# ACADEMIC CURRICULA

UNDERGRADUATE DEGREE PROGRAMMES

Bachelor's Degree in Technology (B.Tech - Four Years) (Choice Based Flexible Credit System)

**Regulations 2018** 

Volume – 2 (Detailed Syllabus for First Year Courses)



## SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)

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Course Code	18LE	H101J	Course Name			ENGLISH		Co Ca	ourse tegory		Η	Н	ımanii	ties ai	nd Soci	al Scie	ences	includ	ing Ma	anage	ement		2	Г I 0	Р 2	<u>С</u> 3
Pre-rec Cour	uisite ses				Co-requisite Courses	Nil			Prog Co	jressi urse:	ive s	Nil														
Course C	ffering Depa	artment	Engli	sh and Foreign L	anguages.		Data Book / Codes/Standards		Nil																	
Course L	Course Learning Rationale (CLR): The purpose of learning this course is to:								Le	arnin	g					Prog	gram l	earn	ing O	utcon	nes (l	PLO)				
CLR-1 :	Analyze the	importance	e of commu	nication in persor	nal, professional co	ontexts. Iden	tify proper English pronunciation		1	2	3		1	2	3 4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 : CLR-3 : CLR-4 : CLR-5 : CLR-6 : Course L	Strengthen Writing briet Write effecti Research of Utilize Engl	vocabulary f paragraph ive essays, n a topic an lish languag comes (CL	and gramm s using app stories. Exp d write a cc ge skills alor <b>O</b> ): At the	ar. Enhance liste ropriate techniqu perience workpla mprehensible ac ng with technical end of this cours	ening and writing co les. Enhance their ce communication cademic project rep skills in build wide skills in build wide se, learners will be	omprehensic English flue aspects ports. Make o r career orie able to:	on. Review films and documentarie: ncy in speaking effective presentations ntations	S	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)		Engineering Knowledge	Problem Analysis	Design & Development Analvsis. Design. Research	Modem Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO – 3
CLO-1 :	Identify type	es, modes, o	channels an	d barriers of con	rriers of communication. distinguish different speech sounds, pronounce correctly			ectly	1	70	60		L	Н	L H	Н	Н	L	Н	Н	Н	-	Н	-	-	-
CLO-2 :	Identify, rec	tify the erro	rs in the use	e of grammar and	grammar and vocabulary. Improve listening and writing skills				2	65	60		L	Н	LH	Н	Н	L	Н	Н	Н	-	Н	-	-	-
CLO-3 :	Develop a to	opic idea int	to a cohesiv	e paragraph witl	ragraph with examples. Improve the fluency of speaking skills			3	75	70		L	Н	LH	Н	М	L	Н	Н	Н	-	Н	-	-	-	
CLO-4 :	Develop ide	as into logi	cal and coh	erent essays. Un	essays. Understand better the workplace culture			3	75	65		L	Н	LH	Н	Н	L	Н	Н	Н	-	Н	-	-	-	
CLO-5 :	Identify the	steps involv	ed in writin	g an academic p	academic project report. List and practice skills need for making a presentation		n	3	75	65		L	Н	LH	Н	Н	L	Н	Н	Н	-	Н	-	-	-	
CLO-6 :	Build listenii	ng, speakin	g, reading,	writing abilities in English, To interact with English speaking people.				3	70	65		L	L	LH	Н	Н	L	Н	Н	Н	-	Н	-	-	-	

		Communication	Vocabulary and Grammar	Discourse Techniques	Workplace Communication	Project Writing
Dura	tion (hour)	12	12	12	12	12
6.4	SLO-1	Definition, process of communication	Words with Foreign roots, Word formation – inflectional, derivational prefixes, suffixes	Sentence structure, Phrases and Clauses	Reading Comprehension, Guidelines questions (referential,critical,interpretative)	Topics for project writing
3-1	SLO-2	Filling in-class worksheets	Quiz - Identifying the borrowed roots and their meanings-Worksheet exercise	Exercise: worksheet, Identifying phrases, clauses, compound, complex sentences	Practice Exercise	Discussion
S-2	SLO-1	Verbal and non-verbal communication	Synonyms and Antonyms and Standard abbreviations	Developing ideas into paragraphs – cohesion markers	Précis-writing Guidelines	Collection of Data – avoiding plagiarism- authenticity and credibility of data
5-2	SLO-2	Individual and group activities - Role play	Context based activity / Learner compiling standard abbreviations from core subject	Identify topic sentence in a paragraph; writing a paragraph based on a topic	Practice Exercise	Collection of data for verification
6.2	SLO-1	LAB: Individual speech sounds	LAB: Listening to long conversations	LAB: Listening to short stories - Science fiction	LAB: Videos on workplace scenario Open Discussion on Workplace Etiquette	LAB: Importance of availing credible resources with examples
3-3	SLO-2	Courseware on speech sounds (Listening and reproducing)	Identify communication contexts, use of making a word list in relation to the context	Identify main idea of the given story and narrate a story on the given topic – Written	speaking language known to everyone, space, polite words, actions, objective	Collecting and compiling resource materials
6.4	SLO-1	LAB: often mispronounced sounds	LAB: Listening to long conversations, daily life	LAB: Speaking - practice activity – brain storming – mind mapping	LAB: Videos on workplace communication	LAB: Guidelines for preparing a PPT; presentation techniques
3-4	SLO-2	Audio visual material (Listening to minimal pairs and reproducing)	Identify various communication contexts and answering questions - collocation	Just a Minute	Role play based on the given workplace contexts	Preparing PPT on the topic of learners' choice
S-5	SLO-1	Other Types of Communication: general technical-formal, informal- external, internal	Homonyms and Homophones	Inputs on writing precisely, redundancies, wordiness-repetition-clichés	Summarising	Guidelines for writing: outline- objectives- background- methodology-discussion
0-0	SLO-2	Write upon a selected type of communication	Fun activities – worksheets- cross words	Error analysis and editing	Group activity (oral/written) on the given passages	Drafting an outline
5.6	SLO-1	Listening, Speaking, Reading, Writing	Articles, Tenses	Defining, describing technical terms	Essay Writing, general introduction	Discussion using sample project
3-0	SLO-2	Group activity (Newspaper) – Discussion and Feedback	Exercise through worksheets- individual activity -peer correction- open discussion	Writing definitions-product and process description	Brainstorming on relevant technical and non-technical topics	Writing the first draft on the selected topic

e 7	SLO-1	LAB: Material on mispronounced words	LAB: Watching documentaries & short films related to science and technology	LAB: Describing a scene or event -videos	LAB: Technical communication – Interpreting Data	Giving inputs on documentation based on IEEE
3-7	SLO-2	Individual oral activity and rectification of the probable mistakes.	Picking out the terminology related to science and technology	String narration – describing an event or a scene	Group activity - interpretation of data - oral presentation	Preparing references
S_8	SLO-1	LAB: sentence types	LAB: Introduction to English es –British and American -Videos	LAB: Channels of communication - videos	LAB: External Communication-Advertising	Checklist for project format (PPT)
3-0	SLO-2	Practice on sentence stress and intonation	Discussion on difference between British and American words	Observing and identifying the channels of communication –Role play	ADZAP (promoting a product) - Oral	Self-verification and submission of final draft
5.0	SLO-1	Communication barriers	Noun-pronoun agreement and subject-verb agreement	Inputs on Classifying/categorising and sequencing ideas with relevant diagrams	Essay Writing Guidelines: introduction, elaboration and conclusion with examples	LAB: Formal Presentation
3-9	SLO-2	Individual activity- sharing of personal experiences	Identifying and learning through error analysis - worksheets	Writing a passage on the given hints, tree diagram, classification table and flow chart	Individual activity (Written) on the given topic	LAB: Formal Presentation
S 10	SLO-1	Organizational communication - Channels of communication	Misplaced modifiers - prepositions- prepositional verbs and phrasal verbs	Importance of punctuation – miscommunication –errors in punctuation	Organisational Report Writing - Progress report- Guidelines	LAB: Formal Presentation
3-10	SLO-2	Group activity (worksheet) with visuals or written material.	Learn through practice – placing same modifier in different places in a sentence	Fun activities - worksheets for appropriate punctuation - written	Writing a progress report	LAB: Formal Presentation
S-11	SLO-1	LAB: short biographical account on famous personalities -video	LAB: Watching video based on daily life	LAB: Barriers of communication Language barriers - videos	LAB: Sample case studies for work ethics - videos	LAB: Formal Presentation
3-11	SLO-2	Oral paraphrasing of the content shown	Observing and recording the features of spoken English	Identifying the language barriers of communication –Written	Debate on the videos shown	LAB: Formal Presentation
S-12	SLO-1	LAB: Listening to short conversations	LAB: Watching interviews of famous personalities	LAB: Barriers of communication-personal and organizational - video	LAB: Learning interview techniques through models	LAB: Formal Presentation
5-12	SLO-2	Answering the questions on the above content	Quiz on the video shown	Role play on the videos shown	Mock interview	LAB: Formal Presentation

Learning	1. Swan, Michael. Practical English Usage. OUP, 1995	3. CIEFL, Hyderabad. Exercises in Spoken English. Parts I-III. OUP	5. www.mmm.english.com	7. www.onlinewriting.com/purdue
Resources	2. Kumar Sanjay and Pushpa Lata. Communication Skills. OUP, 2011	4. Anbazhagan K, Cauveri B, Devika M.P., English for Engineers. Cengage, 2016	6. www.usingenglish.com	8. www.ieee.org/index.html

Learning Assess	ment										
	Diagm's			Conti	nuous Learning Ass	essment (50% weig	htage)			Final Examinatio	n (EO9( weightege)
	Diouin's	CLA –	1 (10%)	CLA – 2 (15%)		CLA –	3 (15%)	CLA –	4 (10%)#		in (50 % weightage)
	Level of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Lovel 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/
Level I	Understand	20%	2076	1370	1370	1576	1570	1576	1370	1370	1370
Lovel 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Leverz	Analyze	2070	2070	2070	2070	2070	2070	2070	2078	2070	2070
Lovel 2	Evaluate	100/	109/	150/	150/	150/	150/	150/	150/	150/	150/
Level 3	Create	10%	1076	1370	1370	1570	1570	1570	1370	1370	1370
	Total	10	0 %	10	0 %	10	0 %	10	0 %	10	0 %

Course Designers				
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Course Code	18LEH102J	Course Name			CHINESE		C Ca	ourse tegory	H Humanities and Social Sciences including Manageme			ent	ł	L 2	T 0	P 2	C 3									
Pre-requis Courses	Pre-requisite Courses Nil Co-requisite Courses Nil						Prog	gress ourse	ive s	Nil																
Course Offe	ring Department	Englis	h and Foreign L	anguages	Data Book	/ Codes/Standards		Nil																		
Course Lear	ning Rationale (CL	R): The pu	rpose of learnin	ng this course is to:				Le	earnir	ıg						Prog	ram L	earni	ing O	utcor	nes (l	PLO)				
CLR-1: PI	ronounce Chinese R	omanization,	know about Chi	ina and Chinese sp	eaking countries, Read l	basic Chinese characte	rs	1	2	3		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2: He CLR-3: As	elp ask about the new sk about directions, l	ed, counting r earn basic co	numbers, Greet nversation on o	each other, expres rientation	ss time and date in daily o	conversations		(mc	(%)	(%		е		ţ	earch			nability		논		0				
CLR-4: Da	ally activities and asi st the Chinese festiv	king about pla als and Chine	ces and Chines se culture, acqu	se etiquette uire basic conversa	ational skills			(Bloc	ency (	nent (		wledg		pmen	Res	ge		ustair		n Wo		nance	þ			
CLR-6 : U	tilize Chinese langua	ige skills alon	g with technical	skills in build wide	r career orientations			king	oficie	tainn		Kno	alysis	evelo	sign,	l Usa	ulture	t & S		Tean	tion	& Fii	arnin			
Course Lear	ning Outcomes (Cl	L <b>O):</b> At the e	and of this cours	se, learners will be	able to:			Level of Thi	Expected Pr	Expected At		Engineering	Problem An	Design & De	Analysis, De	Modem Toc	Society & C	Environmen	Ethics	Individual &	Communica	Project Mgt.	Life Long Le	PSO - 1	PSO - 2	PSO – 3
CLO-1 : PI	ronounce Chinese la	nguage, Iden	tify the basic Ch	ninese scripts, tone	s and greetings			1	60	60		-	-	М	-	М	Н	L	М	Н	L	-	Н	-	-	-
CLO-2 : Id	entify basic gramma	r, count numb	ers, tell date an	nd time, make inter	rogative sentences and b	asic conversations		2	65	62		-	-	Н	-	Н	М	L	М	Н	М	-	Н	-	-	-
CLO-3 : As	sk different kinds of o	questions, to t	ell age using Cl	hinese words				2	68	63		-	-	М	-	М	L	L	М	L	M	-	H	-	-	-
CLO-4: Id	entify the different us	sage of Chine	se grammar an	d vocabulary and i	ntroduce one self			2	69	65		-	-	H	-	H	H	L	M	H	H	-	H	-	-	-
	propriately use diffe	erent verbs an	a aajectivės in t vitina obilitioo in	Dasic conversation	S act with Chinaga nagala	and understand their a	Huro	2	72	63		-	-	Н	-	Н	H	L	M	M	H	-	Н	-	-	-
	unu nsterning, speakir	iy, reading, w	nung abilities in	i Chimese, 10 Intera	act with Chinese people a		iture	2	10	00		-	-	П	-	П	П	L	IVI	п	П	-	п	-	-	-
Duration (ho	ur)	12			12	1:	2							12								12	2			

Duratio	on (hour)	12	12	12	12	12
<b>C</b> 1	SLO-1	About china, Chinese speaking country, chinese language & culture.	Numbers in Chinese.	Introduction of few basic W/H words and framing basic interrogative sentences	Making of Affirmative negative question in Chinese	Introduction & application of few frequently used construction in Chinese.
3-1	SLO-2	Introduction of initials, finals in Mandarin	Counting numbers and numeric system	Nationality	Conversation to make suggestion, accept of dealing suggestion, make comments.	Introduction & application of few frequently used construction in Chinese.
• •	SLO-1	Tables of combination of initials and finals in Putonghua(Mandarin)	Chinese monetary system, Counting Chinese currency.	Direction in Chinese.	Sentence with nominal predicate, Subject verb construction as its predicate.	Famous Chinese festivals
5-2	SLO-2	Basic greetings, Phrases used in daily life (in pinyin)	Converse to greet others, express needs	Making question with <i>几</i> , <i>多少</i>	Fruit related vocabulary, application.	Major Chinese cities
6.2	SLO-1	Tables of combination of initials and finals in Putonghua(Mandarin)	Asking your need	Introducing one's nationality	Asking question with ma , wh words, affermative -negative	Application and usage of construction
3-3	SLO-2	Tables of combination of initials and finals in Putonghua(Mandarin)	Nominal measure word	Asking about nationality	Lianxi	Lianxi
5.4	SLO-1	Prononciation of Pinyin chart	Telling phone number in chinese	Asking price	Asking question with ma , wh words, affermative -negative	Application and usage of construction
3-4	SLO-2	Prononciation of Pinyin chart	Converting numbers	Lianxi	Lianxi	Lianxi
<b>6</b> E	SLO-1	Introduction of Four Tones in Chinese language.	Time & time related greetings,	Politely and formally asking names , Expressing apology.	Making Chinese sentences with verbal & Adjectival predicate.	Grammar related to 但是,可是,以 前,以后,后来。
3-3	SLO-2	Four Tones and related pronunciation.	Days&Seasons.	Introduction & Application of verbal Measure Word.	Introduction of 地	Introduction & Application of the basic optative verbs like <i>会, 能, 可以</i> .
S-6	SLO-1	Tonesandhi <i>(一, 不)</i> in Chinese Tone discrimination in Chinese	Sentence patterns in Chinese, S-V-O sentences. Framing simple sentences.	Make sentences with在,and few corelated words like 这儿,那儿 with example	Few basic verbs and adjectives.	conversation how todescribe likes ,dislikes, interest and hobbies
0-0	SLO-2	Chinese characters. The eight strokes of characters, proper stoke orders.	Introduce 是 and 不是	Important locations used in daily life.	Opposite words.	Conduct conversation how todescribe likes, dislikes.,interest and hobbies

67	SLO-1	Pronounce word in proper tone	Vocabulary	Asking about places.	Usage of verbs	Usage of grammar
5-7	SLO-2	Personal Pronouns and relations, Plural forms of pronouns	Asking date and time	lianxi	练习	lianxi
S-8	SLO-1	Writing characters with proper stroke order	Usage of time words in a sentence	Asking about directions.	Usage of adjectives with different adverbs	Asking about interest and hobbies
3-0	SLO-2	Writing characters with proper stroke order	Introducing each other	lianxi	练习	lianxi
6.0	SLO-1	Sentence structure with the adjective $\mathcal{R}$ and Framing sentences, negative of $\mathcal{R}_{\circ}$	Weekdays in Chinese, Month, Year&Writing Date.	Profession relatedvocabulary, application withexamples.	Colour and vocabulary, application withexamples.	Conversation how to bergain and purchase products.
3-9	SLO-2	Introduction of adverb 也,Interrogative particle 呢,application & Usages.	Introduction of verb有 and it'snegative form .Nominal measure word.	Basic conversation about persons ouccupation	describe family members and talk about university and department	conversation how to bergain and purchase products.
S-10	SLO-1	Possesive/ Structural Particle 約, application of 約with pronouns.	Framing of basic interrogative sentences with modal particle $\pi \mathcal{G}_{o}$	Introduction of interrogative phrase ${\mathscr S}$ ${\mathscr K}, $ Tellingone'sage in Chinese.	Sports &Games realated vocabulary, special usages,	Use of conjugation <i>还是,或者</i> with example.
5-10	SLO-2	Writing Chinese characters basic conversation related to greetings	Framing of basic interrogative sentences with modal particle $\pi \mathcal{G}_{o}$	Introduction of past tense and aspect particle $\mathcal{T}_o$	application withexamples.	
0.44	SLO-1	Writing greetings in characters with proper stoke order	Asking simple question	Asking age	Asking about likes and dislikes	Asking about purchasing products
5-11	SLO-2	练习	Asking date	lianxi	Asking about likes and dislikes	Asking about purchasing products
S-12	SLO-1	Basic Expression	Birthday in Chinese	Asking about occupation	Asking about family members	Usage of conjugation
0-12	SLO-2	练习	Grammar – has, have	lianxi	Asking about family members	Usage of conjugation

Learning Resources

I. Liu Xun, New Practical Chinese reader, Beijing Language and Culture University Press, 2008

2. Elementary Chinese Reader- 1, Sinolingua Beijing China, 2007

Learning Assess	ment										
	Diagm's			Conti	nuous Learning Ass	essment (50% weig	htage)			Final Examination	(E00/ woightage)
	DIOUIII S	CLA –	1 (10%)	,) CLA – 2 (15%)		CLA –	3 (15%)	CLA – 4	l (10%)#		i (50% weightage)
	Level of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Lovel 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/
Level 1 Understand		20%	20%	15%	15%	15%	15%	15%	15%	10%	10%
Lovel 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Leverz	Analyze	20%	20%	20%	2070	20%	2070	2070	20%	20%	2070
Lovel 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	15%	15%
Lever J	Create	1070	1070	1370	1370	1370	1570	1370	1370	1370	1370
	Total	100	) %	10	0 %	10	0 %	10	0 %	10	0 %

# CLA - 4 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.,

#### Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
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2. Mr. Paul Das, NEC, Chennai	2. Ms. Subashree, VIT, Chennai, subashree@vit.ac.in	2. Mr. Soumya Brata Halder, SRMIST

Cou Co	irse de	18LEH103J	Course Name	FRENCH Cours Catego				ourse	y	Н	H	umaniti	es and	l Socia	al Scie	ences	inclua	ling M	anage	əment	t	L 2	T 0	P 2	C 3	
Pre- C	requisite ourses	Nil			Co-requisite Courses	Nil			Pro C	gress ourse	sive es	Nil														
Cours	e Offering	g Department	Englis	h and Foreign I	Languages	Data Book	/ Codes/Standards		Nil																	
Cours	e Learnin	g Rationale (CLF	R): The pu	rpose of learni	ng this course is to				L	earni	ng	] [				Pro	gram l	Learn	ing O	utco	nes (	PLO)				
CLR-1	: Get to	o know about Frai	nce. its cultur	e, heritage and	d countries speakin	g French. Build basic abi	lities to converse in Fre	ench	1	2	3	ן ר	1 2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2	: Ident	ify and ask for info	ormation. Des	scribe people w	vith adjectives. Buil	d conversational abilities												×			1			-		
CLR-3	CLR-3:         Ask for and Provide directions, Identify French educational system, Draft a curriculum vitae           CLR-4:         Tell Time and converse in time related situations, Identify French etiquette							Ê		-				arch			abilit									
CLR-4	CLR-2 :       Identify and ask for information. Describe people with adjectives. Build conversational abilities         CLR-3 :       Ask for and Provide directions, Identify French educational system, Draft a curriculum vitae         CLR-4 :       Tell Time and converse in time related situations, Identify French etiquette         CLR-5 :       Appreciate French cuisine and their food habits         CLR-6 :       Utilize French language skills along with technical skills in build wider career orientations								loor	y (%	it (%		dge	ent	ese			aina		Vork		g				
CLR-5	CLR-4: Tell Time and converse in time related situations, Identify French etiquette CLR-5: Appreciate French cuisine and their food habits CLR-6: Utilize French language skills along with technical skills in build wider career orientations								g (B	ienc	men		all of		R R	age	ø	Sust		۲ ۲	ı	inar	g			
CLR-6	LR-5: Appreciate French cuisine and their food habits LR-6: Utilize French language skills along with technical skills in build wider career orientations								ki.	ofic	tain		Kno H	arys Weld	sign	, sui	- If	t & S		Tea	tion	8 F	arni			
								Ē	d Pr	d At		ring			1 <sup>0</sup>	S S	nen		al &	nica	Mgt.	g Le			-	
Cours	Course Learning Outcomes (CLO): At the end of this course, learners will be able to:							Level of	Expecte	Expecte		Enginee	Design	Analysis	Modem	Society	Environ	Ethics	Individua	Commu	Project I	Life Lon	PS0 - 1	PSO - 2	PSO - 3	
CLO-1	I: Ident	ify and pronounce	French alph	abets, Greet, C	Converse, Introduce	e, Read, identify basic Fre	ench grammar		1	70	60			M	-	M	H	Ē	M	H	Ĥ	-	Ħ	-	-	-
CLO-2	2: Ident	ify French adjectiv	ves, verbs en	ding in"er" and	frame simple sente	ences and make convers	ations		2	65	60			H	-	Н	М	L	М	Н	Н	-	Н	-	-	-
CLO-3	3: Orien	t someone by giv	ing directions	s, Ask for direct	tions, Express poss	session, conjugate verbs	in "ir', Draft curriculum	vitae	2	65	60			L	-	М	L	L	М	L	L	-	Н	-	-	-
CLO-4	: Expre	ess and use time,	create a rout	ine using reflex	xive verbs, conjuga	te a reflexive verb and re	gular verbs in "re"		3	75	65			Н	-	Н	Н	L	М	Н	Н	-	Н	-	-	-
CLO-	5: Parag	graph on French f	food habits ar	nd also their ow	vn using partitive ar	rticles. Alimentation is ass	sociated with partitive a	article	s 3	75	65			H	-	Н	Н	L	М	М	Н	-	Н	-	-	-
CLO-6	<b>5</b> : Build	listening, speakin	ng, reading, w	riting abilities i	n French, To intera	nct with French people an	d understand French c	ulture	3	70	65			Н	-	Н	Н	L	М	Н	Н	-	Н	-	-	-
		1					1																			
Durat	ion (hour)		12			12	1	2							12							13	2			
Status SLO-1 L'alphabet, Les accents Les nombres 70 à 100 Les articles contractes (a					s (au.	) Les ac				ectifs d	émons	stratifs	3			La for	me n	égativ	ve (ne	plu	s, ne.	Ja	imais			
SLO-2 Les salutations Les nombres 101 a 1000 Les articles contractes (					tes (du) La famille						La forme négative (neque. Ne rien)						n)									
SLO-1         Les pronoms sujets, Les verbes: être, avoir, s'appeler, habiter         Le genre des noms         Les verbes : Vouloir, pour					pouvoir, devoir Les 2 groupes verbes Les verbes acheter, i payer					eter, m	, manger, Commencer,															
S-2 SLO-2 Les articles indéfinis le nombre des noms Les verbes irréguliers						3	Les verbes : sortir, partir L'argent																			

6.4		· /· · · · · · · · · · · · · ·			···· <b>j</b> ······	· · · · · · · · · · · · · · · · · · ·
5-1	SLO-2	Les salutations	Les nombres 101 a 1000	Les articles contractes (du)	La famille	La forme négative (ne…que. Ne… rien)
S-2	SLO-1	Les pronoms sujets, Les verbes: être, avoir, s'appeler, habiter	Le genre des noms	Les verbes : Vouloir, pouvoir, devoir	Les 2 groupes verbes	Les verbes acheter, manger, Commencer, payer
-	SLO-2	Les articles indéfinis	le nombre des noms	Les verbes irréguliers	Les verbes : sortir, partir	L'argent
6.2	SLO-1	L'expression	Comprendre une petite annonce	Faire une enquête	Proposer a qqn pour une sortie	Demander le prix
3-3	SLO-2	Les salutations	Rédiger une annonce simple	Ecrire une liste	Proposer a qqn de faire qqc	Faire les courses
6.4	SLO-1	Se communiquer en classe	Chercher un logement	Les gouts des autres	Apprécier qqc	Les services et les commerces
3-4	SLO-2	Epeler, s'appeler	Décrire un logement	Les temps libres et les loisirs	Ne pas apprécier qqc	Payer ses achats
0.5	SLO-1	Les numéros 0 a 69	Le 1 e groupe verbe, les professions	Les adjectifs interrogatifs	Le 3 <sup>e</sup> groupe verbes	L'impératif affirmatif
3-5	SLO-2	Les jours, les mois, les émotions	Les verbes venir et aller	Les mots interrogatifs	Les vêtements	L'impératif négatif
	SLO-1	Les pays, les couleurs	Le genre des adjectifs	Les verbes pronominaux(1)	Les adverbes de fréquence	Les articles partitifs
3-0	SLO-2	Des portraits de pays francophones	les nombre des adjectifs	Les verbes pronominaux(1)	Les adverbes de temps	Les exp. De quantités
S-7	SLO-1	Présentez- vous	Les vocabulaires des objets	Parler de ses loisirs	Décrire une tenue	Accepter une invitation

	SLO-2	Présenter qqn	Décrire son voisin	Exprimer ses gouts	Décrire les accessoires	refuser une invitation
e .	SLO-1	S'informer sur qqn	Décrire votre profession	Exprimer une préférence	Parler qqc	Donner son appréciation
3-0	SLO-2	Demander des informations personnelles	La langue, activité recap.	Exprimer une envie, Activité quotidienne	justifier	S'exprimer a table
5.0	SLO-1	Les prépositions de lieu (1)	Les adjectifs possessifs (sing)	Le verbe aller	Le passe compose : avoir	Le pronom « en » de quantité
3-9	SLO-2	Les verbes : parler, habiter	Les adjectifs possessifs (pl)	Le futur proche	Le passe compose : etre	ll faut
S 10	SLO-1	Les articles définis	Les prépositions de lieu(2)	L'heure	L\imparfait (1)	Les festivals du mot
3-10	SLO-2	Les pronoms Personnelles	Les orientations	Les Temps	L'imparfait (2)	Les festivals en France
6 11	SLO-1	Demander poliment	Les pièces, l'équipement	Demander l'heure	Parler d'un film	Donner des instructions (il Faut)
3-11	SLO-2	Répondre poliment	S'infirmer un logement	Dire l'heure	Féliciter un souhait	Cuisine d'une parisienne d'adoption
6 42	SLO-1	Les vocabulaires d'informatique	Ecrire un portrait	Raconter sa vie sur un blog	Adresser un souhait	Commander au restaurant
3-12	SLO-2	S'inscrire sur un site	La description physique	Justifier	Ecrire une carte postale	Ecrire une recette

Learning Resources

1. SAISONS 1 – Didier - 2017

2. BIENVENUE – Course Book in French – Department of EFL, SRMIST- 2017

Learning Asses	Learning Assessment															
	Ploom's			Conti	nuous Learning Ass	essment (50% weig	htage)			Einal Examination	n (50% woightaga)					
	Diouin's	CLA –	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA – 4	l (10%)#		r (50 % weightage)					
	Level of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice					
Lovel 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/					
Level 1 Rer Unc	Understand	20%	20%	1376	1376	1376	1376	1376	1376	1376	1370					
Lovel 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%					
Level 2	Analyze	2070	2070	2070	2070	2070	2070	2070	2070	2070	2070					
	Evaluate	100/	100/	150/	150/	150/	150/	150/	150/	150/	150/					
Level 3	Create	10%	10%	1370	1370	1370	1376	1370	1370	1370	1370					
	Total	10	0 %	100 %		10	) %	10	0 %	100 %						

Course Designers			
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts	
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2. Mr. Durga Prasad Bokka, TCS Chennai, durgaprasad@tcs.com	2. Ms. Judy Niranjala, SIET college for Women, Chennai	3. Mr. J. Sabastian Satish, SRMIST	

