



VISION

The Department of Electronics & Communication Engineering shall strive to create engineering technocrats for addressing the global challenges in relevant areas to cater the ever changing needs of society at National and International level.

MISSION

- 1. To ensure dissemination of knowledge through effective teaching and learning in Electronics and Communication Engineering.
- 2. To excel in Research and Development activities in emerging areas.
- 3. To promote industry-institute and institute-institute linkages for sustainable development of academic, research, training and placement activities.
- 4. To establish center of excellence in thrust areas to nurture the spirit of innovation and creativity among faculty and students.



Programme Educational Objectives (PEOs)

The Integrated Certificate and Diploma programme (DEC-CTV) shall produce skilled professionals who are:

- 1. Technically competent in service, repair and maintenance of audio video equipment.
- 2. Effective in communication and capable to work in a team.
- 3. Ethically and socially responsible for the development of country and community.
- 4. Able to demonstrate entrepreneurship skills and lifelong learning for successful career.
- 5. Able to adapt themselves with new technological challenges in relevant field.

Programme Outcomes (POs)

After successful completion of ICD (DEC-CTV) program, student will be able to:

- 1. Apply technical skill to troubleshoot, repair, service & maintenance of televisions.
- 2. Apply knowledge of science and humanities for personality development.
- 3. Demonstrate basic electronics engineering principles and conduct related experiments including programming skills.
- 4. Identify and analyze well-defined electronic engineering problems.
- 5. Use appropriate tools and techniques to solve well-defined electronic engineering problems systematically.
- 6. Assist in the design and development of engineering solutions.
- 7. Demonstrate technical skills in utilizing modern electronic engineering tools.
- 8. Communicate effectively with the engineering community and the society at large.
- 9. Demonstrate awareness for societal, health, safety, legal and cultural issues and the consequent responsibilities for sustainable development.
- 10. Develop entrepreneurship skills.
- 11. Understand professional ethics, responsibilities, and norms of electronic engineering practices.
- 12. Function effectively as an individual or in teams with leadership qualities.



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		Semester-I					
S. No	Sub.	Subject Name	L	Т	P	Hrs.	Credits
	Code						
1.	AM-111	Mathematics- I	4	1	0	5	5
2.	PH-111	Physics-I	4	0	2	6	5
3.	CY-111	Chemistry-I	4	0	2	6	5
4.	HU-111	Communication Skills-I	2	0	0	2	2
5.	EE-111	Fundamental of Electrical Engineering	3	0	2	5	4
6.	WS-122	Workshop Practice	0	0	4	4	2
7.	EC-112	Electronic Devices	2	0	2	4	3
		Total	19	1	12	32	26
		Semester-II					
S. No	Sub.	Subject Name	L	Т	Р	Hrs.	Credits
	Code						
1	AM-121	Mathematica II	4	1	Δ	_	_
-	11111121	Maultinaucs- II	4	1	0	5	5
2	PH-121	Physics-II	4	1	2	5 6	5 5
2 3	PH-121 PH-121 CY-121	Physics-II Chemistry-II	4 4 4	1 0 0	2 2	5 6 6	5 5 5
2 3 4	PH-121 CY-121 ME-121	Physics-II Chemistry-II Engineering Drawing	4 4 4 0	1 0 0	0 2 2 4	5 6 6 4	5 5 5 2
2 3 4 5	PH-121 CY-121 ME-121 EC-121	Physics-II Chemistry-II Engineering Drawing Digital Electronics	4 4 4 0 3	1 0 0 0 0	0 2 2 4 4	5 6 4 7	5 5 5 2 5
2 3 4 5 6	PH-121 CY-121 ME-121 EC-121 EC-122	Physics-II Chemistry-II Engineering Drawing Digital Electronics Electronic Workshop Practice-I		1 0 0 0 0 0	0 2 2 4 4 4 4	5 6 4 7 4	5 5 2 5 2 5 2
2 3 4 5 6	PH-121 CY-121 ME-121 EC-121 EC-122	Physics-II Chemistry-II Engineering Drawing Digital Electronics Electronic Workshop Practice-I Total	4 4 0 3 0 15	1 0 0 0 0 0 1	0 2 2 4 4 4 4 16	5 6 4 7 4 32	5 5 2 5 2 2 2 2 2 4
2 3 4 5 6	PH-121 CY-121 ME-121 EC-121 EC-122	Physics-II Chemistry-II Engineering Drawing Digital Electronics Electronic Workshop Practice-I Total Semester-III (A)	4 4 0 3 0 15	1 0 0 0 0 0 1	0 2 2 4 4 4 16	5 6 4 7 4 32	5 5 2 5 2 2 2 2 2 2 4
2 3 4 5 6	PH-121 PH-121 CY-121 ME-121 EC-121 EC-122	Physics-II Physics-II Chemistry-II Engineering Drawing Digital Electronics Electronic Workshop Practice-I Total Semester-III (A) Two Weeks Practical Training during	4 4 0 3 0 15	1 0 0 0 0 0 1	0 2 2 4 4 4 16	5 6 4 7 4 32 80	5 5 2 5 2 2 2 2 2 4 S/US

INTEGRATED CERTIFICATE AND DIPLOMA (DEC-CTV)



		Semester-III (B)					
S. No	Sub.	Subject Name	L	Т	P	Hrs.	Credits
	Code						
1	HU-211	Communication Skills-II	1	0	2	3	2
2	CS-216	Computer Fundamentals	3	0	2	5	4
3	EC-212	Fundamental of Television Engineering	3	1	2	6	5
4	EC-213	Electronics Measurement & Instrumentation	3	1	2	6	5
5	EC-214	Analog Communication	3	1	2	6	5
6	EC-216	Maintenance & Repairing of Televisions	0	0	4	4	2
7	MC-211	Moral values and Professional ethics	1	0	0	1	0
		Total	14	3	14	31	23
		Semester-IV		-			
S. No	Sub.	Subject Name	L	Т	Р	Hrs.	Credits
	Code						
1	AM-221	Applied Mathematics	3	1	0	4	4
2	EC-222	Audio Video System	3	0	2	5	4
3	EC-223	Fundamentals of Microprocessor &	3	1	4	8	6
		Microcontroller					
4	EC-224	Troubleshooting of Audio Video Equipment	0	0	6	6	3
5	EC-228	Network Theory	3	1	0	4	4
6	EC-229	Troubleshooting of Electronic Equipment-II	0	0	4	4	2
		Total	12	3	16	31	23
		Semester-V(A)					
	TP301	Four Weeks Industrial Training during				160	U/US
		summer vacations					



		Semester-V (B)					
S. No	Sub.	Subject Name	L	Τ	P	Hrs.	Credits
	Code						
1	MC-311	Environmental Studies	2	0	0	2	2
2	HU-311	Entrepreneurship	2	0	0	2	2
3	EC-311	Electromagnetic Field Theory	3	0	0	3	3
4	EC-312	Linear IC's & Application	3	1	4	8	6
5	EC-313	Digital Communication	3	1	2	6	5
6	EC-314	Electronic Workshop Practice-II	0	0	4	4	2
7	EC-315	Principles of Microwave Engineering	2	1	0	3	3
8	TP-301E	Industrial Training					S/US
		Total	15	3	10	38	23
		Semester-VI					
S. No	Sub.	Subject Name	L	Т	P	Hrs.	Credits
	Code						
1	EC-321	Industrial Electronics	3	1	4	8	6
2	EC-322	Wireless & Mobile Communication	3	0	0	3	3
3	EC-323	Microprocessor & Microcontroller Applications	3	1	2	6	5
4	EC-324	Antenna Wave Propagation	3	0	0	3	3
5	EC-325	Microelectronics	3	0	2	5	4
7	EC-327	Project	0	0	4	4	2
		Total	15	2	12	29	23
	Total The	ory & Practical Load for Diploma	90	13	80	183	142

