the working of solar								
	PV and thermal systems.									
CO4	Understand principles of energy of	onversion from alternate sources including wind,								
	geothermal, ocean, biomass, biog	as.								
CO5	Understand the concepts and ap	plications of fuel cells, thermoelectric convertor								
	and MHD generator.									
	CO-PO-F	SO Mapping								
COs	PO	s PSOs								

	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	3	-	-	-	-	-	-	-	2	-			
CO2	2	2	3	-	-	-	-	-	-	-	2	-			
CO3	2	2	3	-	-	-	-	-	-	-	2	-			
CO4	2	2	3	-	-	-	-	-	-	-	2	-			
CO5	2	2	3	-	-	-	-	-	-	-	2	-			
Average	2	2	3	-	-	-	-	-	-	-	2	-			

Su	bject:	Tribo	ology	Sylla	bus		Su	bject	Code	: 15M	E742				
						Cours	e Ou	tcome	s						
CO1	Und	erstar	nd the	funda	ament	tals of	tribo	logy a	ind as	sociat	ted pa	rame	ters.		
CO2	Арр	ly con	cepts	of tril	polog	y for t	he pe	erform	ance	analys	sis and	d desi	gn of		
	com	ponei	nts ex	perier	ncing	relativ	e mo	tion.							
CO3	Anal	yse th	ne req	uirem	ents a	and de	sign	hydro	dynar	nic jo	urnal	and p	lane s	lider	
	bear	ings f	or a g	iven a	applic	ation.									
CO4	Sele	ct pro	per b	earing	j mate	erials a	ind lu	Ibricar	nts foi	<sup>r</sup> a giv	en tril	bolog	ical ap	oplicat	ion.
CO5	Арр	ly the	e princ	iples	of sur	face e	ngine	eering	for d	ifferer	nt app	licatio	ons of	tribol	ogy.
					CO	D-PO-	PSO	Mapp	ing						
COs		-	-	-	-	PC	)s		-					PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	3	-	2	-	-	-	-	-	-	-			
CO2	2	2	3	-	2	-	-	-	-	-	-	-			
CO3	2	2	3	-	2	-	-	-	-	-	-	-			
CO4	2	2	3	-	2	-	-	-	-	-	-	1			
CO5	2	2	3	-	2	-	-	-	-	-	-	1			
Average	2	2	3	-	2	-	-	-	-	-	-	0.6			

Subject: F	luid P	ower	Syst	ems	Syllal	bus	Su	bject	Code	: 15M	E72			
					(	Course	e Ou	tcome	es					
CO1	Iden	tify ar	nd ana	alyze t	he fu	nction	al rec	quirem	nents	of a fl	uid pov	wer t	ransmission	
	syste	em foi	r a giv	en ap	plicat	ion.								
CO2	Visua	alize ł	now a	hydra	ulic/p	neum	atic d	circuit	will w	ork to	accom	nplisl	h the function.	
CO3	Desi	Design an appropriate hydraulic or pneumatic circuit or combination circuit like												
	elect	ro hy	drauli	cs, ele	ectro-	pneum	natics	for a	given	appli	cation.			
CO4	elect	and	size th	ne diff	erent	comp	onen	ts of t	he cir	cuit.				
CO5	Deve	elop a	comp	oreher	nsive	circuit	diag	ram in	itegra	ting tl	ne com	pone	ents selected for	
	the g	given	applic	ation										
					CC	D-PO-I	PSO	Mapp	ing					
COs						PC	)s						PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	-1p-2-3	

CO1	2	2	-	2	1	-	-	-	-	-	-	1		
CO2	2	2	-	2	1	-	-	-	-	-	-	1		
CO3	2	2	-	2	1	-	-	-	-	-	-	1		
CO4	2	2	3	-	2	-	-	-	-	-	-	1		
CO5	2	2	3	-	2	-	-	-	-	-	-	1		
Average	2	2	2	1.6	1.6	-	-	-	-	-	-	1		