Course Code	18LEH104J	Course Name			GERMAN	Co Cat	ourse tegory		Η	Hum	anities	and S	Social	Scier	ices ii	ncludi	ing Ma	anage	ement	_	L 2	T 0	P 2	С 3
Pre-req Cour	uisite ses <i>Nil</i>			Co-requisite Courses	Nil		Prog Co	gress ourse	ive s	Vil														
Course C	ffering Department	Englis	h and Foreign L	anguages	Data Book / Codes/Standards		Nil																	
Course L	ourse Learning Rationale (CLR): The purpose of learning this course is to:						Learning Program Learning Outcomes (P								PLO)	_0)								
CLR-1 :	CLR-1:         Get to know about Germany, its culture, heritage. Build basic abilities to converse in German           CLR-2:         Identify and ask for information. Introduce oneself. Build conversational abilities						1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 : CLR-3 : CLR-4 : CLR-5 : CLR-6 : Course L	CLR-2 :       Identify and ask for information. Introduce oneself. Build conversational abilities         CLR-3 :       Ask for and Provide directions in German, Identify German cities, buildings and everyday life like cuisine         CLR-4 :       Develop the ability to read, understand and initiate a conversation         CLR-5 :       Enable basic conversational skills to behave in a German speaking society, in restaurants and in public places         CLR-6 :       Utilize German language skills along with technical skills in build wider career orientations         Course Learning Outcomes (CLO):       At the end of this course, learners will be able to:					evel of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Engineering Knowledge	<sup>2</sup> roblem Analysis	Jesign & Development	Analysis, Design, Research	Aodem Tool Usage	Society & Culture	Environment & Sustainability	Ethics	ndividual & Team Work	Communication	Project Mgt. & Finance	ife Long Learning	sso - 1	sSO - 2	sSO – 3	
CLO-1 :	CLO-1: Identify and pronounce German alphabets, Greet, Converse, Introduce, Read, identify basic German grammar			e, Read, identify basic German grammar		1	70	60	-	-	L	Ĺ	M	Ĥ	L	Ħ	Ħ	Ĥ	-	Ħ	-	-	-	
CLO-2 :	CLO-2: Compose dialogue between strangers, ask simple information				2	65	55	-	-	М	L	М	Н	L	Н	Н	Н	-	Н	-	-	-		
CLO-3 :	CLO-3 : Orient someone by giving directions, by using Imperatives and different types of definite & indefinite articles				2	73	60	-	-	М	М	Н	М	М	Н	Н	Н	-	Н	-	-	-		
CLO-4 :	CLO-4 : Write a dialogue by using different verbs of Accusative articles				3	65	55	-	-	М	М	Н	Н	М	Н	Н	Н	-	Н	-	-	-		
CLO-5 :	.0-5 : Create conversations in social places like; restaurants, identify and order food varieties				3	65	55	-	-	М	М	Н	Н	L	Н	Н	Н	-	Н	-	-	-		
CLO-6 :	Build listening, speaking, reading, writing abilities in German, linteract with Germans and understand their culture				3	75	65	-	-	Н	Н	Н	Н	Н	Н	Н	Н	-	Н	-	-	-		

Durat	ion (hour)	12	12	12	12	12
	SLO-1	Alphabets, Grüßen und Verabschieden.	UmbestimmtArtikel im Nominativ.	T, N, D verbenkonjugationen und Satzschreiben.	Die Uhezeiten verstehen und nennen.	Etwasgemeinsam planen, über Geburtstag sprechen.
S-1	SLO-2	Über Länder, Sprachensprechenim Deutschland, WichtigeStädteim Deutschland.	Zahlenbis 1000 und Wortschatz.	Ordinal Zahlen und Tagezeiten	Zeitangabenmachen.	Schreiben Sie: Einladung für ihre Geburtstag.
6.2	SLO-1	Zahelenbis 20, Sich und andere Vorstellen.	Plätze und Gebäudebe nennen, Fragenzuortenstellen.	Überessensprechen, Verschiedene Gerichte in Deutschland durch PPT.	Umregelmä6ige verbenkonjugationen und BeispieleSatz.	Possessive Artikel im Akkuativ.
3-2	SLO-2	Telefonnummer und E-mail Adressenennen.	Negation und übersetzung.	Buchstabieren und Wortschtz.	"ieren" verben conjugation und Beispielesatz.	BeispieleSätze.
S_2	SLO-1	Alphabet Aussprache und hört die grüßen.	Hörübung: Die Telefonnummer.	Hörübung: Aussprache die Umlauteä, ö, ü und beispieleSätze.	Hörübung: Dem Dialog zuhören und die Zeit schreiben.	E-mail schreiben: Einladung ihrer Geburtstagsferier.
S-3 SLO-1 Alphabet A SLO-2 Verabschi	Verabschiedenen Wörten.	Buchstabieren und Wortschtz.	Hören und buchstabieren.	Übungen.	Übungen.	
6.4	SLO-1	Länder, Sprachen, Der Film: Über den Guten Tag und die Telefonnummer.	Der Film: Über die Sehenwürdigkeiten in Detschland.	Dialog: Über das Essen und seine preisepraktizieren.	Mit den Reguläßige und Umregelmäßigen verbeneigene Sätze schreiben	Das Gesprächhören und verstehen.
3-4	SLO-2	Übungen.	Sprechen über den wichtige Städte im Deutschland.	Übungen.	"ieren" verben konjugationen.	Wortschatz und buchstabieren.
9.5	SLO-1	Über Länder und Sprachensprechen.	Himmelsrichtungen und Verkehrsmittel nennen.	Einen Einkauf Planen und sprechen	Über die Familiesprechen und sichverabreden.	Das Briefeschreiben erklären, eineEinldung verstehen und schreiben.
3-3	SLO-2	Hören und buchstabieren.	NachdemWegfragen und einem Wegbeschreiben	Gespräche beim Einkauf führen.	Sich für eine verspätung entschuldigen.	Personal pronomen und beispieleSätze.
5.6	SLO-1	Aussagesatz und personal pronomen in Nominativ und beispieleSätze.	Texte mit internationalenwörtern verstehen.	Gesprächebeim Essen führen.	EinenTermin telefonisch vereinbaren.	ImRestaurentbestellen und bezahlen, übereinEreignis sprechen,
3-0	SLO-2	ÜberArbeit, Berufe und Arbeitszeitensprechen.	Artikel lernen.	W-fragen texte verstehen.	Schreiben Sie die Uhrzeiten.	BestimmtInformationen in Texten finden.

-	SLO-1	Übersich und anderesprechen.	Hörübung: Schreiben Sie die Zahlen.	Kurzer Dialog über d	las Einkaufen.	Üben: Wie man den Termin festlegt.	Schreiben eines Briefes über jede gegebene situation.
5-7	SLO-2	Fragen und antworten.	Events im Hamburg.	Übungen: Verben kor	njugationen.	Hören und buchstabieren.	Übungen: Trennbare Verben konjugationen.
<b>c</b> 0	SLO-1	Sich und anderevorstellen.	Fragen Sie die Wegbeschreibung in dem sie die Bildersehen.	Kurzer Dialog über da	as Essen.	Hörübung: Die Zeit durch hören des Dialogs schreiben.	Hörübung und Schreiben: Freizeitaktivitäten.
3-0	SLO-2	W-Fragen.	Lesen und verstehen.	Hören: wie man beste	ellt.	Übungen.	Satzmithilfsverben.
S-0	SLO-1	Zahlen ab 20 nennen, über Jahrezeiten im Deutschland.	Imperativ mit Sie, Lesen und verstehen.	Wortschatz und Buchstabieren. Umbesti		Umbestimmt Artikel im Akkusativ.	Untrennbare verben konjugationen. Beispiele Sätze.
0-9	SLO-2	Wochentage und Monate.	Lange und KurzeVokale.	Schreiben Sie die Sätze. Zeitanga		Zeitangabenmit am, um, von bis.	BeispieleSätze.
\$ 10	SLO-1	Bestimmt Artikel in Nominativ.	Regelmä6ige verben Konjugationen.	PositionenimSatz, Bestimmt Artikel im Erklärt die Akkusativ. Akkusativ		Erklärt die Grammatik Präpositionen im Akkusativ.	Präteritum von Hilfsverben und konjugationen.
3-10	SLO-2	Verwendungen von Hilfsverben.	Satzschreiben.	AkkusativVerben konjugationen. Beispie		Beispiele <b>Sätze im</b> Präpositionen .	Modal verben konjugationen und beispiele Sätze.
S-11	SLO-1	Ja oder NeinFragen durch PPT.	Der Imperetivsätze und auch die Regelmä6igeverben	Essen im D-A-CH, Be	eruferund ums Essen.	Hören und sprechen: die Tagesablauf.	Übung für Modal verben wie, Aussagesatz, Satzfrage.
5-11	SLO-2	Typische Hobby's.	Lernen Sie die Sätze durch PPT.	Hören Sie den dialog.		Schreiben: Die Tagesabluf.	W-Frage und Trennabreverben.
S-12	SLO-1	Der Film: Über den Termin.	Der Film: Die Autofahrt und das Verkehrsmittel.	Der Film: Frühstück bei den Bergs. Pünktlichke hast du Zei		Pünktlichkeit in D-A-CH und Der Film: Nie hast du Zeit und Termine.	Der Film: Hast du Zeit? Im Restaurant und Überraschung.
5-12	SLO-2	Über deineFamilie.	Claudia Berg in der Arbeit.	Einkaufen planen.		Der Termin und die Verabredung.	Schreiben Sie die Sätze mit Hilfs verben.
Learni Resou	ng Irces	1. Netzwerk – Klett – Langeiseheidt, Mu	nchen, 2015		2. Grundkurs De	utsch, Dept.of EFL, SRMIST	

.earning	Assessment	

Learning Assess	arming Assessment														
	Ploom's			Contir	nuous Learning Ass	essment (50% weigl	ntage)			Einal Examination	(50% woightage)				
	Diouin's	CLA – 1	1 (10%)	CLA – 2	2 (15%)	CLA – S	3 (15%)	CLA – 4	(10%)#		(50% weightage)				
	Lever of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice				
	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/				
Level 1 Under	Understand	2076	20%	1570	1576	1370	1370	1370	1570	1370	1370				
2 امريم ا	Apply	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%				
	Analyze	2070	2070	2070	2070	2070	2070	2070	2070	2070	2070				
l ovol 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	15%	150/				
Levers	Create	1070	10/0 13/0 13/0 13/0 13/0		1570	1570	1570	1570	1570						
	Total	100 % 100 % 100 %				) %	100	) %	100 %						

Course Designers			
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Course Code	18LEH105	Cou Na	irse me	JAPANESE Co			ourse itegory		Н	Hum	anities	and S	ocial	Scien	ces in	cludii	ng Ma	anage	ment		L 2	т 0	P 2	С 3
Pre-req Cour	uisite ses			Co-requisite Courses	Nil		Prog Co	gressi ourse:	ive s	Nil														
Course C	ffering Departme	t I	English and For	reign Languages	Data Book / Codes/Standards		Nil																	-
Course L	earning Rationale	(CLR): 7	The purpose of l	learning this course is to:			Le	arnin	ıg				F	Progr	am Lo	earni	ng Oı	utcom	nes (F	PLO)				
CLR-1 :	CLR-1:         Identify the basics of Japan language and the facts of Japan, Make useful expressions and basic conversations.         1           CLR-2:         Identify someone and ask for information. Physical description of people with adjectives. Focus of basic conversation         1					2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
CLR-2:       Identify someone and ask for information. Physical description of people with adjectives. Focus of basic conversation         CLR-3:       Ask and give directions, Use conversation on orientation. Identify the Japan educational system         CLR-4:       Create daily activities and tell time. Appreciate Japan etiquette. Conjugate a reflexive verb and 3rd group of regular verbs         CLR-5:       Identify diverse food habits of the Japanese people.         CLR-6:       Utilize Japan language skills along with technical skills in build wider career orientations					Thinking (Bloom)	d Proficiency (%)	d Attainment (%)	rina Knowledae	Analysis	& Development	, Design, Research	Tool Usage	& Culture	nent & Sustainability		al & Team Work	nication	dgt. & Finance	g Learning					
Course L	earning Outcome	(CLO):	At the end of this	s course, learners will be	able to:		Level of	Expecte	Expecte	Endinee	Problem	Design 8	Analysis	Modem	Society	Environr	Ethics	Individua	Commu	Project I	Life Lon	PSO - 1	PSO - 2	PSO-3
CLO-1 :	CLO-1: Identify, pronounce Japan alphabets, know about Japan, its culture. Greet each other and converse, Introduce oneself			1	70	60	М	L	L	L	М	Н	М	Н	Н	М	L	Н	-	-	-			
CLO-2 :	CLO-2: Describe with the help of Japan adjectives, identify first group verbs ending in e. Frame simple sentences			2	65	65	М	L	L	L	М	Н	М	Н	Н	М	L	Н	-	-	-			
CLO-3 :	<b>CLO-3</b> : Orient someone by giving directions, Express possession and conjugate 2 <sup>nd</sup> group verbs. Draft their own curriculum vitae			2	65	65	М	L	L	L	М	Н	М	Н	Н	М	L	Н	-	-	-			
CLO-4 :	<b>CLO-4</b> : Express time and use expressions of time in daily conversations, paragraph on daily routine with the help of reflexive verbs			\$ 3	75	65	М	L	L	L	М	Н	М	Н	Н	М	L	Н	-		-			
CLO-5 :	LO-5 : Create a paragraph on the food habits of the Japan people and also their own using particles.			3	75	65	М	L	L	L	М	Н	М	Н	Н	М	L	Н	-		-			
CLO-6 :	Build listening, speaking, reading, writing abilities in Japan, To interact with Japan people and understand Japan culture			3	75	65	М	L	L	L	М	Н	М	Н	Н	М	L	Н	-	-	-			

Durat	ion (hour)	12	12	12	12	12
6.4	SLO-1	Introduction to Japan	Hiragana Lesson 7 Ma and Ya series.	Lesson 5 – Particles.	Lesson 6 – renshuu and exercises	Lesson 9 Renshuu
3-1	SLO-2	Japanese language and culture	ma/ya series related words	Japanese sports.	Religious beliefs,.	Explanation of ~te form I Group
6.2	SLO-1	Greetings	Lesson 3 – time - reading	Japanese martial arts.	Lesson 7 – reading and grammar	Explanation of ~te form II Group
3-2	SLO-2	Self Introduction	Lesson 3 grammar.Classroom expressions. Kara, made, ni, ne and o	De and to	Ongaku and manga	Explanation of ~te form II and III Group
6.2	SLO-1	Hiragana Lesson 1 (vowels and related Hiragana Lesson 8 Ra/Wa series Kanji		Kanji	Common expressions	Exceptional cases of verb groups
3-3	SLO-2	Lesson 1– reading. Self introduction	Ra/Wa series related words	iku, miru, yasumu and kau	Body parts (vocabulary).	Line
6.4	SLO-1	Lesson 1 grammar (wa,ka,mo,no,desu/ja arimasen)	Lesson 3 – renshuu and exercises	Revision of complete Hiragana	Explanation of past tense of verbs.	Lesson 10 - reading and grammar
3-4	SLO-2	Days of the week	Family. Festivals of Japan.Omiyage	Revision of all Particles	Kanji – kuchi, ame, hairimasu, kirimasu, ji, han and fun	Explanation of ~tai form
8.5	SLO-1	Hiragana Lesson 2	Hiragana Lesson 9	Assignment	Lesson 7 reading.	Japanese currency.
3-3	SLO-2	ka and ga series and related words	Double consonants and related words	Assignment	Lesson 7 exercises	Japanese political system
8.6	SLO-1	Lesson 1 – renshuu	Lesson 4 – reading, grammar and vocabulary	Surprise Test	Introduction to Adjectives	Lesson 10 – renshuu and exercises.
3-0	SLO-2	Ojigi and exercises. Numbers and months	Directions. Kanji – person, man, woman, child, tree and book	Surprise Test	I-ending and na-ending adjectives Forms.	Kanji – ookii, chiisai, eki and chuui
S-7	SLO-1	Hiragana Lesson 3	Directions. Kono, kochira, yo.	Revision of Hiragana (3 charts),	Lesson 8 Reading	Kanji – daigaku, nen, nihon and nihongo

	SLO-2	sa and za series and related words	I & na-ending adjectives introduction	long vowels and double consonants	Lesson 8 grammar	Places of interest in Japan
۰.	SLO-1	Seasons.	Hiragana Lesson 10 (long vowels and related words).	Review of grammar	Explanation of ~masen ka	Food and drink (vocabulary).
3-0	SLO-2	Kore/kono – demonstrative pronouns	Lesson 4 – renshuu	Particles	Explanation of mashou	Transport
	SLO-1	Hiragana Lessons 4 and 5	Hashi	Katakana – introduction	Lesson 8 – renshuu.	Review of particles
9-9	SLO-2	ta/da and na/ha series and related words	Hiragana Lesson 11 (chart 3 and related words).	Katakana – rules	Value your time	Review of Kana and Kanji
SLO-1		Kore…/konoreading, grammar and vocabulary	Counters explanation	Review of lessons 1-5	Kanji - days of the week	Review of verbs and adjectives
3-10	SLO-2	Ni and ga, arimasu/imasu, Dare/donata.Renshuu and Meishi	Kanji – days of the week	Grammar and vocabulary	Japanese food and	Japanese house and living style
S 11	SLO-1	Hiragana Lesson 6 (ba/pa series).	Hiragana – special words like wa, e and o and sentence reading	Katakana vocabulary	Lesson 9 reading	Japanese tea ceremony
S-11 SLO-2 Le	Lesson 2 – exercises. Introduction to time.	Lesson 5 – reading.	Kanji – ikimasu, mimasu, yasumimasu	Lesson 9 grammar	Japanese Religious beliefs.	
6 12	SLO-1	Kanji numbers – 13. Time expressions	Lesson 5 Grammar.	Lesson 6 – reading and grammar	Stationery	Japanese Economy
S-12	SLO-2	Colours and basic 5 kanjis (ue, shita, naka, yama and kawa)	Lesson 5 Vocabulary.	Visiting a Japanese home	Transport (vocabulary)	Calligraphy

Learning Resources

1. Minna no Nihon Go, 3A Corporation, Tokyo, Japan, 2002

2. A Basic Course in Japanese – Department of EFL, SRMIST, 2017

Learning Ass	essment										
	Diagm's			Cont	inuous Learning Ass	essment (50% weig	htage)			Einal Examinatio	n (50% woightaga)
	DIUUIII S	CLA –	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA – 4	4 (10%)#		ii (50 % weigiilage)
	Lever of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember Understand	20%	20%	15%	15%	15%	15%	15%	15%	15%	15%
Level 2	Apply Analyze	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Level 3	Evaluate Create	10%	10%	15%	15%	15%	15%	15%	15%	15%	15%
	Total	10	) %	10	0 %	10	0 %	0 %	100 %		

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
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2. Mr. Paul Das, NEC, Chennai	2. Dr. K. Anbazhagan, SRMIST	2. Mr. B.Vijaya Kumar, SRMIST

Course Code     18LEH106J     Course Name     KOREAN								C Ca	ourse tegory	'	Н	Hurr	anities	s and S	Social	Scie	nces ii	ncludin	g Mar	agem	ənt	2	Т 0	P 2	C 3
Pre-r Co	equisi urses	ie <sub>Nil</sub>	Facilia	h and Faraing	Co-requisite Courses	Nil	sk / Oseles/Ctendende		Pro C	gressi ourse:	ive s	Nil													
Course	Offer	ng Department	Englisi	n and Foreign	Languages	Data Bo	ok / Codes/Standards		INII																
Course Learning Rationale (CLR): The purpose of learning this course is to:												Program Learning Outcomes (PLO)													
CLR-1: Know about Korea and its culture; to be able to read, write the Korean script, and to introduce oneself and other people									1	2	3	1	2	3	4	5	6	7	8	9 1	<u>) 1</u>	1 12	2 1	3 14	15
CLR-2: Manage daily life living in Korea. Talking daily activities. Asking for and giving directions, describing the location															÷			Ξţ							
CLR-3 : Be able to shop by asking for the availability of things, and learning about the currency system CLR-4 : Tell time, to socialize: make appointments, talk about weekend plans/activities										(%)	(%)	a		ŧ	searc			inabi		ž		e,			
CLR-4: Teil line, to socialize. make appointments, taik about weekend plans/activities									(Blc	sucy	ent	vled		ome	Res	ge	-	usta		Ň	000	Janc	D		
CLR-5: Communicate about studying Korean and about tuture career or academic plans CLR-6: Utilize Korean language skills along with technical skills in build wider career orientations									king	oficie	ainn	Knor	lysis	velo	sign,	Usa	lture	s S		lean		A FII			
									Thin	Pro	d Att	ind	Ana	De	De	Tool	s cu	nent		×	1-cau	vigt.			
Course Learning Outcomes (CLO): At the end of this course, learners will be able to:									-evel of	Expected	Expected	Tndinee	Problem	Jesign 8	Analysis	Modem .	Society &	Environn	Thics	naiviau		ifa Lond			- OSc
CLO-1: Read, pronounce and write the Korean script, Introduce oneself and other people. Get to know about Korea and its cultors and its cultor										70	60	-	-	Ē	-	Ħ	Ĥ	Ē	M	N F	i -	- F	-	-	-
CLO-2: Manage daily life in Korea - ask for and give directions, describe locations, count, shop, and talk about daily activities										65	65	-	-	L	-	Н	М	L	Μ	H F	1 -	- E	1 -	-	-
CLO-3	: Tal	k about past activitie	es (past tense	e), the weather	r and use the Kore	an currency			2	65	65	-	-	L	-	M	Н	L	M	N N	1 -	- H		-	-
CLO-4	: Tel	l time, to socialize: n mmunicato about eti	nake appoint udving Koroo	ments, talk abo n and about fu	out weekend plans	s/activities			3	/5 75	65 65	-	-	L	-	Н	H	L	M			- F	1 -	-	-
CLO-5	· Ru	IIIIIuIIIcale about sit	a roodina w	ritina abilitias i	ilure career or aca in Korean. To inter	aet with Korean neonle	and understand Korean	culture	3	75	65	-	-		-	<u>п</u> Н	M H	L	M	 				-	
	.  Dui	iu notering, opeaking	y, reaulity, w	nung abilities i	in Norean, To inter			Juiture	, 0	10	00			-	-	11	11	L		, , ,		- 1			
Duratio	on (hou	r)	12			12	1	12 12								12									
	SLO-	1 Introduction to Ko	orea and Kore	ean -	2 <i>일상 생활</i> dailv	life new vocab (action	listening &key sentence	es dril	ling			dislammar point 1-그래서													
S-1	SLO-	2 <i>한글소개, 한</i> :	국소개	ļ	places)		reading/writing		-		C	dialogue1& dialogue2 practice grammar point1-() =					르거	¶£							
S-2	SLO-	1 single vowels ( E	<i>+모음</i> )	(	grammar point1-0,	-යු/ එ.ය.&grammar	5. 쇼 핑2 shopping2 ne	w voc	ab (co	unter	li	istening	&key s	enten	ces dr	illing		dial	dialogue1& dialogue2 practice						
	SLU-	2		ŀ	001112-91/714		noun)	-1. 4			1	eauing/v	mung												
S-3	OLO-	' <i>이중모음과 자</i>	<sup>l</sup> 음 double vo	owels &	dialoque1& dialoqu	ue2 practice	grammar point1- ビレ/	나/습	L/ <i>L</i> /,-		8	8. <i>入  ?ト</i> ti	me ne	w voca	ab (tin	ne)		liste	nina 8	readi	na				
	SLO-	<sup>2</sup> basic consonants	3			r r	ㅂ니깨습니까&					, – ,			(	,			5		5				
	SLO-	1   <i>쌍 자음과 음절</i>	double cons	onants &																					
S-4	SLO-	2 syllables		lonance a	listening & reading.	/writing	teaching money				1	reaching	date	& weel	ſS			writi	ng for	week	and a	ctivitie	es		
0.5	SLO-				3. 위치location ne	w vocab(object	dialaguat 8 dialagua 2				g	grammar	point1	I_0∥				11.	かえの	ਮ <i>ਨ</i> ਮ	≓(stu	dying	Korea	an) ne	w
S-5 SLO-2  문심과 음설1 Batchim & syllables //ocation/							oraciic	e		g	grammar	point2	?-ㅅ/-분	<u>=</u>			VOC	ab(pro	nouns	)	, ,		,		
9-6	SLO-	1 <i>바치과 으저</i> 20	Potobim & out	(	grammar point1- °,	/// <i>7</i> }	listening &key sentence	es dril	ling			lialogua	1 <i>8. dia</i> l	loguo?	nract	ico		grai	nmar	point1	. L//,	저, 내	.7		
0-0	SLO-	2	ballinn a syn	liables	grammar point2- <i>0</i> 1	베있다(없다	reading/writing				, i	llalogue	i di ului	oguez	prace	100		grar	nmar	oint2	' <i>⊏</i> 'i	irregul	ar ve	rbs	
S-7	SLO-	1 자모 연습. (prad consonants)	ctices vowels	s and	dialogue1& dialogu	ue2 practice	6. 어제 일고lyesterday vocab (action, places)	∕'s dai	ly routi	ine ne	w li r	istening eading/v	&key s vriting	enten	ces dr	illing		dial prac	ogue1 tice	& dialo	gue2	2			
SLO-1 듣기, 교실 표현(listening & class							,			0. <i>St</i> ☆ consistenct pour				ces dı	rilling										
S-8     E/1. 単 실 単 연( listening & class     grammar point - 次 2       SLO-2     terms)     reading/writing     grammar point 2- 0// A									V	vocab(loo	cation	R plan				read	ling/w	riting							

6.0	SLO-1	1. <i>자기소개</i> self –introduction , new	4. 쇼핑1shopping1 new vocab (items to	dialogue1& dialogue2	grammar point1- ( <i>으</i> ) 르까요	
2-9	SLO-2	vocab(nationality, occupation	shop)	practice	grammar point2- <i>아요/어요</i>	12.계획(pian) -(으) 르 가에표.
	9101	grammar point a all all all a		listoning & koy sontoncos drilling		grammar point1- pro nouns の//ニノ/ズ
S-10	3L0-1	yranniar point i- ۳ ۳ شته ۹۱ شد.	shoppina1 teaching numbers	istering and sentences uning	dialoque1& dialoque2 practice	+ <i>컻</i> (things)
	SLO-2	grammar point2-은/는		reading/writing		grammar point2- ' —' irregular verbs & dialogue2
S 11	SLO-1	dialogual 8 dialogua 2 practica	grammar point1- <i>을/ 를</i>	7. 날씨 weather new vocab( season&	listening &key sentences drilling	dialogue 19 dialogue 2 practice
3-11	SLO-2	ulaiogue i a ulaioguez practice	grammar point2-(으)세요	weather)	reading/writing	ulalogue i & ulaloguez practice
S 42	SLO-1	listening &key sentences drilling	dialogue 18 dialogue 2 practice	grammar point1-ユ리ユ	10.주말 활동 (weekend activities) new	listening &key sentences drilling
S-12 SLC	SLO-2	0-2 reading/writing dialogue1& dialogue2 practice grammar point2- 2ł		vocab (places& weekend activities)	reading/writing	
Learni	ng					

Resources

1. Sejong Korean 1, The National Institute of the Korean Language. Hawoo Publisher, 2013

Learning Assess	ment												
	Diagm's			Cont	inuous Learning Ass	essment (50% weig	htage)			Einal Examination	n (50% woightaga)		
	DIUUIII S	CLA –	1 (10%)	CLA –	CLA – 2 (15%)		3 (15%)	CLA – 4	4 (10%)#		in (50 % weightage)		
	Level of Thinking Theory Practice		Theory	Practice Theory		Practice	Theory	Practice	Theory	Practice			
lovel 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/		
Lever	Understand	20%	20%	15%	15%	15%	15%	10%	15%	15%	10%		
	Apply	200/	200/	200/	200/	200/	200/	200/	200/	200/	200/		
Leverz	Analyze	20%	20%	2076	20%	20%	20%	2076	2076	2076	2070		
Lovel 2	Evaluate	100/	100/	150/	159/ 159/		150/	450/ 450/		150/	150/		
Levers	Create	10%	10%	15%	15% 15%		15%	10%	15%	15%	10%		
	Total	100	) %	10	0 %	10	0 %	10	0 %	100 %			

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
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2. Mr. Paul Das, NEC, Chennai	2. Ms. Subashree, VIT, Chennai, subashree@vit.ac.in	2. Ms. Cho Seul Hee, SRMIST