Note:		The r	equired credits for certificate programme					96				
		The r	equired credits for ICD programme					142				
		Maxi	mum courses in one semester					7				
	Maximum Contact Hrs.											
	The common courses and their credits are fixed for all ICD programmes.											
Courses	s offered t	o other	Departments:									
S. No	Sub Cod	le	Subject Name	L	Τ	Р	Hrs	Credits				
1	EC-211		Fundamental of Electronics Engineering	3	0	2	5	4				
2	2EC-221Fundamental of Electronics Engineering3025											

					Floo	EC-112	2 Dovigos						
				T.	Elec		T	1	р		Credits		
				2			0	,	7		3		
		Sessio	nal Mai	<u>rks</u>			0				50		
		End S	emester	· Exami	nation N	Iarks					50		
Course	9	The c	ourse in	tends to	provide	the bas	sic conce	ept and	characte	ristics of	f the elec	ctronics	
Object	Objectives: devices such as diode, BJT, FET, etc. Also aims to provide the understanding application												
	of different electronics devices and simple circuits.												
Course	Course 1. To acquire knowledge about semiconductor physics for intrinsic and extrinsic												
Outco	Outcomes: materials.												
	2. This course gives an overview of various semiconductor devices.												
		3.	Acquire	ed know	ledge at	out acti	ve and p	passive of	compone	ents, volta	age, and	current	
			sources	5.									
	4. Able to understand the working principles of electronic circuits e.g., Rectifiers,												
	Filters, Regulated circuits, etc.												
Mapping of course outcomes with program outcomes													
001	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12												
		N											
	N	N	N										
CO3	N	N		N									
04		N	N	V T Inci	 • T	N						9 hmg	
Voltag	o and Cr	mont	Dociston	oo Ohm	<u>'a low</u> X	/ I Char	ootoristis	Docio	tora Car	naitora 1	nduatora	o mrs.	
V Oltag			ixesistan	ee, Onn	5 law, 1			.s, ICS15	iors, Cap			•	
Active	and Pa	ssive C	ompone	ents: Int	roduction	n to act	ive and	passive	compor	ients; fix	ed and	variable	
resistar	nces, then	various	s types fi	xed and	variable	capacito	ors, their	various	types and	l importa	nt specifi	ications	
and col	or codes.												
Voltag	e and cu	rrent so	ources –	Voltage	and Cur	rent sou	rces, Syı	nbols an	d Graph	ical repre	esentation	n,	
charact	eristics o	f ideal a	nd pract	ical sour	ces. Ove	erview o	f AC, D	C, Cells	and Batt	eries, En	ergy and	Power.	
				Uni	t-II							6 hrs.	
Introd	uction: (Classific	ation of	material	s into co	onducting	g and ins	ulating r	naterials	through	a brief re	ference	
to ator	nic struc	ture, C	onductin	ng Mater	rials, Ins	sulating	Materia	ls, Sem	i-conduc	tor Mate	erial, Eff	fects of	
temper	ature on (Conduct	ivity of	semicon	ductor.	e							
··· ·													
				Unit	t-III							10 hrs.	
Semico	onductor	Diode	s: Atom	nic struc	ture of	German	ium and	I Silicor	n semi-c	onductor	s; intrin	sic and	
extrins	extrinsic semiconductors, PN junction, basic principles of operation and VI characteristics of PN junction												
diode,	static and	dynam	ic resista	ance of a	diode. U	Jse of a	diode in	rectifier	s, half w	ave, full	wave and	l bridge	
rectifie	r with sh	unt cap	acitor fi	ilter, ser	ies induc	ctor filte	r, Zener	diode a	and its a	pplicatio	ns, as a	voltage	
regulat	or, light e	emitting	diode (I	LED), In	troductio	on to Filt	ers, Clip	pers, Cl	ampers.			e	
-	egulator, light emitting diode (LED), introduction to Filters, Chippers, Clampers.												



	<u>Unit-IV</u>		8 hrs.								
Transistors: Introduction to a t	transistor, working of a PNP and	NPN tran	sistor, input and output								
characteristics, transistor configurations, biasing of a transistor, amplifying action of a transistor, comparison											
of different configurations, common emitter amplifier circuit, load line, concept, field effect transistor FET,											
JFET, MOSFET, their characteristics and applications, unijunction transistor (UJT).											
	RECOMMENDED BOOKS										
Title	Author	Publisher									
1. Basic Electronics and Linear	N N. Bhargava and Kulshreshta	McGraw	Hill								
Circuitis											
2. Electronics Devices and	Miliman and Halkias	McGraw	Hill								
Circuits											

	Electronic Devices Lab															
Course	9	To rei	nforce 1	learning	through	n hands	-on exp	perience	by ex	amining	the el	ectrical				
Object	ives:	characte	eristics of	of variou	is semic	onducto	r device	s, such	as diode	es, BJTs	and FE	Ts. To				
		provide	the stude	ent with	the capal	bility to a	measure	and reco	rd the ex	periment	tal data, a	analyze				
		the resu	lts of var	rious sen	niconduc	ctor devi	ces.									
Course	9	1.	To unde	erstand th	he functi	oning of	f various	electron	nic instru	iments li	ke CRO	, signal				
Outco	nes:		generato	or and m	ultimeter	r.										
		2.	To unde	erstand th	ne charac	eteristics	of diode	and BJ	Γ and ver	rify their	response	es.				
		3. To construct various electronic circuits on the bread board and analyses their output. Manning of course outcomes with program outcomes														
	Mapping of course outcomes with program outcomes															
	PO1	PO2	PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12													
CO1																
CO2																
CO3																
		List of 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	Experi To meas To calcu To obse To obse To obse To obse To verif To cons its ripple To cons its ripple To stud	ments: sure valuate the rve the f rve the f rve the V rve the V y the NF truct hal e factor. truct full e factor. y the ap	tes of dif value of front pand ront pand VI charac VI charac PN and P f-wave re l-wave re plication	ferent re various el of CR el of sign cteristics cteristics 'NP trans ectifier, v of Zene	sistors b passive o O. nal gener of semic of Zener sistors. wave sha wave sha vave sha r diode a	y using t compone rator. conducto r diode in ape of the pe of the as a volta	the color ents usin, or diode i n reverse e electric e electric age regul	coding c g multim n forwar e bias. cal signal al signal ator.	chart. eter. d bias. and calo and calo	culate				