Subje	ect: N	lecha	troni	cs Sy	llabu	S	Sul	bject	Code	: 15M	E753				
					(	Cours	e Out	tcome	s						
CO1	Illust	rate v	variou	s com	pone	nts of	Mech	natron	ics sy	stems					
CO2	Asse	ss var	ious c	contro	l syste	ems u	sed ir	n auto	matio	n.					
CO3	Deve	elop n	necha	nical,	hydra	ulic, p	neum	natic a	nd el	ectrica	al con <sup>.</sup>	trol sy	stems	j.	
					CC	D-PO-	PSO	Mapp	ing						
COs						PC	Ds							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	3	1	-	-	-	-	-	-	-	-			
CO2	2	2	3	1	-	-	-	-	-	-	-	-			
CO3	2	2	3	1	-	-	-	-	-	-	-	-			
Average	2	2	3	1	-	-	-	-	-	-	-	-			

Sub	ject: [	Desig	n Lat	o Syll	abus		Su	bject	Code	: 15M	EL76				
					(	Cours	e Ou	tcome	es						
CO1	Cond subje	luct ex ected t	perim o vari	ents te ous loa	o evalı ading.	uate tł	ne des	ign ch	aracte	ristics	of var	ious m	nachine	e elem	ents
CO2	Analyse the theoretical and experimental concept in machine elements subjected to various loading.														
CO3	various loading.         Understand and discuss the design characteristics of various systems subjected to mechanical loading.														
					CC	D-PO-	PSO	Mapp	ing						
COs						PO	Os							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	3	1	-	-	-	-	-	-	-	2			
CO2	2	2	3	1	-	-	-	-	-	-	-	2			
CO3	2	2	3	1	-	-	-	-	-	-	-	2			
Average	2	2	3	1	-	-	-	-	-	-	-	2			

	<u> </u>	Subject Couct 15m2277
	Cours	e Outcomes
CO1	Generate CNC Lathe part progra turning, Taper turning, Circular ir	m for Turning, Facing, Chamfering, Grooving, Step Interpolation etc.

CO2	Gene	enerate CNC Mill Part programming for Point-to-point motions, Line motions, ircular interpolation, Contour motion, Pocket milling- circular, rectangular, Mirror ommands etc. se Canned Cycles for Drilling, Peck drilling, Boring, Tapping, Turning, Facing, aper turning Thread cutting etc. imulate Tool Path for different Machining operations of small components using NC Lathe & CNC Milling Machine. se high end CAM packages for machining complex parts; use state of art cutting pols and related cutting parameters; optimize cycle time. nderstand & write programs for Robot control; understand the operating rinciples of hydraulics, pneumatics and electropneumatic systems. Apply this nowledge to automate & improve efficiency of manufacturing. CO-PO-PSO Mapping POS POS 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1														
	Circu	ular in	terpo	ation	, Cont	our m	notion	, Pocł	ket mi	lling-	circul	ar, rec	tangu	ılar, M	irror	
	com	mand	s etc.													
CO3	Use	Canne	ed Cyd	cles fo	or Drill	ing, P	eck d	rilling	, Borir	ng, Ta	pping	, Turn	ing, Fa	acing,		
	Таре	er turr	ning T	hread	cuttir	ng etc	•									
CO4	Simu	ulate 1	ool P	ath fo	or diffe	erent l	Machi	ning o	opera	tions	of sma	all cor	npone	ents us	sing	
	CNC	Lathe	e & Cl	NC Mi	illing I	Machi	ne.									
CO5	Use	e high end CAM packages for machining complex parts; use state of art cutting ols and related cutting parameters; optimize cycle time. Inderstand & write programs for Robot control; understand the operating														
	tools	se high end CAM packages for machining complex parts; use state of art cutting pols and related cutting parameters; optimize cycle time. Inderstand & write programs for Robot control; understand the operating														
CO6	Und	ise high end CAM packages for machining complex parts; use state of art cutting ols and related cutting parameters; optimize cycle time. Inderstand & write programs for Robot control; understand the operating inciples of hydraulics, pneumatics and electroppeumatic systems. Apply this														
	prine	se high end CAM packages for machining complex parts; use state of art cutting ols and related cutting parameters; optimize cycle time. nderstand & write programs for Robot control; understand the operating rinciples of hydraulics, pneumatics and electropneumatic systems. Apply this														
	knov	vledg	e to a	utoma	ate &	impro	ove ef	ficiend	cy of r	nanuf	acturi	ng.				
					CC	D-PO-	PSO ]	Mapp	ing							
COs						PC	Os		1					PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	2	1	-	-	-	-	-	-	-	-	-	1				
CO2	2	1	-	-	-	-	-	-	-	-	-	1				
CO3	2	1	-	-	-	-	-	-	-	-	-	1				
CO4	2	1	-	-	-	-	-	-	-	-	-	1				
CO5	2	1	-	-	-	-	-	-	-	-	-	1				
CO6	2	1	-	-	-	-	-	-	-	-	-	1				
Average	2	1	-	-	-	-	-	-	-	-	-	1				