Course Code	se 18PDH101T Course GENERAL APTITUDE			C Ca	ourse itegory		H Humanities and Social Sciences including Manager					ment		L 0	T 0	P 2	C 1							
Pre-requisite Courses Nil Co-requisite Courses Nil							Proę Co	yress ourse	ive s	lil														
Course Off	Course Offering Department Career Development Centre Data Book / Codes/Standards Nil																							
Course Lea	Course Offering Department       Career Development Centre       Data Book / Codes/Standards       N         Sourse Learning Rationale (CLR):       The purpose of learning this course is to:       Image: Course is to								g				P	rogr	am Lo	earnir	ng Ou	itcom	ies (P	PLO)				
CLR-1 : F	Recapitulate fundame	ntal mathema	tical concepts a	nd skills			1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 : <i>H</i> CLR-3 : S CLR-4 : <i>ic</i> CLR-5 : <i>n</i> CLR-6 : <i>A</i> Course Lea	lone critical thinking s harpen logical reason lentification of relation urture passion for em cquire the right know rning Outcomes (Cl	kills by analy. hing through s hiships betwee iching vocable ledge, skill ar .0): At the e	zing the argume skillful conceptu en words based ulary d aptitude to fa end of this cours	ents with explicit an alization, 'on their function, u ce any competitive se, learners will be	d implicit premises Isage and characteristics examination able to:		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modem Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO – 3
CLO-1 : E	Build a strong base in	the fundamer	ntal mathematic	al concepts			2	80	75	L	Н	-	Н	М	-	-	-	Н	Н	L	Н	-	-	-
CLO-2 : //	dentify the approache	s and strateg	ies to solve prol	blems with speed a	and accuracy		2	75	70	-	Н	-	Н	М	-	-	-	Н	Н	-	Н	-	-	-
CLO-3: Gain appropriate skills to succeed in preliminary selection process for recruitment						2	80	75	-	Н	-	Н	М	-	-	-	Н	Н	L	Н	-	-	-	
CLO-4: Collectively solve problems in teams and groups						3	75	70	L	Н	-	Н	М	-	-	-	Н	Н	-	Н	-	-	-	
CLO-5 : E	CLO-5 : Build vocabulary through methodical approaches					3	85	80	-	Н	-	Н	М	-	-	-	Н	Н	L	Н	-	-	-	
CLO-6 : E	<b>0-6</b> : Enhance lexical skills through systematic application of concepts and careful analysis of style, syntax, semantics and logic					2	85	80	-	Н	-	Н	М	-	-	-	Н	Н	-	Н	-	-	-	

Durat	ration (hour) 6		6	6	6	6
8.1	SLO-1	Types of numbers, Divisibility tests	Square root, Cube roots, Remainder	Percentage Introduction	Discount	Logarithms Intro
3-1	SLO-2	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
S-2	SLO-1	Introduction to Significance of Verbal Aptitude in Competitive Examinations	Contextual Vocabulary Exercise – Synonyms	Sentence Completion Basic Level Exercises – Single Blank	Reading Comprehension – Introduction	Grammar Rules – A comprehensive Introduction
0-2	SLO-2	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
6.2	SLO-1	LCM and GCD	Identities	Percentage Problems	Simple Interest	Logarithms Rules
0-0	SLO-2	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
S-4	SLO-1	Vocabulary enrichment techniques	Contextual Vocabulary Exercise - Synonyms	Sentence Completion Basic Level Exercises – Double Blank	Reading Comprehension – Summary & Main Idea	Sentence Completion - Grammar
0-4	SLO-2	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
S-5	SLO-1	Unit digit, Number of zeroes, Factorial notation	Fractions and Decimals, surds	Profit and Loss	Compound Interest, Installments	Linear Equations
0-0	SLO-2 S	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
S-6	SLO-1	Vocabulary enrichment Techniques	Contextual Vocabulary Exercise - Antonyms	Cloze Test	Reading Comprehension – Summary & Main Idea	Spotting Errors
0-0	SLO-2	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems

	1. Nishit K. Sinha, The Pearson Guide to Quantitative Aptitude and Data Interpretation for the CAT	5. Norman Lewis, How to Read Better and Faster, Goyal, 4th Edition
Looming	2. Dinesh Khattar-The Pearson Guide to QUANTITATIVE APTITUDE for competitive examinations	6. Franklin GRE Word List, 3861 GRE Words, Franklin Vocab System, 2014Wiley's GMAT Reading
Deseuress	3. Charles Harrington Elstor, Verbal Advantage: Ten Easy Steps to a Powerful Vocabulary, Random House	Comprehension Grail, Wiley, 2016
Resources	Reference, 2002	7. Manhattan Prep GRE : Reading Comprehension and Essays, 5th Edition
	4. Merriam Webster's Vocabulary Builder, Merriam Webster Mass Market, 2010	8. Martin Hewings, Advanced Grammar in Use. Cambridge University Press, 2013

Learning As	ssessment										
	Dia ana'a			Cont	inuous Learning Ass	essment (50% weig	htage)			Einel Exeminatio	(EO0/ weightage)
	BIOOM S	CLA –	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA – 4	4 (10%)#		n (50% weightage)
	Lever of Thirking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember Understand	-	40%	-	30%	-	30%	-	30%	-	30%
Level 2	Apply Analyze	-	40%	-	40%	-	40%	-	40%	-	40%
Level 3	Evaluate Create	-	- 20%		30%	-	30%	-	30%	-	30%
	Total	10	0%	10	0%	10	0%	10	0 %	10	0 %

Course Designers		
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2. Mr Ajay Zenner, Career Launcher, ajay.z@careerlauncher.com	2. Dr. Dinesh Khattar, Delhi University, dinesh.khattar31@gmail.com	3. Mr Jayapragash J, SRMIST 4. Mrs. Rukmani, SRMIST



Course Code	18PYB101J	Course Name	PHYSICS: ELECTROM	AGNETIC THEORY, QUANTUM MECHANICS, WAVES AND OPTICS	C Ca	ourse tegory	, E	3				Basic	Scien	nces				_	L 3	T 1	P 2	C 5
Pre-requ Cours	Pre-requisite Courses         Nil         Co-requisite Courses         Nil           Sourse Offering Department         Physics and Nanotechnology         Data Book / Codes/Standards																					
Course Offering Department         Physics and Nanotechnology         Data Book / Codes/Standards           Course of Learning Deticnale (CLR)         The surgeous of Learning this source is to:																						
Code       18PYB101J       Source       HTTOBOL ELECTION ONE IN OUR IN ACTIVITION MEDIATION, CONTROL IN OUR AUTON MEDIATION, CONTROL IN AUTON, CONTROL INTERVISE AUTON, CONTROL IN AUTON, CONTROL INTERVISE AUTON, CONTROL INTERVISE, CONTROL IN AUTON, CONTROL INTERVISE, AUTON, AUT												Prog	ram L	.earn	ing O	utcor	nes (l	PLO)				
CLR-1 :	Identify the application	ns of electric f	field on materials		1	2	3	Γ	1	2 3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-1:       Identify the applications of electric field on materials         CLR-2:       Identify the applications of magnetic field on materials         CLR-3:       Identify the significance of quantum theory         CLR-4:       Create insights to the concepts of optical effects         CLR-5:       Analyze the working principle of lasers and optical fibers         CLR-6:       Utilize the concepts in physics for the understanding of engineering and technology         Course Learning Outcomes (CLO):       At the end of this course, learners will be able to:							xpected Attainment (%)	-	ngineering Knowledge	roblem Analysis lesion & Develonment	nalysis, Design, Research	fodern Tool Usage	ociety & Culture	invironment & Sustainability	thics	ndividual & Team Work	communication	roject Mgt. & Finance	ife Long Learning	SO - 1	SO - 2	SO – 3
CLO-1 :	Identify the effect of cl	harge dvnami	ics		2	80	70	-	H	<del>-</del> -	-	-	-	-	-	-	-	-	-	-	-	-
CLO-2 : Analyze electromagnetic induction						85	75		H	Ч-	-	-	-	-	-	-	-	-	-	-	-	-
CLO-3 :	CLO-3 : Apply quantum mechanics to basic physical problems					75	70		Н		Н	-	-	-	-	-	-	-	-	-	-	-
CLO-4 :	CLO-4: Apply ray propagation and optical effects						80		H I	Ч-	-	-	-	-	-	-	-	-	-	-	-	-
CLO-5 :	LO-5: Identify the applications of lasers and optical fiber						75		Н	- H	-	-	-	-	-	-	-	-	-	-	-	-
CLO-6 :	<ul> <li>a proving the applications of lasers and optical meet</li> <li>Apply the concepts of electromagnetic theory and mechanics in real time applications</li> </ul>								-	-   -	-	-	-	-	-	-	-	-	-	-	-	-

Durat	ion (hour)	18	18	18	18	18
6.1	SLO-1	Del, divergence, curl and gradient operations in vector calculus	Magnetization, permeability and susceptibility	Introduction to Quantum mechanics	Introduction to interference	Absorption and emission processes-two level
3-1	SLO-2	Gauss-divergence and Stoke's theorem	Classification of magnetic materials	Explanation of wave nature of particles	Introduction to diffraction	Einstein's theory of matter radiation A and B coefficients
6.2	SLO-1	Electric field and electrostatic potential for a charge distribution	Ferromagnetism	Black body radiation, Concept of Photon	Fresnel diffraction	Characteristics of laser beams
3-2	SLO-2	Gauss' law and its applications	Concepts of ferromagnetic domains	Photoelectric effect, Compton effect	Fraunhofer diffraction	Amplification of light by population inversion
6.2	SLO-1	Laplace's equations for electrostatic potential	Hard and soft magnetic materials	de Broglie hypothesis for matter waves	Fraunhofer diffraction at single slit	Threshold population inversion
3-3	SLO-2	Poisson's equations for electrostatic potential	Energy product	Physical significance of wavefunction	Fraunhofer diffraction at double slit	Essential components of laser system and pumping mechanisms
54	SLO-1	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
3-4	SLO-2	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
S 5-6	SLO-1 SLO-2	Basics of experimentation	Calibrate Ammeter using Potentiometer	Determine Planck's Constant	Determine wavelength of monochromatic light Newton's ring	Determine laser parameters – divergence and wavelength for a given laser source
6.7	SLO-1	Concepts of electric current	Ferrimagnetic materials	Time independent Schrödinger's wave equation	Fraunhofer diffraction at multiple slit	Nd: YAG laser
3-1	SLO-2	Continuity equation	Ferrites-regular spinel and inverse spinel	Time independent Schrödinger's wave equation	Diffraction grating	Semiconductor laser
e .	SLO-1	Laws of magnetism Faraday's law	Magnetic bubbles	Time dependent Schrödinger's wave equation	Characteristics of diffraction grating	CO <sub>2</sub> laser: Vibrational modes
3-0	SLO-2	Ampere's law	Magnetic thin films	Time dependent Schrödinger's wave equation	Applications of diffraction grating	CO2 laser: energy level

8.0	SLO-1	Maxwell's equations	Spintronics	Particle in a 1 D box	Polarization by reflection	Optical fiber-physical structure
3-9	SLO-2	Maxwell's equations	GMR	Normalization	Polarization by double refraction	Total internal reflection
C 40	SLO-1	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
3-10	SLO-2	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
S 11-12	SLO-1 SLO-2	Determine Coulomb's potential and Coulomb's field of metal spheres	Calibrate Voltmeter using Potentiometer	Repeat/Revision of experiments	Determine particle size using laser	Study of attenuation and propagation characteristic-optical fiber
6 42	SLO-1	Polarizations, permeability and dielectric constant	TMR	Born interpretation of wave function	Scattering of light	Numerical aperture
5-13	SLO-2	Polar and non-polar dielectrics	CMR	Verification of matter waves	Circular polarization	Acceptance angle
6 14	SLO-1	Types of polarization	Garnets	Concept of harmonic oscillator	Elliptical polarization	Losses associated with optical fibers
5-14	SLO-2	Frequency and temperature dependence	Magnetoplumbites	Quantum harmonic oscillator	Optical activity	Classification of optical fibers
S 15	SLO-1	Internal field in a field	Multiferroic materials	Hydrogen atom problem	Fresnel's relation	Optical fiber communications system
3-15	SLO-2	Clausius-Mossotti equation	Applications of multiferroic materials	Hydrogen atom problem	Brewster's angle	Optical sensors
S 16	SLO-1	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
5-10	SLO-2	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
S 17-18	SLO-1 SLO-2	Determine dielectric constant of the sample (Expt-2)	Determine magnetic susceptibility- Quincke's method	Study of I-V characteristics of a light dependent resistor (LDR)	Determine Wavelength- diffraction grating	Mini project

 Learning
 1.David Jeffery Griffiths, Introduction to Electrodynamics, Revised Edition, Pearson, 2013

 Resources
 2.Ajay Ghatak, Optics, Tata McGraw Hill Education, 5th Edition, 2012

B.David Halliday, Fundamentals of Physics, 7th edition, John Wiley & Sons Australia, Ltd, 2004
 Eisberg and Resnick, Quantum Physics: Of Atoms, Molecules, Solids, Nuclei and Particles, John Wiley & Sons, 2<sup>nd</sup> Edition, 1985

Learning Assess	ment										
	Diaam'a			Conti	nuous Learning Ass	essment (50% weig	htage)			Final Examination	(EOV) weightege)
	DIUUIII S	CLA – 1	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA – 4	(10%)#		r (50% weightage)
	Lever of Thirking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Lovel 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/
Level 1 Unde	Understand	20%	20%	15%	15%	10%	15%	15%	15%	13%	15%
	Apply	200/	200/	200/	200/	200/	200/	200/	200/	20%	200/
Level 2	Analyze	20%	20%	20%	20%	20%	eightage)         Final Examination (50% weightage)          3 (15%)         CLA - 4 (10%)#         Final Examination (50% weightage)           Practice         Theory         Practice         Theory         Practice           15%         15%         15%         15%         15%           20%         20%         20%         20%         20%           15%         15%         15%         15%         15%           100 %         100 %         100 %         100 %         100 %	20%			
Lovel 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	CLA - 4 (10%)#         Final Examination (50% weightage)           Theory         Practice         Theory         Practice           15%         15%         15%         15%           20%         20%         20%         20%           15%         15%         15%         15%           100 %         100 %         100 %         100 %		
Level 3	Create	1070	1070	1576	1370	1570	1570	1570	1570	1370	1570
	Total	100	) %	100	0 %	10	0 %	100	) %	10	0 %
#CLA Loop ho	from any combinatio	n of these Assignm	anta Caminara Ta	ah Talka Mini Draiad	to Coop Studios S	alf Study MOOCo	Cartificationa Canf	Deper ete			

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Dr. Vinay Kumar Gupta, National Physical Laboratory, guptavinay@nplindia.org	Prof .C. Vijayan, IITM, Chennai, cvijayan@iitm.ac.in	Dr. C. Preferencial Kala, SRMIST
	Prof. S. Balakumar, Univ of Madras, balakumar@unom.ac.in	Dr. M. Krishnamohan, SRMIST

Course Code	18PYB102J	OF SOLIDS	Course Category	,	В				Ba	isic So	cience	əs					L 3	T 1	P 2	C 5		
Pre-requisite Courses         Nil         Co-requisite Courses         Nil           Course Offering Department         Physics and Nanotechnology         Data Book / Codes/Standards							ive s	Nil														
Course Of	fering Department	Physic	s and Nanotechnology Data Book	/ Codes/Standards	Nil																	
Course Le	arning Rationale (CL	Le	arnir	ıg					Progr	am L	earni	ng Oı	utcon	nes (P	PLO)							
CLR-1:       Utilize the principles pertaining to vector mechanics         CLR-2:       Utilize the knowledge on rigid body mechanics								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-1: Oulde the principles pertaining to vector mechanics CLR-2: Utilize the knowledge on rigid body mechanics											_			Þ.								
CLR-3 :	Apply knowledge on s		Ê	(%)	(%)				arch			bilit		~								
CLR-4 :	Identify the theory of e	lasticity at a b	asic level		3loor	cy (9	nt (9	adge		rent	ese			taina		Vor		nce				
CLR-5 :	Apply the concept of fi	iction and its	applications		g (E	ienc	mer	owle	<u>.</u>	ndo	Ľ Ľ	sage	e	Sus		m m		ina	ing			
CLR-6 :	Utilize the concepts in	physics for th	e understanding of engineering and technology		nkin	rofic	ttain	Ř	alys	evel	esig	ñ	ultu	nt &		Teã	ation	<u>ъ</u>	earn			
Course Learning Outcomes (CLO):         At the end of this course, learners will be able to:					Level of Thi	Expected P	Expected A	Engineering	Problem An	Design & D	Analysis, Di	Modern Toc	Society & C	Environmer	Ethics	Individual &	Communice	Project Mgt	Life Long Le	PSO - 1	PSO - 2	PSO – 3
CLO-1 : Identify the principle of mechanics					2	80	70	Н	Н	-	-	-	-	-	-	-	-	-	-	-	-	-
CLO-2 : Determine the resultants of force systems acting on rigid bodies					2	85	75	Н	Н	-	-	-	-	-	-	-	-	-	-	-	-	-
CLO-3 : Establish the equations of equilibrium for a rigid body					2	75	70	Н	-	-	Н	-	-	-	-	-	-	-	-	-	-	-
CLO-4 : Analyze the internal forces in engineering structures composed of simple trusses					2	80	75	Н	Н	-	-	-	-	-	-	-	-	-	-	-	-	-
CLO-5: Apply the concepts of stress and strain in different bodies						75	70	Н	-	Н	-	-	-	-	-	-	-	-	-	-	-	-
CLO-6 :	<b>O-6</b> : Apply the concepts of mechanics and mechanics of solids in real time applications							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Durat	ion (hour)	18	18	18	18	18
6.4	SLO-1	Introduction to vector analysis	Definition and motion of a rigid body in the plane	Introduction to rigid body	Concept of stress at a point	Force analysis -axial force
5-1	SLO-2	Scalar quantities & vector quantities	Rotation in the plane	Free body diagrams with examples	Planet stress	Force analysis -shear force, bending moment
<b>S</b> _2	SLO-1	Transformation of scalars and vectors	Kinematics in a coordinate system rotating in the plane	Reactions at Supports and connections for a two dimensional structure	Transformation of stresses at a point	Twisting moment diagrams of slender members
5-2	SLO-2	Transformation of scalars and vectors under rotation transformation	Kinematics in a coordinate system translating in the plane	Examples on modeling of typical joints	Principal stresses and Mohr's circle	Twisting moment diagrams of slender members (without singularity function)
6.2	SLO-1	Forces in nature	Angular momentum about a point of a rigid body in planar motion	Equilibrium of a rigid body in two dimensions	Displacement field	Torsion of circular shafts- Definition of torsion, effects of torsion
3-3	SLO-2	Newton's laws	Euler's laws of motion	Condition for equilibrium in two dimensions	Concept of strain at a point	Generation of shear stresses
S-1	SLO-1	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
0-4	SLO-2	Solving Problems	Solving Problems	Solving Problems	Solving Problems	Solving Problems
S 5-6	SLO-1 SLO-2	Basics of experimentation	Determine acceleration due to gravity- Compound bar pendulum	Determine Moment of inertia and angular acceleration with precision pivot bearing	Measurement of free fall-Dynamics method	Determine Young's modulus-non-uniform bending
S-7	SLO-1	Form invariance of Newton's second law	Independence of Euler's laws from Newton's laws	Equilibrium of a rigid body in three dimensions	Plane strain- transformation of strain at a point	Torsion of thin walled tubes
3-7	SLO-2	Solving Newton's equations of motion in polar coordinates	Describing rigid body motion	Condition for equilibrium in three dimensions	Principal strains	Shear test by torsion of tube
6.0	SLO-1	Fundamentals of simple harmonic motion	Precession of a body	Friction-limiting cases	Mohr's circle	Moment-curvature relation in pure bending of beams with symmetric cross-section
3-8	SLO-2	Harmonic oscillator	Precession of a spinning top	Friction- non limiting cases	Strain Rosettes	Moment-curvature relation in pure bending of beams with symmetric cross-section

5.0	SLO-1	Damped harmonic motion	Introduction to three-dimensional rigid body motion	Force-displacement relationship	Concepts of elasticity, plasticity	Bending stress, Shear stress
3-9	SLO-2	Different cases-over critically and lightly damped oscillators	Distinction from two-dimensional motion	Simple illustration of force displacement	Strain hardening, work hardening	Cases of combined stresses
S 10	SLO-1	Solving problems	Solving problems	Solving problems	Solving problems	Solving problems
3-10	SLO-2	Solving problems	Solving problems	Solving problems	Solving problems	Solving problems
S 11-1	SLO-1 2 SLO-2	Determine acceleration due to gravity using Bifilar pendulum	Determine spring constant-Expansion of a helical spring	Repeat/Revision of experiments	Determine rigidity modulus-Torsional pendulum	Determine Young's Modulus-Uniform Bending
6.47	SLO-1	Fundamentals of vibrations	Two- dimensional motion in terms of angular velocity vector, its rate of change	Geometric compatibility for small deformations	Failure of materials	Concept of strain energy
5-13	SLO-2	Vibration model	Two- dimensional motion in terms of Moment of inertia tensor	Illustrations based on axially loaded members	Yield criteria, Deflection due to bending	
6.44	SLO-1	Forced oscillations	Three-dimensional motion of a rigid body - coplanar manner	Introduction to trusses	Idealization of one dimensional stress- strain curve	Deflection due to bending-integration of the moment
3-14	SLO-2	Magnification factor of forced oscillations	Rod executing conical motion with center of mass fixed	Types of trusses	Generalized Hooke's law with thermal strains for isotropic materials	curvature relationship for simple boundary conditions
S 16	SLO-1	Resonance	Rod executing conical motion-two dimension and three dimension	Method of joints	Characteristics of elasticity	Integration of the moment-curvature relationship. Method of superposition
3-10	SLO-2	Application of resonance	Failure of two-dimensional formulation	Method of section	Complete equations of elasticity	Strain energy and complementary strain energy for simple structural elements
S 10	SLO-1	Solving problems	Solving problem Solving problem		Solving problem	Solving problem
3-10	SLO-2	Solving problems	Solving problem	Solving problem	Solving problem	Solving problem
S 17-1	SLO-1 SLO-2	Newton's 2nd law-Demonstration track with measure Dynamics	Determine Static friction, sliding friction and rolling friction	Determine moment of inertia and angular acceleration- Gyroscope	Mechanical conservation of energy- Maxwell's wheel with measure Dynamics	Mini Project
		1 Mahendra K Verma, Introduction to Mech				
Lear	ning		anios, oniversities i 1855 (inula) i vi. Liu., 20		,s, Dover i ubiloalions IIIc., 1901	

Resources

2.J. L. Meriam, Engineering Mechanics – Dynamics, 7<sup>th</sup> Edition, Vol. 2, Wiley Publishers, 2012

4.E.P. Popov, Engineering Mechanics of Solids, Prentice Hall India Learning Private Limited; 2<sup>nd</sup> Edition, 2002.

Learning Assess	ment										
	Diaam'a				Final Examination	n (E0% weightege)					
	DIUUIII S	CLA –	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA – 4	4 (10%)#	FINALEXAMINATIO	n (50% weightage)
	Lever of Thirking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Loval 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/
Level 1 Under	Understand	20%	20%	15%	10%	15%	10%	15%	15%	15%	10%
Lovel 2	Apply	200/	200/	200/	200/	200/	200/	200/	200/	200/	200/
Leverz	Analyze	20%	20%	2076	2076	2076	2076	2076	2076	2076	2070
Lovel 2	Evaluate	1.00/	1.00/	150/	150/	150/	150/	150/	150/	150/	150/
Level 3	Create	1076	1070	1370	1370	1370	1370	1370	1370	1370	1370
	Total	10	0 %	10	0 %	10	0 %	10	0 %	10	0 %

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Dr. D.K. Aswal, National Physical Laboratory, dkaswal@nplindia.org	Prof. V. Subramaniam, IITM, Chennai, manianvs@iitm.ac.in	Dr. C. Preferencial Kala, SRMIST
	Prof. C. Venkateswaran, Univ of Madras, venkateswaran@unom.ac.in	Dr. M. Krishnamohan, SRMIST

Cou Co	ırse de	18PYB103J	Course Name	Durse PHYSICS: SEMICONDUCTOR PHYSICS Ca								Cou Cate	ırse gory		В					E	Basic	Scien	ces					L 3	T 1	P 2	C 5					
Pre- Cours	requisite ourses e Offerin	Nil g Department	Physic	cs and Nano	otechno	Co-requisite Courses logy	e ∧	Vil	Data Boo	ok / C	Codes	s/Star	ndard	ls	N	Prog Co Vil	gress ourse	sive es	Nil																	
Cours	e Learnir	ng Rationale (CL	R): The pu	irpose of lea	ərnina tl	his course is	to:									Le	arni	na	1					Pro	aram	Lear	nina (	Dutco	mes	(PLO	)					
	. Intro	dues hand een an		in constants	. <u>.</u>											4	0	2	, 1	4	2	2	4	E		7	0	0	10	44	10	10	14	45		
CLR-1	: Intro	ouce band gap an	a termi ievei i	in semicona	auctors	n n and mat		miconducto	or iunction							1	2	3	-	1	2	3	4	5	6	1	8	9	10	11	12	13	14	15		
CLR-2	Prov	ide an insight on s	semiconducto	or ontical trai	nsitions	and photov	ai sei nltair	niconducio c effect	Juncuon						-	(	_						<del>г</del>			oility										
CLR-4	: Proc	ure knowledge of	electrical and	l optical mea	asurem	ents in semi	icond	luctor								moo	(%) /	t (%)		dge		at a	seal			ainat		'ork		8						
CLR-5	: Deve	lop necessary ski	ills for low din	nensional se	emicon	ductor mater	rial pr	ocessing a	and charact	teriza	ation					(BI	ency	nent		wled	s	bme	, Re	ade	, <sub>a</sub>	Susta		N ≈		inan	b					
CLR-6	i: Utiliz	e the concepts in	physics for th	ne understar	nding o	f engineering	g and	l technolog	<i>y</i>							lking	ofici	tainr		Kno	alysi	svelc	sign	I N <sup>s</sup>	Ita	t & S		Tear	tion	S E	arni					
																Thir	d Pr	d Att		ring	I Ana	& De	, De	T <sub>00</sub>	୍ର ଅ	meni		al &	nicat	Mgt.	g Le			_		
Cours	e Learnir	ng Outcomes (CL	<b>O):</b> At the e	end of this c	course, learners will be able to: occupation probability							-evel of	Expecte	Expecte		Enginee	Problem	Design &	Analysis	Modern	Society	Environ	Ethics	ndividua	Commu	Project I	-ife Lon	- 0So	- SO - 2	0SO – 3						
CLO-1	: Ident	ify the energy bar	nd in solids ar	nd electron d	occupa	tion probabil	lity									2	85	75	1	H	Ĥ	-	-	-	-	-	-	-	-	-	-	-	-	-		
CLO-2	: Anal	yze the working of	f optoelectron	nic devices	vices t of new and novel optoelectronic devices							2	75	70	]	Н	Н	-	-	-	-	-	-	-	-	-	-	-	-	-						
CLO-3	: Appl	y the knowledge to	o the develop	ment of new	nt of new and novel optoelectronic devices							2	80	75		Н	-	-	Н	-	-	-	-	-	-	-	-	-	-	-						
CLO-4	I: Ident	ify the working me	echanism of e	electrical and	trical and optical measurements							2	75	70		H	Н	-	-	-	-	-	-	-	-	-	-	-	-	-						
CLO-S	D: Utiliz	e the knowledge of	of the low aim	iensional se	ensional semiclation meterial fabrication and characterization.						2	80	70		н	-	н	-	-	-	-	-	-	-	-	-	-	-	-							
	Appi	r the concepts of a	Semiconducid	di pitysics ili	i ieai ui	ne applicatio	5115									2	00	70		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Durat	on (hour)		18					10						18				T	10																	
Durat			10					10			oncor	nt of o	ntical	10 I transit	ione	in hu	lk						U								10			_		
S-1	SLO-1	Classical Free e	lectron theory	/	Intri	insic semico	nduc	tor	- <del>(</del>	se	emico	onduct	ors	i li ansil	10113 1	111 DU	IN	(	Concept of electrical measurements									Density of states in 2D								
	SLO-2	Quantum Free e	electron theory	y	Fer tem	mi level on c iperature in l	carrie Intrin	r-concentra sic semicor	ation and nductor	op	optical	l abso	rption	n proce	SS				Two-point probe technique								Dens	sity of	state	s in 1	D and	) and 0 D				
<b>S</b> .2	SLO-1	Density of states	6		Ext	rinsic semico	onduc	ctors		Сс	oncep	pt of re	ecom	binatio	n pro	cess		I	Four-p	point	orobe	e tech	nique	e-linea	ar met	thod	Intro	ductio	n to l	ow di	mens	ional	syster	ns		
0-2	SLO-2	Energy band in s	solids		Fer tem	mi level on c perature in e	carrie. extrin	r-concentra Isic semico	ation and Inductors	Op	ptical	l recon	nbina	ation pro	ocess	s		1	Four-µ methc	point   od	orobe	e tech	nique	-Van	der P	auw	Quai	ntum (	well							
	SLO-1	Kronig-Penney r	nodel		Exp	lanation for	carrie	er generatio	on	Ex	xplan	ation f	for sp	ontane	ous e	emiss	sion	\$	Signif	icance	e of c	arrier	dens	sity			Quai	ntum (	wire a	and de	ots					
3-3	SLO-2	Kronig-Penney r	model		Exp	lanation for	recor	mbination p	processes	Ex	xplan	ation f	for sti	imulate	d em	issio	n	3	Signif	icance	e of r	esisti	vity a	nd Ha	all mol	bility	Intro syste	ductio ems	n to i	novel	low d	imens	sional			
	SLO-1	Solving problem	S		Sol	ving problem	1			So	olving	g probl	lem					5	Solvin	ng pro	blem						Solv	ing pr	oblen	า						
5-4	SLO-2	Solving problem	s		Sol	ving problem	1			So	olving	g probl	lem					8	Solvin	ng pro	blem						Solv	ing pr	oblen	n						
S 5-6	SLO-1 SLO-2	Basics of experi	mentation		Stu dep	dy of I-V cha endent resis	aracte stor (l	eristics of a LDR)	light	Ch (Fo	harac Forwa	cteriza ard Bia	tion o ns)	of pn jui	nctior	n dio	de		Deteri Laser	mine	Partic	cle Si.	ze of	Semi	condu	ıctor	Dete	rmine	of ef	ficien	cy of a	solar	cell	-		
6.7	SLO-1	E-k diagram			Carrier transport - diffusion and drift current Joint density of states in service		semi	icond	uctor	r I	Hot-p	oint p	robe	meas	urem	ent			CNT- properties and					d synthesis												
3-1	SLO-2	Direct and Indire	ect band gap		Continuity equation Density of states for photo					ons			(	capac	itance	ə-volt	age r	neasi	ureme	ents		Appl	icatioi	ns of	CNT											
	SLO-1	Concept of phon	nons		p-n	junction	tion Explanation of transition						rates	3		I	Extrac	ction o	of par	ramet	ers in	a dic	ode		Fabr	icatio	n tecł	nnique	ə-CVL	)						
5-8	SLO-2	Concept of Brillo	ouin Zone	Continuity equation     Density of s       p-n junction     Explanation       Biasing concept in p-n junction     Fermi's gold							s golde	en rul	le				1	l-V ch	aract	əristic	cs of a	a dioc	le			Fabrication technique-PVD										

50	SLO-1	Energy band structure of semiconductor- Brillouin zone	Metal-semiconductor junction -Ohmic contact	Concept of optical loss	Principle of Deep-level transient spectroscopy (DLTS)	Characterizations techniques for low dimensional systems
3-9	SLO-2	Concept of effective mass	Metal-semiconductor junction - Schottky junction	Concept of optical gain	Instrumentation of DLTS	XRD-Powder method
S 10	SLO-1	Solving problems	Solving problem	Solving problem	Solving problem	Solving problem
3-10	SLO-2	Solving problems	Solving problem	Solving problem	Solving problem	Solving problem
S 11-12	SLO-1 SLO-2	Determine Hall coefficient of Semiconductor material	Determine Band Gap of semiconductor- Four probe method	Repeat/Revision of experiments	Attenuation, propagation characteristic of optical fiber cable using laser source	Determine lattice parameters using powder XRD
S-12	SLO-1	Classification of electronic materials	Semiconductor materials of interest for optoelectronic devices	Basic concepts of Photovoltaics	Significance of band gap in semiconductors	Principle of electron microscopy
5-15	SLO-2	Fermi level	Photocurrent in a P-N junction diode	Photovoltaic effect	Concept of absorption and transmission	Scanning electron microscopy
S 14	SLO-1	Probability of occupation	Light emitting diode	Applications of Photovoltaic effect	Fundamental laws of absorption	Transmission electron microscopy
0-14	SLO-2	Influence of donors in semiconductor	Classification of Light emitting diode	Determination of efficiency of a PV cell	Instrumentation of UV-Vis spectroscopy	Atomic force microscope
S-15	SLO-1	Influence of acceptors in semiconductor	Optoelectronic integrated circuits	Theory of Drude model	Determination of band gap by UV-Vis spectroscopy	Heterojunctions
0-13	SLO-2	Non-equilibrium properties of carriers	Organic light emitting diodes	Determination of conductivity	Concept of Photoluminescence	Band diagrams of heterojunctions
S 16	SLO-1	Solving problems	Solving problem	Solving problem	Solving problem	Solving problem
3-10	SLO-2	Solving problems	Solving problem	Solving problem	Solving problem	Solving problem
S 17-18	SLO-1 SLO-2	Determine Band Gap of semiconductor- Post Office Box method	Study of V-I and V-R characteristics of a solar cell	To verify Inverse square law of light using a photo cell.	Characteristic of p <u>-</u> n junction diode under reverse bias	Mini Project

Learning Resources

J. Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw-Hill Inc. 1995.
 B. E. A. Saleh and M. C. Teich, Fundamentals of Photonics, John Wiley & Sons, Inc., 2007.