						EC-121								
			1	r	Digit	al Electi	onics	1	D		Cr	adita		
				L 3			<u>1</u> 0		<u> </u>		Cr	5		
		Session	nal Marl	s ks			U		-		4	50		
		End Se	mester	Examina	ation Ma	arks						50		
		This co	ourse wi	ill provi	de the i	ntroduct	tion of t	he basic	princip	oles, char	racteristi	ics and		
		operati	ons of a	digital s	ystem. N	Next focu	us is to g	give the	detail de	scription	about E	Boolean		
Course	•	algebra	and the	various r	nethods	of Boole	an functi	ion reduc	ction, des	signing of	f combir	national		
Object	ives:	circuits	bv usi	ng logic	gates.	design a	ind anal	vses of	asvnchr	onous an	d svnch	ironous		
9		sequent	tial Circi	uits using	y flip flo	ps and a	t last to i	, understa	nd princ	iple of or	peration	of shift		
		resistor	s and D/	A an A/I	D convei	rters.			F	-rr				
1. Learn to apply Boolean laws/K-Map-method method to reduce a given Boolean function.														
2. Able to design & realize combinational logic circuits using logic gates for various														
Course practical applications.														
Outcomes: 3. Able to demonstrate the operation of flip-flops, counters, and shift registers.														
4. Able to understand various A/D and D/A converters.														
4. Able to understand various A/D and D/A converters. Mapping of course outcomes with program outcomes														
	PO1	PO2	2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12											
CO1				\checkmark	\checkmark									
CO2					\checkmark									
CO3			\checkmark	\checkmark	\checkmark									
CO4														
T / 1			·C 1		<u>Unit-I</u>	1 1	1.0. 1			1 4 1		<u>10 hrs.</u>		
Introd	uction:	Basic dif	terence l	between	analog a	nd digita	al Signal	s, applica	ations an	id Advan	tages of	Digital		
Signals Deview	, digital	systems,	and the	r applica	tion Dimony	Ootol a	nd have	deaimal	numbar	aristana	and that	n inton		
conver	ions Si	mod and	Junsian	echnal,	Dillaly,	octal, a	nu nexa	dition	Subtract	system a	illu ulei Itiplicati	on and		
divisio	1: Exces	s 3 code.	Grav co	de and A	SCII co	de	ations-a	duition,	Subtract	.1011, 1110	inpiteati	on and		
	-,	,			Unit-Il	[12 hrs.		
Logic g	gates: D	efinition	s, symbo	ols and tr	uth table	e of NO	Γ, OR, A	ND, NA	ND, NO	OR, XOR	, XNOF	R gates,		
De-Mo	rgan's tl	heorems,	realizat	tion of b	asic gat	tes using	g univers	sal gates	; realiza	tion of s	imple E	Boolean		
equatio	ns using	universa	al gates,	introduct	tion to k	-map (up	to 4 var	riables)						
Combi	national	l Circuit	s: Comb	oinationa	l circuit	design,	adders, s	subtracto	r, code o	converter	s, multip	plexers,		
demult	iplexer, e	encoders	and dec	oders.	T T 1 / T T	T						1(1		
G	<u></u>	•4 •	. 1	. .	Unit-II	<u>I</u>	. 11	• 1		1	6.6.1	16 hrs.		
Sequer	and flin	flops N	Troduction (COR later	on, Logie 6 NANT	c diagrai	m, truth	table, tin	ning dia	gram and	d operation	on of follons	llowing		
using w	using waveforms and truth tables of PS. T. D. and Master/Slava IK flip flops.													
Counters: Introduction to Asynchronous and Synchronous counters. Binary counters. Divide by N ripple														
counter	s, Up/do	wn cour	iter, Ring	g counter	with tin	ning diag	gram.					r r		

Shift Resistors: Introduction, Serial in parallel out, serial in serial out, parallel in serial out, parallel in parallel out.



Unit-IV			10 hrs.							
A/D and D/A converters: Binary Weighted D/A	converter, R/2R ladder D/	A converter, St	tair step Ramp							
A/D converter, Dual Slope A/D converter, Success	sive Approximation A/D C	onverter.								
RECOMMENDED BOOKS										
Title Author Publisher										
1. Fundamentals of Digital Electronics	A. Anand Kumar	PHI 2 nd Editio	'n							
2. Digital Electronics	R P Jain	McGraw Hill Edition	Education 4 th							
3. Digital Logic Designs	Morris Mano	PHI 5 th Edition	n							
4. Digital Systems: Principles and Applications	R J Tocci	PHI 10 th Editi	on							

	Digital Electronics Lab														
Cours	e	To ma	ke stude	nts fami	iliar wit	h differe	ent types	s of des	igns as	sequentia	l logic d	circuits,			
Object	tives:	combin	ational 1	ogic circ	uits, tro	uble sho	oting of	various o	ligital sy	stems &	study of	various			
		digital	systems	. Know	ledge o	of basic	electron	nics &	digital	technique	es is us	eful in			
		underst	anding t	heory an	d practic	cal of the	e subject	•							
Cours	e	1.To a	inalyses	and de	esign d	igital c	ombinati	onal ci	rcuits li	ke deco	ders, er	icoders,			
Outco	mes:	multi	plexers,	and de-n	nultiplex	ters as w	ell as ari	thmetic	circuits (half adde	r, full ad	der and			
		multi	plier).				4 - 1								
		2. 10 at 3 Unde	halyses a	na aesig	n sequer	itial digi	tal circu	its like I	lip-flops	, registers	, counter	rs. Lacion			
		for testability.													
Mapping of course outcomes with program outcomes															
PO1PO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12															
CO1	√	10 <u>1</u>	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$												
CO2	,	 √													
03	2	۰ ۷	,		N										
05	v	v			v	v									
		T :	· F												
			Varific	ments:	intonna	tation of	femath tol	las for /				OD and			
					(OD) on	A Exclus			\mathbf{D} , \mathbf{D}	, NOT N	AND, N	OK allu			
						I EXClus		(EANU	ND and						
		2.				· voi			AND OF I		s.	<i>.</i> .			
		3.	To desig	gn a nair	adder us	sing XOI	x and NP	AND gate	es and ve	rification	of its op	eration.			
		4.	Constru	iction of	t a full a	adder ch	rcuit usi	ng XOR	and NA	IND gate	s and ve	erity its			
		0]	peration.												
		5.	To desi	gn a NO	R Gate I	Latch an	d verific	ation of	its opera	tion.					
		6.	Verifica	ation of t	ruth tabl	e for pos	sitive edg	ge trigge	red, nega	ative edge	e triggere	d, level			
		tr	iggered	IC flip-fl	ops (At	least one	e IC each	n of D la	tch, D fli	p-flop, JI	K flip-flo	ops).			
		7.	Verifica	ation of t	ruth tab	le for en	coder an	d decode	er ICs, M	lux and D	emux.				
		8.	To desi	gn a 4 bi	t SISO,	SIPO, P	ISO, PIP	O shift r	egisters	using JK/	D flip fl	ops and			
		V	erificatio	n of thei	r operati	ion.									
		9.	To desi	gn a 4 bi	t ring co	ounter an	d verify	its opera	tion.						
		10	0. Async	hronous	Counter	ICs									
			Use of	IC 7490	or equiv	alent TT	L (a) divi	ide by 2	(b) divid	e by 10 Co	ounter				



						EC-122	_						
		1		Elec	tronics	worksho	op Pract	ice-I					
			L	4		<u> </u>	1	<u> </u>			Credits		
C		TT1 1	0)	4 11	0		4		1 1	2	1 (
Cours	e	The obj	ective is	to under	rstand ba	asic elect	ronic ins	strument	termino	logy and	to learn	how to	
Object	lives:	calibrat	e and in	lonitor a	i variety	of elec	tronic ii	istrumen	its so as	to appi	y measu	irement	
Cours	e	1 Or	erate the	electror	nic instru	iments li	ke digita	l and an	alog mul	timeter	CRO etc	,	
Outco	mes:	2. To	recogni	ze and te	est vario	us active	and pas	sive elec	tronic co	omponen	ts like re	esistors,	
		caj	pacitors,	diodes, t	ransisto	rs etc.	1			I			
		3. To	design a	and impl	ement el	ectronic	circuits	on PCB.	s				
			Mappi	ng of co	urse out	tcomes v	vith pro	gram ou	tcomes				
	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 CO1 V <td< th=""></td<>												
CO1													
CO2	N	V	N			1							
CO3													
		List of 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12.	Experin Study of This top various to check Study of basic el Transist Testing compon To study Solderi electron To sold To use a To find To study To study	Section Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector Sector S	onic me s the use ic compo- juency a onic con comport s etc.) an etronic ing multin sualize th tice: Cir onents. base on liode as pint for c ut and ou ut and o plifying imple el the follo tifier cir	asuring e of mult onents an nd ampli mponent nents and id identif compon meters (A ne solder couit asse a genera a voltage ommon utput V-1 utput V-2 characte lectronic wing cir cuit with	Instrum imeter to d (Study tude of a s: This l circuit ication o ents: Th Active an ing kit as embling al purpos e regulate emitter of character i character i character cistics of cuits and wit	hents: (M o check w o of CRO a signal w topic co symbols of compo- nis topic d passiv practice a PCB. for. configura eristics o eristics o eristics o sonfigura topic co sonfigura	Aultimeter voltage, c voltage, c vaveform vers the s (Resist nent value covers e compo us solder using pr ttion. f commo of commo d PNP to pic cove	er - Digit current an opic cove n. familiar ors, Cap ues. how to nents) ing preca inted cir on Emitte on Base of ransistor rs the use	al and A nd also to rs the pro- ization of acitors, 1 test ele- autions. reuit boa er configura e of bread	analog): o check ocedure of some Diodes, ectronic rd with uration. ation. dboards	
			c. Simp d. DC re	le LED f egulated	lashing of power s	circuit us upply.	sing Trar	nsistors /	ICs				