Subject: P	roject	Work P	hase - 2	L			Su	bject	Code	e: 15№	1EP78				
					Co	urse	Outc	omes							
CO1	Ident	tify and	interp	et the	e realist	ic me	chanio	cal eng	gineer	ing pr	oblem	s and	relate	d syste	ems.
CO2	Appl base	y the ba d on pr	asic prir ofessio	nciple: nal et	s and co hics and	oncep <sup>.</sup> d resp	ts of n onsibi	necha ilities.	nical e	engine	ering	in real	world	syste	ms
CO3	Criticize and experiment to achieve optimum solutions for mechanical engineering problems. Analyze, evaluate and review the obtained solution for problems in mechanical														
CO4	Analyze, evaluate and review the obtained solution for problems in mechanical engineering systems.														
CO5	engineering systems.         Demonstrate professionalism with ethics; present effective communication skills and relate engineering issues to broader societal context.														
					CO-I	PO-PS	SO M	appin	g						
COs						POs	5							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3				1	2	2	-	3	3	1	2			
CO2	3	1			2	1	-	1	3	3	1	3			
CO3	3	2	2	2	2	2	1		3	3	1	2			
CO4	3	2	2	2	2	2	1		3	3	1	120	Spe	2-70	

CO5						1		3	3	3		1		
Average	2.5	2.33	2.33	2	1.75	2	2	2.5	3	3	1.6	2.6		

#### VIII-Semester

S	ubject	t: Ope	rations	Resea	rch		Su	bject	Code	<b>:</b> 15M	E81				
					(	Cours	e Ou	tcome	es						
CO1	To er organ	nable th nizatior	ne stude n with a	ents to 1 quant	unders itative	tand th basis o	e scien f decis	itific m ion ma	ethods king.	of prov	viding	various	depart	ments o	of an
CO2	To er optim form	nable th nal solu of Mer	e stude tions to 1, Mate	entsto u o probl rials a	underst ems in nd mac	and the volving hinery.	e impor g limito	rtance o ed reso	of vario urces i	ous tool n the	ls and t	echniq	ues in f	inding	
					CC	)-PO-	PSO	Mapp	ing						
COs						Р	Os							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	3	1	-	-	-	-	-	-	-	2			
CO2	2	2	3	1	-	-	-	-	-	-	-	2			
Average	2	2	3	1	-	-	-	-	-	-	-	2			

	Sub	ject:	Additi	ve Ma	nufacti	uring		Sul	bject	Code	: 15MI	E82				
						(	Cours	e Out	tcome	es						
CO1		Unde	erstand	l the a	dditive	e manu	ıfactur	ring pr	ocess,	polyn	nerizat	ion an	d pow	der me	etallurg	gy
	process															
CO2	CO2 Understand characterisation techniques in additive manufacturing.															
CO3	CO2Understand characterisation techniques in additive manufacturing.CO3Acquire knowledge on CNC and Automation.															
	·					CC	D-PO-	PSO	Mapp	ing						
COs							PC	Ds							PSOs	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1		2	2	3	1	-	-	-	-	-	-	- 0	2	Op	27	2
													-			

CO2	2	2	3	1	-	-	-	-	-	-	-	2		
CO3	2	2	3	1	-	-	-	-	-	-	-	2		
Average	2	2	3	1	-	-	-	-	-	-	-	2		

Subjec	t: Inte	rnship	/ Profe	essiona	l Pract	ice	Su	Subject Code: 15ME84								
Course Outcomes																
CO1	Conduct experiments to evaluate the design characteristics of various machine elements subjected to various loading.													ents		
CO2	Analyse the theoretical and experimental concept in machine elements subjected to various loading.															
CO3	Understand and discuss the design characteristics of various systems subjected to mechanical loading.															
					CC	D-PO-	PSO	Mapp	ing							
COs						PC	Ds							PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	2	2	3	1	-	-	-	-	-	-	-	2				
CO2	2	2	3	1	-	-	-	-	-	-	-	2				
CO3	2	2	3	1	-	-	-	-	-	-	-	2				
Average	2	2	3	1	-	-	-	-	-	-	-	2				