S. M. Sze, Semiconductor Devices: Physics and Technology, Wiley 2008.
 A. Yariv and P. Yeh, Photonics: Optical Electronics in Modern Communications, Oxford University Press, New York 2007.

Learning Asse	essment										
	Pleam's			Conti	nuous Learning Ass	essment (50% weig	htage)			Final Examination	(EO9/ woightage)
	DIUUIII S	CLA –	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA – 4	4 (10%)#		r (50% weightage)
	Level of Thirking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Loval 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/
Level 1	Understand	20%	20%	1376	1376	1376	1376	1576	1370	1370	1370
Loval 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Level 2	Analyze	2070	2070	2070	2070	2078	2070	2070	2070	2070	2078
	Evaluate	100/	1.00/	150/	150/	150/	150/	150/	150/	150/	150/
Level 5	Create	10%	1076	1370	1370	1370	1370	1370	1370	1370	1370
	Total	10	0 %	100	)%	10	0 %	10	0 %	10'	0 %

Total
 T

Course Designers										
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts								
Dr. Vinay Gupta, National Physical Laboratory, guptavinay@nplindia.org	Prof. C. Vijayan, IITM, Chennai, cvijayan@iitm.ac.in	Dr. C. Preferencial Kala, SRMIST								
	Prof. S. Balakumar, University of Madras, balakumar@unom.ac.in	Dr. M. Krishnamohan, SRMIST								

Course Code	18CYB101J	Course Name			CHEMISTRY	C Ca	ourse itegory	,	В	Basic Sciences						L 3	T 1	P 2	C 5						
Pre-requ Cours	iisite es <sup>Nil</sup>			Co-requisite Courses	Nil		Pro Ce	gress ourse	sive s	Nil															
Course O	fering Department	Chem	istry		Data Book / Codes/Standards		Perio	dic Ta	able																
Course Learning Rationale (CLR):       The purpose of learning this course is to:       Learning       Program Learning Outcomes (PLO)																									
CLR-1 :	Utilize the atomic and	molecular m	anipulation towa	rds the design of n	ew materials		1	2	3		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-1:       Utilize the atomic and molecular manipulation towards the design of new materials         CLR-2:       Employ various spectroscopic techniques in identifying the structure and correlate it with their properties         CLR-3:       Exploit the periodic properties of elements for bulk property manipulation towards technological advancement         CLR-4:       Address concepts related to electrochemistry, such as corrosion, using thermodynamic principles         CLR-5:       Employ various organic reactions towards the design of fine chemical and drug molecules for industries         CLR-6:       Utilize the basic chemistry principles applied in various engineering problems and identify appropriate solutions         Course Learning Outcomes (CLO):       At the end of this course, learners will be able to:						Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)		Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO – 3	
CLO-1 :	Analyze atomic, mole	cular orbitals	of organic, inorg	anic molecules to	identify structure, bonding, molecular energy le	vels	2	70	65		Н	-	Н	-	-	-	-	-	-	-	-	-	-	-	-
CLO-2 :	Utilize the principles of	of spectroscop	pic technique in a	analysing the struc	ture and properties of molecules		2	80	70		Н	-	-	Н	Н	-	-	-	-	-	-	-	-	-	-
CLO-3 :	Rationalize bulk prop	erties using th	nermodynamic co	onsiderations and p	periodic properties of elements		2	75	60		-	Н	-		-	-	-	-	-	-	-	-	-	-	-
CLO-4 :	Utilize the concepts of	f thermodyna	mics in understa	nding thermodyna	mically driven chemical reactions		2	70	70		H	H	-	Η	-	-	-	-	-	-	-	-	-	-	-
CLO-5 :	Perceive the important	nce of stereod	hemistry in synth	hesizing organic m	olecules applied in pharmaceutical industries		2	80	70		-	Н	Н	-	-	-	-	-	-	-	-	-	-	-	-
CLO-6 :	Utilize concepts in ch	emistry for te	chnological adva	ncement based on	electronic, atomic and molecular level modific	ation	2	75	65		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Durat	ion (hour)	18	18	18	18	18
<b>S</b> 1	SLO-1	Schrodinger equation- introduction	Crystal field theory-Explanation	surface characterization techniques – XPS - Introduction	Hard soft acids and bases	Optical activity, absolute configurations
3-1	SLO-2	Schrodinger equation-Derivation	Crystal field theory-Explanation	surface characterization techniques – XPS - Explanation	Hard soft acids and bases	conformational analysis
6.2	SLO-1	Particle in a box solutions	Energy level diagrams for transition metal ions	Diffraction and scattering of solids	Thermodynamic functions: energy	Isomerism in transitional metal compounds-Introduction
3-2	SLO-2	Applications for conjugated molecules	Energy level diagrams for transition metal ions	Explanation	Entropy and free energy	Isomerism in transitional metal compounds-Types
6.2	SLO-1	Forms of the hydrogen atom wave functions	Magnetic properties of transition compounds	Ionic, dipolar interactions	Estimation of entropy	Introduction to reactions involving substitution
3-3	SLO-2	plots of these functions to explore their spatial variations	Magnetic properties of transition compounds	Van der Waals interactions	Estimation of free energies.	Addition reaction
S-4	SLO-1	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session
0-4	SLO-2	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session
S 5-6	SLO-1 SLO-2	Lab Introduction	Estimate of amount of chloride content in a water sample.	Determine strength of a mixture of acetic and hydrochloric acid by conductometry.	Determine adsorption of oxalic/acetic acid from aqueous soln. by activated charcoal	Experiment - Repeat - 2
67	SLO-1	Molecular orbitals of diatomic molecules- Homonuclear	Principles of spectroscopy-Introduction	Equations of state of real gases	Free energy and emf. Cell potentials	Elimination reaction
3-1	SLO-2	Heteronuclear diatomic molecules	Principles of spectroscopy-Explanation	critical phenomena	The Nernst equation and applications	Oxidation reaction
۰ ،	SLO-1	Equations for atomic orbitals	Selection rules-Introduction	Effective nuclear charge, penetration of orbitals	Acid base, oxidation reduction	Reduction reaction
3-0	SLO-2	Equations for molecular orbitals	selection rules-Explanation	variations of s, p, d and f orbital energies of atoms in the periodic table	Solubility equilibria	Examples

8.0	SLO-1	Energy level diagrams of diatomic- introduction	Electronic spectroscopy -Introduction	Electronic configurations, atomic and ionic sizes	Water chemistry	Cyclization
2-9	SLO-2	Energy level diagrams of diatomic- explanation	Electronic spectroscopy-Explanation	Electronic configurations, atomic and ionic sizes	Water chemistry	Ring opening reactions
S 40	SLO-1	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session
3-10	SLO-2	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session
S 11-12	SLO-1 SLO-2	Determine amount of sodium carbonate, sodium hydroxide in a mixture by titration	Determine strength of an acid using pH meter	Determine ferrous ion using potassium dichromate by potentiometric titration	Determine rate constant of Acid hydrolysis of an ester	Experiment - Repeat - 3
0.40	SLO-1	$\pi$ -molecular orbitals of butadiene	Rotational spectroscopy of diatomic molecules	ionization energies, electron affinity and electronegativity	Corrosion	Synthesis of a commonly used drug molecule-Introduction
5-13	SLO-2	$\pi$ -molecular orbitals of benzene	Rotational spectroscopy of diatomic molecules	ionization energies, electron affinity and electronegativity	Corrosion	Synthesis of a commonly used drug molecule-Examples
6 44	SLO-1	Aromaticity-Introduction	Vibrational spectroscopy of diatomic molecules.	Polarizability, oxidation states	Representations of 3 dimensional structures	Synthesis of a commonly used drug molecule-Introduction
3-14	SLO-2	Aromaticity-explanation	Applications of vibrational and rotational spectroscopy of diatomic molecule	Polarizability, oxidation states	structural isomers and stereoisomers	Synthesis of a commonly used drug molecule-Examples
C 15	SLO-1	Crystal field theory-Introduction	Nuclear magnetic resonance - Introduction	Coordination numbers and geometries	Configurations and symmetry and chirality	Question & Answer
3-13	SLO-2	Crystal field theory-Introduction	Nuclear magnetic resonance - Explanation	Coordination numbers and geometries	enantiomers, diastereomers	Question & Answer
S-16	SLO-1	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session
0-10	SLO-2	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session
S 17-18	SLO-1 SLO-2	Determine hardness (Ca <sup>2+</sup> ) of water using EDTA – complexometry method	Determine strength of an acid by conductometry	Determine molecular weight of a polymer by viscosity average method	Experiment - Repeat - 1	Demonstration Practical Session

Learning Resources B. H. Mahan, R. J. Meyers, University Chemistry, 4<sup>th</sup> ed., Pearson publishers, 2009.
 M. J. Sienko, R. A. Plane, Chemistry: Principles and Applications, 3<sup>rd</sup> ed., McGraw-Hill publishers, 1980
 C. N. Banwell, Fundamentals of Molecular Spectroscopy, 5<sup>th</sup> ed., McGraw-Hill publishers, 2013

 B. L. Tembe, Kamaluddin, M. S. Krishnan, Engineering Chemistry (NPTEL Web-book) http://nptel.ac.in/downloads/122101001/

Peter W. Atkins, Julio de Paula, James Keeler, Physical Chemistry, 11<sup>th</sup> ed., Oxford publishers, 2018
 K. P. C. Vollhardt, N. E. Schore, Organic Chemistry: Structure and Function 7<sup>th</sup>ed., Freeman, 2014

Learning Assessr	ment										
	Diaam'a			Conti	nuous Learning Ass	essment (50% weig	htage)			Einal Examinatio	n (50% woightaga)
	DIUUIII S	CLA –	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA – 4	l (10%)#		in (50 % weightage)
	Level of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Lovel 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/
Lever	Understand	20%	20%	15%	10%	10%	10%	15%	15%	10%	10%
Loval 2	Apply	200/	200/	200/	200/	200/	200/	200/	200/	200/	200/
Leverz	Analyze	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Lovel 2	Evaluate	1.00/	1.00/	150/	150/	150/	150/	150/	150/	150/	150/
Level 3	Create 10% 10% 15% 15%					1370	1370	1370	1370	1370	1370
	Total 100 % 100 %					10	0 %	10	0 %	10	0 %

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
1. Dr. Sudarshan Mahapatra, Encube Ethicals Pvt. Ltd, sudarshan.m@encubeethicals.com	1. Prof. G. Sekar, IIT Madras, gsekar@iitm.ac.in	1. Prof. M. Arthanareeswari, SRMIST
2. Dr. Shanmukhaprasad Gopi, Dr. Reddy's Laboratories, shanmukhaprasadg@drreddys.com	2. Prof. Vivek Polshettiwar, TIFR Mumbai, vivekpol@tifr.res.in	2. Dr. K. K. R. Datta, SRMIST

Course Code	18CYB102J	Course Name		CONCE	PTS IN CHEMISTRY		C Ca	ourse itegory	,	В		Basic Sciences						L 3	T 1	P 2	C 5					
Pre-requis Courses	site Nil			Co-requisite Courses	Nil			Pro C	gress ourse	sive s	Nil															
Course Offe	ering Department	Chemi	stry		Data Book	/ Codes/Standards		Perio	dic Ta	able																
Course Lea	rning Rationale (CL	R): The pu	rpose of learni	ng this course is to:				L	earni	ng	] [				Р	rogr	am L	.earn	ing O	utcor	nes (l	PLO)				
CLR-1: U	tilize the atomic and	molecular ma	nipulation towa	ards the design of n	ew materials			1	2	3	1 [	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 :         U           CLR-3 :         E           CLR-4 :         S           CLR-5 :         E           CLR-6 :         U	se the concepts of comploy stereochemical mploy stereochemical ynthesis of new orga mploy various organi tilize the basic chemi rning Outcomes (CL	ordination and al aspects in t nic molecules c reaction me istry principle -O): At the	nd organometa he design of fir s by controlling echanism towar s applied in var end of this cour	llic chemistry in des the chemical and dru- kinetic and thermou- rds the synthesis of rious engineering pr rse, learners will be	igning new compounds Ig molecules for industrie Jynamic factors organic molecules roblems and identify appu able to:	ropriate solutions		evel of Thinking (Bloom)	xpected Proficiency (%)	xpected Attainment (%)		ingineering Knowledge	roblem Analysis	lesign & Development	nalysis, Design, Research	Aodern Tool Usage	ociety & Culture	invironment & Sustainability	thics	ndividual & Team Work	communication	roject Mgt. & Finance	ife Long Learning	SO - 1	SO - 2	SO – 3
CLO-1 : A	nalyze atomic, molec	ular orbitals o	of organic, inor	ganic molecules to	identify structure, bondin	g, molecular energy leve	els	2	80	60	1	H	-	H	-	-	-	-	-	-	-	-	-	-	-	
CLO-2: P	erceive the concepts	of structure a	and bonding of	inorganic complexe	es	<u>.</u>		2	75	65		Н	-	-	Н	Н	-	-	-	-	-	-	-	-	-	-
CLO-3: P	erceive the important	ce of stereocl	hemistry in syn	thesizing organic m	olecules			2	70	65		-	Н	-		-	-	-	-	-	-	-	-	-	-	-
CLO-4 : P	erceive kinetic and th	ermodynami	c factors that c	ontrol the reactivity	organic molecules			2	75	65		Н	Н	-	Н	-	-	-	-	-	-	-	-	-	-	-
CLO-5 : U	tilize various organic	reaction med	hanism to synt	hesize new organic	molecules			2	85	60		-	Н	Н	-	-	-	-	-	-	-	-	-	-	-	-
CLO-6 : U	tilize concepts in che	mistry for tec	hnological adv	ancements based o	n the electronic, atomic,	molecular level modifica	tion	2	75	65		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Duration (ho	our)	18			18	18								18								18	8			
SLO-1 Schrodinger equation Structure, bonding and energy levels - polyatomic molecules - I Organometallic chemistry - Compounds molecules factors influencing basicity of molecules Reactive intermediates																										

Duit		10	10	10	10	10
6.4	SLO-1	Schrodinger equation	Structure, bonding and energy levels - polyatomic molecules - I	Organometallic chemistry - Compounds	factors influencing basicity of molecules	Reactive intermediates
3-1	SLO-2	Derivation	polyatomic molecules - I	Organometallic chemistry - Compounds	factors influencing basicity of molecules	Reactive intermediates
5.2	SLO-1	Structure and spectra of Hydrogen atom -I	Structure, bonding and energy levels - polyatomic molecules - II	Introduction to stereo chemistry	factors influencing basicity of molecules	Substitution reactions
3-2	SLO-2	Structure and spectra of Hydrogen atom -I	polyatomic molecules - II	Stereodescriptors – R, S, E and Z	factors influencing basicity of molecules	Substitution reactions
6.2	SLO-1	Structure and spectra of Hydrogen atom -II	Coordination Chemistry - Introduction	Enantiomers and Diastereoisomers	factors influencing nucleophilicity of molecules	Substitution reactions
3-3	SLO-2	Structure and spectra of Hydrogen atom -II	Coordination Chemistry - Introduction	Enantiomers and Diastereoisomers	factors influencing nucleophilicity of molecules	Substitution reactions
5.4	SLO-1	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session
0-4	SLO-2	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session
S 5-6	SLO-1 SLO-2	Lab Introduction	Estimate the amount of chloride content of a water sample.	Determine strength of a mixture of acetic acid, hydrochloric acid by conductometry	Determine adsorption of oxalic/acetic acid from aqueous soln. by activated charcoal.	Experiment - Repeat - 2
6 7	SLO-1	Atomic orbitals and their energies -I	Coordination Chemistry - Structure	Racemates and their resolution	factors influencing nucleophilicity of molecules	Elimination reactions
3-1	SLO-2	Atomic orbitals and their energies -I	Coordination Chemistry - Structure	Racemates and their resolution	factors influencing nucleophilicity of molecules	Elimination reactions
5-9	SLO-1	Atomic orbitals and their energies –II	Coordination Chemistry – Complexes	Racemates and their resolution	kinetic vs. thermodynamic control of reactions	Elimination reactions
3-0	SLO-2	Atomic orbitals and their energies -II	Coordination Chemistry – Complexes	Racemates and their resolution	kinetic vs. thermodynamic control of reactions	Elimination reactions

8.0	SLO-1	Structure of many-electron atoms - Introduction	Electronic spectra of complexes	Conformations of cyclic systems	kinetic vs. thermodynamic control of reactions	Rearrangement reactions
3-9	SLO-2	Structure of many-electron atoms - Explanation	Electronic spectra of complexes	Conformations of cyclic systems	kinetic vs. thermodynamic control of reactions	Rearrangement reactions
S 40	SLO-1	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session
3-10	SLO-2	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session
S 11-12	SLO-1 SLO-2	Determine amount of sodium carbonate, sodium hydroxide in a mixture by titration	Determine strength of an acid using pH meter	Determine ferrous ion using potassium dichromate by potentiometric titration.	Determine rate constant of Acid hydrolysis of an ester	Experiment - Repeat - 3
6 42	SLO-1	Introduction to molecular orbital theory	Magnetic properties of complexes	Conformations of acyclic systems	Kinetic vs. thermodynamic control of reactions	Rearrangement reactions
3-13	SLO-2	Introduction to molecular orbital theory	Magnetic properties of complexes	Conformations of acyclic systems	Kinetic vs. thermodynamic control of reactions	Rearrangement reactions
S 14	SLO-1	Structure, bonding and energy levels - Homonuclear diatomic molecules	Organometallic chemistry - Bonding	Factors influencing acidity of molecules	Reactive intermediates	Role of solvents
3-14	SLO-2	Homonuclear diatomic molecules	Organometallic chemistry - Bonding	Factors influencing acidity of molecules	Reactive intermediates	Role of solvents
C 15	SLO-1	Structure, bonding and energy levels - Heteronuclear diatomic molecules	Organometallic chemistry - Ligands	Factors influencing acidity of molecules	Reactive intermediates	Kinetic and thermodynamic aspects
3-13	SLO-2	Heteronuclear diatomic molecules	Organometallic chemistry - Ligands	Factors influencing acidity of molecules	Reactive intermediates	Kinetic and thermodynamic aspects
S-16	SLO-1	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session
3-10	SLO-2	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session	Tutorial Session
S 17-18	SLO-1 SLO-2	Determination of hardness (Ca <sup>2+</sup> ) of water using EDTA – complexometry method	Determination of strength of an acid by conductometry	Determination of molecular weight of polymer by viscosity average method	Experiment - Repeat - 1	Demonstration Practical Session

Learning Resources B. H. Mahan, R. J. Meyers, University Chemistry, 4<sup>th</sup> ed., Pearson publishers, 2009.
 M. J. Sienko, R. A. Plane, Chemistry: Principles and Applications, 3<sup>rd</sup> ed., McGraw-Hill publishers, 1980
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4. B. L. Tembe, Kamaluddin, M. S. Krishnan, Engineering Chemistry (NPTEL Web-book)

http://nptel.ac.in/downloads/122101001/

Peter W. Atkins, Julio de Paula, James Keeler, Physical Chemistry, 11<sup>th</sup> ed., Oxford publishers, 2018
 K. P. C. Vollhardt, N. E. Schore, Organic Chemistry: Structure and Function 7<sup>th</sup>ed., Freeman publ., 2014

Learning Assess	ment												
	Diaam'a			Conti	nuous Learning Ass	essment (50% weig	htage)			Final Examination	(EO0/ waightaga)		
	DIUUIII S	CLA – <sup>2</sup>	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA – 4	l (10%)#		r (50% weightage)		
	Lever of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice		
Lovel 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/		
Lever	Understand	20%	20%	15%	15%	13%	15%	13%	15%	15%	15%		
Lovel 2	Apply	y 20%		pply 20%		200/	200/	200/	200/	200/	200/	200/	200/
Leverz	Analyze	20%	20%	20%	20%	20%	20%	20%	20%	2076	20%		
Lovel 2	Evaluate	1.00/	1.00/	150/	150/	150/	150/	150/	150/	150/	150/		
Level 5	Create	1076	1070	1370	1370	1370	1370	1370	1370	1370	1370		
	Total	100	) %	10	0 %	10	0 %	100	0 %	10	0 %		

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
1. Dr. Sudarshan Mahapatra, Encube Ethicals Pvt. Ltd, sudarshan.m@encubeethicals.com	1. Prof. G. Sekar, IIT Madras, gsekar@iitm.ac.in	1. Prof. M. Arthanareeswari, SRMIST
2. Dr. Shanmukhaprasad Gopi, Dr. Reddy's Laboratories, shanmukhaprasadg@drreddys.com	2. Prof. Vivek Polshettiwar, TIFR Mumbai, vivekpol@tifr.res.in	2. Dr. N. Abirami, SRMIST

Cou Co	urse ode	18MAB101T	Course Name		CALCULUS	AND LINEAR ALGEBR	Ą	C Ca	ourse tegory	B Basic Sciences								T 1	P 0	C 4							
Pre- C Cours	requisit ourses e Offeri	e Nil ng Department	Mathem	patics	Co-requisite Courses	Nil Data Book	/ Codes/Standards		Pro C Nil	gress ourse	ive s	e <sub>Nil</sub>															
Cours	e Learn	ing Rationale (CL	R): The pur	pose of learni	ing this course is to:				L	earnir	ng					Progr	am L	earni	ing O	utcon	nes (I	PLO)					
CLR-1 CLR-2 CLR-3 CLR-4 CLR-5	I:         App           2:         Util           3:         App           4:         Util           5:         App	lication of Matrices ze Taylor series, M ly the concept of D ze the concepts of lication of Sequence	s in problems c laxima minima Differential Equ radius of curve ces and Series	of Science and a, composite fu ations in prob ature, evolute s in all problem	d Engineering unction and Jacobia lems of Science an , envelope in proble ns involving Science	an in solving rea- time app d Engineering oms of Science and Engir e and Engineering	plication problems		g (Bloom)	iency (%) C	ment (%)		2 . <u>.</u>	opment 6	n, Research	5 2	6 9	Sustainability 2	8	am Work 🕒	10	11 inance	12 Bui	13	14	15	
CLR-6 Cours CLO-1	6 : Util se Learn I : App	ze appropriate mai ing Outcomes (Cl ly Matrices, Eigen	thematical tech -0): At the e values and Eig	nniques for the nd of this cou en Vectors Re	e different solutions rse, learners will be educe to Quadratics	required in Science and able to: s form in Science and Eng	Engineering applicatio	ons ving	C Level of Thinkin     A     Second	& Expected Profic	S Expected Attain	H Fnaineerina Kn	Problem Analys	H Design & Devel	<ul> <li>Analysis, Desigi</li> </ul>	<ul> <li>Modern Tool Us</li> </ul>	<ul> <li>Society &amp; Cultur</li> </ul>	<ul> <li>Environment &amp; ;</li> </ul>	- Ethics	H Individual & Tea	<ul> <li>Communication</li> </ul>	<ul> <li>Project Mgt. &amp; F</li> </ul>	⊥ Life Long Learn	- PSO - 1	- PSO-2	- PSO - 3	
CLO-2 CLO-3 CLO-4 CLO-5 CLO-5	2: App 3: Sol 4: Ide 5: App 5: Ide	ly Maxima and Mir re the different type tify Radius, Centre ly convergence an tify, Analyze and A	nima, Jacobian es of Differenti e, envelope an d divergence of Apply mathema	n, and Taylor s al Equations i d Circle of of of series using atical techniqu	series to solve problem in Science and Engle curvature and apply g different test and a lies to arrive at solution	lems in Science and Engi ineering applications / them in the problem solv apply sequences and Sen tions in Science and Engi	neering ving ies in the problem solv ineering	ving	2 2 2 2 2 2 2	85 85 90 90 90	80 80 90 80 90	<u>н</u> - - Н	- H H	- - - H H	H H - -	H - - -	- - - -	- - - -		- H H H	- - - -	- - - -	- H H H	- - - -	- - - -	- - - -	
Durat	ion (hou	)	12			12		12						12	2							12	12				
S-1	SLO-1	Characteristic ed	quation		Functions of two va derivatives	ariables – Partial	Linear equations of s constant coefficients	econd when l	order PI=0 o	with r exp.	F	Radius of coordinate	Curva es	nture –	Cartes	sian			Series Conve	s of Po ergen	ositive ce-	e term					
0-1	SLO-2	Eigen values of	a real matrix		Total differential		Linear equations of s constant coefficients	econd when i	order PI=sin	with x or co	F DSX C	Radius of coordinate	Curva es	nture –	Cartes	sian		(	Сотр	arisoi	n test	– Inte					
S-2	SLO-1	Eigen vectors of	a real matrix		Total differential		Linear equations of s constant coefficients	econd when l	order PI=pol	with ynomi	ial <sup>F</sup>	Radius of	Curva	nture –	Polar	coord	linates	s (	Сотр	arisoi	n test	lest – Integral test-					
0.2	SLO-2	Eigen vectors of	<sup>r</sup> a real matrix		Taylor's expansion second order terms	n with two variables up to s	Linear eqn. of secone coefficients when PI=	d order =exp. w	with c vith sin	consta x / Co	nt Isx F	Radius of	Curva	nture –	Polar	coord	linates	s (	Сотр	arisoi	n test	– Inte	əgral t	est			
S-3	SLO-1	Properties of Eig	gen values		Taylor's expansion third order terms	with two variables up to	Linear eqn. of secone coefficients when PI=	d order = exp.l	with c with p	consta olynor	nt nial (	Circle of c	urvatı	ıre				l	D'Aler	nbert	s Rat	io tesi	t,				
0-0	SLO-2	Cayley – Hamilte	on theorem		Maxima and Minim	a	Linear eqn. of 2 <sup>nd</sup> ord when PI=polynomial	ler with with si	n consi nax or	t. coef cosax	ί. (	Circle of c	urvatı	ıre				l	D'Aler	nbert	s Rat	io tesi	t,				
5.4	SLO-1	Problem solving	using tutorial	sheet 1	Problem solving us	sing tutorial sheet 4	Problem solving usin	g tutor	ial she	et 6	F	Problem solving using tutorial sheet 11						Proble	em so	lving	using	tutori	al she	eet 14	4		
0-4	SLO-2	Problem solving	using tutorial	sheet 1	Problem solving us	sing tutorial sheet 4	Problem solving usin	g tutor	ial she	et 6	Æ	Applications of Radius of curvature in engineering						Proble	em so	lving	using	tutori	al sh	eet 14	4		
с <i>Е</i>	SLO-1	Finding A invers theorem	e using Cayley	y – Hamilton	Maxima and Minim	a	Linear equations of s coefficients	econd	order	variab	ole (	Centre of curvature					Raabe's root test.										
3-3	SLO-2	Finging higher p Hamilton theore	owers of A usi m	ing Cayley –	Maxima and Minim	a	Linear equations of s coefficients	econd	order	Centre of curvature Raabe's root tes					ot tes	t.											
	SLO-1	orthogonal reduction to diagonal form	ction of a symr	netric matrix	Maxima and Minim	a	Homogeneous equat	ion of	Euler t	uler type Centre of curvature Covergent of Exponential Set					eries												
5-0	SLO-2	orthogonal reductor	ction of a symr	netric matrix	Constrained Maxin Lagrangian Multipl	na and Minima by ier method	Homogeneous equat	ion of	of Legendre's Evolute of a parabola Cauchy's Root test																		

