

(An Autonomous Institute Affiliated to RGPV Bhopal)

## Department of Electronics Engineering Syllabus applicable to July 2022 admitted and later batches

Iname 0	f the co	ourse:				B. Tech in Electronics & Instrumentation Engineering								ering						
Semeste	er and	Year	of study	/		B. Tech 2 <sup>nd</sup> Year 3 <sup>rd</sup> Semester									-					
Subject	Catego	ory				Depa	artme	ental C	ourse (	DC)										
Subject(	Code:E	I-301				Subje	ect N	lame: I	Fundan	nentals c	of Ins	trur	ment	atio	n					
			Ma	aximun	n Marks	Allotte	ed					Со	ntac	t						
		The	eory				Pra	actical	1	Total		Н	ours		Total					
End Sem	Mi Se	d-   m   '	Assign	ment	Quiz	Enc Sen	d   I n   N	Lab- Nork	Quiz	Marks	5   L		Т	Ρ	Credits					
60	20	)	10	)	10	30		10	10	150	3		0	2	4					
Prerequis	sites:	tes:																		
Basic Ele	Electrical Concepts, Mathematics (Matrices, Laplace Transform, Differential Eq													and	Complex					
Variables	Variables).																			
Course C	Course Objective:																			
The cour	se aims	s at pro	oviding	the fun	damenta	al conce	epts o	f the In	strumer	ntation ar	nd Me	ası	ureme	ent,	static and					
dynamic	charac	teristic	s of in	strume	nts and	their e	error a	analysi	s, provi	ides an	overv	iew	of	the l	laboratory					
Instrume	truments such as CRO, function generators, multimeters etc. It also includes the measurement of passive																			
Course C	al elements like R, L,C.																			
Upon cor	npletior	n of the	e course	e. stude	nt will be	e able to														
				,			-													
• (	CO1: Id	entifv.	concer	otualize	. demor	strate a	and a	tt vlage	ne fund	amentals	of m	ieas	surer	nent	science.					
r	neasuri	ng inst	trument	s and th	neir char	acteristi	ics.								,					
• (	CO2: In	vestia	ate and	analyz	e the wo	rking of	f elect	trical m	easurin	g instrum	ents.									
• (	CO3: Ar	alvze	the wor	king of	Cathode	RayO	scillos	scone (	(CRO) a	nd other	lahor	ator		uinm	onto					
• (	CO4· A						CO3: Analyze the working of Cathode Ray Oscilloscope (CRO) and other laboratory equipments.													
	<ul> <li>CO4: Analyze DC bridges used for measurement of Resistance.</li> </ul>												уеч	upn	ients.					
• (	<ul> <li>CO5: Analyze AC bridges used for measurement of Capacitance and Inductance.</li> </ul>													uipn	ienis.					
• (	CO5: A	nalyze nalyze	DC brid AC brid	dges us dges us	ed for m ed for m	easurei easurei	ment ment	of Resi of Cap	istance. acitance	e and Indi	uctan	ce.	y eq	upm	ients.					
• ( <u>CO-PO</u>	CO5: A	nalyze nalyze <b>g</b>	DC brid AC brid	dges us dges us	ed for m ed for m	easurei easurei	ment ment	of Resi of Cap	istance. acitance	and Indi	uctan	ce.	y eqi		lents.					
• ( CO- PO	Mappin	nalyze nalyze <u>g</u> PO2	DC brid AC brid	dges us dges us PO4	ed for m ed for m	easurei easurei PO6	ment ment	of Resi of Cap	istance. acitance	and Ind	uctan	ce.	PO1:	2	lents.					
• ( CO- PO POs	Mappin PO1	nalyze nalyze <u>g</u> PO2	AC brid	dges us dges us	ed for m ed for m	easurei easurei PO6	ment ment	of Resi of Cap	erice) a istance. acitance	e and Ind	uctan	ce.	<b>PO1</b> :	2	ienis.					
CO- PO POs COs	Mappin PO1	nalyze nalyze <u>9</u> PO2	AC brid	dges us dges us PO4	ed for m ed for m	easurei easurei PO6	ment ment	of Residence (	PO9	PO10	PO1 <sup>2</sup>		<b>PO1</b> :	2	ienis.					
CO- PO POs COs CO1	Mappin PO1	nalyze nalyze <b>g</b> PO2	PO3	dges us dges us PO4	ed for m ed for m PO5	PO6	ment ment	of Residence (	PO9	PO10	PO1 <sup>2</sup>		<b>PO1</b> 2	2 	ienis.					
CO- PO POs COs CO1 CO2	CO5: A Mappin PO1	nalyze nalyze <b>9</b> <b>PO2</b> 2 3	PO3 PO3 2 2	PO4	ed for m ed for m	PO6	ment ment	of Resion of Capa	PO9	PO10	PO1 <sup>2</sup>		PO1:	2 	lenis.					
CO- PO POs COs CO1 CO2 CO3	CO5: A Mappin PO1 3 3 3	nalyze nalyze PO2 2 3 3	PO3 PO3 2 2 2 2 2	PO4	ed for m PO5	PO6	ment ment	PO8	PO9	PO10	PO1 <sup>2</sup>		PO12	<b>2</b>	ienis.					
• CO- PO POs COs CO1 CO2 CO3 CO4	Mappin PO1 3 3 3 3 3	nalyze nalyze PO2 2 3 3 3	DC brid           AC brid           PO3           2           2           2           2           2           2           2           2           2           2           2	PO4	ed for m PO5	PO6	ment ment	PO8	PO9	PO10	PO1 <sup>2</sup>		PO1:	2 	ienis.					
• ( CO- PO POs COs CO1 CO2 CO3 CO4 CO5	Mappin PO1 3 3 3 3 3 3 3	nalyze nalyze PO2 2 3 3 3 3 3	PO3 PO3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	PO4       1       2       2       2       2       2	PO5	PO6	PO7	PO8	PO9	PO10	PO1 <sup>2</sup>		PO1:	2						
CO- PO POs COs CO1 CO2 CO3 CO4 CO5 UNITS	Mappin PO1 3 3 3 3 3 3	nalyze nalyze PO2 2 3 3 3 3	PO3 PO3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	PO4       1       2       2       2       2       2	ed for m PO5 De	PO6	PO7	PO8	PO9	PO10	PO1 <sup>2</sup>		PO1:	2    3.	CO's					
CO- PO POs COs CO1 CO2 CO3 CO4 CO5 UNITs	Mappin PO1 3 3 3 3 3 3 3 3 3 3 8 asic	nalyze nalyze PO2 2 3 3 3 3 3 5 Conc	PO3 PO3 2 2 2 2 2 ept of	PO4          PO4         1         2         2         2         1         1         2         1         1         1         1         2         2         1         1         1         1         1         1         1         1         1         2         1         1         1         1         2         1         1         1         1         2         1	PO5	PO6 escriptic	PO7 PO7	PO8	PO9	PO10	PO1 <sup>-</sup>	ce.	PO1:	<b>2</b>	CO's					
CO- PO POs COs CO1 CO2 CO3 CO4 CO5 UNITs	Mappin PO1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	nalyze nalyze <b>g</b> PO2 2 3 3 3 3 3 3 conc ication	PO3	PO4          PO4         1         2         2         2         3         1         2         2         3         1         1         2         2         2         1         1         2         2         1         1         1         2         1         1         2         1         1         1         2         1         1         1         2         2         1	PO5 PO5 Demonstrum	PO6 escriptic on: Fun ents, st	PO7 PO7 Cons Cons Cons Cons Cons Cons Cons Cons	PO8 al elen and dy	PO9	PO10 PO10 f an instruction	PO1 <sup>2</sup>	ce. 1	PO1:	<b>2</b>	CO's					
CO- PO POS COS CO1 CO2 CO3 CO4 CO5 UNITS	Mappin PO1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	nalyze nalyze 9 PO2 2 3 3 3 3 conc ication strume	PO3	PO4          PO4         1         2         2         2         3         1         2         3         1         1         2         2         2         1         2         3         1         1         2         1         1         2         2         1         1         2         2         1         1         2         1         1         2         2         3         1         1         1         1         1         2         2         3         3         3         3         3         3         3         3         3         3         3         3         3	PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5	PO6 PO6 escriptic on: Fun ents, st prations	PO7 PO7 Dons Doctionates of Ir	PO8 PO8 al elen and dy nstrume	PO9 PO9 Points of the first of	PO10 F an instruction PO10	PO1 <sup>2</sup>	tion tion tion tion	PO1:		CO's CO1					
• ( CO- PO POs COs CO1 CO2 CO3 CO4 CO5 UNITs I	Mappin PO1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	nalyze nalyze g PO2 2 3 3 3 3 3 conc ication strume uremer	PO3	PO4 PO4 1 2 2 2 Instruit andards rtainty a	PO5	PO6 escriptic on: Fun ents, st prations	PO7 PO7 Cons Cons Cons Cons Cons Cons Cons Cons	PO8 al elen and dy	PO9 nents of namic cents, Er	PO10 F an instruction f an instructori rors in	PO1 <sup>2</sup>	nt, of	PO1:	2 	CO's CO1					
CO- PO POs COS CO1 CO2 CO3 CO4 CO5 UNITS	Mappin PO1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 5 8asic classif the ins measu	nalyze nalyze g PO2 2 3 3 3 3 3 conc ication strume uremer	PO3 PO3 PO3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	PO4 PO4 1 2 2 1 suring andards rtainty a	PO5 PO5 Do PO5	PO6 escriptic on: Fun ents, st prations	PO7 PO7 Cons Cons Cons Cons Cons Cons Cons Cons	PO8	PO9 PO9 nents of namic cents, Er	PO10 F an insti- haracteri rors in	PO1 <sup>2</sup>	nt, of	PO1:	<b>2</b>	CO's CO1					
CO- PO POs COS CO1 CO2 CO3 CO4 CO5 UNITS	Mappin PO1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	nalyze nalyze g PO2 2 3 3 3 3 conc ication strume uremer g Instr	PO3 PO3 PO3 2 2 2 2 2 2 ept of n of mea ents, Sta nt, unce	PO4 PO4 1 2 2 Instrum asuring andards rtainty a s: Class	PO5 PO5 PO5 mentatic instrum s & Calit analysis.	PO6 escriptic on: Fun ents, st prations	PO7 PO7 Cons Cons Cons Cons Cons Cons Cons Cons	PO8 al elen and dy strume	PO9 PO9 nents of namic cents, Er	PO10 F an instruction F an instruction Port of the second	PO1 <sup>2</sup>	nt, of	PO1:	<b>2</b>	<u>CO's</u> CO1					
- (0 CO- PO POs COs CO1 CO2 CO3 CO4 CO5 UNITS I	Mappin PO1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	nalyze nalyze g PO2 2 3 3 3 3 conc ication strume uremer g Instr onval f	PO3 PO3 PO3 2 2 2 2 ept of n of meants, Stant, unce rument type Ga	PO4 PO4 1 2 2 Instrum asuring andards rtainty a s: Class	PO5 PO5 PO5 De mentatic instrum s & Calit analysis. sification neter, Pri	PO6 PO6 escriptic on: Fun ents, st prations	PO7 PO7 Cons Cons Cons Cons Cons Cons Cons Cons	PO8 PO8 al elen and dyn strume eration	PO9 PO9 nents of namic c ents, Er nts, and cor	PO10 F an instruction	PO1 <sup>-</sup> rumer stics	nt, of	PO1:	2 	<u>CO's</u> CO1					
CO- PO POS COS CO1 CO2 CO3 CO4 CO5 UNITS	Mappin PO1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	nalyze nalyze g PO2 2 3 3 3 3 3 conc ication strume uremer g Instr onval t s analo	PO3 PO3 PO3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	PO4 PO4 1 2 2 2 1 suring andards rtainty a s: Class alvanom ating ty	PO5 PO5 PO5 De mentatic instrum s & Calit analysis. sification peter, Pri pes of ir	PO6 PO6 escriptic on: Fun ents, st prations	PO7 PO7 PO3 PO7 PO3 PO7 PO3 PO5	PO8 PO8 al elen and dyn strume eration sources	PO9 PO9 nents of namic of ents, Er nts, and cor	PO10 PO10 f an instruction r, extensi	PO1 <sup>2</sup> PO1 <sup>2</sup> rumer stics of on	nt, of	PO1:	2 	CO's CO1 CO3					
CO- PO POS COS CO1 CO2 CO3 CO4 CO5 UNITS	Mappin PO1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	nalyze nalyze g PO2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	PO4 PO4 1 2 2 2 Instrum asuring andards rtainty a s: Class alvanom ating ty ation of	PO5 PO5 PO5 PO5 nentatic instrum s & Calit analysis. sification peter, Pri pes of ir ammete	PO6 PO6 escriptic on: Fun ents, st prations n of anal nciple on strume ers & vo	PO7 PO7 Dons Doctionates of Ir log in of opeents, soltmete	PO8 PO8 al elen and dy nstrume eration sources ers.	PO9 PO9 nents of namic c ents, Er nts, and cor	PO10 PO10 f an instruction rors in	PO1 <sup>2</sup> PO1 <sup>2</sup> rumer stics of on	nt, of	PO1:	2 	CO's CO1 CO3					
CO- PO POS COS CO1 CO2 CO3 CO4 CO5 UNITS	Mappin PO1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	nalyze nalyze g PO2 2 3 3 3 3 conc ication strume iremer g Instr onval to s analo	PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	PO4 PO4 1 2 2 2 1 nstrun asuring andards rtainty a s: Class alvanom ation of	PO5 PO5 PO5 PO5 PO5 Instrum S & Calita analysis. Sification pes of ir ammete	PO6 PO6 escriptic on: Fun ents, st prations n of anal nciple on strume ers & vo	PO7 PO7 Dons Dons Dons Dons Dons Dons Dons Dons	PO8 PO8 al elen and dy astrume eration sources ers.	PO9 PO9 nents of namic cents, Er nts, and cor	PO10 PO10 f an instruction rors in	PO1 <sup>2</sup> PO1 <sup>2</sup> rumer stics of on	nt, of	PO12	2 	CO's CO1 CO3					
• ( CO- PO POs CO3 CO1 CO2 CO3 CO4 CO5 UNITS I	Mappin PO1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	nalyze nalyze g PO2 2 3 3 3 3 3 conc ication strume iremer g Insti onval 1 s analo ges an atory	PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	PO4 PO4 1 2 2 2 1 1 2 2 1 1 1 2 2 2 1 1 1 2 2 2 1 1 1 2 2 2 1 1 2 2 1 2 1 2 2 1 2 1 3 1 2 1 2 1 2 1 3 1 1 2 1 2 1 3 1 1 1 2 1 2 1 3 1 1 1 2 1 2 1 3 1 1 1 1 1 2 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1	PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5	PO6 PO6 escriptic on: Fun ents, st prations n of anal inciple construme ers & vo	PO7 PO7 Cons Cons Cons Cons Cons Cons Cons Cons	PO8 PO8 al elen and dyn strume eration sources ers.	PO9 PO9 Ponents of namic contents, Er nts, and corro	PO10 PO10 f an instruction r, extensi	PO1 <sup>2</sup> PO1 <sup>2</sup> rumer stics of on on ar	nt, of	PO1:	2 	CO's CO1 CO3					