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	TP-201												
	Two Weeks Practical Training during summer vacations												
Course	Course Students have to undergo two – week practical training in Department of Electronics &												
Object	D bjectives: Communication Engineering so that they become aware of the practical application of												
	theoretical concepts studied in the classrooms.												
Course	e	1. Gair	1 experie	ence in v	various c	lomains	such as	hardwar	e, softw	are, main	tenance, a	nd	
Outco	mes:	testing	•										
			Map	ping of o	course o	outcome	s with p	orogram	outcon	nes			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1													



EC-212 Fundamentals of Television Engineering												
L T P Credits 3 1 2 5												
				L			<u>I</u> 1	1	-			
		Section	nal Mar	<u>3</u> dra			1	4			50	
		Session End Se	nai Mai	TKS Evomi	notion N	Ionka					50	
7		Ella So	emester	Examin		larks					50	. ~ .
Cours	e	The co	urse ain	is to giv	ve the ba	sic knov	vledge a	nd work	ing abou	ut each pai	rt of BW a	ind Color
Object	tives:	TV. S	tudent v	will lear	n the b	asic ide	a of A	mplitude	and fr	equency	modulatio	n. Basic
~		concep	ots of Co	mposite	video si	ignal and	d picture	e tube ha	ive been	presented	1.	
Cours	e	1.	Under	stand the	e basic io	dea of A	M and I	-M mod	ulation			
Outcomes: 2. Understand the function of each block of AM transmitter and receiver												
	3. Understand the basic concept of composite video signal											
		4.	Under	stand the	e workin	g of eac	h block	of Mone	Chron	ne and Col	our TV.	
			Map	ping of o	course o	outcome	s with p	orogram	outcon	nes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4	\checkmark											
				Uni	<u>it-I</u>							10 hrs.
Idea O	of Modu	lation:	Concept	t of amp	litude m	odulatio	n (AM)	, frequer	ncy mod	ulation (F	M), Frequ	iency
spectru	m of A	M and F	M, Idea	of doub	le side b	and and	single s	side band	l for AN	A systems.	, Basic co	ncepts
of ante	nna, Ya	gi anten	na.									
Trans	mitter A	And Rec	eiver: E	Block dia	igram of	an AM	transmi	tter and	function	n of variou	is blocks,	Block
diagrai	n of an	AM Rec	eiver an	id functi	on of va	rious blo	ocks.					101
	4 067			<u>Uni</u>	<u>t-II</u>	1 1	1. \			.1 1	1. \	12hrs
Eleme	nts Of	IV Syste	em: IV	transmi	ssion (vi	deo and	audio),	TV rece	ption (v	'ideo and a	audio),	
Synchr	onizatio	on, Scani	ning, Fli	icker, in	terlaced	scannin	g, Aspec	ct ratio,	video, a	ind audio :	signais. C	oncept
UI Col	mposite	video S	Signal:	video si	gnai ain	nensions	, Horizo	ontal syn	chronot	is details,	vertical	
synchr	synchronous details, Scanning sequence details.											
Signal	Trong	mission	and Ch	<u>UIII</u> onnol P	<u>-III</u> ondwid	th. Cha	nnal han	dwidth	Vactici	alaidahan	d transmi	
Vestig	Signal Transmission and Channel Bandwidth: Channel bandwidth, Vestigial sideband transmission,											
Pictur	ar siucu e Tiihe	and Car	mera Ti	he • Mo	aius. nochron	ne nictu	re tube c	onstruct	ion ite	characteri	stics and a	vircuit
control	Basic	concepts	s of TV	camera f	ubes for	example	e image	orthico	n vidice	on nlumbi	icon	mount
control	. Dusic	concepts	,0114			Champ	e mage	oruneo	i, viuiet	, prunio		



	Unit-IV		14 hrs.							
TV Receiver: Block diagram of a TV receiver, Brief description of each stage, EHT										
Color television: Block diagram of color TV camera, color signal generation, compatibility of color and										
black and white signal, natural lig	black and white signal, natural light and three colors theory, the luminance signal, line saturation, band width									
requirement, modulation of color	r deference signal, weighing factor	rs. Introdu	ction to SECAM and NTSC							
system, PAL-TV system, PAL-I	O system, PAL color receivers.									
	RECOMMENDED BOOKS	5								
Title	Author	Publisher								
1. Monochrome and color TV	RR Gulati	New Age	e International, New Delhi							
2. Color TV theory and practice	SP Bali	TMH, N	ew Delhi							



	Fundamentals of Television Engineering Lab Course The course aim is to give the basic knowledge and working about each section of BW and Color TV and observe them experimentally													
Cours	e	The c	ourse ai	m is to g	give the	basic kn	owledge	e and wo	orking a	bout each	section o	f BW and		
Objec	tives:	Color	TV and	lobserv	e them e	xperime	ntally.							
Cours	e	1. U	J <mark>nderst</mark> a	and the v	vorking	of mone	ochrome	televisi	on trans	mitter and	l receiver	systems.		
Outco	mes:	2. U	Jndersta	and the v	various r	nonochr	ome and	l colour	televisio	on section	s.			
			Map	ping of	course o	outcome	es with j	progran	1 outcor	nes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
CO1														
CO2														
		List of 1. 2. 3. 4. 5. 6. 7. 8. 9. 10 11 12 13	 bf Expe Draw Obse Obse Obse Obse Obse Section Obse 	eriment the blo rve the rve the rve the rve the rve the brve the brve the rve the rve the rve the rve the rve the rve the blo rve the rve the blo rve the rve the rve the blo rve the rve the rve the blo rve the rve the	ts: Dck diag ICs use input/o interna alignm horizon EHT se Dck diag operati audio a EHT se SMPS video a	gram an ed in dif utput si l and ex ent and ntal osci ection o gram an ng unit und vide ection o section section	d obser ferent s gnals o adjustr illator, y f B & V d obser and tur to IF se f color of colo or sectio	ve work sections f a 20" controls nent provertical W TV. ve work ner of co ction of TV. r TV. n of col	king pri of B & B & W of B & ocedure oscillat king pri olor TV color T	inciple of W TV. receiver W TV. of B & V tor and sy inciple of TV.	B & W W TV rea and separ color T	TV. ceiver. ator		