Туре

Constrained Maxima and Minima by Lagrangian Multiplier method

S-7 SLO-1 orthogonal reduction of a symmetric matrix to diagonal form

Homogeneous equation of Legendre's

Log test

Evolute of an ellipse

	SLO-2	orthogonal reduction of a symmetric matrix to diagonal form	Constrained Maxima and Minima by Lagrangian Multiplier method	Equations reducible to homogeneous form	Envelope of standard curves	Log test
۰.	SLO-1	Problem solving using tutorial sheet 2	Problem solving using tutorial sheet 5	Problem solving using tutorial sheet 9	Problem solving using tutorial sheet 12	Problem solving using tutorial sheet 15
3-0	SLO-2	Problem solving using tutorial sheet 2	Problem solving using tutorial sheet 5	Problem solving using tutorial sheet 9	Applications of Curvature in engineering	Problem solving using tutorial sheet 15
	SLO-1	Reduction of Quadratic form to canonical	Jacobians of two Variables	Equations reducible to homogeneous form	Beta Gamma Functions	Alternating Series: Leibnitz test
5-9	SLO-2	Quadratic form to canonical form by orthogonal transformations	Jacobians of Three variables	Variation of parameters	Beta Gamma Functions and Their Properties	Alternating Series: Leibnitz test
S-10	SLO-1	Quadratic form to canonical form by orthogonal transformations	Jacobians problems	Variation of parameters	Sequences – Definition and Examples	Series of positive and Negative terms.
5-10	SLO-2	Orthogonal matrices	Jacobians Problems	Simultaneous first order equations with constant co-efficient.	Series – Types of Convergence	Series of positive and Negative terms.
6 44	SLO-1	Reduction of quadratic form to canonical form	Properties of Jacobians and Problems	Simultaneous first order equations with constant co-efficient.	Series of Positive terms – Test of Convergence-	Absolute Convergence
3-11	SLO-2	Reduction of quadratic form to canonical form	Properties of Jacobians and problems	Simultaneous first order equations with constant co-efficient.	Comparison test – Integral test-	Conditional Convergence
S 12	SLO-1	Problem solving using tutorial sheet 3	Application of Taylor's series Maxima Minima Jacobians in Engineering	Problem solving using tutorial sheet 10	Problem solving using tutorial sheet 13	Problem solving using tutorial sheet 13
3-1Z	SLO-2	Applications of Matrices in Engineering	Application of Taylor's series Maxima Minima Jacobians in Engineering	Applications of Differential Equation in engineering	Problem solving using tutorial sheet 13	Applications Convergence of series in engineering

Learning Resources

B. H. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
 B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
 Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008

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Learning Assess	sment										
	Diagm's			Conti	nuous Learning Ass	essment (50% weig	phtage)			Einal Examinatio	n (50% woightaga)
	DIUUIII S	CLA –	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA – 4	¥ (10%)#		in (50 % weightage)
	Level of Thinking	vel of Thinking Theory Practice Theory Practice Theory Practice Theory Practice Theory Practice									Practice
Lovel 1	Remember	10.0/		20.0/		20.0/		20.0/		200/	
Level	Understand	40 %	-	30 %	-	30 %	-	30 %	-	30%	-
	Apply	10.9/		10.0/		10.0/		10.0/		400/	
Leverz	Analyze	40 %	-	40 %	-	40 %	-	40 %	-	4076	-
Loval 2	Evaluate	20.0/		20.0/		20.0/		20.0/		200/	
Level 3	Create 20% - 30% - 30% - 30% -									30%	-
	Total	100	0 %	10	0 %	10	0 %	10	0 %	10	0 %

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
1. Mr. V. Maheshwaran, CTS, Chennai, maheshwaranv@yahoo.com	1. Dr. K. C. Sivakumar, IIT, Madras, kcskumar@iitm.ac.in	1. Dr. A. Govindarajan, SRMIST
2. Dr. Sricharan Srinivasan, Wipro Technologies, sricharanms@gmail.com	2. Dr. Nanjundan, Bangalore University, nanzundan@gmail.com	2. Dr. Srinivasan, SRMIST

Course Code	18MAB102T	Course Name	A	DVANCED CALCI	JLUS AND COMPLEX ANALYSIS	C Cá	ourse ategory		В				Ba	sic Sc	cience	es					L 3	T 1	P 0	C 4
Pre-req Cour	uisite ses			Co-requisite Courses	Nil		Prog Co	ressi urse	ive s	Vil														
Course O	ffering Department	Mather	matics		Data Book / Codes/Standards		Nil																	
Course L	earning Rationale (CL	R): The pu	rpose of learning	g this course is to:	:		Le	arnin	g				l	Progr	am L	earni	ng Oı	utcon	nes (F	PLO)				
CLR-1 :	Evaluate Double and	triple Integral	and apply them	in problems in Eng	gineering Industries		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 : CLR-3 : CLR-4 : CLR-5 : CLR-6 :	Evaluate Surface, Vol Transform engineering To know the propertie Evaluate improper inte Identify how Engineeri	ume Integral a g problems int s of Complex egrals involvin ing problems	are Application of to ODE, PDE an functions and ap to complex funct can be transform	of Gauss theorem, d Integrals and so oply them in the al ions using Residu ned in to simple m	Stokes and Green's theorem in Engineering fi live them using Laplace / complex analytic met Il Engineering fields the theorem and apply them in Engineering field athematical constructs and solve the same	elds thods Is	l of Thinking (Bloom)	cted Proficiency (%)	cted Attainment (%)	reering Knowledge	lem Analysis	gn & Development	/sis, Design, Research	em Tool Usage	ety & Culture	onment & Sustainability	S	idual & Team Work	munication	ect Mgt. & Finance	-ong Learning	- 1	- 2	- 3
Course L	earning Outcomes (C	LO): At the	end of this cours	se, learners will be	able to:		Level	Expe	Expe	Engi	Probl	Desic	Analy	Mode	Socie	Envir	Ethic	Indivi	Com	Proje	LifeL	PSO	PSO	PSO
CLO-1 :	Evaluate multiple integ	grals using ch	ange of variable	S			3	95	90	Н	-	Н	-	-	-	-	-	Н	-	-	Н	-	-	-
CLO-2 :	Apply techniques of ve	ector calculus	in problems invo	olving Science and	d Engineering. Solving Ordinary Differential Eq	uation	s 3	90	85	Н	-	-	Н	Н	-	-	-	-	-	-	-	-	-	-
CLO-3 :	Apply techniques of La	aplace Transf	orms and invers	e transform for pro	oblems in Science and Engineering		2	85	80	-	Н	-		-	-	-	-	Н	-	-	Н	-	-	-
CLO-4 :	Apply complex analyti	c functions an	nd its properties i	in solving problem	IS		3	80	80	Н	Н	-	Н	-	-	-	-	Н	-	-	Н	-	-	-
CLO-5 :	Evaluate improper inte	egrals using R	Residue theorem	involving problem	is in Science and Engineering		2	80	90	-	Н	Н	-	-	-	-	-	Н	-	-	Н	-	-	-
CLO-6 :	Create mathematical	constructs for	engineering pro	blems and identify	<ul> <li>solutions to solve them</li> </ul>		3	90	80	Н		Н	-	-	-	-	-	Н	-	-	Н	-	-	-

-						
Dura	tion (hour)	12	12	12	12	12
S_1	SLO-1	Evaluation of double integration Cartesian and polar coordinates	Review of vectors in 2,3 dimensions	Laplace Transforms of standard functions	Definition of Analytic Function – Cauchy Riemann equations	Cauchy's integral formulae - Problems
3-1	SLO-2	Evaluation of double integration of polar coordinates	Gradient, divergence	Transforms properties	Cauchy Riemann equations	Cauchy's integral formulae- Problems
6.2	SLO-1	Evaluation of double integration of polar coordinates	curl – Solenoidal	Transforms of Derivatives and Integrals	Properties of analytic function functions	Cauchy's integral formulae- Problems
5-2	SLO-2	Evaluation of double integration of polar coordinates	Irrotational fields	Transform of derivatives and integrals	Determination of analytic function using – Milne-Thomson's method	Taylor's expansions with simple problems
6.2	SLO-1	Evaluation of double integral by changing the order of integration	Vector identities (without proof) – Directional derivatives	Initial value theorems (without proof) and verification for some problems	Determination of analytic function using – Milne-Thomson's method	Taylor's expansions with simple problems
5-3	SLO-2	Evaluation of double integral by changing the order of integration	Line integrals	Final value theorems (without proof) and verification for some problems	Determination of analytic function using – Milne-Thomson's method	Laurent's expansions with simple problems
54	SLO-1	Problem solving using tutorial sheet 1	Problem solving using tutorial sheet 4	Problem solving using tutorial sheet 7	Problem solving using tutorial sheet 10	Problem solving using tutorial sheet 13
3-4	SLO-2	Problem solving using tutorial sheet 1	Problem solving using tutorial sheet 4	Problem solving using tutorial sheet 7	Problem solving using tutorial sheet 10	Problem solving using tutorial sheet 13
с <i>Б</i>	SLO-1	Evaluation of double integral by changing the order of integration	Line integrals	Inverse Laplace transforms using partial fractions	Conformal mappings: magnification	Laurent's expansions with simple problems
3-5	SLO-2	Area as a double integral (Cartesian)	Surface integrals	Inverse Laplace transforms using Partial fractions	Conformal mappings: rotation	Singularities
	SLO-1	Area as a double integral (Cartesian)	Surface integrals	Inverse Laplace transforms using second shifting theorem	Conformal mappings: inversion	Types of Poles and Residues
3-0	SLO-2	Area as a double integral (polar)	Volume Integrals	LT using Convolution theorem -problems only	Conformal mappings: inversion	Types of Poles and Residues
S-7	SLO-1	Area as a double integral (polar)	Green's theorem (without proof),	LT using Convolution theorem -problems only	Conformal mappings: reflection	Cauchy's residue theorem (without proof)-

	SLO-2	Triple integration in Cartesian coordinates	Green's theorem (without proof),	ILT using Convolution theorem -problems only	Conformal mappings: reflection	Contour integration: Unit circle.
5.9	SLO-1	Problem solving using tutorial sheet 2	Problem solving using tutorial sheet 5	Problem solving using tutorial sheet 8	Problem solving using tutorial sheet 11	Problem solving using tutorial sheet 14
3-0	SLO-2	Problem solving using tutorial sheet 2	Problem solving using tutorial sheet 5	Problem solving using tutorial sheet 8	Problem solving using tutorial sheet 11	Problem solving using tutorial sheet 14
	SLO-1	Conversion from Cartesian to polar in double integrals	Gauss divergence theorem (without proof), verification	LT of periodic functions -problems only	bilinear transformation	Contour integration: Unit circle.
2-9	SLO-2	Conversion from Cartesian to polar in double integrals	Gauss divergence theorem (without proof) applications to cubes.	LT of periodic functions -problems only	bilinear transformation	Contour integration: Unit circle
S 40	SLO-1	Triple integration in Cartesian coordinates	Gauss divergence theorem (without proof applications to parallelepiped.	Solve linear second order ordinary diff. equations with constant coefficient only	bilinear transformation	Contour integration: semicircular contour.
5-10	SLO-2	Triple integration in Cartesian coordinates	Stoke's theorems (without proof) – Verification	Solve linear second order ordinary diff. equations with constant coefficient only	bilinear transformation	Contour integration: semicircular contour.
6.44	SLO-1	Triple integration in Cartesian coordinates	Stoke's theorems (without proof) – Applications to cubes	Solution of Integral equation and integral equation involving convolution type	Cauchy's integral theorem (without proof)	Contour integration: semicircular contour.
3-11	SLO-2	Volume as a triple Integral	Stoke's theorems (without proof) – Applications to parallelepiped only.	Solution of Integral equation and integral equation involving convolution type	Cauchy's integral theorem applications	Contour integration: semicircular contour.
S 12	SLO-1	Problem solving using tutorial sheet 3	Problem solving using tutorial sheet 6	Problem solving using tutorial sheet 9	Problem solving using tutorial sheet 12	Problem solving using tutorial sheet 15
3-12	SLO-2	Application of Multiple integral in engineering	Application of Line and Volume Integrals in engineering	Application of Laplace Transform in engineering	Application of Bilinear Transformation and Cauchy Integral in engineering	Application Contour integration in engineering

Learning Resources

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Learning Assess	sment										
	Diagm's			Conti	nuous Learning Ass	essment (50% weig	phtage)			Einal Examinatio	n (50% woightaga)
	DIUUIII S	CLA –	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA – 4	¥ (10%)#		in (50 % weightage)
	Level of Thinking	vel of Thinking Theory Practice Theory Practice Theory Practice Theory Practice Theory Practice									Practice
Lovel 1	Remember	10.0/		20.0/		20.0/		20.0/		200/	
Level	Understand	40 %	-	30 %	-	30 %	-	30 %	-	30%	-
	Apply	10.9/		10.0/		10.0/		10.0/		400/	
Leverz	Analyze	40 %	-	40 %	-	40 %	-	40 %	-	4076	-
Loval 2	Evaluate	20.0/		20.0/		20.0/		20.0/		200/	
Level 3	Create 20% - 30% - 30% - 30% -									30%	-
	Total	100	0 %	10	0 %	10	0 %	10	0 %	10	0 %

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Course Code	18MES101L	Course Name	ENGINEERING GRA	PHICS AND DESIGN	C Ca	ourse	,	S			E	Engine	ering	Scien	ces				L 1	T 0	P 4	C 3
Pre-requi	site Courses Nil		Co-requisite Courses	Nil		Prog	gress	ive Co	purses Nil													
Course O	fering Department	Mecha	nical Engineering	Data Book / Codes/Standards		Nil																
Course Le	arning Rationale (CL	R): The pu	rpose of learning this course is to:			L	earni	ng				F	Progr	am Le	arnir	ng Out	comes	(PLO	)			
CLR-1 :	Utilize engineering gra	phic fundame	entals. apply the same to draw/evaluate e	ngineering curves and projection of obje	ects	1	2	3	1	2	3	4	5	6	7	8 !	9 10	11	12	13	14	15
CLR-2 : CLR-3 : CLR-4 : CLR-5 : CLR-6 :	Draw projection of soli Draw the projection of Create 3D part models Evaluate the assembly Draw, Create, Evaluat arning Outcomes (Cl	d objects like combination c. Develop its of engineeri e, Interpret en .0): At the	prisms, cylinders, pyramids and cones u of solids, and section of solids. Create bu surfaces using solid-modeling software f ng component parts. Create 2D drawings ngineering 2D and 3D surfaces of engine end of this course, learners will be able to	sed in various engineering objects illding plans for construction or effectiveness, clarity, accuracy, porta for assembly of engineering componen ering components using modeling softw o:	bility ts are	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	acted Attainment (%) algineering Knowledge blem Analysis algin & Development dem Tool Usage siety & Cutture vironment & Sustainability ics vidual & Team Work vidual & Finance e Long Learning no - 1 0 - 1							II - OSd	PSO – III					
CLO-1 :	Identify engineering gr	aphics. Draw	objects like points, lines, planes, and sol	ids in perspective & orthographic projec	tions	3	90	85	Н	Н	L	L	L	Н	L	H	. H	L	L	L	L	L
CLO-2 :	Draw projection of soli	ds like prism,	cylinder, pyramid and cone inclined in ge	eneral positions, obtain auxiliary views		2	95	90	D M M L L M H H L L H L L L L L L							L						
CLO-3 :	Draw projection of con	nbination of s	olids made out of primitives, draw the see	tion of solids, create building plans		3	90	85	85 <u>H H M M H H H H M H L H L L L</u>						L							
CLO-4 :	Create 3D part models	. Develop its	surfaces with solid modeling software for	effectiveness, clarity, accuracy, portabi	lity	3	90	85	Н	Н	Н	Н	Н	Н	Н	LI	H H	L	Н	М	L	М
CLO-5 :	Evaluate the assembly	of parts inclu	uding interference of parts. Create 2D dra	wings of assembly of parts		3	85	80	Н	Н	М	Н	Н	Н	Н	H	_ H	L	Н	L	М	L
CLO-6 :	Draw graphics of engine	ering pans wi	th point, line, plane, solids, in perspective ar	d orthographic projections		2	90	85	М	М	L	М	L	L	L	H	_   <mark>L</mark>	L	L	L	L	L

		Engineering graphics and Projection	Projection of solids using CAD software	Projections of combination of solids	Part Modeling and Drawing	Assembly Modeling and Drawing
Durat	tion (hour)	15	15	15	15	15
6.1	SLO-1	Principles, Standards, Conventions	Introducing CAD Software, layers, dimensions, tolerance, annotations	Combinations of solids, Constructive Solid Geometry(CSG), Boolean operations	3D modelling, parametric, non- parametric, parts of CSG, surface, wireframe, shaded	Part/ component model creation for assembly.
3-1	SLO-2	Angle Projection, Symbols, Dimensions	Create, modify, customize, print using CAD	Creating combination of solids, isometric, perspective views, shaded, wire-frame	Rendered models, background, shadows, multi-view, isometric, perspective views	Study of various widely used assembly of parts like flanged joint, universal joint etc.
S-2	SLO-1	2D Geometric Constructions	Demo: Menu, Toolbars, Drawing Area, Dialog box, windows, Shortcut menus	Constructive Solid Geometry, Boolean operations, Creating combination of solids	3D modelling, parametric, non- parametric, parts of CSG, surface, wireframe, shaded	Creation of parametric parts for assembly
5-2	SLO-2	2D Geometric Constructions	Command Line, Status Bar, Different zoom methods, Create, Select, Erase objects	isometric, perspective, shaded, wire-frame	Rendered models, background, shadows, multi-view, isometric, perspective views	non- parametric parts for assembly
6.2	SLO-1	Conic Curves ellipse by eccentricity method	Draw straight lines, rectangle, polar, absolute, relative	Constructive Solid Geometry, Boolean operations, Creating combination of solids	Viewing models in multi-view, isometric, and perspective views	Creation of parametric parts for assembly
3-3	SLO-2	Conic Curves ellipse by eccentricity method	Orthographic constraints, Ortho ON, snap to objects manually, automatically	isometric, perspective, shaded, wire-frame	Viewing models in multi-view, isometric, and perspective views	non- parametric parts for assembly
S-4	SLO-1	Cycloids, Epicycloids	drawing lines, arcs, circles, polygons, create, edit, use layers, extend lines	Constructive Solid Geometry, Boolean operations, Creating combination of solids	Modelling industrial part drawings	Creation of parametric parts for assembly
	SLO-2	Hypocycloid	Dimensioning objects, annotations	isometric, perspective, shaded, wire-frame	Modelling industrial part drawings	non- parametric parts for assembly
S-5	SLO-1	Involute of a Square, Circle	Demo: drawing page, print, units/ scale/ limits settings, standards for dimensioning	Constructive Solid Geometry, Boolean operations, Creating combination of solids	Design new components as a team	Creation of parametric parts for assembly
	SLO-2	Spirals	ISO, ANSI Std. dimensioning, tolerancing	isometric, perspective, shaded, wire-frame	Design new components as a team	non- parametric parts for assembly
	SLO-1	Introduction to perspective projection with terminologies and concepts	Projection of solid prisms and cylinders inclined to both the planes	Section of right regular solid with axis perpendicular to one principal planes and	3D Part to 2D Drawings geometric dimensioning and tolerancing annotations	Simple assembly of parts,
3-0	SLO-2	Orthographic multiview and isometric projection	change of position method, reference line method / auxiliary projections,	cutting plane perpendicular to any one principle plane true shape of the section	generating 2D from 3D models, printing drawings, generating sectional views	associated part and assembly
6.7	SLO-1	Perspective projection of a point, line	Projection of solid prisms and cylinders inclined to both the planes	Section of right regular solid with axis perpendicular to one principal planes and	Geometric dimensioning and tolerancing annotations	Simple assembly of parts,
3-1	SLO-2	Perspective projection of a planes, solids	Change of position method	cutting plane perpendicular to any one principle plane true shape of the section	Geometric dimensioning and tolerancing annotations	associated part and assembly

-												
5-8	SLO-1	Orthographic multiviev	v of point, line	Projection of solid inclined to both the	l prisms and cylinders ne planes	Section of ri	ght regular solid witl ar to one principal pl	h axis Ianes and	Generating 2D drawings f	rom 3D models	Simple assembly of par	ts,
3-0	SLO-2	Orthographic multiview	v of planes, solids	Reference line m	ethod	cutting plane principle pla	e perpendicular to a ne true shape of the	ny one e section	Generating 2D drawings f	rom 3D models	associated part and ass	embly
S-9	SLO-1	Isometric projection of	a point, line	Auxiliary projectio	ns	Section of	olids with axis incline nd cutting plane per	ed to both rpendicular	Generating sectional view	s	Simple assembly of par	ts,
	SLO-2	Isometric projection of	planes, solids	Auxiliary projection	ons	to any one p	rincipal plane only.		Generating sectional view	S	associated part and ass	embly
S-10	SLO-1	Isometric to orthograph sketching	hic multiview	Viewing isometric shaded, wire-fran	and perspective views, ne models	Sectional pla side-view of	an elevation, and se Building/ dwelling, i	ectional include	Printing drawings to printe	r or as .pdf	Simple assembly of par	ts,
	SLO-2	Orthographic multiviev	v to isometric sketch	Oblique prismatio	solids and its projections	s windows, do	ors, fixtures, etc.		Printing drawings to printe	er or as .pdf	associated part and ass	embly
	901	Orthographic multiviev	v projection of lines	Projection of solid	l pyramids and cones	Building/ Dw	elling drawing, Terr	ninology,	Development of surfaces:	un-cut, & cut	Assembly Drawings: ex	ploded view with
S-11	010-1	inclined to both planes	1	inclined to both th	ie planes	conventions	, sectional plan and	side-view	right / oblique regular soli	ds	assembly annotations p	art details
0-11	SI 0-2	Orthographic multiviev	v projection of planes	change of positio	n method and reference	of Building/	dwelling, include wir	ndows,	Simple position with cuttin	g planes	Printing assembly draw	ings to printer and
	010 2	inclined to planes, aux	iliary projection	line method / aux	iliary projections,	doors, fixtur	əs,		perpendicular to any one	principal plane	as pdf	
	SI 0-1	Projection of lines incli	ined to both the	Projection of solid	l pyramids and cones	Sectional pla	an elevation, and se	ctional	Development of surfaces:	un-cut, & cut	Exploded view with ass	embly annotations
S-12	020 1	planes		inclined to both th	e planes	side-view of	Building/ dwelling, i	include	right / oblique regular soli	ds		onnory annotationio
	SLO-2	true length, true inclina	ations, traces of lines	Change of positio	n method	windows. do	ors, fixtures, etc.		Simple position with cuttin	g planes	part details	
									perpendicular to any one	principal plane		
	SLO-1	Projection of lines incli	ined to both the	Projection of solid	l pyramids and cones	Sectional pla	an elevation, and se	ctional	Development of surfaces:	un-cut, & cut	Exploded view with ass	embly annotations
S-13		planes		inclined to both th	ie planes	side-view of	Building/ dwelling, i	nclude	right / oblique regular solid	15	· ·	,
	SLO-2	true length, true inclina	ations, traces of lines	Change of referen	nce line method	windows, do	ors, fixtures, etc.		perpendicular to any one	g planes principal plane	part details	
	901	Finding shortest distar	nce between a point	Auxiliany projectio	200	Sectional pla	an elevation, and se	ectional	Dooign of rool time ourfoo	o dovolonmont	Exploded view with and	ombly appatations
S-14	-14 SLO-T and a plane Auxiliary projections				1115	side-view of	Building/ dwelling, i	include	Design of real time surfac	e-development	Exploded view with ass	emply annotations
	SLO-2	Shortest distance betw	veen two lines	Auxiliary projection	ns	windows, doors, fixtures, etc. Design of real time sur				e-development	part details	
S-15	SLO-1	shortest distance betw	een point and plane	Viewing isometric shaded wire-fran	and perspective views, ne models	Sectional pla side-view of	an elevation, and se Building/ dwelling_i	ectional include	Design of real time surfac	e-development	Printing assembly draw	ings
0.0	SLO-2	shortest distance betw	een point and plane	Oblique pyramida	I solids and projections	windows, do	ors, fixtures, etc.		Design of real time surfac	e-development	Printing assembly draw	ings
Learr Reso	ning urces	<ol> <li>Bhatt, N.D., Eng.</li> <li>Bethunc, J., Eng</li> <li>Khristofor Artem</li> <li>Natarajan, K.V.,</li> <li>Shah. M. B.,Ran</li> <li>Jevapoovan, T.</li> </ol>	ineering Drawing (Firs ineering Graphics wit yevich Arustamov, Pr A Text Book of Engin a, B. C, Engineering I Engineering Drawing	st Angle Projection h AutoCAD 2017, oblems in projectiv eering Graphics, 2 Drawing, Pearson and Graphics usir	),53 <sup>rd</sup> ed., Charotar Publi Pearson Education, 2016 re geometry, MIR Publish 11st Edition, Dhanalakshr Education, Pvt. Ltd., 200 ra AutoCAD, Vikas Pub.	shing House, 2 bers, Moscow, ni Pub., 2012 05 House, 2015	2017 7. Nar. 8. Luz. 1972 Inte 9. Mol Pen 10. Use	ayanan, K. I zader, Warr vractive Com hammad Da formance, D er Manual of	, Kannaiah, V., Engineeri, en J., Duff John M., Funda puter Graphics for Design stbaz, Chris Gorse, Alice M esign and Smart Construc Respective CAD Software	ng Graphics, Scite mentals of Engine and Production, F loncaster (eds.), I tion, Springer 201 s	ech Publications,2010 eering Drawing with an in Prentice Hall of India Pvt. Building Information Mod 7	troduction to Ltd., 2005. elling, Building
Learn	nina Asse	sment	0 0 0	'	•		4		•			
Louii					Continuous	Learning Ass	essment (50% weig	htage)				
		Bloom's	CLA – 1 (	(10%)	CLA – 2 (15)	%)	CLA –	3 (15%)	CLA –	4 (10%)#	Final Examination	i (50% weightage)
		Level of Thinking	Theory	Practice	Theory	Practice	Theory	Pract	ice Theory	Practice	Theory	Practice
Level	1	Remember Understand	-	40%	-	30%	-	30%	6 -	30%	-	30%
Level	2	Apply Analyze	-	40%	-	40%	-	40%	6 -	40%	-	40%
Level	3	Evaluate Create	-	20%	-	30%	-	30%	6 -	30%	-	30%
		Total	100 9	%	100 %		10	0 %	1	00 %	100	) %
# CL	A – 4 can b	pe from any combination	n of these: Assignmer	nts, Seminars, Tec	h Talks, Mini-Projects, C	ase-Studies, S	elf-Study, MOOCs,	Certification	s, Conf. Paper etc.,			
Cours	se Design	ers										
Exper	ts from Inc	lustry			Experts from H	igher Technica	I Institutions			Internal Experts		
1.Dr.	R. Kalimut	hu, ISRO,			1. Dr. Ramkum	ar P, IIT Madra	as, ramkumar@iitm.	ac.in		1. Mr. D. Kumara	an, SRMIST	
2. Dr. A. Velayutham, DRDO, 2. Dr. Sourav Rakshit, IIT Madras, srakshit@iitm.ac.in 2. Mr. S. Balamurugan, SRMIST								rugan, SRMIST				

2.Dr. A. Velayutham, DRDO, 2. Mr. S. Balamurugan, SRMIST Note: For all B.Tech Programmes other than Civil, Mechanical, Automobile, Aerospace and Mechatronics, the entire course would be conducted using CAD Software only.