Lissajous patterns, Digital Storage Oscilloscope (DSO), Spectrum Analyze Harmonic Distortion Measurement, Function Generators, Digital Multimeter, Digital frequency meter.	ers,	
Measurement of Resistance: Measurement of resistance (Low, Medium and High): voltmeter-ammeter method, ohmmeter, DC Bridges: Wheatstone bridge-design, arrangement of ratio arms, bridge sensitivity, errors in bridge circuits, Sensitivity and Calibration adjustments of Wheatstone bridge, Kelvin bridge, Various application of DC bridges, milli ohmmeter, mega ohmmeter, Meggar, Wagner earthing device	08	CO4
<ul> <li>Measurement of Inductance and Capacitance (A. C. Bridges): Measurement of inductance using A. C. Bridges: Maxwell's bridge, Varia applications of Maxwell Bridges, Hay's Bridge, Anderson's Bridge, vector impedance meter, Q factor measurement. Measurement of Capacitance using A. C. Bridges: Schering bridge, Wien Bridge, storage and dissipation factors.</li> </ul>	ous 07 's	CO4
Guest Lectures (if any)	Nil	
Total Hours	45	
<ol> <li>Study of different parts of CRO. Measure the amplitude, frequency &amp; phase different parts of CRO. Measure the amplitude, frequency &amp; phase different parts of digital LCR meter and working of CRT and observe the effect of switched fa important sections.</li> <li>Study of digital LCR meter and measurement of unknown L, C, R parameters.</li> <li>Study of universal frequency counter and measurement of all parameters.</li> <li>Determination of unknown inductance using Maxwell Inductance Bridge.</li> <li>Determination of unknown inductance and Q factor using Maxwell Inductance method.</li> <li>Measurement of unknown value capacitance using Wien's Capacitance Bridge.</li> <li>Measurement of unknown value capacitance using Anderson Bridge.</li> <li>Measurement of unknown value of Inductance using Hay's Bridge.</li> <li>Measurement of unknown Frequency using Wien's Bridge.</li> <li>Cooper W.D., Helfrick A.D. "Modern Electronic Instrumentation Measurement", 2. Sawhney A.K. "Electrical and Electronics Measurements &amp; Instrumentation", D sons.</li> <li>Doeblin E.D., Measurement system, Tata McGraw Hill., 4th ed.</li> <li>Kalsi, Electronic Instrumentation, Tata McGraw Hill</li> </ol>	erence. Stud ults on the e Capacitar , Prentice Ha hanpatRai&	ly of CRO working of
Reference Books         1. Terman& Petit, Electronic Measurement.         2. Carr, Instrumentation, Pearson Education         List and Links of e-learning resources: MCET – http://sgsmcet.co.in/eie .         Modes of Evaluation and Rubric         The evaluation modes consist of performance in Two mid-semester Tests, Quiz/ As	signments, t	erm work,
Recommendation by Board of studies on		
Approval by Academic council on		