	EC-213													
		-	E	ectroni	c Measu	irement	s and Ir	nstrume	ntations	5				
				L		Т			Р		Credits	3		
				3		1			2		5			
		Sessio	nal Mai	rks							50			
		End S	emester	· Exami	nation N	Marks					50			
Cours	e	Aim of	f the cou	rse is to	study th	e basics	of unit,	dimensi	ons, and	standards	s. It also gi	ves deep		
Objec	tives:	insight	t into the	e PMM	C instru	ment and	d bridge	s. It dis	cusses th	ne CRO i	n detail. F	inally, it		
		introdu	ices sign	nal gene	rator and	d analyz	er.							
Cours	e	1 . Able	e to und	erstand	the varic	ous types	s of error	rs introd	uced in	measuren	nents.			
Outco	mes:	2. Able	e to und	erstand	the PMN	AC instr	uments a	and brid	ge theor	у.				
		3. Able	e to und	erstand	the CRC), signal	generato	ors and a	analysers	5.				
	DO1	DO1		ping of	course (DOC	s with p	brogram	outcon	1es	DO11	DO12		
<u>CO1</u>	POI	POZ	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									POI2		
$\frac{COI}{CO2}$	N	N	2	2	2									
CO_2	N	N	N											
03	V	V	V											
T T •4	1.	•	1 4	<u>, </u>	<u>nit-l</u>	~ , ,	•	1 (· · ·		1 . 1	12 hrs.		
Unit,	dimens	ions, ai	nd stan	dards:	Scientii	ic notal	tions an	id metri	c prefix	kes. SI e	lectrical i	units, SI		
error	and rel	ales, ull	ror acc	, and sta	nualus.	n resolu	ution at	nois. O	ficant f	igures N	Alle ellor,	absolute		
combi	nation b	anve en	statistic	al analy	vsis	ii, iesoii	ution a	iu sigin	incant i	iguies, N	reasureine			
comon	nution, c		statistic	<u>ur unur</u> U	nit-II							12 hrs.		
PMMO	C instrur	nent, gal	lvanome	eter, DC	ammete	er, DC ve	oltmeter	, series of	ohm met	er. AC el	ectronic v	oltmeter,		
digital	voltme	ter syste	ems, dig	ital mu	ltimeters	s, digital	freque	ncy met	er syste	m, Whea	tstone brid	dge, low		
resista	nce mea	asuremei	nts, low	resista	nce mea	suring i	nstrume	nts.AC	bridge t	heory, ca	pacitance	bridges,		
Induct	ance bri	dges, Q	meter.								-			
				Uı	nit-III							12 hrs.		
CRO:	CRT, w	vave form	n displa	y, time l	base, dua	al trace o	scillosc	ope, mea	asuremen	nt of volta	ige, freque	ency, and		
phase	by CRO	, oscillo	scope pr	obes, os	scillosco	pe speci	fications	s and pe	rforman	ce.				
				<u>U</u> 1	<u>nit-IV</u>							12 hrs.		
Signal	genera	ator an	d analy	yzer: S	ignal ge	enerator:	Sine v	wave, n	on-sinus	soidal sig	gnal, and	function		
genera	tors. Sp	bectrum analyzer and distortion.												
T:41	_			A	RECON	MMENI	DED RC	JOKS	D-12-1					
	e duran in T				thor	2 - 11			Publish	ler	D 11.			
I. Elec	ctronic I	nstrumei	ntation a	ind Da	avid A. I	Sell			2nd Ec	I., PHI, N	ew Deini			
2 Elac	tropic N	Jagouror	nanta an		ivor and	Cago			2008. TMU	2000				
L. Elec	nentatio	neasurer n	nems an		iver and	Cage			тип,	2009.				
3 Meg	suremen	nt and		Δ1	an S. M.	orris			Fleevie	er (Butter	worth			
Instrur	nentatio	n Princi	ples	11	un 5. 141	01110			Heinm	ann), 200	8			



	Electronic Measurements and Instrumentations Lab Course To introduce the concept of measurement and the related instrumentation requirement as a												
Cours	e	To intro	oduce the	e concep	t of mea	suremer	t and the	e related	instrum	entation r	equirem	ent as a	
Object	tives:	vital ing	gredient	of electro	onics and	d comm	unication	enginee	ering.		-		
Cours	e	1.	Underst	and basi	c measu	rement c	concepts.						
Outco	mes:	2.	Able to	measure	the valu	ues of in	ductance	, resistai	nce and c	capacitan	ce using	various	
			bridges										
		3.	Able to	operate	signal ge	enerator	and sign	al analyz	zer for el	ectronic	measure	ments.	
			Mappi	ing of co	urse out	tcomes	with pro	gram ou	itcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1													
CO2				\checkmark	\checkmark								
CO3		\checkmark	\checkmark		\checkmark								
		List of 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	Experi To obse To obse Measur Measur Measur To find To find To stud recorde To stud data acc Displac To mea variatio	ments: erve the of ement of ement of ement of ement of Q of a c y & obse r. y & obse r. y & obse n ement m asuring n of tem	waveforr lynamic Inducta small re Capacit medium oil by a rve the r erve the system. easurem the temp perature	n on a st recordir nce by M esistance ance of n resistan series re ecording acquisit ent usin perature with res	orage Os ng of diff Maxwell' by the k the Sche nce with sonance g of differ ion of da g LVDT, of sold pect of v	scillosco erent sig s bridge Kelvin's ring Brid the help method rent sign ta from ata from funduction ering by voltage.	pe. gnals on o Bridge. dge. of Whea and verif als from strain ga ve pick u y using	oscillogra at stone b fy it by us sensors c auge-base up and cap thermoc	nphic rec sing Q-m on magne ed transd pacitive p ouple. F	orders. neter. etic tape ucer on pick up. Plot the	



	EC-214 Analog Communication											
	Analog Communication											
				L			Т]]	2		Credits	
				3			1		2		5	
		Sessio	nal Mar	:ks							50	
		End S	emester	Examir	nation M	larks					50	
Course	<u>e</u>	The f	ocus of t	he cours	e is on u	nderstar	ding the	importa	nce and	theories of	of analog	5
<u>Object</u>	ives:	comm	nunicatio	on system	ns. The s	tudents	will unde	erstand th	ne variou	ıs analog		
communication techniques, AM, FM generation, detection, transmission and reception												
methods, analog pulse modulation techniques.												
Course 1. To gain knowledge about the fundamental concepts of various analog												
Outcome: 1. To gain knowledge about the fundamental concepts of various analog communication systems.												
		2. To	o study tl	he metho	ds of ge	neration	and dete	ction of	AM and	FM		
		3. A	cquire kr	nowledge	e about A	M and	FM trans	mission	and rece	ption.		
		4. To	o study v	arious p	ulse com	municat	ion schei	mes.				
		I	Mappi	ng of co	urse out	comes v	vith prog	gram ou	tcomes			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	N	V	V	V								
CO2	V	N	V	N								
CO3	N	N	N			N						
CO4		N	N	√.								101
T 4		C		Un	<u>it-1</u>	M		C:1	. E1			12 hrs.
Closeif	uction:	Comm	unication	i, infor	mation,	Messa	ge and	Signal	s, Eleci	tromagne	tic Sp	ectrum,
randon	ication of	the elec	monts of		on-perio	uic signa	ais, Allai n Modu	og and c	ligital sig	gilais, De	of mod	ulation
Need f	or moduls	the ele	ments of		numean	JII Syster	II, MIOUU	nation, i		n, Types	or mou	ulation,
Ampli	tude Mo	dulation.	n: Defi	nition F	xpressio	n of AN	/ wave	modulat	ion inde	x freque	ency sp	ectrum
bandwi	idth. pow	er conte	nts of sid	debands	and carri	er.	,	1110 000100		,	, sp	
	, ,			Uni	t-II							14 hrs.
Freque	ency Mod	lulation	: Modul	ation ind	lex, frequ	iency de	viation, f	frequenc	y spectru	m and ba	andwidth	n of FM
wave, l	Power con	ntents ir	n FM, Ph	ase mod	ulation.	2						
Genera	ation of	AM a	nd FM	Waves	DSB-S	C, DSH	B-SC, SS	SB-SC,	their co	mparisor	n and a	reas of
applica	tions, Bas	sic prine	ciple of A	AM gene	ration, C	Beneratio	on of DSI	B and SS	B signal	s. Basic	principle	e of FM
generat	generation, Varactor diode modulator.											
				Unit	t-III							12 hrs.
Radio	Transmi	tter and	Receive	er: Bloch	k diagran	n of AM	and FM	transmit	ter, Worl	king prin	ciple wit	h block
diagrar	n of AM	and FM	receiver	(Superh	etrodyne	e).						·
Democ	Iulation:	AM die	ode dete	ction, en	velope d	letector,	FM dete	ection, ba	asic prin	ciple of	slope de	tection,
balance	ed slope d	letector.										