Course Code		18MES102J	Course Name		BASIC CIVIL AND MEC	HANICAL ENGINEERING	i	Co Ca	ourse tegory	,	S	Engineering Sciences				T 1	P 2	C 5									
Pre-req Cours	uisite ses	Nil			Co-requisite Courses				Pro	gress ourse	ive s	Nil															
Course O	ffering	Department	Civil Ei	ngineering & Me	chanical Engineering	Data Book / Code	s/Standards		Nil																		
Course L	earning	Rationale (CLI	R): The pu	rpose of learnin	g this course is to:				L	earnir	ng	[				l	Progr	ram L	.earn	ing O	utcor	nes (	PLO)				
CLR-1 :	Learn a	about building m	aterials and	identify the com	ponents of a building				1	2	3	[	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 :	Know t	he Transportatio	on system, br	idges and dams																							
CLR-3 :	Learn a Know t	about Water sup he working of IC	ply system, s Cengines and	solid waste man d identify the sub	agement and Surveying b system requirements				Ê	()	(9					arch			ability		~						
CLR-4 :	Apply t	he concept of h	arnessing en	ergy from variou	is energy sources				Bloor	oy (%	nt (%		adge		lent	ese			taine		Nork		nce				
CLR-5 :	Apply r	nanufacturing p	rocesses; ca	sting, forming. L	ist machining operation	s; lathe, drilling. Identify pro	ocess of welding		) g (E	cienc	Imer		owle	.s	ndo	'n, R	sage	e	Sus		am /	_	-ina	ing			
CLR-6 :	Utilize	the basic civil ar	nd mechanica	al engineering ki	nowledge for a broader	perspective of engineering	around us		Thinkir	d Profic	d Attair		ring Kn	Analys	k Deve	, Desig	Tool U	& Cultu	nent &		al & Te:	nicatior	Agt. & I	g Learr			
Course L	earning	Outcomes (CL	. <b>0):</b> At the	end of this cours	se, learners will be able	to:			Level of	Expecter	Expecter		Enginee	Problem	Design 8	Analysis	Modem	Society	Environr	Ethics	Individua	Commur	Project N	Life Lon	PSO - 1	PSO - 2	PSO – 3
CLO-1 :	Charac	terize building r	naterials and	its applications					1	90	85		Н	-	L	Н	Н	Н	М	-	-	-	-	Н	-	-	-
CLO-2 :	Unders	tand the buildin	g component	s and its applica	ations				1	90	85		Н	М	М	М	Н	Н	М	-	Н	-	-	Н	-	-	-
CLO-3 :	Identify Identify	different transp the working of	ortation syste IC engines a	ems, water and nd understand ti	waste water treatment a he need of various auxil	nd its applications iary systems			1	90	85		Н	М	М	М	Н	Н	Н	Н	L	L	Н	М	М	L	М
CLO-4 :	List the	basic compone	ents and anal	yze the working	of major power plants	• •			2	90	85		Н	L	L	L	L	М	Н	L	L	L	L	М	М	L	М
CLO-5 :	Identify	r manufacturing	processes; c	asting, forming.	List machining operatio	ns; lathe, drilling. Identify p	process of weldir	g	2	90	85		Н	L	М	L	М	L	L	L	L	L	L	М	М	L	М
CLO-6 :	Apply t	he basic knowle	dge of civil a	nd mechanical e	engineering				2	90	85		Н	L	L	L	L	М	Н	L	L	L	L	М	М	L	М

		Building Materials, Foundations	Civil Engineering Constructions	Waste Management, IC Engines	Power Plants	Manufacturing Processes
Durat	on (hour)	18	18	18	18	18
<b>S</b> 1	SLO-1	Introduction to Civil Engineering, Building Materials, History	Cement concrete flooring, Mosaic Flooring, Marble flooring	Disinfection of water and its methods.	Coal based thermal Power Plant: layout, components description	Casting introduction and history Expendable mold casting process
3-1	SLO-2	Disciplines in Civil Engineering, Early constructions and development over time	Terrazzo flooring, Granite flooring, Ceramic tile flooring	Water distribution system and methods	Coal based thermal Power Plant: working, advantages, disadvantages	Production steps in a typical sand-casting process, terms including patterns and core
S-2	SLO-1	Ancient Monuments: Peruvudaiyar or Brihadeeswarar Temple, Kallanai dam	Roofs: Types of roofs, madras terrace roof	Sewage collection, treatment, disposal	Hydro Electric power plant: layout, components description	Other expendable mold casting: shell molding, vacuum molding
5-2	SLO-2	Grand Anicut, Taj Mahal, Golconda fort, Angkor Wat, Pyramids of Giza, Colosseum	Reinforced concrete roofs, pitched roof, trussed roof	Methods of collection, sewerage systems	Hydro Electric power plant: working, advantages and disadvantages	expanded polystyrene process, Investment casting
S-3	SLO-1	Building Materials - Stone – Classification of Rocks,	Roof coverings: classification, types	Septic tank, principle	Nuclear power plant: Nuclear fission and fusion reactions	Metal forming, forging
5-5	SLO-2	Quarrying, Dressing, Properties and Uses of Stone	Weathering course: Classification, Types	Working and construction details	Nuclear reactor, components description	Rolling, extrusion, drawing
S-4	SLO-1 SLO-2	Tutorial 1 : Pictures of Ancient Monuments and their Pictures	Tutorial 4: Flooring and roof coverings available in market	Tutorial 7: Water distribution system	Tutorial 10: Comparison of different Power Plants	Tutorial 13: Casting Processes
S 5-6	SLO-1 SLO-2	Lab 1: Learn the Building Materials and Properties (Strength of Materials Lab)	Lab 4: Learn types of floors and roofs (Structural Engineering Lab)	Lab 7: Site Visit: Sewage treatment plant	Lab 10: Site Visit: Power Producing Plant	Lab 13: Basic Lathe operation: facing, turning, step turning
e 7	SLO-1	Mortar, Plain and Reinforced Cement	Stress and strain, types	Solid waste management: Sources and types of solid waste	Layout, working, merits and demerits of boiling water reactor	Sheet metal working, applications. Cutting operations: shearing, blanking, punching,
3-1	SLO-2	Concrete Grade and properties and uses	Stress & strain curve for mild steel	Sources and types of solid waste	Layout, working, merits and demerits of pressurized water reactor	cutoff, parting, slotting, perforating, notching, trimming, shaving, fine blanking
S-8	SLO-1	Special Concretes	Three moduli of elasticity, poisson's ratio,	Solid waste: Collection	Gas turbine power plants: components description	Material removal processes: Conventional lathe with its main components

	SLO-2	Fiber reinforced concrete and Ferro cement, Pre-stressed concrete	Ductility, stiffness, simple problems	Solid waste: Transfer and Disposal.	Working and types gas turbines, methods to improve performance	three and four-jaw chuck, tool and work holding devices
S-0	SLO-1	Construction chemicals	Transportation: Introduction, classification, Highways: design elements, cross section	Surveying, Levelling: Objectives	Layout and working of open cycle and closed cycle plants	Lathe operations: facing, turning
0-9	SLO-2	Recycling: construction, demolition wastes	Classification of Roads, Administrative and Structural	Classifications of Surveying, Instruments used	Plants with inter-cooling, reheating and regeneration	drilling, boring and thread cutting
S-10	SLO-1 SLO-2	Tutorial 2 : Identify various fibers and construction chemicals used in market	Tutorial 5: Three Moduli problems	IC Engine: Classification, Comparisons Engine operations: 2 stroke & 4 stroke	Tutorial 11: Layout of a Power Plant	Tutorial 14: Lathe operations
S 11-12	SLO-1 SLO-2	Lab 2: Learning Building Materials Properties (Concrete & Highway Lab)	Lab 5: Stress & Strain Curve for Mild steel (Strength of Materials Lab)	Lab 8 Study of two stroke and four stroke cycle engines,	Lab 11: Practical study of mold, molding and casting processes	Lab 14: Lathe operation: Taper turning, grooving, thread cutting
0.40	SLO-1	Buildings, Classification of Buildings, Selection of site for a building	Railways – Zone and Headquarters, permanent way and its requirement	Comparison of SI & CI engines, Numerical Problems	Solar Thermal power plant: layout of Flat plate collector based plant	Overview of radial drilling machine with its main components
5-13	SLO-2	Components of Buildings, Soil, General types of soil, Classification	Bridges: Components of bridge, classification, types, structure	Engine starting system: battery ignition system, Magneto ignition system	Solar Thermal power plant: central receiver type plant, advantages, disadvantages	Overview of upright drilling machine with its main components
	SLO-1	Bearing Capacity, Factors affecting bearing capacity, Methods to improve	Dams: Purpose, Classification, Selection of Site, Gravity, Advantages, Limitations	Fuel supply systems of SI Engine : working of carburettor	Wind energy conversion system – wind turbine types	Metal joining process-welding, types
S-14	SLO-2	Foundations: Functions, General types of foundation, Shallow foundations	Water supply system, Per capita demand, Factors affecting, Sources of water supply	Fuel supply systems of CI Engine: fuel injector, working of Common Rail Diesel Injection	Working, advantages and disadvantages	Welding equipment, tools and accessories
S 15	SLO-1	Deep Foundations	Water Treatment: Standards of Drinking water, Layout of treatment plant	Lubrication systems: Functions, working of mist and forced feed lubrication system	Ocean Thermal Energy Conversion system: layout of open cycle	Types of weld joints: butt, corner, lap, tee, edge joint
3-13	SLO-2	Machine Foundations	Treatment plant, Slow Sand filter, Rapid Sand filter	Cooling Systems: Air and Water Cooled Engines	Layout of closed cycle, advantages, disadvantages	Types of welds: fillet, groove, plug, spot, seam weld
S-16	SLO-1 SLO-2	Tutorial 3: Making model for Building Components	Tutorial 6: Model making - Sand Filters	Tutorial 9: Alternate fuels for IC Engines Properties, Limitations, Emission Standards	Tutorial 12: Energy Conversion Methods	Tutorial 15: Metal Joining Processes
S 17-18	SLO-1 SLO-2	Lab 3: learn different types of Soils and Foundations (Soil Mechanics Lab)	Lab 6: Water standards and treatment methods (Environment Lab)	Lab 9: Practical study of I.C engine auxiliary system components	Lab 12: Casting operation: pattern and core	Lab 15: Drilling, boring, counter boring, counter sinking, reaming, tapping

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5 Howard S Doavy Donald D Dowo (Coorgo Lebobanogloue Environmental Engineering Melcraw Hill 1985 111 K		9. JUIII D. H

Ipakjian, Steven Schmid, Manufacturing Processes for Engineering Materials, Pearson, 2016 y F. Boston, Patricia G. Westra, Kayla L. Black, Veatch, Power Plant Engineering, Kluwer, 1995

er, "Solar Energy", John Wiley & Sons, 2013

ywood, Internal Combustion Engine Fundamentals, Tata McGraw Hill Education, 2017 Leenus Jesu Martin, Murali. G, Basic Mechanical Engineering, Suma Publications, 2007

Learning Ass	essment											
	Diaam'a		Continuous Learning Assessment (50% weightage)									
	DIUUIII S	CLA –	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA – 4	¥ (10%)#		in (50 % weightage)	
	Lever of Thirking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	
Lovel 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/	
Level I	Understand	20%	20%	1370	1576	1370	1370	1376	1370	1576	1370	
Lovel 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	
Leverz	Analyze	2070	2070	2070	2070	2070	2070	2070	2070	2070	2078	
Lovel 3	Evaluate	10%	10%	15%	150/	15%	15%	15%	15%	15%	15%	
Lever J	Create	1070	1070	1570	1570	1570	1370	1370	1570	1570	1570	
	Total	10	0 %	10	0 %	10	0 %	10	0 %	10	0 %	

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
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2. Dr. R. Kalimuthu, ISRO	2. Dr. Sourav Rakshit, IIT Madras, srakshit@iitm.ac.in	2. Dr. K. Suresh Kumar, SRMIST

Course Code	18EES101J	Course Name	BASIC ELECTRICAL	& ELECTRONICS ENGINEERING	C Ca	ourse itegory	1	S				Eng	ineeri	ng Sci	ences	;				L 3	T 1	P 2	C 5
Pre-requ Cours	iisite es		Co-requisite Courses	Nil		Pro C	gress ourse	ive s	Nil														
Course O	fering Department	Electric	cal & Electronics Engineering	Data Book / Codes/Standards		Nil																	
Course Le	arning Rationale (CLI	R): The pu	rpose of learning this course is to:			L	earnir	ıg					Pro	gram	Learn	ing O	utcor	mes ('	PLO)				
CLR-1 :	Analyze given electric	circuits consi	sting of active and passive compo	nents		1	2	3	Γ	1	2	3 4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 : CLR-3 : CLR-4 : CLR-5 : CLR-6 : Course Le	Identify the parts, funct Utilize the basic electro Utilize transducers for Build simple logical cir Utilize the basic electri earning Outcomes (CL	tions and wor onic devices a measuring di cuits using Bo cal circuits, n .0): At the e	king of motors, generators and tra and circuits splacement, pressure, flow, sound polean expressions. Identify eleme nachines, electronic devices, trans end of this course, learners will be	nsformers that function in AC and DC , light, temperature, chemical changes etc., nts in a communication system ducers and digital system principles and opera able to:	ions	vel of Thinking (Bloom)	pected Proficiency (%)	pected Attainment (%)		gineering Knowledge	oblem Analysis	sign & Development	dem Tool Usage	ciety & Culture	vironment & Sustainability	lics	lividual & Team Work	mmunication	oject Mgt. & Finance	e Long Learning	0 - 1	0 - 2	0 – 3
CL 0-1 ·	Analyza basic theony u	tilized in elec	trical circuits and its circuits			- Le	<u><u></u> ① 75</u>	<u>前</u> 70	-	ш Н			<u>Š</u>	Š	<u>ш</u> М	Ш	<u> </u>	М	4	<u> </u>	č	<u> </u>	ě
CLO-1 :	Identify working princip	le of direct c	urrent and alternative current macl	hines such as transformers, motors and genera	tors	2	75	70	F	H	M		M	-	M	M	M	M	-	M	-	-	
CLO-3 :	Operate the basic elec	tronic device	s. Identify their uses and construct	ion features		3	75	70		H	-	LL	M	-	М	М	М	M	-	М	-	-	-
CLO-4 :	Identify the different ty	pes of transd	ucers used in measurement of var	ious physical parameters		3	75	70		Н	-	L N	М	-	М	М	М	М	-	М	-	-	-
CLO-5 :	Apply binary logic and	Boolean exp	ressions for digital circuit design, la	dentify elements in a communication Systems		3	75	70		H	Μ	M N	M	-	М	М	М	М	-	М	-	-	-
CLO-6 :	Identify the basic elect	rical circuits,	machines, electronic devices, tran	sducers and digital system principles and oper	ations	3	75	70		-	-	LN	M	-	М	М	М	М	-	М	-	-	-

		Electrical Circuits	D.C Machines & A.C Machines	Electronic Devices	Transducers	Digital Systems
Durat	ion (hour)	18	18	18	18	18
6.1	SLO-1	Introduction to DC and AC circuits	Sinusoids, Generation of AC, Average, RMS values, Form and peak factors	Safety measures in electrical systems	Transducer function and requirements	Number systems, binary codes
3-1	SLO-2	Active and Passive two terminal elements	Analysis of single phase AC circuit, Real, Reactive, Apparent power, Power factor	Types of wiring, wiring accessories	Classification: Active and Passive	Binary arithmetic
5.2	SLO-1	Ohms law, Voltage-Current relation, Power, Energy	Magnetic materials, B-H Characteristics Simple magnetic circuits	House wiring for staircase, fluorescent Iamp, LED Iamp & corridor wiring	Displacement: Capacitive, Inductive, Variable Inductance	Boolean algebra, laws and theorems
5-2	SLO-2	R,L,C Circuits, Voltage and Current Sources	Faraday's laws, induced emfs and inductances.	Basic principles of earthing, Types of earthing. Grounding in DC circuits	Linear Variable Differential Transformer	Simplification of Boolean expression
S-3	SLO-1	Kirchoff's current law	1 - phase transformers: Construction, types, ideal, practical transformer	Basic principles and classification of instruments	Electromechanical: Pressure, Flow, Accelerometer, Potentiometer etc.	Logic Gates and Operations
	SLO-2	Kirchoff's voltage law	EMF equation, Regulation, Efficiency	Moving coil and moving iron instruments	Strain Gauge	Simplification of Boolean expression
S-4	SLO-1 SLO-2	Problem Solving Session	Problem Solving Session	Problem Solving Session	Problem Solving Session	Problem Solving Session
S 5-6	SLO-1 SLO-2	Lab 1: Verification of Kirchoff's Law	Lab 4: Transformer Operation, Efficiency	Lab 7: Types of wiring (fluorescent lamp wiring, staircase wiring, godown wiring)	Lab 10: Measurement using LVDT and Strain Gauge	Lab 13: Verification of Boolean expression using logic gates
6.7	SLO-1	Mesh Current Analysis	Construction, working of DC Generators	Overview of Semiconductors	Chemical: pH probes, Electro galvanic Sensor etc.,	SOP and POS Expressions
3-7	SLO-2	Nodal Voltage Analysis	Types of DC generators	PN junction diode	Electroacoustic: Mic, Speaker, Piezoelectric, Sonar, Ultrasonic	Standard forms of Boolean expression
	SLO-1	Thevenin's Theorem	Characteristics of Generators	Zener diode	Tactile, Geophones, Hydrophone	Simplify using Boolean Expressions
S-8	SLO-2	Norton's Theorem	Armature reaction, Losses	Diode circuits: rectifiers, half and full wave	Electrooptical: LED, Laser, Photodiode, Photoresistor, Phototransistor	Minterm and Maxterm
S-0	SLO-1	Maximum Power Transfer Theorem	Power stages of DC generators	Bridge type rectifier, filter circuit	Photoconductive cell, photovoltaic cell, solar cell	K-Map Simple ReductionTechnique
3-9	SLO-2	Star- Delta Transformation	Working and types of DC motors, Characteristics, Starters	Clippers and clampers	LED, infrared emitters, LCD, optocouplers	Two, Three and Four Variable K-Map

S-10	SLO-1 SLO-2	Problem Solving Session	Problem Solving Session	Problem Solving Session	Problem Solving Session	Problem Solving Session
S 11-12	SLO-1 SLO-2	Lab 2: Verification of all Theorems	Lab 5: Demo of DC Machine & Parts	Lab 8: Characteristics of semiconductor devices	Lab 11: Measurement using Electro acoustic and Electrooptical transducers	Lab 14: Reduction using Digital Logic Gates
S 12	SLO-1	Resistive Circuit Analysis	Construction, working of AC Generators	BJT construction, operation	Thermoelectric: Resistance Temperature Detectors	Principles of Communication
3-13	SLO-2	Superposition, Convolution	Types of AC generators	BJT characteristics (CB, CE and CC configurations) and uses	Thermocouple	Block diagram of a Communication System
	SLO-1	RL Circuit Transient Analysis	Characteristics of AC Generators, Losses	JFET construction, operation	Thermister	Amplitude Modulation
S-14	SLO-2	RC & RLC Transient Analysis	Single Phase and Three Phase Machines	JFET characteristics (CS configuration) and uses.	Electrostatic: Electrometer	Frequency Modulation
S 15	SLO-1	Three Phase Systems, Connections	Working and types of AC motors	MOSFET construction, operation	Electromagnetic: Antenna, Hall effect, Magnetic Cartridge etc.,	Phase Modulation
3-13	SLO-2	Relation between Line and Phase	Induction, Squirrel Cage, Synchronous	MOSFET characteristics (CS configuration) and uses	Radioacoustic: Geiger Muller Tubes, Radio receiver, Radio transmitter	Demodulation
S-16	SLO-1 SLO-2	Problem Solving Session	Problem Solving Session	Problem Solving Session	Problem Solving Session	Problem Solving Session
S 17-18	SLO-1 SLO-2	Lab 3: Time Domain Analysis (RL, RC)	Lab 6: Demo of AC Machine & Parts	Lab 9: Wave shaping circuits	Lab 12: Measurement using Thermoelectric and Electromagnetic	Lab 15: Demo of Transmission and Reception using MODEM

Learning Resources

Dash.S.S., Subramani.C, Vijayakumar.K, Basic Electrical Engineering, 1st ed., Vijay Nicole, 2013
 Jegatheesan .R, Analysis of Electric Circuits, Tata McGraw-Hill, 2014
 P. S. Bimbhra, ElectricalMachinery, 7<sup>th</sup> ed,. Khanna Publishers, 2011

R. Muthusubramanian, S. Salivahanan, "Basic Electrical and Electronics Engineering, Tata McGraw-Hill, 2012
 Moris M. Mano, Digital Design, 3<sup>rd</sup> ed., Pearson, 2011

Learning Asse	essment										
	Diaamia				Final Examination	n (EOQ/ weightege)					
	Bloom S	CLA –	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA – 4	4 (10%)#		i (50% weightage)
	Level of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Lovel 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/
Lever	Understand	20%	20%	15%	15%	15%	15%	15%	10%	13%	15%
Lovel 2	Apply	200/	200/	200/	200/	200/	200/	200/	200/	200/	200/
Leverz	Analyze	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Lovel 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	15%	15%
Level 5	Create	1076	1076	1576	1370	1370	1370	1570	1370	1370	1570
	Total	10	0 %	10	0 %	10	0 %	10	0 %	10	0 %

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
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2. Dr. Sricharan Srinivasan, Wipro Technologies, sricharanms@gmail.com	2. Dr. Rajeev Sukumaran, IIT Madras, rajeev@wmail.iitm.ac.in	2. Dr. S. S. Dash, SRMIST

Cou Co	ırse de	18MES103L	Course Name	CI	VIL AND MEC	HANICAL E	NGINEERING W	ORKSHOP	C Ca	ourse itegory	y	S				Engir	eerin	g Scie	ences					L 1	T 0	P 4	C 3	
Pre-	requisite	Nil			Co-requis	ite <sub>Nil</sub>				Pro	gress	ive	Nil															
Cours	e Offerin	g Department	Civil Eng	ineering & M	lechanical Engi	ineering	Data Book	/ Codes/Standards		Nil	ourse	5																
Cours	e Learnir	ng Rationale (CLI	R): The purp	ose of learni	ng this course	is to:				L	earnir	ng					Prog	ram L	.earn	ing O	utcor	nes (	PLO)					
CLR-1	: Praci	tice machining and	d alass cuttina	shop floor tra	ade					1	2	3		2	3	4	5	6	7	8	9	10	11	12	13	14	15	
CLR-2	: Prace	tice arc & gas wel	ions and tolerances								E			ity														
CLR-3	Pract	tice basic carpenti tice casting, mould			(mo	(%)	(%)		0	ŧ	searc			inabil		¥		ġ										
CLR-5	: Pract	tice and make G.I			g (Blc	ency	nent	-		bme	, Res	age	a)	usta		n Wo		nanc	бĽ									
CLR-6	: Prace	tice machining, gla	nithy and plumbing		nking	rofici	ttainr	2	olvi u bive	evelo	esign	ol Us	ulture	nt & S		Tear	ation	. α Fi	earnir									
				i	ted P	ted A	-		8 D	is, D	n Toc	y & C	nmer		ual &	unice	t Mgt	ng Le	-	2	ŝ							
Cours	Course Learning Outcomes (CLO): At the end of this course, learners will be able to:										xpec	xpec	-		lesigr	nalys	loder	ociet	inviro	thics	bivibu	mmo	rojec	ife Lc	- OS	- OS	- SO -	
CLO-1	: Mach	to specifications		1	90	ш 85	l		H	 L	$\ge$	ся Н	H	L	M	L	L	H	Ĺ	Ĺ	Ĺ							
CLO-2	?: Weld	l joints using arc &	gas welding. I	Fit pipes and	fixtures. Make	new assem	bly for given dime	nsions, and tolerance	es	1	90	85	1	L	Н	L	Н	Н	Η	L	Η	L	L	Н	М	М	М	
CLO-3	: Pract	tice basic carpenti	ry joints used ir ding_8 smithy f	<u>n house hold</u> trados	furniture items,	, and sheet	metal items used	shop floor practices		1	90	85			H	L	M	M	H	L	M	L	<u></u>	M	L	L	L	
CLO-	i: Flaci	G.I & P.V.C. pipe	e line connectio	ons used in th	ne plumbina tra	de				2	90	85	H		H	L	M	H	M	L	L	L	L	M	L	L	L	
CL O-6	. Pract	tice basic skills of	f machining, gla	ass cutting, w	elding, fitting, o	carpentry, si	heet metal, castin	g, mouldings, smithy	and	2	90	85									_				_			
0204	, plum	bing								2	00	00	I	L	Н	L	М	Н	Η	L	М	L	L	М	L	L	L	
		Machining, Drilli	ng, Tapping, G	Glass cutting	Welding	(Arc and Ga	ns) and fitting	Carpentry a	Carpentry and Sheet metal Casting, moulding and smithy Plumbing (C									ng (G	(G.I and P.V.C)									
Durat	on (hour)		15			15			15						1	5							15					
	SLO-1	Machining: Basic	cs of Machining	g Processes	Basics of Meta	al Arc weldir	ng operations,	Basics of Carpentry	operati	ons,		В	asics of	Castir	g, pro	cesse	s, Equ	ıipmeı	nt's	Basic	s of P	lumbing practices for G.I and						
S-1		Tools and demo	nstration of ma	chinina to	Equiprifient s Tools and den	nonstration	of producina	Equipments Tools and demonstr	ration o	f produ	icina	T	ools and	demo	nstrati	on of	produ	cina		P.v.C Tools	and c	lemoi	nstrat	ion of	produ	ıcina		
	SLO-2	produce models			models			models				m	nodels					. 0		mode	ls							
s	SLO-1	Simple turning of rod using lathe n	f cylindrical sur nachine tool	face on MS	Butt joint of tw welding proces	o metal plat ss	tes using arc	Cross halving joint of at perpendicular dire	of two w ection	ooden	piece	es T	To make the mould using stepped flange							Plumt usina	oing o G.I. fi	f bath ittinas	nroom S	/ kitch	en fitt	tings		
2-5	SLO-2	Simple turning of	f cylindrical sur	face on MS	Lap joint of two	o metal plat	es overlapping	To make duster from	n wood	en pied	ce usir	ng T	o make	he m	ould us	ing ste	epped	flang	е	Plumb	oing o	f bath	room	/ kitch	en fitt	tings		
	SI 0-1	Basics of drilling	and tapping pr	rocesses,	Basics of gas	welding ope	erations,	Basics of Sheet me	tal oper	ations,		В	asics of	injecti	on moi	ulding	and p	oroces	ses,	PVC F	Plumb	ing o	, f bath	nroom	' kitch	en fit	tings	
S-6 S-6 Equipment's, tools Equipment's, Equipment's, Equipment's, Tools and domenatorition of producing Tools and the set of the set								Equipment's	ration o	fnrodu	icina	E	quipmei	t's, dom	netrati	on of	nrodu	cina		using Tools	P.V.C	C. fittii	ngs nstrat	ion of	nrodi	icina		
SLO-2 produce models. models								sheet metal models		prouu	ung	m	ools and odels	uemi	instiati		orouu	ung		mode	ls	lenio	iisiiai		prout	Juli		
S         SLO-1         Generate hole on a metal piece         MIG welding of metal plates								To make Rectangul GI sheet	lar shap	bed tray using To make plastic models using injection moulding of simple part					n Plumbing of bathroom/ kitchen fittings using P.V.C. fittings													
7-10	SLO-2	Generate interna	al thread on a n	netal piece	TIG welding o	f metal plate	es	To make bigger size	e scoop	using	GI she	eet. m	o make noulding	olastic of sim	mode ple pa	ls usir rt	g inje	ction		Plumb using	oing o P.V.C	f bath C. fittir	nroom ngs	/ kitch	en fitt	tings		
	SLO-1	Basics of Glass ( Equipment's.	cutting process	ses,	Basics of fitting	g practice, t nodels	ools and method	Basics of different g Sheet metal operati	ical sh	apes i	n B	asics of	Smith	y proce	esses,	Equip	oment	'S,	Basic: lines a	s of P and fit	lumbi tings	ing pr for pr	actice umps	s for ( and m	G.I pi 1achii	pe nes		
SLO-2 Tools and demonstration of producing Tools and demonstration of producing models Final Research Science Final Research Res									Equipment's, tools and demonstration of Tools and demonstration of producing Equipment's, too producing models producing models					ls an Is.	d dem	onstra	ation	of										
S	SLO-1	Make glass pane	els for boxes		Step fitting of t	two metal pl	lates using fitting	To make geometrica	al shape	e like fi	rusturr	Istum, To forge chisel from MS rod using black Plumbing of pipe lines and fitti						itting	for									
14-13	010-2		ny 0.13	1001		smithy Pumps using G.I fittings																						

	1. Jeyachandran K., Natarajan S. & Balasubramanian S., A Primer on Engineering Practices Laboratory,	5. Kannaiah P. & Narayana K.L., Manual on Workshop Practice, Scitech Publications, 1999.
	Anuradha Publications, 2007	6. Hajra Choudhury S.K., Hajra Choudhury A.K., Nirjhar Roy S.K., Elements of Workshop Technology, Vol.I &
Learning	2. Jeyapoovan T., Saravanapandian M. & Pranitha S., Engineering Practices Lab Manual, Vikas Publishing	Vol.II 2010, Media promoters and publishers private limited, Mumbai.
Resources	House Pvt.Ltd, 2006.	7. Rao P.N., Manufacturing Technology, Vol. I & Vol. II, Tata McGrawHill,2017.
	3. Bawa H.S., Workshop Practice, Tata McGraw, 2007.	8. Gopal T.V, Kumar. T, Murali. G, A first course on workshop practice – Theory, Practice and Work Book,
	4. Rajendra Prasad A. & Sarma P.M.M.S., Workshop Practice, Sree Sai Publication, 2002.	Suma Publications, Chennai, 2005.