(An Autonomous Institute Affiliated to RGPV Bhopal)

Department of Electronics Engineering

Syllabus applicable to July 2022 admitted and later batches

	ame of the course:         B. Tech in Electronics & Instrumentation Engineering												neering	
Semest	mester and Year of study B. Tech 2 <sup>nd</sup> Year 3 <sup>rd</sup> Semester													
Subject	Categ	ory				Dep	artmei	ntal C	Course	(DC)				
Subject	Code:	EI-302	2			Sub	ject Na	ame:	Electr	onic Dev	ices a	ind C	ircuits	3
			Max	ximum	Marks	Allotte	əd							
		The	ory				Prac	tical		Total		ontact	Hours	Total
End Ser	n N S	lid- em	Assign	ment	Quiz	En Sei	d L m V	₋ab- Vork	Quiz	Marks	L	Т	Р	Credits
60		20	10	)	10	30	)	10	10	150	3	0	2	4
_														
Prerequ	lisites:	<u> </u>		<u> </u>				<u> </u>						
Basic kn	sic knowledge of electrical and electronic components and laws such as KCL, KVL, etc.													
Course	Course Objective:													
1.	The cou	urse in	tends to	provid	de an ov	verview	v of the	e prino	ciples,	operation	and a	pplica	ation c	of the, JFET
	and MC	SFET	s for per	rtormin	g variou	is funct	tions.	aualita	otivo	nalvaia	and n	alkaa		of cimple
2.	models	and e	austion	to illu	strate th	be con	icanu i	qualita	alive a	analysis	anu n	lakes	use	or simple
3.	To prov	ide an	overvie	w of M	OS amo	lifiers.	icept3		cu.					
4. 3	Sufficie	nt knov	wledge i	is provi	ded so	that stu	udents	will be	e able t	to use this	s cours	se as t	the ba	sis for other
	advance	ed cou	rses like	e Ánalo	og Circu	its, Pov	ver Ele	ectroni	ics.					
Course	Outco	mes:												
After	comple	tion of	this co	urse st	udents v	will be a	able to							
CO1:	Acquir	e knov	vledge c	of JFET	s and M	IOSFE	Ts.				_			
CO2:	: Analyz	e vario	IFF פוור	Tanad										
000	· ·			is and		Eisba	sed ele	ectron	ic circu	uit configu	rations	5.		
CO3	CO3: Analyze the circuit characteristics and compute its parameters.													
CO3: CO4:	Analyz Desigr	the on vario	circuit cl us elect	haracte	eristics a ircuits.	EIS DA and cor	sed ele npute i	ectron ts par	ic circu amete	uit configu rs.	rations	5.		
CO3: CO4: <b>CO-PO I</b>	: Analyz : Desigr <b>Vappin</b>	the on vario	circuit cl us elect	haracte	eristics a ircuits.	E IS ba and cor	sed ele npute i	ectron ts par	ic circu amete	uit configu rs.	rations	5.		
CO3: CO4: CO-PO I	Analyz Desigr Mappin PO1	e the on vario	circuit cl us elect	haracte ronic c	ircuits.	PO6	sed ele npute i PO7	ectron ts par	amete	uit configu rs. 9 PO10	rations	5. 1 P	012	
CO3: CO4: CO-PO I POs COs	Analyz Desigr Mappin PO1	e the on vario	PO3	ronic c	PO5	PO6	sed elennpute i PO7	ectron ts par	amete 8 PO	uit configu rs. 9 PO10	PO1	s. 1 P	012	
CO3: CO4: CO-PO I POs COs CO1	Analyz Desigr Mappin PO1 3	e the on vario	PO3	PO4	PO5	PO6	sed elennpute i PO7	ectron ts par	samete 8 PO	uit configu rs. 9 PO10	PO1	5. 1 Pe	012	
CO3: CO4: CO-PO I POs COs CO1 CO2	Analyz Desigr Mappin PO1 3 2	g PO2 2 3	PO3 PO3 1 3	PO4	PO5	PO6	sed ele npute i PO7	PO8	8 PO	9 PO10	PO1	s. 1 P 2	012	
CO3: CO4: CO-PO I POs COs CO1 CO2 CO3	Analyz Desigr Mappin PO1 3 2 2	g PO2 2 3 3	PO3 PO3 1 3 3	PO4 1 2 2	PO5	PO6	sed elennpute i PO7	PO8	8 PO	9 PO10	PO1	s. 1 P 2	012	
CO3: CO4: POs COs CO1 CO2 CO3 CO4	Analyz Desigr Mappin PO1 3 2 2 2 2	g PO2 2 3 3 3	PO3 PO3 1 3 3 3	PO4 1 2 3	PO5	PO6	sed ele npute i PO7	PO8	8 PO	9 PO10	PO1	1 P 2	012	
CO3: CO4: CO-PO I POs CO3 CO1 CO2 CO3 CO4 UNITS	Analyz Desigr Vappin PO1 3 2 2 2 2	<b>g</b> PO2 2 3 3 3	PO3 PO3 1 3 3	PO4 1 2 3	PO5 2 2 2 Des	PO6	PO7	PO8	8 PO	9 PO10	PO1	1 P 2	012	CO's
CO3: CO4: POs COs CO1 CO2 CO3 CO4 UNITS	Analyz Desigr Mappin PO1 3 2 2 2 2 5	g PO2 2 3 3 5 Effect	PO3 PO3 1 3 3 ct Trai	PO4 1 2 3 nsistors	PO5 PO5 2 2 2 2 Des s (FE	PO6	PO7	PO	8 PO	9 PO10	PO1	1 P 2 1 H	012  rs.	CO's
CO3: CO4: POs COs CO1 CO2 CO3 CO4 UNITS	Analyz Desigr Mappin PO1 3 2 2 2 2 5 Field Disado	g PO2 2 3 3 5 Effectivantag	PO3 PO3 1 3 3 ct Trai es of	PO4 1 2 3 nsistors	PO5 PO5 2 2 2 2 Basic	PO6 scriptic Ts): Cons	PO7 PO5	POS	8 PO	9 PO10 9 rs. 9 rotages 9 vantages	PO1 2 and urves;	1 P 2 1	012  rs.	CO's
CO3: CO4: POs COs CO1 CO2 CO3 CO4 UNITS	Analyz Desigr Mappin PO1 3 2 2 2 2 5 Field Disady Princip	g PO2 2 3 3 3 Effect vantag	PO3 PO3 1 3 3 ct Trates of operation	PO4 1 2 3 FET, ons of	PO5 PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 5 5 5 5	PO6 PO6 Scriptic Ts): Cons T, Effe	PO7 PO7 Introdu	POS POS Inction, n; C	8 PO	9 PO10 9 PO10 vantages eristic cu el conduc	PO1 2 and urves; ctivity,	1 P 2 H	012  rs.	CO's
CO3: CO4: POs CO3 CO1 CO2 CO3 CO4 UNITS	Analyz Desigr Vappin PO1 3 2 2 2 5 Field Disado Princip Chanr	g PO2 2 3 3 3 Effect vario	PO3 PO3 1 3 3 ct Trai es of operation mic Reg	PO4 1 2 3 FET, ons of gion ar	PO5 PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 5 5 5 5 7 5 8 8 5 7 5 8 8 5 7 7 8 8 7 7 8 7 7 8 7 8	PO6 PO6 scriptic Ts): Cons T, Effe n-Off R	PO7	POS Inction, n; C Char	8 PO	9 PO10 9 PO10 vantages eristic cu tic Paran	PO1 PO1 2 and urves; ctivity, neters	1 P 2 1 H	012 rs.	CO's
CO3: CO4: POs CO3 CO1 CO2 CO3 CO4 UNITS	Analyz Desigr Mappin PO1 3 2 2 2 2 2 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1	g PO2 2 3 3 3 Effect vantag bles of hel Oh	PO3 PO3 1 3 3 ct Trates of operation inc Reg	PO4 1 2 3 FET, ons of gion ar rature c	PO5 PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 5 8 5 7 8 8 8 5 7 8 8 8 5 7 8 8 8 9 7 8 9 7 8 9 7 8 9 7 9 7 9 7 9	PO6 PO6 Scriptic Ts): Cons T, Effe o-Off R parame	PO7 PO7 PO7 PO5 PO7 PO5	POS POS Inction, n; C Ds on Char ET Bi	8 PO	9 PO10 9 PO10 vantages eristic cu el conduc tic Paran	PO1 PO1 2 and urves; ctivity, neters	1 P 2 1 H	012 rs.	CO's CO1,CO2, CO3, CO4