<u>Unit-IV</u> 10											
Pulse Modulation: Sampling process, Sam	pling theorem, Basic idea about	t PAM, PWM and PPM and									
typical applications, Reconstruction of message, Pulse code modulation.											
RECOMMENDED BOOKS											
Title Author Publisher											
1. Electronic communication systems	Kennedy	Tata McGraw Hill									
2. Electronic Communications System:	by Wayne Tomasi	5 th Edition, Pearson									
Fundamentals Through Advanced,		Education									
3 . Electronic communications	Roddy and Coolen	Prentice Hall of India									
4 . Principles of communication systems	Taub and Schilling	Tata McGraw Hill									
5. Communication system (Analog and	Sanjay Sharma	Katson Books									
Digital)											



				A	nalog C	ommuni	cation I	Lab							
Cours	e	This lab	aims to	provide	basic pr	actical k	nowledg	ge about	different	AM and	FM mod	lulation			
Object	tives:	techniq	ues by o	bserving	the outp	out wave	forms or	n CRO.							
Cours	e	1.	Calibrat	te modul	ated as v	well as d	emodula	ted wave	eforms o	n CRO.					
Outco	mes:	2.	Generat	e DSB-S	SC, SSB	and FM	signals.								
		3.	Analyse	super l	neterody	me AM	receiver	and me	asureme	nt of its	paramete	ers like			
			sensitiv	ity and s	electivit	<u>y.</u>									
			PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12												
	PO1	PO2	<u>'O2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12</u>												
CO1															
CO2			$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$												
CO3				\checkmark											
		List of 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	Experim To obse To obse Generat Generat To obse To gene To stud viz. sen To obse detector To obse locked-	nents: rve ampler in Ampler ve envection of D ion of site ion of site rve frequent ve super l sitivity a rve the vector loop deter	litude m itude mo elop dete SB-SC s ngle side uency m M Signa neterody nd selec waveforn waveforn ector.	odulatio odulated ector for signal us e band si odulatio l and me ne AM r etivity. m of den m of den	n and its Envelop demodul ing balan gnal. n and its asure de eceiver a nodulated	wavefor and dete lation of need more wavefor pth of m and meas d FM sig d FM sig	rm on CI ermine d AM sigr dulator. rm on CI odulation surement gnal with	RO. epth of m hal. RO. n. t of receiv the help the help	nodulatio ver paran of ratio of Phase	n. neters			



				Mainten	ance &	EC-216 Repairi	ng of Te	levision	s					
Cours Object	e tives:	This lat for dipl Horizon fault fir	o aims to oma stuc ntal/ Ver nding in l	explore lents. Stu tical osci IF, EHT	practical idents w illator, sy and SMI	Ily about ill learn ync sepa PS sectio	t comport the work rator sec	nents use ting of e tion, aud	ed in Tele ach secti- lio and v	evisions (on of TV ideo sect	BW and e.g., IC ion and	Color) 's used, various		
Course Outco	e mes:	 Gain Knowledge about various ICs used in different sections of colour TV. Understand various important sections of TV receiver. Detect fault in IF, EHT and SMPS section. Mapping of course outcomes with program outcomes 												
	PO1	PO2	O2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12											
CO1														
CO2	\checkmark		$\begin{array}{c c c c c c c c c c c c c c c c c c c $											
CO3														
		List of 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	Experin To study To study To study To study To study To study To study To study To study	the operation of the second se	eration of ction of easure the serve the serve the faults an faults an faults an faults an	f LED T front par e voltage wavefo wavefo d wavefo d troubl d troubl d troubl d troubl	elevisior nel contr es of pov orm / sign orm / sign orm / sign eshootin eshootin eshootin	n. Tols and a wer secti- nals of T nals of A nals of L g in Auc g in Auc g in LEI g in fror	remote co on of LE uner sect .udio sec ED Disp lio-Video Dio-Video D Display nt panel c	ontrol. D TV. tion. lay Interf o input se o output s y interfac	face sect ection. section. se section id Logic	ion. 1. Board.		

						EC-211	l					
	Fundamentals of Electronics Engineering L T P Credits											
				<u>L</u>			<u>T</u>		P		Credits	
				3			0		2		4	
		Sessio	nal Mai	rks							50	
		End S	emester	·Exami	nation N	larks					50	
Course	9	The c	ourse in	tends to	provide	the bas	sic conce	ept and	characte	ristics of	the ele	ctronics
Object	ives:	device	es such a	s diode,	BJT, FE	T, etc. A	lso aim	s to prov	ide the u	Inderstan	ding app	olication
	of different electronics devices and simple circuits.											
Course	Course 1. To acquire knowledge about semiconductor physics for intrinsic and extrinsic											
Outco	Dutcomes: materials.											
		2.	This co	ourse giv	es an ove	erview o	f various	s semico	nductor	devices.		
		3.	Acquir	ed know	ledge at	oout acti	ve and	passive	compone	ents, volt	age and	current
			sources	5.				1 0				
		4.	Able to	o unders	tand the	working	g princij	ples of e	electronic	c circuits	e.g. Re	ectifiers,
			Filters,	Regulat	ed circui	ts, etc.	• 41					
	DO1	DOA		ing of co	DO5	tcomes v	with pro	gram of	utcomes	DO10	DO11	DO12
	POI	POZ	P03	PO4	P05	PO6	PO/	PO8	P09	POIO	POII	POIZ
CO1		V										
CO2												
CO3		\checkmark		\checkmark								
CO4		\checkmark										
				Un	<u>it-I</u>							10 hrs.
Active	and Pa	ssive C	ompone	ents: Int	roduction	n to act	ive and	passive	compon	ents; fix	ed and	variable
resistar	nces, their	r various	s types fi	xed and	variable	capacito	rs, their	various	types and	l importa	nt specif	ications
and col	or codes											
Voltag	e and cu	rrent so	ources –	concept	of const	ant volta	ges and	constant	t current	sources,	symbol a	and
graphic	al repres	entation	. charact	teristics	of ideal a	and pract	tical sou	rces.		,	5	
8r			,	Uni	t-II	F						8 hrs.
Introd	uction:	Classif	fication	of mate	rials int	o condu	ictors, s	emi-con	ductors.	and ins	ulators.	Atomic
structu	re of Ger	manium	and Sili	con sem	i-conduc	ctors; int	rinsic an	d extrins	sic semic	onductor	ſs.	
				T T 1								4.11
G •		D: 1	DN .	Unit	<u>-111</u>	1	f	1	VI -1		- C DNI	14 hrs.
Semico	onductor	Diodes	S: PN Jui	nction, b	asic prir	iciples o	f operat	ion and	VI chara		s of PN j	unction
diode, s	diode, static and dynamic resistance of a diode. Use of a diode in rectifiers, half wave, full wave and bridge											
rectifie	rectifier with shunt capacitor filter, series inductor filter, Zener diode and its applications, as a voltage											
regulat	or, right (mung	uloue (I	LED).								