Learning Assessment

	Bloom's			Conti	nuous Learning Ass	essment (50% weig	htage)			Final Examination	(EOV) weightege)		
	Diuuiii S	el of Thinking CLA – 1 (10%) CLA – 2 (15%) CLA – 3 (15%) CLA – 4 (10%)#									i (50 % weightage)		
	Level of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice		
Lovel 1	Remember		409/		200/		200/		200/		200/		
Level I	Understand	-	40%	-	30%	-	30%	-	30%	-	30%		
Lovel 2	Apply		109/		100/		409/		100/		409/		
Leverz	Analyze	-	40%	-	40%	-	4070	-	40%	-	4070		
Loval 2	Evaluate		200/		200/		200/		200/		200/		
Level 5	Create	-	20%	-	30%	-	30%	-	30%	-	30%		
	Total	1	00 %	10	0 %	10	0 %	10	0 %	100 %			

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
1.Dr. R. Kalimuthu, ISRO,	1. Dr. Ramkumar P, IIT Madras, ramkumar@iitm.ac.in	1. Mr. A. Thirugnanam, SRMIST
2.Dr. A. Velayutham, DRDO,	2. Dr. Sourav Rakshit, IIT Madras, srakshit@iitm.ac.in	2. Dr. S. Prabhu, SRMIST

Course Code	18EES102L	Course Name	ELECT	RICAL AND ELEC	TRONICS ENGINEERIN	G WORKSHOP	C Ca	ourse itegory	,	S				Engin	eering	g Scie	ences					L -	T 0	P 4	C 3
Pre-requisit Courses	te <sub>Nil</sub>			Co-requisite Courses	Nil			Pro C	gress ourse	sive es	Nil														
Course Offeri	ing Department	Electrica	al and Electror	nics Engineering	Data Book	/ Codes/Standards		Nil																	
Course Learn	ing Rationale (CL	R): The purp	pose of learnir	ng this course is to:	:			L	earni	ng					Prog	ram L	.earn	ing O	utcon	nes (F	PLO)				
CLR-1: Des	sign a layout of resi	idential wiring a	and introductio	n to PV powered h	nouse			1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 :         Imp           CLR-3 :         Gai           CLR-4 :         Union           CLR-5 :         Gai           CLR-6 :         Union	oart knowledge on r in knowledge on tro derstand the basic in knowledge on fal derstand the basics	measurements oubleshooting v working of Elec brication of Prir s of illumination	of various ele various electric ctrical machine nted Circuit Bo and study the	ctrical quantities cal and electronic e es, transformers pards and IC fabrica e various componen	equipment ation nts of Power System			Thinking (Bloom)	d Proficiency (%)	I Attainment (%)	ina Knowledae	Analysis	Levelopment	, Design, Research	Fool Usage	& Culture	nent & Sustainability		ll & Team Work	lication	Agt. & Finance	g Learning			
Course Learn	ing Outcomes (CI	L <b>O):</b> At the el	nd of this cour	se, learners will be	able to:			Level of	Expecter	Expecter	Enainee	Problem	Design 8	Analysis	Modem	Society -	Environr	Ethics	Individua	Commur	Project N	Life Lon	PSO - 1	PSO - 2	PSO – 3
CLO-1 : Col	mprehend the basic	s of residential	wiring and un	derstand the desigr	n of the solar system for s	small homes		1	85	80	Н	-	Н	-	-	Н	Н	-	-	-	-	Н	-	-	-
CLO-2 : Un	derstand the meas	urement of the	various electr	ical quantities (like	voltage, current, power,	power factor)		1	85	80	Н	-	Н	-	Н	Н	Н	-	Н	-	-	Н	-	-	-
CLO-3 : Ga	in knowledge on wo	orking and trou	bleshooting of	various electrical	and electronic circuits in I	real time application		1	85	80	H	-	-	-	-	-	H	-	-	-	-	-	-	-	-
CLO-4: Uni	derstand the constr	uctional details	s and principle	of operation of DC	machines and Transform	mers		2	85	08	Н	-	-	-	-	-	Н	-	-	-	-+	-	-	-	-
CLO-5: Far	millarized with PCB	design and fail	prication proce	ess en componente				2	80	80	Н	-	-	-	-	-	-	-		-	-	-+	-	-	-
CLU-U: ACC	une knowledge on	niunninalion ar	iu power syste	em components				2	00	00	п	-	-	-	-	-	11	-	-	-	-	-	-	-	-
	Wirii	ng and Earthing	g	Solar Par	nels and Wiring	Electrical & Elec	tronic	Equipr	nent		DC,	AC Ma	chine	s, PC	B Des	sign				Pane	əls, 3D	) Printi	ing		
Duration (hour)         15         15         15         15																									

		rrining and Eardining	eelar r artele and rrining	Electrical a Electronic Equipment	2 0, / 10 maonino0, / 02 200.gm	r anolo, ob r intang
Du	ation (hour)	15	15	15	15	15
6	SLO-1	I.E. rules for electrical wiring as per 2003 actPrepare Layout, load calculation	Wiring layout using simulation software	Measurement of energy	Principles of DC machines	Illumination concepts
3-	SLO-2	Estimation and costing of domestic installation. (Residential, lab, hall etc.,)	Examples of Wiring	Single-phase and Three-phase energy meter	Principles of AC machines	lighting calculation
S	SLO-1	Lab 1: Residential Wiring: Energy meter,	Lab 4: Design of Wiring layout using	Lab 7: Measurement of energy using	Lab 10: DC machine: commutator, brush	Lab 4: Experiment and test: inverse square
2-	SLO-2	fuses, switches, indicator, lamps, etc.,	simulation software	single-phase, three-phase energy meter	AC: induction-squirrel cage, synchronous	law of illumination, photometer experiment
6	SLO-1	Types of wiring: fluorescent lamp wiring	Study of PV cells characteristics (series, parallel connections, partial shading, etc.,)	Troubleshooting electrical equipment: fan, iron box	Assembly of choke	Power system components: Circuit Breakers, switchgears
3-	SLO-2	Staircase, godown wiring	Design of PV system	Troubleshooting electrical equipment: mixer and grinder	Small transformer and winding of machines	Control panel, relays
S	SLO-1	Lab 2: Wiring: fluorescent lamp, stair	Lab 5: Design of Solar system for small	Lab 8: Troubleshooting of equipment: fan,	Lab 11: Assembly of choke, transformer and	Lab 5: Design of control panels
7-1	0 SLO-2	case, godown wiring etc.,	houses	iron-box, mixer, grinder	winding practices in electrical machines	Lab 5. Design of control pariets
6.1	SLO-1	Study of Earthing	Measurement of electrical quantities: voltage, current,	Electronic components: active & passive, Electronic Instruments: CRO	PCB Design	3D Printing and its components
3-1	SLO-2	Measurement of Earth resistance.	Power, Power factor in RLC circuits)	Function generator, Power Supply, Multi- meter, IC tester and Solder practice	PCB Fabrication	Advantages and Uses of 3D printing
S	SLO-1	Lab 3: Study of Earthing and Measurement	Lab 6: Measurement of electrical voltage,	Lab 9: Trouble shooting of electronic	Lab 12: PCP Design and fabrication	Lab 6: 2D Brinting domonstration
12-	5 SLO-2	to Earth resistance.	current, power, power factor	circuits and Soldering practices	Lab 12. FOB Design and Tabrication	Lab 0. 3D Filinding demonstration

Learning
Resources

1. Subhransu Sekhar Dash & K. Vijayakumar, Electrical Engineering Practice Lab Manual. Vijay Nicole, 2013

Learning Assessment

Learning Ass	sessment										
	Dia am'a			Con	tinuous Learning Ass	essment (50% weig	htage)			Final Examinatio	n (EQ0/ weighten)
	BIOOM S	CLA –	1 (10%)	CLA -	- 2 (15%)	CLA –	3 (15%)	CLA – 4	4 (10%)#	Final Examinatio	n (50% weightage)
	Level of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Lovel 1	Remember		109/		200/		200/		200/		200/
Lever	Understand	-	40%	-	30%	-	30%	-	30%	-	30%
Lovel 2	Apply		10%		10%		10%		10%		10%
Leverz	Analyze	-	4070	-	4070	-	4070	-	4070	-	4070
Lovel 3	Evaluate		20%		200/		200/		200/		200/
Level 5	Create	-	2070	-	30%	-	30%	-	30%	-	30%
	Total	10	0 %	10	00 %	10	0 %	10	0 %	10	0 %

Course Designers		
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2. Dr. Sricharan Srinivasan, Wipro Technologies, sricharanms@gmail.com	2. Dr. Rajeev Sukumaran, IIT Madras, rajeev@wmail.iitm.ac.in	2. Dr. S. S. Dash, SRMIST

Course Code	18CSS101J	Course Name		PROGRAMMIN	NG FOR PROBLEM SOLV	VING	Cour Categ	se ory	S				Engir	neerin	g Scie	nces					L 3	T 0	P 4	C 5
Pre-requis Courses	site s			Co-requisite Courses	Nil		P	rogre Cour	ssive ses	Nil														
Course Offe	ering Department	Сотри	iter Science ai	nd Engineering	Data Book	/ Codes/Standards	Ni																	
Course Lea	rning Rationale (CL	R): The pu	rpose of learn	ing this course is to				Lear	ning					Prog	ram L	earni	ing Oı	utcom	ies (F	PLO)				
CLR-1 : T	hink and evolve a log	gically to cons	truct an algori	thm into a flowchart	t and a pseudocode that c	an be programmed		1 2	2 3	] [	1 2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2: U	Itilize the logical oper	ators and exp	pressions to so	lve problems in end	gineering and real-time	1 0										>					_			-
CLR-3 : S	tore and retrieve dat	a in a single a	nd multidimen	sional array	,			e .					arch			bilit								
CLR-4 : U	Itilize custom designe	ed functions th	hat can be use	d to perform tasks a	and can be repeatedly us	ed in any application			t (%		dge	Put	ese			aina		Vork		ge				
CLR-5 : C	create storage constru	ucts using str	ucture and uni	ons. Create and Uti	ilize files to store and retri	eve information		g) G	nen		all of	, u	Å Å	age	e	Sust		s E		inar	bu			
CLR-6 : C	reate a logical minds	set to solve va	rious enginee	ring applications us	ing programming construc	cts in C			tain		Å L	i ya	sigr	IUs	ultur	t & S		Tea	tion	<u>8</u>	arni			
Course Lea	rnina Outcomes (C	LO): At the	end of this cou	ırse. learners will be	e able to:			/el or I nii	bected At		gineering		alysis, De	dern Too	ciety & C	vironmen	ics	ividual &	mmunica	oject Mgt.	e Long Le	0 - 1	0 - 2	0 – 3
	<b>J</b>							É É	δ Δ	_	<u>ي</u>		An I	Ň	Ŝ	Ē	詽	Pul	8	Pro	Life	R	R	PS
CLO-1 : /c	lentify methods to so	lve a problem	through comp	outer programming.	List the basic data types	and variables in C		2 8	5 80		LH	I H	H	H	-	-	М	M	L	-	Н	-	-	-
CLO-2 : A	pply the logic operate	ors and expre	ssions. Use lo	op constructs and r	recursion. Use array to sto	ore and retrieve data		3 8	5 80		LH	I H	H	H	-	-	М	M	L	-	H	-	-	-
CLO-3 : A	nalyze programs tha	t need storag	e and form sin	gle and multi-dimen	nsional arrays. Use prepro	cessor constructs in C		3 8	5 80		LH	I H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-4 : C	reate user defined fu	inctions for m	athematical ar	nd other logical oper	rations. Use pointer to add	dress memory and data		3 8	5 80		LH	I H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-5: Create structures and unions to represent data constructs. Use files to store and retrieve data								LH	I H	H	H	-	-	М	M	L	-	H	-	-	-			
CLO-6 : A	pply programming co	oncepts to sol	ve problems. L	earn about how C	programming can be effe	ctively used for solutions		3 8	5 80		Lŀ	I   H	Н	Н	-	-	М	М	L	-	Н	-	-	-
Duration (hour)	n	21			21	21						:	21							2	1			
SLC	0-1 Evolution of Pro	Initializing and Accessi	ng 2D A	ray		Passing	Array	Eleme	nt to Fi	unctio	1		Initiali	zing S	Struct	ture, I	Declar	ing st	ructu	re				

(h	iour)	21	21	21	21	21
6.4	SLO-1	Evolution of Programming & Languages	Relational and logical Operators	Initializing and Accessing 2D Array	Passing Array Element to Function	Initializing Structure, Declaring structure variable
5-1	SLO-2	Problem solving through programming	Condition Operators, Operator Precedence	Initializing Multidimensional Array	Formal and Actual Parameters	Structure using typedef, Accessing members
S-2	SLO-1	Creating algorithms	Expressions with pre / post increment operator	Array Programs – 2D	Advantages of using Functions	Nested structure Accessing elements in a structure array
5-2	SLO-2	Drawing flowcharts	Expression with conditional and assignment operators	Array Contiguous Memory	Processor Directives and #define Directives	Array of structure Accessing elements in a structure array
6.2	SLO-1	Writing pseudocode	If statement in expression	Array Advantages and Limitations	Nested Preprocessor Macro	Passing Array of structure to function
3-3	SLO-2	Evolution of C language, its usage history	L value and R value in expression	Array construction for real-time application Common Programming errors	Advantages of using Functions	Array of pointers to structures
S 4-7	SLO-1 SLO-2	Lab 1: Algorithm, Flow Chart, Pseudocode	Lab 4: Operators and Expressions	Lab 7: Arrays - Multidimensional	Lab 10: Functions	Lab 13: Structures & Unions
<b>c</b> 0	SLO-1	Input and output functions: Printf and scanf	Control Statements – if and else	String Basics	Pointers and address operator	Bit Manipulation to structure and Pointer to structure
3-0	SLO-2	Variables and identifiers	else if and nested if, switch case	String Declaration and Initialization	Size of Pointer Variable and Pointer Operator	Union Basic and declaration
s 0	SLO-1	Expressions	Iterations, Conditional and Unconditional branching	String Functions: gets(), puts(), getchar(), putchar(), printf()	Pointer Declaration and dereferencing pointers	Accessing Union Members Pointers to Union
3-9	SLO-2	Single line and multiline comments	For loop	String Functions: atoi, strlen, strcat, strcmp	Void Pointers and size of Void Pointers	Dynamic memory allocation, mallaoc, realloc, free

S 10	SLO-1	Constants, Keywords	While loop	String Functions: sprint, sscanf, strrev, strcpy, strstr, strtok	Arithmetic Operations	Allocating Dynamic Array
5-10	SLO-2	Values, Names, Scope, Binding, Storage Classes	do while, goto, break, continue	Arithmetic Characters on Strings	Incrementing Pointers	Multidimensional array using dynamic memory allocation.
S 11-14	SLO-1 SLO-2	Lab 2: Input and Output Statements	Lab 5: Control Statements	Lab 8: Strings	Lab 11: Pointers	Lab 14: Structures & Unions
S-15	SLO-1	Numeric Data types: integer	Array Basic and Types	Functions declaration and definition	Constant Pointers	file: opening, defining, closing, File Modes, File Types
5-15	SLO-2	Numeric Data types: floating point	Array Initialization and Declaration	Types: Call by Value, Call by Reference	Pointers to array elements and strings	Writing contents into a file
S 16	SLO-1	Non-Numeric Data types: char and string	Initialization: one Dimensional Array	Function with and without Arguments and no Return Values	Function Pointers	Reading file contents
3-10	SLO-2	Increment and decrement operator	Accessing, Indexing one Dimensional Array Operations	Function with and without Arguments and Return Values	Array of Function Pointers	Appending an existing file
S-17	SLO-1	Comma, Arrow and Assignment operator	One Dimensional Array operations	Passing Array to Functions with return type	Accessing Array of Function Pointers	File permissions and rights
5-17	SLO-2	Bitwise and Sizeof operator	Array Programs – 1D	Recursion Functions	Null Pointers	Changing permissions and rights
S 18-21	SLO-1 SLO-2	Lab 3: Data Types	Lab 6: Arrays – One Dimensional	Lab 9: Functions	Lab 12: Pointers	Lab 15: File Handling

Learning Resources

 g
 1. Zed A Shaw, Learn C the Hard Way: Practical Exercises on the Computational Subjects You Keep Avoiding (Like C), Addison Wesley, 2015

 ces
 2. W. Kernighan, Dennis M. Ritchie, The C Programming Language, 2<sup>nd</sup> ed. Prentice Hall, 1996

3. Bharat Kinariwala, Tep Dobry, Programming in C, eBook 4. http://www.c4learn.com/learn-c-programming-language/

Learning Assess	ment										
	Dia ami'a			Conti	inuous Learning Ass	essment (50% weig	htage)			Final Eveninatio	- (EOO/ weighters)
	BIOOM S	CLA –	1 (10%)	CLA –	2 (15%)	CLA –	3 (15%)	CLA –	4 (10%)#	Final Examination	n (50% weightage)
	Level of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Lovel 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/	150/	150/
Lever	Understand	20%	20%	13%	15%	10%	10%	15%	15%	15%	15%
Lovel 2	Apply	200/	200/	200/	200/	200/	200/	200/	200/	200/	200/
Leverz	Analyze	20%	20%	20%	2070	2070	2070	2070	2070	2070	20%
Loval 2	Evaluate	100/	100/	150/	150/	150/	150/	150/	150/	150/	150/
Levers	Create	10%	10%	15%	15%	10%	10%	15%	15%	10%	15%
	Total	100	0 %	10	0 %	10	0 %	10	0 %	10	0 %

Course Designers		
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2. Dr. Sricharan Srinivasan, Wipro Technologies, sricharanms@gmail.com	2. Dr. Rajeev Sukumaran, IIT Madras, rajeev@wmail.iitm.ac.in	2. Dr. B. Amutha, SRMIST

Course Code	18MES104L	Cour Nam	se Ie	ACTIVE LEA	RNING LABORATOR	Y	C Ca	our	se ory		S			E	ngine	ering	Sciend	ces					L ·	Т Э	P 2	C 1
Pre-requis	site Nil			Co-requisite Courses	Nil	/ 0 - d - /0t - d -		P	Progr Cou	ressiv urses	ve Ni	il														
Course Offe	ring Department	M	ecnanical Engineel	ing	Data Book	(/Codes/Standar	ras	INII																		
Course Lea	rning Rationale (CL	<b>R):</b> Th	ne purpose of learn	ing this course is to:					Lea	irning	g				Р	Progra	m Lea	arning	Outc	ome	es (P	LO)				
CLR-1 : /a	lentify the equilibrium	of force	s using Lami's theo	orem					1	2	3	1	2	3	4	5	6	7 8	3 9	1	0	11	12	13	14	15
CLR-2 : /a	lentify the equilibrium	of force	s using Lami's theo	prem with single and t	wo unknown weights										_			≥								
CLR-3 : /a	entify the friction bet	ween an	y two surfaces that	contacts and slide ag	ainst each other in the	horizontal plane			Ê	(%	(%	Φ		-	sarch		-	abili	÷	2						
CLR-4: /a	entify the friction bet	veen an	y two surfaces that	contacts and slide ag	ainst each other in an	inclined plane		į	Bloc	)cy (	ent (°	ledg		men	Rese	Ð		stain	Mor			ance	-			
CLR-5: //	nly and utilize the h	asic con	cents using learning	n through discovery n	nethod				cing (	ficier	inme	Now	ysis	elop	ign, l	Jsag	ture	ns su	eam		E	Ë	ming			
<b></b>	A d d d d d d d d d d d d d d d d d d d																									
Course Lea	Conserved ending and																									
CLO1:     Verify Lam's theorem using distance and angle methods     T     CLO3       2     90     85       L     H     H     L       L     H     H     L       L     H     H     L       L     H     H     L       L     H     H     L       L     H     H     L       L     H     H     L																										
$\begin{array}{c c c c c c c c c c c c c c c c c c c $																										
$\begin{array}{c c c c c c c c c c c c c c c c c c c $														L												
	elemnine the coemcle erify Grashof's law in	a four-h	ar mechanism	e and unierent materia	als in an inclineu plane				2	90	85		п Н	н	n H	L			<u>и п</u> И Н				п Н	L	L	
CLO-6: P	CLO-5:       Verify Grashof's law in a four-bar mechanism       3       90       85         CLO-6:       Practice basic concepts using learning through discovery method       2       90       85																									
	CLO-6:         Practice basic concepts using learning through discovery method         2         90         85         L         H         H         L         L         H         L         L         H         L         L         H         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L         L <thl< th="">         L         L         <t< td=""></t<></thl<>																									
Duration (hour)	Duration (hour) 6 6 6 6 6																									
S SLO 1-2 SLO	-1 -2 Lami's theorem -	- verifica	ation methods	Lami's theorem –Ca weight	lculate unknown	Friction in horizo	ontal plane				Fric	ction in a	n Incli	ned pla	ne			Fo	our bar	r meo	chan	ism				
S SLO 3-4 SLO	<ul> <li>Verifying Lami's</li> <li>method</li> </ul>	theorem	using Distance	Determine unknown theorem (Angle met	weight using Lami's hod)	Determine coeffi same materials v	icient of fric with horizor	tion ntal	betv plane	veen e	Det san	termine c ne mater	oeffic ials w	ient of i ith incli	frictio ned p	n betw blane	veen	Ve	erify G	rash	of's L	aw				
S SLO 5-6 SLO	-1 Verifying Lami's -2 method	theorem	using Angle	Determine two unkn Lami's theorem (Ang	own weights using gle method)	Determine coeffi different material	icient of fric als with hori.	tion zont	betw tal pla	veen ane	Det diffe	termine c erent ma	oeffic terials	ient of t with in	rictio cline	n betw d plan	veen e	In	ersio/	n of I	Four	bar n	necha	nism		
Learning Resources	1. Ferdinand. P. Mechanics fo	Beer. E r Engine	, Russell Johnston ers: Statics and Dy	Jr., David Mazurek, I vnamics, 10 <sup>th</sup> ed. McG	Philip J Cornwell, Vecto Traw Hill, 2013.	or 2. Ra	attan, S. S,	The	eory o	of Ma	chines	s, 4 <sup>th</sup> ed.	McGra	aw Hill,	2015	5										
Learning As	sessment																									-
	Bloom's			•	Continuous	Learning Assessn	ment (50%	weię	ghtag	ge)		I.							Fin	al E	xamii	natio	n (50%	6 wei	ahta	ne)
	Level of Think	king	CLA – 1	(10%)	CLA – 2 (15%	6)	CL	_A –	- 3 (1	<u>5%)</u>			<b>T</b> 1	CLA	– 4 (	<u>10%)</u> #	ŧ				Admin	natio	1 (007	-	gina	<b>j</b> 0/
l evel 1	Remember	-	i neory	40%	-	30%	i neory			Pra	actice		IN	eory -		PI	actice	)		i ne	eory			Prac 30	0%	
	Understand								-														-			
Level 2	Analyze		-	40%	-	40%	-			4	40%		- 40%						-	-			40	)%		
Level 3 Create - 20%					-	30%	-			3	30%			-			30%			-	-			30	)%	
Total 100 %					100 %			10	)0 %						100 9	%						10	0 %			
# CLA – 4 c	an be from any comb	ination c	of these: Assignment	nts, Seminars, Tech T	alks, Mini-Projects, Ca	se-Studies, Self-S	Study, MOC	)Cs,	Cerl	tificat	ions, C	Conf. Pap	er etc	<b>)</b> .,												
Course Des	igners																									
Experts from	Industry				Experts from Highe	er Technical Institu	utions					In	ernal	Expert	S											
1.Dr. R. Kaliı	R. Kalimuthu, ISRO, 1. Dr. Ramkumar P, IIT Madras, ramkumar@iitm.ac.in 1. Mr. D. Raja, SRMIST																									
2.Dr. A. Vela	Dr. A. Velayutham, DRDO,     2. Dr. Sourav Rakshit, IIT Madras, srakshit@itm.ac.in     2. Dr. M. Kamaraj, SRMIST																									

Course Code	18AUS101L	Course Name	Α	ARTIFACT DISSECTIO	N LABORA	TORY		C:	Course ategor	se S Enginee						cien	ces			L 0	T 0	P 2	C 1	
Pre-requisi Courses	ite <sub>Nil</sub>		Co-requisite Courses	Nil			Pro C	gress ourse	ive s	lil														
Course Offer	ring Department	Automobile Engineer	ing	Data Book	/ Codes/S	tandards	Nil																	
Course Lear	ning Rationale (CLR): 7	The purpose of learn	ing this course is to:				L	earnir	ng				F	Progra	am Lea	arnii	ng Ou	itcon	nes (F	PLO)				
	antify the commonly used to	ols in a household :	and its usagos. Dovol	on abilitios to ronair a b	icvelo		1	2	3	1	2	3	4	5	6	7	8	٥	10	11	12	13	1/	15
CLR-1 Ide	entify the parts in a sewing	machine and drilling	machine Develop al	bilities to repair the sam			1	2	5		2	5	4	5	0		0	3	10		12	13	14	15
CLR-3: Ide	entify the parts in a two stro	ke and four stroke e	ngines. Develop abili	ties to identify faults	C		Ē	-	(				гch			bility								
CLR-4 : Inv	vestigate about the working	of household machi	nes. Develop abilities	s to repair the same			loon	y (%	nt (%		þ	ent	esea			taina		Vork		ЭС				
CLR-5 : Ide	entify the parts in electrical	machines. Develop a	abilities to repair the s	same			g (B	cienc	umer	ahuon	sis.	ndol	Jn, R	sage	e	Sus		am V	_	Final	ing			
CLR-6: De	evelop abilities to dismantle	and assemble comr	non household mach	ines and use handheld	tools		inkii	Profi	Attaiı	k l	naly	Deve	Desic		Cult	ent &		& Te	ation	Jt. &	-eart			
Course Lear	ning Outcomes (CLO):	At the end of this cou	rse, learners will be a	able to:			Level of Th	S Expected	R Expected	- Encineerir	- Problem A	- Design & I	- Analysis, [	z Modern To	- Society &	- Environme	Ethics	Individual	Communic	- Project Mç	Clife Long I	: PSO - 1	5 - DSO - 2	: PSO – 3
$ \begin{array}{c} CLO-1: Study the function of commonly used and special tools. Distinatule and assemble a bicycle \\ \hline CLO-2: Dismantle and study a sewing machine and a drilling machine and identify its working from parts. Assemble the parts 3 90 85 \\ \hline M & M & L & L & M & H & M & H \\ \hline M & M & L & M & H & M & H & M & H \\ \hline \end{array}$													H											
CLO-3: Dismantle and study two and four stroke engines and identify its working from parts. Assemble the parts 3 90 85 M M L M M L L M H M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M L H M M M L H M M L H M M M L H M M M L H M M L H M M M L H M M M L H M M M L H M M M L H M M M L H M M M L H M M M L H M M M L H M M M L H M M M M																								
CLO-4 : Dis	CLO-3: Dismantie and study two and four stroke engines and identify its working from parts. Assemble the parts 3 90 85 H M L M H L L M H M L H H M H													Н										
CLO-5 : Dis	smantle and study ceiling fa	an and identify its wo	rking from parts. Ass	emble the parts			3	90	85	h	M	L	Н	Н	LI	М	М	Н	М	L	Н	Н	М	Н
CLO-6 : St	udy the common household	machines and its p	arts		Π		2	90	85		М	L	Η	Н	LI	М	М	Η	М	L	Н	Η	М	Н
	Study of Common & S	Special tool usage	Study of Sewing	and Drilling Machine	Study of	Two and Four St	troke E	Engine	s	Stu	dy of H	louseh	old M	lachine	es			Stuc	dy of l	Electi	rical M	lachir	ies	
Duration (hour)	6			6		6						6								6	<b>b</b>			
S SLO- 1-2 SLO-	1 Study of common tools 2 Study of special tools		Dismantle sewing m working	achine and study its	Dismantle working. A	two stroke engin Assemble the dism	e and a nantleo	study i 1 engir	its Dia ne the	smantle e workin	wet gri g. Asse	nding r emble t	nach he m	ine an achine	d stud <u>.</u> Ə.	y	Disma	antle (	Ceilin	g fan				
S SLO- 3-4 SLO-	1 Dismantle the bicycle a 2 parts	nd study of working	Assemble the Sewir	ng Machine	Dismantle stroke eng	kick starter asse nine and study its	mbly o workin	f two Ig	Di: stu	smantle Idy the	mixer y vorking	grinding I. Assei	g mac mble	chine a the m	and achine	).	Study	the v	vorkin	g of v	variou	s part	s	
S SLO- 5-6 SLO-	Assemble the given bic	ycle	Dismantle and Asse Machine	mble a Drilling	Assemble stroke eng	the kick starter a jine	ssemb	ly of t	vo Di: wa	smantle orking oi	washir variou	ig maci s parts	hine a	and st	udy the	e,	Assen	nble t	he Ce	eiling	fan			
Learning Resources	1. V. Ganesan, Interna. 2. Karen E. Kunkel "Th	l Combustion Engine e Complete Sewing	es, Tata McGraw-Hill Machine Handbook "	Education. 2004. Sterling, 1999		3. B. L. Theraja 4. Bosch servic	"Fund e man	ament ual for	tals of cordeo	Electrica d drills	l Engir	neering	and	Electro	onics",	S. (	Chand	, 199	7					
Learning Ass	sessment			<b>2</b> #																				
	Bloom's		(10%)		Learning As	ssessment (50%	weight	age) (15%)				CI 4	_1	(10%)	#		— F	inal	Exam	inatio	on (50	% we	ighta	ge)
	Level of Thinking	Theory	Practice	Theory	Practice	Theory		(13%) P	ractice		Th	eorv	4 (	(1070); P	# Practice	e	_	Tł	neorv		1	Pra	ctice	
Level 1	Remember Understand	- 40% - 30% - 30% - 30%						30%	-			-			30	0%								
Level 2	Apply Analyze	-	40%	-	40%	-			40%			-			40%				-			40	0%	
Level 3	Evaluate Create	-	-	30%	-			30%			-			30%				-			30	0%		
	Total	100	%	100 %	01 "		100	%					100	%						1(	00 %			
# CLA – 4 ca	in be from any combination	of these: Assignment	nts, Seminars, Tech	Talks, Mini-Projects, Ca	se-Studies,	Self-Study, MOC	DCs, C	ertifica	tions,	Conf. P	aper et	D.,												
Course Desig	gners			Exercise Co. 18.1		1				н.	- 4 - 1 - 1	<b>F</b>												
Experts from	Industry			Experts from Highe	er Technical	Institutions					nterna	Experi	S											
1. Dr. Ramak	rishnan Ekambaram, Robei	t Bosch, Coimbator	Э.	1 .Dr. K.Arunachala	am, MIT, Cł	hrompet, karunac	halam	@mitiı	ndia.eo	lu	. Mr.T	Kaviya	rasu,	SRM	IST									