CO3: CO4: POs CO3 CO3 CO1 CO2 CO3 CO4 UNITS	Analyz Desigr Mappin PO1 3 2 2 2 2 2 5 Field Disado Princip Chanr and Ef	g PO2 2 3 3 3 Effect vantag bles of hel Oh ifect of ET: Ir	PO3 PO3 1 3 3 3 ct Trates of operation mic Reg temper	PO4 PO4 1 2 3 FET, ons of gion ar ature c ion, St	PO5 PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	PO6 PO6 Scriptic Ts): Cons T, Effe oarame and P	PO7 PO7 PO7 PO7 PO7 PO7 PO7 PO7 PO5	POS Inction, n; C Dos on Char ET Bi I Ope	8 PO	9 PO10 9 PO10 vantages eristic cu el conduc stic Paran of the n	PO1 PO1 and urves; ctivity, heters MOS,	1 P 2 H	012  rs. 0	CO's CO1,CO2, CO3, CO4
CO3: CO4: POs COs CO1 CO2 CO3 CO4 UNITS	Analyz Desigr Mappin PO1 3 2 2 2 2 2 5 Field Disady Princip Chanr and Ef MOSF pMOS	g PO2 2 3 3 3 5 Effect vantag bles of hel Oh ffect of ET: Ir , Enha	PO3 PO3 1 3 3 ct Trai es of operation mic Reg temper ntroduction	PO4 PO4 1 2 3 FET, ons of gion ar rature c ion, St nt –Typ	PO5 PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	PO6 PO6 Scriptic Ts): Cons T, Effe o-Off R oarame and P SFET, (	PO7 PO7 Introdu truction truct	POS POS Inction, n; C Dos on Char ET Bi I Ope t-Volta	8 PO	PO10 PO10 PO10 PO10 PO10 PO10 PO10 PO10	PO1 PO1 and urves; ctivity, heters MOS, ics of	1 P 2 1 H	012  rs. 0	CO's CO1,CO2, CO3, CO4
CO3: CO4: POs CO3 CO3 CO1 CO2 CO3 CO4 UNITS	Analyz Desigr Mappin PO1 3 2 2 2 2 2 2 2 5 1 1 1 1 1 1 1 1 1 1 1 1	g PO2 2 3 3 3 5 Effect vantag bles of hel Oh ffect of ET: Ir , Enhance nhance be	PO3 PO3 1 3 3 ct Trates of operation mic Reg temper htroduction ancement ement	PO4 PO4 1 2 2 3 nsistors FET, ons of gion ar ature c ion, St nt –Type JEFT s	PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 Basic the JFE basic the JFE d Pinch on FET p ructure be MOS MOSF	PO6 PO6 scriptic Ts): Cons T, Effe o-Off R oarame and P SFET, ( SET, T SET, T	PO7	POS POS Inction, n; C Char ET Bi I Ope t-Volta epletic	Adv Adv haracteris iasing. eration age Ch	PO10 PO10 PO10 PO10 PO10 PO10 PO10 PO10	PO1 PO1 and urves; ctivity, heters MOS, ics of SFET,	1 P 2 1 H	012 rs.	CO's CO1,CO2, CO3, CO4
CO3: CO4: POs CO3 CO3 CO1 CO2 CO3 CO4 UNITS	Analyz Desigr <b>Vappin</b> <b>PO1</b> 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	e the on vario g PO2 2 3 3 Effect vantag bles of hel Oh ffect of ET: Ir hance block nhance block on Score	PO3 PO3 1 3 3 3 ct Trates of operation mic Reg temper htroduction ancement etween ource Au	PO4 PO4 1 2 2 3 FET, ons of gion ar rature c ion, St nt –Typ JFETs C Amo	PO5 PO5 PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	PO6 PO6 Scriptic Ts): Cons T, Effe and P SFET, ( SFET, T SFET, T SFET, T	PO7 PO7 PO7 PO7 PO7 PO5	POS POS Inction, n; C Ds on Char ET Bi I Ope t-Volta epletic	8 PO 8 PO Adv haracterisiasing. age Chon –T f Bias.	9 PO10 9 PO10 9 PO10 9 vantages eristic cu el conduc tic Paran of the n paracterist ype MOS The Cor	PO1 PO1 2 and urves; ctivity, neters MOS, ics of SFET, mmon	1 P 2 1 H	012 rs.	<u>CO's</u> C01,C02, C03, CO4
CO3: CO4: POs CO5 CO1 CO2 CO3 CO4 UNITS	Analyz Desigr PO1 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	g PO2 2 3 3 3 5 Effect vantag bles of hel Oh ffect of ET: Ir , Enha nhanc ence be on Sco or Soo	PO3 PO3 1 3 3 3 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7	PO4 PO4 1 2 3 nsistors FET, ons of gion ar ature c ion, St nt –Type JFETs C Amp Ilower.	PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5	PO6 PO6 Scriptic Ts): Cons T, Effe and P SFET, ( SFET, ( SFET, ( SFET, 1 DSFETs ixed Bi ommor	PO7 PO7 PO7 Introdu struction ect of V Region, eters, F Physica Current The Do s. ias with Gate	POS POS Inction, n; C ips on Char ET Bi I Ope t-Volta epletic	8 PO 8 PO Adv haracteris iasing. eration age Ch on -T f Bias, Amplit	9 PO10 9	PO1 PO1 and urves; ctivity, heters MOS, ics of SFET, nmon uency	1 P 2 H 1	012 rs.	CO's CO1,CO2, CO3, CO4
CO3: CO4: POs CO5 CO1 CO2 CO3 CO4 UNITS	Analyz Desigr PO1 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	g PO2 2 3 3 3 3 Effect vantag bles of hel Oh ffect of ET: Ir , Enha nhanc ence be non Sc or Solonse of	PO3 PO3 PO3 1 1 3 3 ct Trates of operation mic Reg temper troduction ancement etween to ource Action of the FE	PO4 PO4 1 2 2 3 nsistors FET, ons of gion ar rature c ion, St nt –Type JFETs C Amp Ilower, T Amp	PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5	PO6 PO6 Scriptic Ts): Cons T, Effe and P SFET, ( SFET, T DSFET ixed B ommor Other A	PO7 PO7 PO7 Introdu struction struct	POS POS Inction, n; C Dos on Char ET Bi I Ope t-Volta epletic h Self FET r Con	Representation of the second s	PO10 PO10 PO10 PO10 PO10 PO10 PO10 PO10	PO1 PO1 and urves; ctivity, heters MOS, ics of SFET, mmon uency SFET	1 P 2 H H	012 rs. 0	CO's CO1,CO2, CO3, CO4
CO3: CO4: POs CO3 CO3 CO1 CO2 CO3 CO4 UNITS	Analyz Desigr Vappin PO1 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	g PO2 2 3 3 3 5 Effect vantag bles of hel Oh ffect of ET: Ir , Enha nhanc ence be on Sc or So onse of Amplif	PO3 PO3 1 3 3 3 3 ct Trates of operation mic Reg temper ntroduction ancement etween ource Ad urce Foo f the FE ier, Bias	PO4 PO4 1 2 2 3 nsistors FET, ons of gion ar ature c ion, St nt –Type JFETs C Amp Ilower, T Amp sing in	PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5	PO6 PO6 Scriptic Ts): Cons T, Effe and P SFET, ( SFET, ( SFET, ( SFET, ( SFET, 0) SFET, ( SFET, 0) SFET, ( SFET, 0) SFET, ( SFET, 0) SFET,	PO7 PO7 PO7 Introduction Provident of V Region, Provident of V Regio	POS POS Inction, n; C Char ET Bi I Ope t-Volta epletic h Self FET r Con its, Ba	Representation and the second	PO10 PO10 PO10 PO10 PO10 PO10 PO10 PO10	PO1 PO1 and urves; ctivity, heters MOS, ics of SFET, mmon uency SFET ons of	1 P 2 1 H	012 rs. 0	CO's CO1,CO2, CO3, CO4