	<u>Unit-IV</u>		14 hrs.								
Transistors: Introduction of BJT	, working of PNP and NPN transist	or, input a	nd output characteristics,								
transistor configurations, biasing of	transistor configurations, biasing of a transistor, amplifying action of a transistor, comparison of different										
configurations, MOSFET, their characteristics and applications.											
RECOMMENDED BOOKS											
Title	Author	Publisher									
1. Basic Electronics and Linear	N N Bhargava and Kulshreshta	McGraw	Hill								
Circuits											
2. Electronics Devices and	Millman and Halkias	McGraw	Hill								
Circuits											

			Fu	ndamen	tals of E	lectroni	ics Engiı	neering	Lab						
Course	e	To rei	nforce	learning	throug	h hands	s-on ex	perience	by ex	amining	the el	ectrical			
Object	ives:	characte	eristics of	of variou	us semic	conducto	r device	es, such	as diode	es, BJTs	and FE	Ts. To			
		provide	the stud	ent with	the capa	bility to	measure	and reco	ord the ex	periment	tal data,	analyze			
		the resu	ilts of va	rious ser	nicondu	ctor devi	ces.								
Course	e	1.	To unde	erstand t	he funct	ioning o	f various	s electro	nic instru	uments li	ke CRO	, signal			
Outco	mes:		generate	or and m	ultimete	r.									
		2.	To unde	erstand th	ne charac	cteristics	of diode	e and BJ	T and ve	rify their	response	es.			
		3.	To cons	truct var	ious elec	tronic ci	rcuits on	the brea	d board a	and analy	ses their	output.			
			Mapping of course outcomes with program outcomes												
	PO1	PO2	PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12												
CO1															
CO2															
CO3															
		List of 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	Experim To meas To calcu To obse To obse To obse To obse To verif To cons its rippl To cons its rippl To stud	nents: sure valuate the prive the forve the V prive the V Fy the NH struct hal e factor. struct full e factor. by the ap	tes of dif value of front pan front pan VI charac VI charac PN and F f-wave r l-wave r plication	Efferent re various el of CR el of sig cteristics cteristics PNP tran rectifier, ectifier,	esistors b passive O. a of semi- a of Semi- a of Zene sistors. wave sha wave sha er diode a	by using component rator. conductor r diode i ape of the ape of the as a volta	the color ents usin or diode i n reverse e electric age regul	coding c g multim in forwar e bias. cal signal cal signal ator.	hart. eter. d bias. and cale and cale	culate			

EC-222 Audio Video Systems													
				L	Auulo		T	I	•		Credits		
				3			0	2	2		4		
		Sessio	nal Mar	:ks				1		50			
		End S	emester	Examir	nation M	larks					50		
Course		The of	ojective o	of teachi	ng this s	ubject is	to give s	tudents a	ın in dep	th know	ledge of	various	
Objectiv	ves:	electro	onic aud	io and v	video rec	cording	and play	back sy	stems. I	Further the	his subje	ect will	
		introd	uce the	students	with wo	orking p	rinciples	, main f	eatures	of consu	mer elec	ctronics	
		TV w	ls/goods/ hich in t	urn will	develor	Systems	, CD sys n. canabi	lems vC	K, LCD	, Plasma	, LED a t diagno	nu HD-	
		rectifi	cation in	a systen	natic way	V.	li capaol	nues or	assentor	ing, iau	t ulagilt	sis and	
Course	Course 1. Acquired knowledge of various types of microphones and loudspeakers												
Outcom	e:	2.	Learn	various s	stages of	Public /	Address s	vstems	iones un	a rouasp	ounors.		
		3.	Acquit	red know	ledge of	f workin	g princip	le of ma	gnetic ta	ne record	ding and	optical	
			record	ing. Vide	eo record	ling and	various	VCR for	mats.	T		-1	
		4. Understand various Display TV's like LCD, LED and HD- TV's.											
	Mapping of course outcomes with program outcomes												
I	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1													
CO2		\checkmark	\checkmark										
CO3			\checkmark										
CO4													
		•		Uni	i t-I							8 hrs.	
Microph	iones:	Workin	ıg princij	ple of co	ndenser	microph	one, coll	ar micro	phone, 7	Types of a	microph	ones.	
Loudspe	eakers:	piezoele	ectric mo	oving coi	1 Horn t	ype spea	ker, woo	fer, twee	eter, mid	-range sp	beaker,		
Crossove	er netwo	ork.											
				Uni	t-II						<u> </u>	8hrs	
Public a	address	system	n: Type	of amp	lifier, H	orn unit	t, echo ι	init, mix	ker-their	working	g princij	ple and	
CD/DVI	nion. D record	der/nla	ver• Blo	ck diaora	m and it	ts explan	ation ex	nlanatio	n of vari	ous cont	rols: and	lio	
recording	g and pla	avback:	heads s	stereo rec	cording.	tane sne	ed signa	l biasing		ous com	1015 , uu u	10	
Teeoranig	5 und pr	uj ouon,	neuus, s	Unit	-III	upe spe	ou, signu	i olusing	•			8 hrs.	
Video C	D playe	r/recor	der: Prin	nciples o	f video r	ecording	on magi	netic tape	es; video	tape rec	ording n	nedium.	
video cas	ssette fo	rmat; vi	ideo cass	sette spec	cification	ı.	0	I	,	1	U	,	
Amplifie	Amplifiers: Hi-Fi system, pre-amplifiers, amplifiers and equalizers, Stereo amplifiers.												
Unit-IV 8 hrs.													
Television: Introduction to LCD, Plasma, LED, and High Definition Television.													
Sound R	mechanism Digital sound recording on tape and Disc												
meenailly	sin, Dig	11.41 5001			ECOM	AENDE		<u>KS</u>					
Title				Autho	or		- 2001	 Pu	blisher				
1. Audio	. Audio Visual Systems Sanjay Attri. BPB Publishers New Delhi.									i.			
1. Audio	O Visual SystemsSanjay Attri.BPB Publishers New Delhi.												

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	Audio Video Systems Lab												
Cours	se	The ob	jective	of this 1	ab is to	provide	the ba	sic princ	piple and	1 working	g of publi	c address	
Objec	tives:	system	, LED T	".V., CD	/DVD p	olayer, V	'CD pla	yer. Fur	ther the	students	will be ab	le to plot	
		the dire	ectional	pattern o	of variou	is audio	and vid	eo equip	ment.				
Cours	se	1. Understand the working principle of different audio- video systems.											
Outco	mes:	2. Understand the response of loudspeaker, audio amplifier and microphones.											
	Mapping of course outcomes with program outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
C01						\checkmark							
CO2													
		List of 1. To 2. To 3. To 4. To 5. To 6. To 7. To 8. To 9. To 10. To	Expering plot the plot the study th understa study & study & study th study th study th	ments: directio directio e block und the r plot the plot the e block e block e block	nal patte nal patte diagram ecording frequen diagram diagram diagram diagram	ern of a l ern of a r and wo g and pla acy respo acy respo and wo and wo and wo and wo	oudspea noving of rking of ayback p onse of a onse of a rking of rking of rking of	aker. coil mic: an audio process of Audio A cross-ov Public a inciple of a CD/D a VCD	rophone o tape re of an auc mplifier er netwo address s of LED 7 VD play player th	ecorder. lio tape re prk used it system. Γ.V. yer trainer rainer.	ecorder. n stereo-a	mplifier.	