Subje	Subject: Product life cycle management Subject Code: 15ME835														
					(	Cours	e Out	tcome	es						
CO1	Familiarize with various strategies of PLM														
CO2	Understand the concept of product design and simulation.														
CO3	Develop New product development ,product structure and supporting systems														
CO4	Interpret the technology forecasting and product innovation and development in														
	business processes.														
CO5	Understand product building and Product Configuration.														
CO-PO-PSO Mapping															
COs						PC	Ds							PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	3	1	-	-	-	-	-	-	-	2			
CO2	2	2	3	1	-	-	-	-	-	-	-	2			
CO3	2	2	3	1	-	-	-	-	-	-	-	2			
CO4	2	2	3	1	-	-	-	-	-	-	-	2			
CO5	2	2	3	1	-	-	-	-	-	-	-	2			
Average	2	2	3	1	-	-	-	-	-	-	-	2			

Subject: P	roject Phase – II	Subject Code: 15ME85						
Course Outcomes								
CO1	Identify and interpret the realistic mec	hanical engineering problems and related systems.						
		aroper						

CO2	Apply the basic principles and concepts of mechanical engineering in real world systems based on professional ethics and responsibilities.															
CO3	Criticize and experiment to achieve optimum solutions for mechanical engineering problems.															
CO4	Analyze, evaluate and review the obtained solution for problems in mechanical engineering systems.															
CO5	Demonstrate professionalism with ethics; present effective communication skills and relate engineering issues to broader societal context.															
	CO-PO-PSO Mapping															
	POs												PSOs			
COs						POs	5							PSOs		
COs	1	2	3	4	5	PO9 6	5 7	8	9	10	11	12	1	PSOs 2	3	
COs CO1	<b>1</b> 3	2	3	4	<b>5</b> 1	PO: 6 2	<b>7</b> 2	8	<b>9</b> 3	<b>10</b> 3	<b>11</b> 1	<b>12</b> 2	1	PSOs 2	3	
COs CO1 CO2	1 3 3	<b>2</b>	3	4	<b>5</b> 1 2	PO: 6 2 1	<b>7</b> 2 -	<b>8</b> - 1	<b>9</b> 3 3	<b>10</b> 3 3	<b>11</b> 1	<b>12</b> 2 3	1	PSOs 2	3	
CO1 CO2 CO3	1 3 3 3	<b>2</b> 1 2	<b>3</b>	<b>4</b> 2	5 1 2 2	PO: 6 2 1 2	<b>7</b> 2 - 1	<b>8</b> - 1	<b>9</b> 3 3 3	<b>10</b> 3 3 3	11 1 1 1	<b>12</b> 2 3 2	1	<b>PSOs</b> 2	3	
CO1 CO2 CO3 CO4	1 3 3 3 3	<b>2</b> 1 2 2 2	<b>3</b> 2 2	<b>4</b> 2 2	5 1 2 2 2	PO: 6 2 1 2 2 2	<b>7</b> 2 - 1 1	8 - 1	<b>9</b> 3 3 3 3	<b>10</b> 3 3 3 3	11 1 1 1 1	<b>12</b> 2 3 2 2	1	2	3	
CO1 CO2 CO3 CO4 CO5	1 3 3 3 3	2 1 2 2	<b>3</b> 2 2	<b>4</b> 2 2	5 1 2 2 2	POs 6 2 1 2 2 1	<b>7</b> 2 - 1 1	8 - 1 - 3	<b>9</b> 3 3 3 3 3	<b>10</b> 3 3 3 3 3 3	11 1 1 1	12 2 3 2 2 1	1	PSOs 2	3	

	Sı	ıbject	: Semi	inar			Subject Code: 15MES86										
					(	Cours	e Ou	tcome	es								
CO1	Identify recent technical topics from interested domains																
CO2	Acquire basic skills for performing literature survey.																
CO3	Improve their Presentation and Communication skills.																
CO4	Develop skills for preparing technical report																
					CC	D-PO-	PSO	Mapp	ing								
COs						РС	)s							PSOs			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	2	2	3	1	-	-	-	-	-	-	-	2					
CO2	2	2	3	1	-	-	-	-	-	-	-	2					
CO3	2	2	3	1	-	-	-	-	-	-	-	2					
CO4	2	2	3	1								1					
Average	2	2	3	1	-	-	-	-	-	-	-	1.8					

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