111	FET Small Signal Analysis: FET Small Signal Model, Voltage Gain, S Follower Circuit, Common Gate Circuit, Design of FET Amplifier Ci Low frequency analysis, High Frequency Analysis of FET.	Source ircuits,	10	CO1,CO2, CO3, CO4
IV	IC Technology: Overview of IC fabrication process: crystal growth, preparation, oxidation, epitaxial layer growth, lithography, diffusion implantation, metallization, fabrication process of BJT and Transistors	wafer on, ion CMOS	9	CO1,CO2, CO3, CO4
V	The complementary MOS (CMOS) inverter-DC characteristics, Static MOS inverters, Pseudo NMOS Transistors, Tristate inverter, Static C gate circuits (NAND, NOR, XOR, XNOR etc.) Static and Dynamic Me Cell.	: load MOS emory	8	CO1,CO2, CO3, CO4
Guest L	_ectures (if any)		May be arranged as required	
Total H	lours		45	
Sugges	stive list of experiments:			
1.	To plot transfer and output characteristics of an n-channel Junction Fie	eld Effect	t Transisto	r (JFET).
2.	To plot transfer and output characteristics of a p-channel Junction Field	d Effect	Transistor	(JFET).
3.	To plot transfer and output characteristics of an n-channel Metal Oxid	de Semi	iconductor	Field Effect
	Transistor (MOSFET) in Common-source configuration.			
4.	To plot transfer and output characteristics of a p-channel Metal Oxid	de Semi	conductor	Field Effect
	Transistor (MOSFET) in Common-source configuration.			
5.	To design a common source JFET amplifier and plot its frequency resp	onse.		
6.	To design a common source MOSFET amplifier and plot its frequency	respons	e.	
7.	Study and investigate various fabrication techniques of BJT and MOS	ICs.		
Text Bo	ook-			
1.	Integrated Electronics. – MillmanHalkias			
2.	Electronic Devices & Circuits – Boyelstad&Nashelsky – PHI			
3. ⊿	Electronic Devices & Circuits – David A. Bell – PHI Principles of Electronic Devices – Malvino			
5.	Digital Integrated Circuits - D. A. Hodges, H. G. Jackson, R. A. Saleh,	McGrav	v Hill	
Referer	nce Books-			
1.	Microelectronic Circuits- Sedra, Smith.			
2.	Electronics Circuits And Systems- Owen Bishop			
3. 4.	Starting Electronics (Fourth Edition)-Keith Brindley			
List and	d Links of e-learning resources:			
	1. https://nptel.ac.in/courses/117103063/			
Modes	2. https://www.electronics-tutorials.ws/			
The ev	aluation modes consist of performance in Two mid-semester Tests (	Duiz/ As	sianments	term work
end-ser	mester examinations, and end-semester practical examinations.		giioi.io,	tonn nonn,
Desert	mendation by Decad of studies on			
Approv	mendation by Board of Studies on			
Compile	ed and designed by			



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## Department of Electronics Engineering Syllabus applicable to July 2022 admitted and later batches

Name of	the cou	rco.		B. Tech in Electronics & Instrumentation								
Name of		130.		Engin	Engineering							
Semester	r and Ye	ear of study		B. Tech 2 <sup>nd</sup> Year 3 <sup>rd</sup> Semester								
Subject C	Category	/		Depar	tmental	Course	e (DC)					
SubjectC	ode:El-	303		Subje	ct Name	: Netwo	ork Analys	sis				
-		Maximum	n Marks	Allotte	d			-				
	т	heory			Practica	al	Total	Co H	ntac	t.	l otal Credits	
	•	neery		•	140100	••	Marks		ouro	·	oround	
End	Mid-	Acciercont	<u></u>	End	Lab-				т	Р		
Sem	Sem	Assignment	Quiz	Sem	Work	Quiz		L	I	Р		
60	20	10	10	30	10	10	150	3	0	2	4	
	•		•	•	•		•			•		

#### Prerequisites:

- Mathematics I & II
- Fundamentals of Electrical Engineering

#### Course Objective:

To make the students capable of analyzing any given electrical network.

To make the students learn how to synthesize an electrical network.