Course Code	18PDM101L	Course Name		PROFESSION	AL SKILLS AND PRACTICES	Co Ca	ourse tegory	,	М	Mandatory									L 0	Т 0	P 2	C 0	
Pre-requi Course Course Off	isite es <sup>i</sup> ering Department	Careel	r Development C	Co-requisite Courses Centre	Nil Data Book / Codes/Standards	3	Prog Cc Nil	gressi ourse:	ive s	Vil													
Course Learning Rationale (CLR): The purpose of learning this course is to: Learning Program Learning Outcomes (PLO)																							
CLR-1 :	Utilize success habits t	to improve ad	chievement in life	e			1	2	3	1	2	3	4	5	6	7	8	9 1	10 1	11 12	2 13	3 14	15
CLR-2:       Develop inter personal skills and be an effective goal oriented team player to achieve success         CLR-2:       Develop inter personal skills and be an effective goal oriented team player to achieve success         CLR-3:       Utilize professionalism with idealistic, practical and moral values that govern the behavior         CLR-4:       Become an expert in communication and problem solving skills         CLR-5:       Re-engineer attitude required to succeed and understand its influence on behavior to achieve professionalism         CLR-6:       Enhance holistic development of students and improve their employability skills         Course Learning Outcomes (CLO):       At the end of this course, learners will be able to:							Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance		PSO - 2	PSO – 3
CLO-1 : /	dentify success habits	3					2	80	75	-	-	-	-	-	-	Н	H .	H I	H	- H	- 1	-	-
CLO-2 :	Acquire inter personal	skills and be	an effective goa	al oriented team pla	ayer		2	75	70	-	-	-	-	-	-	Н	H	н   І	H	-   F	1 -	-	-
CLO-3 :	Develop professionalis	m with ideali	istic, practical an	d moral values			2	80	75	-	-	-	-	-	-	Н	H	ΗI	H ·	- H	1 -	-	-
CLO-4 : /	Acquire communication	n and problei	m solving skills.				2	75	70	-	-	-	-	-	-	Н	H	ΗI	H	- H	1 -	-	-
CLO-5 : /	Re-engineer their attitu	ide and unde	erstand its influe	nce on behavior			2	85	80	-	-	-	-	-	-	Η	Н	ΗI	H	- H	- 1	-	-
CLO-6 : /	Apply behavior changi	ng elements	to construct prof	fessionalism in cha	aracter and behavior		2	85	80	-	-	-	-	-	-	Η	H	ΗI	H	- H	1 -	-	-

Durat	ion (hour)	6	6	6	6	6
6.1	SLO-1	Personality profiling	Etiquette and Grooming	Surveying and Reporting	Profile building	Innovation
3-1	SLO-2	Being Proactive	Etiquette and Grooming	Surveying and Reporting	Profile building	Innovation
6.2	SLO-1	Begin with the end in mind	Collaborative skills	Projects	Personal Branding	Innovation
3-2	SLO-2	Putting first things first	Collaborative skills	Projects	Personal Branding	Innovation
6.2	SLO-1	Thinking Win-Win	Networking skills	Paper presentations	Personal Branding	Creativity and out of box thinking
5-3	SLO-2	Seeking first to understand and then to be understood	Networking skills	Paper presentations	Personal Branding	Creativity and out of box thinking
S-4	SLO-1	Synergizing	Team work and Support	Introduction to design thinking	USP	Creativity and out of box thinking
3-4	SLO-2	Sharpening the saw	Team work and Support	Introduction to design thinking	USP	Creativity and out of box thinking
0 F	SLO-1	Character building	Leadership Skills	Generate ideas that are potential solutions to the problem identified	Developing profile	Six thinking hats
5-0	SLO-2	IKIGAI	Leadership Skills	Generate ideas that are potential solutions to the problem identified	Developing profile	Six thinking hats
<b>S</b> <i>E</i>	SLO-1	Self-worth	Leadership Styles	Report writing	Developing profile	Six thinking hats
3-0	SLO-2	Attitude	Leadership Styles	Report writing	Developing profile	Six thinking hats

Learning	1. Charles Harrington Elster, Covey Sean, Soven Habits of Highly Effective Teans, New York, Eiroside Publishers, 1008	2.	Thomas A Harris, I am ok, You are ok, New York-Harper and Row, 1972
Resources	1. Chanes Hannington Listor, Covey Sean, Seven Habits of Highly Enective Teens, New Tork, Theside Fublishers, 1990	3.	Carol Dweck, Mindset, The New Psychology of Success, Random House Pub. 2006

Learning	Assessment

Learning Assess	ment										
	Diaam'a			Contir	nuous Learning Asse	essment (100% weig	ghtage)			Final Fre	mination
	DIUUIII S	CLA –	1 (20%)	CLA –	2 (30%)	CLA –	3 (30%)	CLA – 4	(20%)#		ammauon
	Level of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Lovel 1	Remember		100/		200/		200/		200/		
Level I	Understand	-	40%	-	30%	-	30%	-	30%	-	-
Lovel 2	Apply		100/		100/		409/		100/		
Leverz	Analyze	-	40%	-	40%	-	40%	-	40%	-	-
Lovel 2	Evaluate		200/		200/		200/		200/		
Level 5	Create	-	20%	-	30%	-	30%	-	30%	-	-
	Total	100	) %	10	0 %	10	0 %	100	) %		-

Course Designers			
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts	
1. Ms. Sudha Mahadevan, Career Launcher, sudha.m@careerlauncher.com	1. Mr. Nishith Sinha, dueNorth India Academics LLP, nsinha.alexander@gmail.com	1. Dr. T. Mythili, SRMIST	2. Mrs. B. Revathi, SRMIST
2. Mr Ajay Zenner, Career Launcher, ajay.z@careerlauncher.com	2. Dr. Dinesh Khattar, Delhi University, dinesh.khattar31@gmail.com	3. Mr. P. Priyanand, SRMIST	4. Mrs.Kavitha Srisarann,, SRMIST

Course Code	18LEM101T	Course Name	CONS	TITUTION OF INDIA	C Ca	ourse tegory	,	М	1 Mandatory									L 1	T 0	P 0	C 0		
Pre-req Cour	uisite ses		Co-requisite Courses	Nil		Pro C	gress ourse	sive s	Vil														
Course C	ffering Department	English	1	Data Book / Codes/Standards		Nil																	
Course Learning Rationale (CLR): The purpose of learning this course is to: Learning Program Learning Outcomes (PLO)																							
CLR-1 :	Utilize the citizen's rig	hts				1	2	3		2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 : CLR-3 : CLR-4 : CLR-5 : CLR-6 : Course L	Utilize the basic citize Identify the Indian cor Utilize the States func Identify the emergenc Utilize the rights of a con- earning Outcomes (C	n's fundament stitutional frar tionality and p y provisions, t itizen both inc itizen both inc At the e	al rights of freedom of speech, exp nework with union parliament, gov rovisions for the betterment of the he functions of election and public lividual and as a society by unders end of this course, learners will be	pression, equality, religion and privacy remment and their functions and citizen's rights individual and society service commissions, identify the tax system standing the constitutional provision and rights able to:		vel of Thinking (Bloom)	pected Proficiency (%)	scted Attainment (%) scted Attainment (%) scted Attainment (%) hereing Knowledge bem Analysis besign, Research 4 ysis, Design, Research 4 ysis, Design, Research 4 system Control Usage ety & Culture ety & Culture scted attainability z sidual & Team Work c scted attainability z scted att					oject Mgt. & Finance	e Long Leaming	0 - 1	0 - 2	0 – 3						
CL 0-1 ·	Identify the basic prov	isions in the ir	ndian constitution			2	<u>山</u> 80	<u>山</u> 75			<u> </u>	- An	۲ ۲	So.	Ш М	苗	<u> </u>	<u></u> Н	Ĕ	5 H	8 -	8	<u>8</u>
CLO-2 :	List the fundamental r	iahts. riahts to	equality, freedom, religion, culture	e. education and the right against exploitation		2	75	70			-	-	-	-	M	H	H	H	-	Н	-	-	-
CLO-3 :	Identify the fundamen	tal duties of th	e Union of India, President, Vice-I	President, Union Ministers and Parliament funct	ions	2	80	75			-	-	-	-	М	H	Н	Н	М	Н	-	-	-
CLO-4 :	Identify the power of s	tates, its legis	lature, Governors role and the sta	te judiciary		2	75	70			-	-	-	-	М	Н	Н	Н	М	Н	-	-	-
CLO-5 :	List the special provis	ions and funct	ionality of election commission, ρι	ublic service commission, individual tax and GS	Т	2	85	80			-	-	-	-	М	Н	Н	Н	Н	Н	-	-	-
CLO-6: Build knowledge on the various aspects in the Indian Constitution, its provisions and right of a citizen and the society 2 85 80 M H H H M H									-	-	-												

Dura	tion (hour)	6	6	6	6	6
6.4	SLO-1	Meaning of the constitution law and constitutionalism	The Directive Principles of State Policy	President of India (with Powers and Functions)	Governor of the State (with Powers and Functions)	Local Self Government – Constitutional Scheme in India
3-1	SLO-2	Historical perspective of the Constitution of India	Scheme of the Fundamental Right to Equality	Prime Minister of India (with Powers and Functions)	The Chief Minister of the State (with Powers and Functions)	Emergency Provisions : National, President Rule, Financial Emergency
6.2	SLO-1	Salient features and characteristics of the Constitution of India	Scheme of the Fundamental Right to certain Freedom under Article 19	Union Judiciary (Supreme Court) Jurisdiction of the Supreme Court	State Judiciary (High Courts)	Election Commission of India (with Powers and Functions)
5-2	SLO-2	Citizenship	Scope of the Right to Life and Personal Liberty under Article 21	State Government	Union Territories, Panchayats,	The Union Public Service Commission (with Powers and Functions)
6.2	SLO-1	Scheme of the fundamental rights	Union Government, Union Legislature (Parliament)	State Legislature, Legislative Assembly, Legislative Council	Municipalities, Scheduled and Tribal Areas	Amendment of the Constitutional Powers and Procedure
3-3	SLO-2	The scheme of the Fundamental Duties and its legal status	Lok Sabha and Rajya Sabha (with Powers and Functions), Union Executive	Powers and Functions of the State Legislature, State Executive	Co-operative Societies	Income Tax, Goods and Services Tax

Learning	1. Durgadas Basu, Introduction to the Constitution of India,Lexis- Nexis, 2015	3.	Kaushal Kumar Agarwal, India's No 1 book on Tax : Simple Language Advanced Problems: Income Tax, Kindle, 2017
Resources	2. Subash C Kashyap, Our Parliament, National Books Trust, 2011	4.	Vivek K R Agarwal, GST Guide for students: Making GST – Good and Simple Tax, Neelam Book House, 2017

Learning As	sessment													
	Pleam's		Continuous Learning Assessment (100% weightage)											
	DIUUIII S	CLA –	1 (20%)	CLA –	2 (30%)	CLA –	3 (30%)	CLA – 4	4 (20%)#					
	Lever of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice			
Level 1	Remember Understand	40%	-	30%	-	30%	-	30%	-	-	-			
Level 2	Apply Analyze	40%	-	40%	-	40%	-	40%	-	-	-			
Level 3	Evaluate Create	20%	-	30%	-	30%	-	30%	-	-	-			
	Total	10	0 %	10	0 %	10	0 %	10	0 %		-			

# CLA - 4 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.,

#### Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts		
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2. Mr. Durga Prasad Bokka, TCS Chennai, durgaprasad@tcs.com	2. Ms. Subashree, VIT, Chennai, subashree@vit.ac.in	2. Ms. Cauveri B, SRMIST	4. Dr. M. M.Umamaheswari, SRMIST	

Course Code	18GNM101L	Course Name	PHYSI	CAL AND M	ENTAL HE	ALTH USING YOGA	(	Cou Cate	urse gory		M Mandatory					L 0	T 0	P 2	C 0								
Pre-requi Course	site Nil		Co- C	requisite ourses	Nil				Prog Co	ressi urse	ive s	Nil															
Course Off	ering Department	Centre for	r Applied Research	in Education		Data Book / Codes/St	tandards	Ν	Vil																		
Course Lea	arning Rationale (CL	R): The purpo	ose of learning this	course is to:				][	Le	arnin	g					P	rogr	am Le	earni	ng Oı	utcon	nes (I	PLO)				
CLR-1: (	Jtilize rich Indian herita	age and knowled	dge for self-healing	and self-pro	tection from	diseases		] [	1	2	3	Γ	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2: / CLR-3: / CLR-4: \$ CLR-5: \$ CLR-6: /	Apply meditation for at ntellectually develop c Socially transform into Spiritually enlighten on Achieve personal bene	taining happines oneself by identif a meaningful an eself by purifyin ofits of whole hea	ss and balancing en fying oneness with o nd purposeful indivio 1g the body, soul an alth and wellbeing b	notions and s divine state a dual to both s d have a blis y practicing	state of mini- and transform self and soc ssful existen yoga for ph	d and body m towards absolute one iety ce ysical, emotional and me	ness in space ental fitness	-	Thinking (Bloom)	d Proficiency (%)	d Attainment (%)		ring Knowledge	Analysis	k Development	, Design, Research	Tool Usage	& Culture	nent & Sustainability		al & Team Work	nication	Agt. & Finance	g Learning			
Course Lea	arning Outcomes (CL	<b>.0):</b> At the end	d of this course, lea	mers will be	able to:				Level of	Expecte	Expecte		Enginee	Problem	Design 8	Analysis	Modem	Society a	Environr	Ethics	Individua	Commur	Project N	Life Lon	PSO - 1	PSO - 2	PSO – 3
CLO-1: /	dentify Indian heritage	e, culture. Identif	fy key anatomical st	ructures in th	he human b	ody and basic exercises	for the same		2	80	75		-	М	-	-	-	Н	Н	Н	Н	Н	-	Н	-	-	-
CLO-2: /	Apply yoga meditation	practices for em	notional developme	nt and wellbe	eing				2	75	70		-	М	-	-	-	Н	Н	Н	Н	Н	-	Н	-	-	-
CLO-3 : /	dentify educational an	d intellectual de	velopment methods	using five s	ense realiza	ation and transformation			3	80	75		-	М	-	-	-	Н	Н	Н	Н	Н	-	Н	-	-	-
CLO-4 : 1	Demonstrate human va	alues and emotion	ons through thoroug	gh understan	nding about	life, naturopathy and foo	od habits		3	75	70		-	М	-	-	-	Н	Н	Н	Н	Н	-	Н	-	-	-
CLO-5 : /	mpact self and society	/ by peaceful coe	existence with self-i	ntrospection	and baland	ed diet charts			3	85	80		-	М	-	-	-	Н	Н	Н	Н	Н	-	Н	-	-	-
CLO-6 : 1	Demonstrate yoga exe	ercises and postu	ures to stretch and a	strengthen th	ne body and	l mind			3	85	80		-	М	-	-	-	Н	Н	Н	Н	Н	-	Н	-	-	-

		Physical Development	Emotional Development	Intellectual Development	Social Development	Spiritual Development
Durati	on (hour)	6	6	6	6	6
S-1	SLO-1	Indian Heritage & Culture, Concept of Yoga, Objectives, Science & Art of Yoga	Brain Functions, Bio-Magnetism, Cognitive Mind	Education & Intelligence Development using Yoga. Improving Intelligence	Introduction: Social Intelligence	Spiritual Connect & Yoga: Self-Realization, Self-Awareness, Self-Actualization
5-1	SLO-2	Women and Yoga Practice – Classification, Modern Age, Philosophy of Life	Emotional Intelligences, Managing Stress and Emotions	Learnability through Concentration, Intelligence through learning sense organs	Human values, Ethics & Morality	Cause and Effect Realization (Karma Yoga), Harmony in Life
<b>6</b> .2	SLO-1	Practice1: Standing exercise, Surya Namaskar	Practice4: Surya Namaskar, Standing asanas	Practice7: Yoga for Youthfulness (Kayakalpah Yoga)	Practice10: Kayakalpha, Bhandas, Meditation (Crown)	Practice13: Management of Physical problems (Yoga therapy)
5-2	SLO-2	Meditation (Self Realization), Relaxation	Meditation (Five Sense Realization), Relaxation	Meditation (Five Sense Realization), Relaxation	Self-introspection Practice (Moralization of Desire) & Relaxation	Meditation (Nine centre) & Relaxation
6.3	SLO-1	Physical Health: Body Structure, Diseases and Causes, Science of Human Body	Meditation for Emotional development: Eyebrow Center (Agna) Meditation	Theory of Intellectual Transformation: Divine state origin, absolute space,	Exercises for Self-Introspection: Analysis of thoughts, Moralization of desires	Spiritual Enlightenment
0-0	SLO-2	Yoga &Youthfulness. Benefits, Comparison between other exercises and Yoga	Genetic Centre (Santhi) Meditation. Stress Relaxation Exercises	Transformation of universe, living beings, Intelligence, Knowledge, Wisdom & Peace	Anger Management, Eradicating worries, concerns & challenges	Purifying the Body (Genetic center)
84	SLO-1	Practice2: Surya Namaskar, Sitting Exercises	Practice5: Surya Namaskar, Sitting asanas,	Practice8: Kayakalpha Yoga, Pranayama	Practice11: Kayakalpha Yoga, Krisya Yoga	Practice14: Project Submission
3-4	SLO-2	Meditation (Self Realization) – Relaxation	Meditation (Agna) & Relaxation	Meditation (Agna) - Relaxation	Yoga Mudhras, Meditation (Santhi) & Relaxation	Meditation, Introspection, Sublimination
S-5	SLO-1	Exercises: Hands, Legs, Neuro-Muscular breathing, Eye, Ears, Nostrils, kidney, brain	Asanas (Postures) for Body Structure: Full Body Structure Maintenance	Exercises: Intellectual development Brain Crown Centre (Thuriyam) Meditation	Therapy for Social Development: Gestures Yoga (Mudhras) – Body locks (Bhandhas)	Spirituality for Stress Management
0-0	SLO-2	digestive tract, stomach, lungs, spine, hip, neck. Pressure points in our body	Standing, Sitting, Prone & Supine Posture, Benefits of asanas	Five Senses (Panchendriya) Meditation, Consciousness and Law of nature	Indian Medical System: Naturopathy, Food, Nutrition, Diet Chart for Youthfulness	Yoga Practices for blissful existence
5-6	SLO-1	Practice3: Prone & Supine posture Exercises	Practice6: Surya Namaskar, Prone & Supine posture Asanas	Practice9: Kayakalpha, Mudhras, Self- introspection Practice (Thought Analysis)	Practice12: Balancing Asanas,	Practice15: Practical Exam
0-0	SLO-2	Meditation (Self Realization) – Relaxation	Meditation (Shanthi) & Relaxation	Meditation (Santhi), & Relaxation	Meditation (Crown) & Relaxation	Meditation & Relaxation

	1.	Sadhguru Jaggi Vasudev, Inner Engineering – A yogi's guide to joy, 2016	6.	Vivekananda Kenthria Prkasan Trust, Yogam, 2006
Looming	2.	Shri Shri Ravi Shankar, The Art of stress-free Living, 2011	7.	Swami Chetanananda, Meditation and Its Methods According to Swami Vivekananda, Jan 2001
Deseurose	3.	Swami Ramdev Ji Yog Its Philosophy and Practice, 2008	8.	Dr. Lakshminarain Sharma, Yoga for the cure of Common Diseases, Mar 2016
Resources	4.	Yogiraj Vethathiri Maharishi, Yoga for Modern Age, Tenth edition, Vethathiri Publications, 2007	9.	Swami Satyananda Saraswati, Asana Pranayama Mudra Bandha, Bihar School of Yoga, 1993
	5.	Yogiraj Vethathiri Maharishi, Simplified Physical Exercises, Forty Second edition, Jan-2014	10.	Dr. Asana Andiappan, Thirumoolar's Astanga Yoga, International Yoga Academy, 2017

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	Bloom's		Continuous Learning Assessment (100% weightage)											
	DIUUIII S	CLA –	1 (20%)	CLA –	2 (30%)	CLA –	3 (30%)	CLA – 4	4 (20%)#					
	Lever of Thinking	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice			
Level 1	Remember Understand	-	40%	-	30%	-	30%	-	30%	-	-			
Level 2	Apply Analyze	-	40%	-	40%	-	40%	-	40%	-	-			
Level 3	Evaluate Create	-	20%	-	30%	-	30%	-	30%	-	-			
	Total	10	0 %	10	0 %	10	0 %	10	0 %		-			

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
1. Mr. K. Sivakumar, LIC of India, ksivalic1970@gmail.com	1. Dr. R. Elangovan, Tamilnadu Physical Education and Sports University, relangovantnpesu@yahoo.co.in	1. Dr. V. Nithyananthan, SRMIST
2. Mrs. R. Piramukutty, World Community Service Centre, piramukutty.gdvmvkm@gmail.com	2.Dr. N. Perumal, Vethathiri Maharishi Institute for Spiritual and Intuitional Education, visionacademy@vethathiri.edu.in	2. Dr. S. Jahira Parveen SRMIST

Course Code	18LEM102J	Course Name		VALUE EDUCATION Con			ourse itegory		М					Manda	atory						L 1	T 0	Р 1	C 0
Pre-requ Cours	iisite es		C	Co-requisite Courses	Nil		Proę Co	jressi jurse:	ive s	Vil														
Course Of	fering Department	English	and Foreign Langu	lages	Data Book / Codes/Stand	dards	Nil																	
Course Learning Rationale (CLR): The purpose of learning this course is to:							Le	arnin	g					Progr	am Le	earnin	g Ou	itcom	ies (P	PLO)				
CLR-1 :	Connect the learners to	o their potenti	ial, identify their pote	ential to create	a new positive world		1	2	3		1 2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 : CLR-3 : CLR-4 : CLR-5 : CLR-6 :	Analyze the merits and Draw attention towards Instill a sense of profes Cultivate a spirit of will Strengthen, enhance th	I demerits of a sthe weakness ssional ethics ing accommo he spirit of po	different educational sses they are suscep which help them der dation in an increasi sitivity and facilitate	I systems. Iden ptible to and ins evelop a safe co ingly diverse w positive contrib	tify the different systems of education spire them through positive models omfortable and prosperous society orld bution in various spheres of life		l of Thinking (Bloom)	ected Proficiency (%)	ected Attainment (%)		neering Knowledge Iem Analysis	gn & Development	ysis, Design, Research	em Tool Usage	ety & Culture	ronment & Sustainability	S	idual & Team Work	munication	ect Mgt. & Finance	Long Learning		- 2	- 3
Course Le	arning Outcomes (CL	. <b>O):</b> At the 6	end of this course, le	earners will be a	adie to:		Leve	Expe	Expe		Engi Prob	Desi	Anal	Mod	Soci	Envi	Ethio	Indiv	Com	Proje	Life	PSO	PSO	PSO
CLO-1 :	Equipped with an awar	eness of thei	r positive energy and	nd power			2	80	75		L M	-	-	М	H	-	Н	Н	Н	-	Н	-	-	-
CLO-2 :	Identify the meaning of	f 'education';	have a clearer and b	better understa	nding in taking education to the masse	S	2	75	70		M H	М	-	Н	Н	Μ	М	Н	Н	-	Н	-	-	-
CLO-3 :	Assess their weakness	es; understa	nd risks involved and	d rectify them t	hrough learning from positive and nega	ative instance	s 2	80	75		м -	-	-	М	Н	М	М	Н	Н	-	Н	-	-	-
CLO-4 :	Realize their profession	nal responsib	ilities				2	75	70		H M	-	-	Н	Н	Н	Н	Н	Н	-	Н	-	-	-
CLO-5 :	Acquire the required va	he required values in an expanding pluralistic world not be swept off their feet due to the rapid changes			ges	2	85	80		м -	-	-	Н	Н	Н	Н	Н	Н	-	Н	-	-	-	
CLO-6 :	Equip with better understanding of themselves, society they live. Identify responsibilities in creating a peaceful world				ıl world	2	80	75		M M	-	-	Н	Н	Н	Н	Н	Н	-	Н	-	-	-	

		Visions for Youth	Youth and Education	Youth and Society	Youth as Professionals	Youth in Pluralistic Society
Durati	on (hour)	6	6	6	6	6
S-1	SLO-1	Introduction	Meaning and the significance of education	Need for social values in the present context	Introduction to professional values	Introduction to pluralistic society, forces of globalization
5-1	SLO-2	Quiz	Brainstorming	Poem – "Where the mind is without fear" Write up on various instances from real life	Brainstorming through visual cues	Group Discussion
6.2	SLO-1	Two speeches by great personalities	Overview of different (traditional, modern) educational systems	Individual and group behavior, respect for others	Engineering societies in India	Science and technology intercultural proximity
3-2	SLO-2	Oral presentations	Debate	Case study on recent happenings	Quiz	Narration of stories from various religions to illustrate the oneness of humanity
S.2	SLO-1	Quotes, proverbs relating to the power and potential of youth, Excerpts: Wings of Fire	Overview of different (traditional, modern) educational systems	Civic sense, bullying-substance abuse, uses of expletives	Challenges to be addressed by Engineers in India	Positive, Negative impact: religion, politics, gender, economic status, aesthetics
0-0	SLO-2	ollecting proverbs highlighting the otential of youth Debate Case study on recent happening		Case study on recent happenings	Case Study	Discussion on "To Kill a Mocking Bird"
84	SLO-1	Two news articles highlighting the initiatives for social causes by youth	Role of youth in education, Urban and Rural set up, dissemination	Hero worship, gender insensitivity, moral policing	Challenges in different sectors: agriculture	Values required to live in a global society
3-4	SLO-2	Role play in a similar context	Student presentations	Case study on recent happenings	Case Study	Poster presentation on festivals of various religions
8.5	SLO-1	Two news articles highlighting the initiatives for social causes by youth	Designing and framing educational curriculum and materials	Positive contribution by youth in promoting social welfare	Challenges in different sectors: urban development, environment	Learning the etiquettes of various societies
3-3	SLO-2	Role play in a similar context	Students' Presentation based on write ups	Short videos followed by discussions	Group activity (oral and written)	Poster presentation on festivals of various religions
	SLO-1	One song exhibiting the positive energy of youth	The pressing challenges in current educational system	Positive contribution by youth in promoting social welfare	Challenges in different sectors: sustainable development, cyber security	Success of pluralistic society, enliven the society, religious harmony through literary
SLO-2		Discussion on the song	Collage Design	Short videos followed by discussions	Case Study – from Newspapers	Writing the aspects of pluralistic society based on the text

	1. Kalam, APJ Abdul. Wings of Fire: AN Autobiography of APJ Abdul Kalam. Ed. Sangam Books Ltd., 1999	A Thomas A Address to VIII Students by Nersyana Murthy
Learning	2. "Banaras Hindu University Speech" and "To Students". The Voice of Truth. General Editor Shriman Narayan. Navajivan Publishing	4. Thomas A Aduress to VTO Students by Narayana murthy/ tu address 2006/
Resources	House. pp. 3-13 and pp. 425-30. www.mkgandhi.org	Tillps://www.karnalaka.com/personalilies/narayana-munity/vlu-aduress-2000/
	3. Piroda, Sam. "Challenges in Science and Technology". www.nfdindia.org/loc19.htm	5. Wohu Economic forum. India's top'r chanenyeu nom skins to water scarcity

Learning Assessment													
	Bloom's Level of Thinking	Continuous Learning Assessment (100% weightage)									Final Examination		
		CLA – 1 (20%)		CLA – 2 (30%)		CLA – 3 (30%)		CLA – 4 (20%)#					
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice		
Level 1	Remember	200/	200/	150/	150/	150/	150/	150/	150/				
	Understand	20%	20%	15%	15%	10%	10%	15%	15%	-	-		
Level 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	-	-		
	Analyze												
Level 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	-	-		
	Create												
	Total	100 %		100 %		100 %		100 %			-		

Course Designers											
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts									
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2. Mr. Durga Prasad Bokka, TCS, durgaprasad@tcs.com	2. Ms. Subashree, VIT, Chennai, subashree@vit.ac.in	3. Dr. M. M.Umamaheswari, SRMIST	4. Dr. Suk	kanya Saha, SRMIST	5. Ms .S. Ramya, SRMIST						

### SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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