#### Course Outcomes:

CO1.Acquire and demonstrate the knowledge of circuit elements, different laws and theorems.-(BL1, BL2)

CO2. Analyze and solve different Electrical networks in time and frequency domain by utilizing fundamental concepts and mathematics.-(BL3, BL4)

CO3. Design/synthesize the electrical networks in time and frequency domain.(BL3, BL6)

CO4. Evaluate / Estimate the performance of a particular network.(BL3, BL5)

#### **CO-PO Mapping**

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO	11 P	012	
CO1	3	2												
CO2	3	3		2	2									
CO3	3	2	3	2	2									
CO4	3	2		2	2									
UNITs					De	scriptio	ns					Hrs.		CO's
Ι	DC c practi Ohm's analys transf Steac vector RLC r	ircuits cal volt s Law, sis, So ormatic ly state r, Impe- network	Curre age & Kirchho ource on. <b>e AC c</b> dance a s with s	nt, volt current off's lav transfo <b>ircuits</b> & admit sinusoid	age, p t sourc v, Volta rmation - RMS tance, dal and	ower, e es, dep age and n, Sup & Aver Node a	energy, benden d curren bermes rage va and Mes driving s	circuit t & ind nt divis h⊇ lue, Co sh anal sources	eleme lepende ion, No ernode, oncept ysis of s.	nts, ide ent sour odal & m Star-E of phase RL, RC	al & ces, nesh Delta or & and	12	1	, 2, 3, 4
Ξ	Netwo Norto and sourc	<b>ork Th</b> n's, Re Substitu es.	eorem eciproci ution t	s for A ty, Max neorem	. <b>C &amp; D</b> kimum I, Prob	C circ power plems	<b>uits-</b> S transfe with de	uperpo er, Mill epende	sition, man's, nt &	Theveni Tellege ndepen	n's& en's, dent	8	1	, 2, 3, 4

	<b>Transient analysis-</b> Transients in RL conditions and time constants, Network d & their solutions.	., RC & RLC Circuits, initial riven by constant driving sources	7	1, 2, 3, 4
IV	Frequency domain analysis – Revier properties, Initial and final value the transform: circuit element models, circuit Resonance- Series & parallel resonance Analysis of magnetically coupled inductance, Energy in coupled circuit, Do	w of Laplace transform and its eorem, Application of Laplace analysis. , Quality factor. <b>circuits-</b> Mutual and self t convention.	10	1, 2, 3, 4
V	<b>Two port networks-</b> Impedance part hybrid and inverse hybrid parameter, transmission line parameter, reciproci network, relationship between parameter networks.	ameter, admittance parameter, transmission line and inverse ty and symmetry in two port ers, Interconnection of two ports	8	1, 2, 3, 4
Guest Le	ctures (if any)		Nil	
Total Ho	urs		45	
Suggest	ve list of experiments:			
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. <b>Text Bo</b> • •	To observe and plot the V-I characteristic of To observe and plot the V-I characteristic of To verify Superposition Theorem for a given To verify Thevenin's Theorem for a given ele To verify Norton's Theorem for a given ele To verify Maximum Power Transfer Theore To verify Millman's Theorem for a given ele To observe the Response of RC Integration the Time Constant of the circuit. CO2 To observe the Response of RC Differen measure the Time Constant of the circuit. To determine the Open Circuit and Short C To determine the h- parameters of a Two I To determine the Inverse ABCD Circuit parameters To determine the Inverse ABCD Circuit parameters ok- Hayt, Kemmerley and Durbin, "Engineering M.E. Van Valkenburg, "Network analysis", F Charles K. Alexander and Matthew N. O. S edition, McGraw Hill.	of Constant Current Source. CO1 of Constant Voltage Source.CO1 en electrical circuit. CO2 electrical circuit. CO2 em for a given electrical circuit. CO ectrical circuit. CO2 ang Circuit using various input signatic tiating Circuit using various input signatic CO2 Circuit parameters of a Two Port Net Port Network. CO4 s of a Two Port Network. CO4 rameters of a Two Port Network. CO4 Circuit Analysis", TMH. PHI. adiku "Fundamentals of Electric Ci	2 als anc signals etwork. :O4	l measure s and CO4 4 <sup>th</sup>
Referen	ce Books-			
• / • / •	Artice M Davis "Linear Circuit Analysis", PV /an Valkenberg M.E., B.K. Kinarawala "Lin David K. Cheng "Analysis of Linear System Bruce Carlson, "Circuits", Thomson Learnir	VS Pub. Co. ear circuits", PHI. s", Narosa Publishing House. ıg.		
List and	_inks of e-learning resources:			
Modes o	f Evaluation and Rubric			
The eval work, en	uation modes consist of performance in T d-semester examinations, and end-semest	wo mid-semester Tests, Quiz/ As er practical examinations.	signme	ents, term
Recomm	endation by Board of studies on			
Approva	by Academic council on			
Compile	d and designed by	Dr.AnkitaShrivastava		



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#### **Department of Electronics Engineering**

### Svllabus applicable to July 2022 admitted and later batches

		,	abuo	appno		obaly						•		
Name of	e of the course: B. Tech in Electronics and Instrumentation												ineering	
Semeste	er and	Year c												
Subject	Catego	ory				Depa	rtment	al Cou	ırse (D	)C)				
Subject	Code:	EI-304	1			Subje	ct Nar	ne:Sigi	nals &	System	IS			
			Ma	ximum	n Mark	s Allott	ed			-	Car	ta at I la um		
		Theo	ry				Pract	ical		Total	- Con	tact Hours	5 I otal	
End Sen	n Mic	d-Sem	Assig	nment	Quiz	End S	Sem	Lab-W	/ork	Marks	L	TF	Credits	
60		20	1	0	10	-		-		100	3	1 (	) 4	
Prerequ	isites:													
Basic al	gebra,	Differ	ential	equat	tions, <sup>-</sup>	Trigono	metry	, Comp	olex Ar	ithmetic	;			
Course	burse Objective:													
When a	Vhen a student completes this course, s/he should be able to:													
• (	<ul> <li>When a student completes this course, s/he should be able to:</li> <li>Understand the fundamentals of the Signals and Systems.</li> </ul>													
• (	<b>Jnders</b>	tand L	TI syst	ems ai	nd able	e to obt	ain ma	themat	tical eq	uation e	of the s	ystem.		
• 4	Apply t	he con	cepts (	of freq	uency	domair	n repre	sentati	ons to	analyze	contin	uous an	d	
C	discrete	e time s	signals	s and s	system	s.	-			-				
• 7	To get i	unders	tandin	g of sa	mpling	g and it	s role i	in disci	rete-tin	ne signa	als and	system.		
• 1	o exan	nine the	e discre	te time	signal	s and s	stem i	n the Fo	ourier a	nd Z tra	nsform	domain.		
• 7	o corre	elate the	e signa	ls and s	system	s in rea	l time a	pplicati	ons.					
Course C	Outcom	es:												
Upon cor	npletio	n of this	s cours	e, the s	student	will be a	able to:							
CO1	: Discrii	minate	the nat	ure of t	the give	en signa	als and	system	s.					
CO2	: Analyz	zeLinea	ar Time	Invaria	ant Syst	tems ar	nd its re	presen	tation.					
CO3	: Analyz	ze the c	discrete	and co	ontinuo	us time	signals	s in frec	quency	domain.				
CO4	: Under	stand t	he proc	cess of	sampli	ng and	the effe	ects of u	under s	ampling				
CO5	: Comp	ute the	output	of an L	_II syst	em in ti	ne time	and fre	equency	y domair	IS.			
CO-1	PO Mar	nina												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
COs	101	102	105	104	105	100	107	100	107	1010	1011	1012		
C01	3	1		2		1			1			1		
CO2	3	2	2		1									
CO3	3	3	2	3	1									
CO4	3	2	2	3										
CO5	3	2	1	3	1	1			1			1		
UNITs	-				_							Hrs.	CO's	
	Siana		ovote:	ma in	01/0 ~ /-	lov life	Dafin	ition of	f olana	ا ممط م	votom			
	Signa	is and	syster	ns in Dianolo	everyo	iay ille,	Denn	ition oi	l signa	and s	system,			
	Elomo	ntanu	rignalo	signais	. Con	ctop	mouler				signal,			
1	triona	ular o	signals	b. The		siep, i	nipuise	, rann molitud	p expo	Jineriliai,	Sille,	8	1	
•	multin	ulai e	timo	scalin	n timo	shiftin	ais. A a time	foldin	a diffe	uny, a	n and	0	1	
	integr	ation (	l, unie Nassifi	Scaling	y, une of evete	Sillini Sillini	y, une stom r		y, une station	and pro	n, anu			
	of svs	tems	1033110		Ji Syste	, Julia,	Stem I	chiesei	nation		periles			
		r Time-	Invaria	nt Svet	ems. I	ntroduc	tion C	nvoluti	on im		snonse			
	renreg	sentatio	n for		system	s nror	berties	of th	e imn	ulse re	sponse			
	repres	sentatio	n for I	TI svs	stems	differen	tial and	d differe	ence e	guation	for I TI	8	2	
	Syste	ms. blo	ock dia	aram	represe	entation	s (dire	ct form	I. dire	ect form	-II.	Ŭ	_	
	casca	de and	paralle	el).					,		,			
	Fourie	er serie	s and	their i	propert	ies: Ap	plicatio	n of F	ourier	series 1	to LTI	10	3,4	

	ansform & its properties; ems; Magnitude and phase n; Reconstruction of a signal ency domain, Basic concept							
IV	Introduction of Laplace transform; Region-of- Laplace transform; Inverse Laplace Transforr Transform in analysis of LTI systems, Unilate applications to solve differential equations.	convergence; Properties of m, Applications of Laplace ral Laplace transform & its	6	3,5				
V	V       Iransform in analysis of LTI systems, Unilateral Laplace transform & its applications to solve differential equations.         Z-transform: Basic principle of z-transform, definition, region of convergence, transfer functions, poles and zeros of systems and sequences, properties of z-transform, Inverse z-transform relationship between z-transform and Fourier transform, Unilateral z-transform & its applications to solve difference equations.         Quant L patterne (if appl)							
Guest L	ectures (if any)		Nil					
Total H	ours		40					
Suggest	tive list of experiments:							
INII Toyt Po	ak							
• • •	Signals and Systems, ANagoorKani, 2e, TMH, 201 Signals and Systems, A. Anand Kumar, 2e, PHI, 20 Signals and Systems, Tarun Kumar Rawat, Oxford Signals and Systems, B. Kumar, New Age Internati	0. 012. University Press, 2010. ional Publishers, 2011.						
Referen • •	ce Books- Signals and Systems, H P Hsu, Schaum's Outline S B.P. Lathi, "Signal Processing and Linear Systems' Signals and Systems, Simon Haykin, Barry van Ve 1998.	Series, 2e, McGraw Hill, 2008. ", Oxford University Press, 1998 een, John Wiley and Sons (Asia	8. a) Private	e Limited,				
List and	Links of e-learning resources: NPTEL Course. MOOC, IIT Bombay, EE210x, Signals and Systems	5.						
Modes of	of Evaluation and Rubric							
The eva	Iuation modes consist of performance in Two mider examinations.	-semester Tests, Quiz/Assignm	nents, en	d-				
Recomr	nendation by Board of studies on	05.06.2023						
Approva								
Compile	Dr.D.K.Shakya							



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## Department of Electrical and Electronics Engineering Syllabus applicable to July 2022 admitted and later batches

Name	Name of the course: B. Tech in Electronics & Instrumentation Engineer											eering	g		
Seme	ster and	d Year o	of stud	у	B. Tech 2nd <sup>st</sup> Year 3 <sup>rd</sup> Semester										
Subje	ct Cate	gory			Oper	n Elect	tive (C	DE-I)							
Subje	ctCode:	OE-305	5(A)		Subj	ect Na	me: E	Basic I	Electro	nics					
			Maxim	um Ma	arks All	otted				Con	tact H	oure			
		Theory				Pract	ical		Total	COL		Juis	Тс	otal	
End Sem	Mid- Sem	Assign	ment	Quiz	End Sem	Lab Wor	k C	Quiz	Marks	i L	Т	Ρ	Cre	edits	
60	20	10	)	10	-	-		-	100	3	0	0		3	
Prerec	uisites:														
Funda	undamentals of Physics														
Course	Course Objective:														
1.	The co	ourse int	tends t	o provi a block	ide an	overvie	ew of	the pr	rinciples	, operat	ion an	d ap	plicat	ion	
2		allaiug			S like C	troatm	opto					metio	lis.		
Ζ.					entary	teaun	ent a	the	antative	andiysi	s dilu	IIIc	ikes	use	
2		npie mo		nu equ			strate	the	concept	SINVOIVE	20.				
3.		ovide an	overvi	ewora	mpine	ers.			:11 b a a b	1	- +l-:			م ال	
4.	Sumici	ent kno	wiedge	e is pro	vided s		stude	nts w	iii be ac	le to us	e this (	cour:	se as	the	
	Dasis 1	for othe	r advai	ncea co	ourses	like An	alog (	Ircuit	s and Li	near ICs	s, Pow	er El	ectroi	nics	
_	etc.														
5.	Contir	iue to ei	nhance	e oral a	nd writ	ten coi	mmur	nicatio	on skills	specifica	ally dire	ecte	d to th	ne	
	practio	ce of ele	ectronic	s engir	neering	5.									
Carrier	0														
Course	e Outco	mes:													
After o	complet	ion of th	nis cou	rse stu	dents v	vill be a	able to	)							
CO1: A	Acquire	knowled	dge of s	semico	nducto	r devic	es an	d thei	r workir	ng mech	anism.				
CO2: A	Analyze	various	electro	onic ciro	cuit cor	nfigura	tion.								
CO3: A	Analyze	the circ	uit cha	racteris	tics an	d com	pute i	ts para	ameters	5.					
CO4: [	Design v	arious e	electro	nic circi	uits.										
CO PC	) Mappi	ing													
PO	s PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO	8 PO9	PO10	PO1	1 P	012		
COs															
CO1	3	2	1	1		2							2		
CO2	3	3	3	3	2										
<b>CO3</b>	3	3	3	3	2										
<b>CO4</b>	3	3	3	3	2						2				
UNITs					Descr	iptions					Hr	s.	CC	)'s	
	Somi	iconduc	tor di	odes: h	atrodu	ction t		unctic	n diad	and its					
1	Joneli	cotione		tifiors	Clinnin		5 F IN J 1 Class	aning			0	,	CO	1,	
	appli		Reci	uners,	Dogula	ig dilû	Cidf	hing	circuits	s, zener	ŏ	•	CC	)4	
	uidde	e and its	s applic	.auons,	Regula	aluis.									

	Special Purpose Diodes: Tunnel diod	de, Schottky diode, Varactor						
	diode and their applications, Op	otoelectronic devices: PIN						
	diode,Light Emitting Diode (LED), Laser	diode.						
	Bipolar Junction Transistors (BJT	s): Physical structure and						
П	operation modes of PNP and NPN T	ransistors, Biasing the BJT:	10	CO2,				
	fixed bias, emitter feedback bias, c	ollector feedback bias and		CO4				
	voltage divider bias.							
	<b>Transistor as an amplifier</b> , Basic I	BJI amplifier configuration:	10	600				
	common emitter, common base and c	ommon collector amplifiers,	12	CO3				
	, Iransistor as a switch: cut-off and sat	uration modes.						
	Multistage Amplifiers: Multistage	e or Cascade amplifier:						
	classification of multi-stage amplifie	r, coupling and frequency						
IV	response of cascaded systems, effect of	of cascading on voltage gain,	8	CO2				
	current gain, phase, input and output	impedances and bandwidth						
	of cascaded or multistage amplifiers.	Types of coupling, cascade						
	and cascode circuits, Darlington pair, b	ootstrap circuit.						
	Power Amplifiers: Class A large	signal amplifiers, second-						
.,	harmonic distortion, Transformer cou	pled audio power amplifier,	_	600				
V	Class B amplifier, Class AB operation p	bush pull and Class C power	/	CO2				
	amplifiers, Comparison of their effic	iencies, types of distortion,						
	I uned Amplifiers.							
Guest L	ectures (if any)		NI					
Total H	lours		45					
Text Bo								
1.	Integrated Electronics – Millman Halkias	, IMH						
2.	Electronic Devices & Circuits – Boyelstad	1 & Nashelsky – PHI						
3.	Electronic Devices & Circuits – David A. I	Bell – PHI						
4.	Principles of Electronic Devices – Malvin	O I MH						
Referer	ICE BOOKS-							
1.	Microelectronic Circuits- Sedra, Smith.	Diskar						
2.	Electronics Circuits And Systems- Owen	Bisnop						
3.	Intuitive Analog Circuit Design- Marc 1.	nompson						
4.	Starting Electronics (Fourth Edition)-Keit	n Brindley						
List and	Links of e-learning resources:	27						
	<ol> <li>https://npter.ac.in/courses/11/10306.</li> <li>https://www.electropics.tutorials.ws/</li> </ol>	57						
Madaa	2. https://www.electronics-tutorials.ws/							
The ever	of Evaluation and Rubric	in Two mid compostor Tosta		annonta				
end-sei	nester examinations.	in two mid-semester tests, C	uizi Assi	gnments,				
Recom	mendation by Board of studies on	05 06 2023						
Approv	al by Academic council on	00.00.2020						
Compil	ed and designed by							
Compli	ca ana designed by							



(An Autonomous Institute Affiliated to RGPV Bhopal)

# Department of Electronics Engineering Syllabus applicable to July 2022 admitted and later batches

Name of	of the course: B. Tech in Electronics & Instrumentation Engineering													
Semes	ster and Year of study B. Tech 2 <sup>nd</sup> Year 3 <sup>rd</sup> Semester													
Subject	t Categ	ory			Oper	n Electi	ive (O	E-I)						
Subject	tCode:0	DE-305	5(B)		Subj	ect Nai	me: In	strun	nentatio	n-l				
			Maxim	ium Ma	arks All	otted					Contac	t		
-	Т	heory				Practi	ical		Total		Hours		T	otal
End Sem	Mid- Sem	Assign	ment	Quiz	End Sem	Lab- Work	Q	uiz	Marks	L	Т	Ρ	Cr	edits
60	20	10	)	10	-	-		-	100	3	0	0		3
Prerequ	uisites:													
Basic El	asic Electrical Concepts, Mathematics (Matrices, Laplace Transform, Differential Equations and													
Comple	x Varial	bles).												
Course	Objecti	ve:												
The co	ourse a	aims a	t prov	viding	the fu	undame	ental	conc	epts of	the I	nstrum	ienta	ation	and
Measur	ement,	static	and o	dynami	c char	acteris	tics o	f inst	truments	s and	their e	error	an	alysis,
provide	s an o	overvie	w of	the la	borato	ry inst	rumei	nts s	uch as	CRO,	functio	n ge	ener	ators,
multime	eters et	c. It als	o inclu	des the	measu	Jremer	nt of p	assive	e electric	al elem	ents lik	æ R,	L,C.	
Course	Outcon	nes:												
Upon co	ompleti	on of th	ne coui	rse, stu	dent w	ill be al	ole to							
•	•			·										
•	CO1: Id	lentifv.	concei	otualize	e. demo	onstrat	e and	appl	v the fur	idamen	tals of	mea	isure	ement
	science	meas	uring ii	nstrum	ents ar	nd their	chara	octerio	stics					
•		wostia	ato ano		the v	working		octric	al moacu	uring inc	trumo	ntc		
•		ivestige		i anaiyi 		vurking thada							aba	coto ro r
•	CO3: A	naiyze	the w	vorking	or Ca	thode	Ray (	JSCIIIC	oscope (	CRO) a	ina otr	ier i	abor	atory
	equipm	nents.												
•	CO4: A	nalyze	DC bri	dges us	sed for	measu	remer	nt of F	Resistanc	ce.				
•	CO5: A	nalyze	AC brid	dges us	ed for	measu	remer	nt of C	Capacitar	nce and	Induct	ance	<u>)</u> .	
60		· · · · · ·												
0	PO Maj	pping												
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO	8 PO9	PO10	PO11	PO	012	
COs														
CO1	3	2	2	1										
CO2	3	3	2	2										
CO3	3	3	2	2								1		
CO4	3	3	2	2								+		
CO5	3	3	2	2										
		5	4		Descr	intions		1		1				<u></u>
UNITS	Bacic		ont of	Instru	ment	tion	Tupeti	onal	olomont	c of an		<u>,                                    </u>		05
	Dasic			fication	of					s ur díl				
		mient,	CIdSSIT		or m	easurin	g msi	u ume			10		~	01
	avna	mic C	naracte	eristics	ort	ne in:	strum	ents,	Standa	iras &	12		Ľ	01

Calibrations of Instruments, Errors in measurement, uncertainty

analysis.

11	<b>Analog Instruments:</b> Classification D' Arsonval type Galvanometer, Prin construction of various analog	of analog instruments, ciple of operation and indicating types of	10	CO3	
	instruments, sources of error, exter calibration of ammeters & voltmeters.	ension of ranges and			
	<b>Laboratory Instruments</b> : Cathode construction and operation, measure and frequency with CRO, Lissajous Oscilloscope (DSO), Spectrum Analy Measurement, Function Generators, Digital Multimete	Ray Oscilloscope - types, ement of amplitude, phase patterns, Digital Storage zers, Harmonic Distortion er, Digital frequency meter.	08	CO2	
IV	<b>Measurement of Resistance:</b> Mease (Low, Medium and High): voltme ohmmeter, DC Bridges: Wheat arrangement of ratio arms, bridge sen circuits, Sensitivity and Calibrat Wheatstone bridge, Kelvin bridge, Va bridges, milli ohmmeter, mega ohmme earthing device	urement of resistance eter-ammeter method, sotone bridge-design, sitivity, errors in bridge ion adjustments of rious application of DC neter, Meggar, Wagner	08	CO4	
v	Measurement of Inductance and Capacitance (A. C. Bridges): Measurement of inductance using A. C. Bridges: Maxwell's bridge, Various applications of Maxwell Bridges, Hay's Bridge, Anderson's Bridge, vector impedance meter, Q factor measurement. Measurement of Capacitance using A. C. Bridges: Schering bridge, Wien's Bridge, storage and dissipation factors.			CO4	
Guest Lectures (if any)			Nil		
Total Hours			45		
<ol> <li>1. Cooper W.D., Helfrick A.D. "Modern Electronic Instrumentation Measurement", Prentice Hall.</li> </ol>					
2. 9	<ol> <li>Sawhney A.K. "Electrical and Electronics Measurements &amp; Instrumentation", Dhanpat Rai&amp; sons.</li> </ol>				
3. I	Doeblin E.D., Measurement system, Tata McGraw Hill., 4th ed.				
4. Kalsi, Electronic Instrumentation, Tata McGraw Hill					
Reference Books					
1. Terman & Petit, Electronic Measurement.					
List and Links of e-learning resources: MCET – http://sgsmcet.co.in/eie .					
Modes of Evaluation and Rubric					
The evaluation modes consist of performance in Two mid-semester Tests, Quiz/ Assignments,					
end-semester examinations.					
Recommendation by Board of studies on 05.06.2023					
Compiled and designed by					