EC-223												
			Funda	mentals	s of Micı	roproces	sor & M	licrocon	troller		-	
]	Ĺ			Т		Р		Cre	edits
				3			1		4			6
		Session	al Mark	KS								50
		End Se	mester]	Examina	ation Ma	arks					-	50
Course	е	The obj	ective of	f the cour	rse is to o	expose to	o the stud	lents to t	he evolu	tion of m	nicroproc	cessors,
Object	ives:	the arch	itecture	and inst	ruction s	et of typ	ical 8-bi	t microp	rocessor	8085. It	also dea	als with
		Assemb	ly Lang	uage Pro	grammi	ng and in	put-out	out techn	iques. N	ext focus	s is to in	troduce
		the arch	itecture.	progran	nming, a	nd interf	acing of	8051 mi	crocontr	ollers.		
Course	n	1 Un	larstand	the evol	ution of	compute	r0					
Outco	r mes:	$\begin{array}{c} 1 \\ 2 \\ \mathbf{\lambda} \\ \mathbf{n} \end{array}$	leistailu	orchitaa	tunon of th	o Intol (15.		and and	9051 mia	nocontro	llon for
Outcon	ines.	2. And	i yse the	architec	ture of th	le mer d	5085 mic	roproces	sor and	8031 mic	rocontre	oner for
		its various applications.										
		3. App	3. Apply the programming techniques in designing simple assembly language programs									
		for	for solving simple problems by using instruction sets of microprocessor and									
		mic	microcontroller.									
4. Use the addressing modes and timing diagram for executing program efficiently.												
			Mappi	ng of co	urse out	tcomes v	vith prog	gram ou	tcomes			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
					<u>Unit-I</u>							14 hrs.
Introd	uction:	Typical	organiza	ation of	a micro	ocomput	er syster	m and f	functions	of its	various	blocks,
Microp	processo	r, its evol	ution, fu	inction, a	and its ap	oplicatio	ns.				005 6	. 1
Introd	uction t	0 8-bit N	licropro	cessor A	Architect	ture: Co	ncept of	Bus, bus	s organiz	ation of δ	8085, fur	
DIOCK C	nagram	01 8085,	lunction	s of each	Unit I	1 8085 ai r	cintectu	re, pin de	etans of a	5085 and	related	signals.
Momo	ries and	I/O Int	arfacing	• Momo	UIIIt-II	ization	concept	of mome	mu mann	ing part	itioning	of total
memor	v space	address	decoding		f y 0 g an	manned	I I/O and	l memor	v manne	d I/O R	asic Con	cept of
RAM, ROM, PROM, EPROM and EEPROM.												
Unit-III 12hrs.												
Progra	mming	using 80)85 Mici	roproces	ssor: 808	<u>-</u> 85: 8085	progran	nming m	odel, bri	ef ideas	of mach	ine and
assemb	ly langu	lages, ma	chines a	nd mnen	nonic co	les, basi	c idea of	instructi	on forma	at and add	dressing	modes.
basic c	oncept o	of instruct	tion set f	or data t	ransfer g	roup, ar	ithmetic	group, lo	ogic grou	p, stack,	subrouti	ne, I/O
and ma	and machine control group, writing assembly language programs.											



<u>Unit-IV</u>			14hrs.						
Architecture of 8051 Microcontroller: Architecture of 8051, I/O ports in 8051, basic concept of memory									
in 8051, basic idea of addressing Modes in 8051, basic idea of instructions in 8051.									
RECOMM	ENDED BOOKS								
Title	Author	Publisher							
1. Microprocessor Architecture- Programming &	Ramesh S Gaonkar	5th Edition, P	enram						
Applications with 8085/8080A		International l	Publishing						
2. Introduction of Microprocessors &	Ram B	4th Edition, D	hanpat Rai						
Microcomputers		Publisher (P)	Ltd.						
3. The 8051 Microcontroller	Kenneth J. Ayala	3rd Edition, C	lengage						
		Learning, 200	4						

]	Fundam	entals of	f Microp	processo	r & Mic	rocontr	oller La	b			
Course	e	The ob	ective of	this lab	is to fan	niliarize	the stude	ents with	architec	ture, pin	configu	ration	
Object	tives:	and pro	grammir	ng of 808	35 micro	processo	r kit. Fu	rther stu	dents wil	1 perform	n various	3	
		arithme	tic opera	tions on	micropr	ocessor	kit. The	basic con	ncept of	8051 mic	rocontro	oller	
		has also	been in	cluded in	n this lab				-				
Course	e	1.	Underst	and the a	architect	ure and	oin confi	guration	of 8085	micropro	ocessor a	ind	
Outco	mes:		8051 microcontroller.										
		2.	2. Implement various programs on 8085 microprocessor kit and 8051										
			microcontroller kit.										
			Mappi	ng of co	urse out	comes v	vith pro	gram ou	tcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1													
CO2													
		List of 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14.	Experim To study To get f Familian To fami Steps to Writing Writing Writing Writing To study To get f Familian To fami Steps to	y the arc amiliariz rization of liarize w enter, m and exe and	hitecture the with P of different with enter nodify da cution of cution of cution of cution of cution of hitecture the with P of different with enter nodify da	e of 8085 Pin Confi ent keys ring vari- ta/program f program f program f program f program f program f of 8051 Pin Confi ent keys ring vari- ta/program	Microp of 8085 ous steps am and t n for sub n for sub n for mu n for div Microco iguration of 8051 ous steps am and t	rocessor of 8085 micropre- s of a pro- to execut lition of otraction litiplicati ision of ontroller of 8051 microco s of a pro- to execut	Micropri ocessor k ogram in two 8 bit of two 8 on of two two 8 bit Microco ntroller k ogram in te a progr	rocessor. it. 8085 kit. ramme o t number bit numl o 8 bit nu c number ontroller. it. 8051 kit. ramme o	n 8085 k s. bers. imbers. s. n 8051 k	it. it.	



	EC-224 Troubleshooting of Audio- Video Equipment											
			T	oublesh	ooting o	ייייייייייייייייייייייייייייייייייייי	, , , , , , , , , , , , , , , , , , ,	D			Cradita	
			L 0	<u> </u>				I 			<u>2</u>	
Course Object	e tives:	The obj audio a working audio-s turn wit	jective o nd video g princip ystems, l ll develo	f this lat devices les, bloc LCD TV p in the	o is to g and syst k diagra f, LED T n capabi	ive stud tems. Fu m, main TV, VCI ilities of	ents an i arther this features player, assembl	n depth s subject of elect CD/DV ing, faul	knowled will int ronic ga D record t diagno	lge of va roduce th dgets/go ler/playe sis and r	rious ele ne studer ods/devie r etc. Wl ectificati	ectronic its with ces like hich in- ion in a
Cours	Δ	systema 1	<u>ttic way.</u> Trouble	shoot va	rious sec	ctions of		T				
Outco	mes:	2.	Fault fi	nding ii	n PA sy	/stems,	Cassette	Tape re	ecorder,	CD/DV	D/VCD	player,
			Manni	ng of co	urse ouf	tcomes v	with prog	gram ou	tcomes			
	PO1	PO2	PO3	PO4	P05	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	101	102	100	10. V	100	100	10/	100	107	1010	1011	1012
CO2	v V			V	V							
		List of 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17.	Experim To study To mean sections Fault Fi To under Fault Fi To study To mean sections Fault fin To study To mean TV Train To find To study To mean sections To find To study To mean sections To find To study To mean sections To find To study To mean sections	ents: y the blo sure the of PA s nding in erstand th nding in y the blo sure the of telep nding in y the blo sure the out fault y the blo sure the cD/DV out fault y the blo sure the out fault	ck diagra AC/DC ystem. Public a ne record Tape Tr ck diagra AC/DC hone trai different ck diagra AC/DC in differ ck diagra AC/DC D player in differ ck diagra AC/DC	am and voltage a address s ling and ansport am and voltage a iner. sections am and v voltage a rent sect am and v voltage a r trainer rent sect am and v voltage a r trainer rent sect am and v voltage a r trainer.	working and wave ystem. playback Mechani working and wave s of telep working at differe ions of L working and wave ions of C working and wave	of Public eform at of sm of a 0 principle eform at of hone tra principle nt points LED TV f of a CD/ eform at of CD/DVD of a VCI eform at of	e address different s of an au Cassette e of telep different iner. e of LED in Diffe trainer. DVD pla different player tr D player different	s system. points in ndio tape Tape Re hone train points in T.V. erent sect ayer train rainer. trainer. trainer. points in er.	n differen recorder ner. n differen ions of L ner. n differen	1t r. nt LED nt

Image: Net INORY THEORY Image: Net INFORY Image: Net INFORY Image: Net INFORY Image: Net INFORY Sessional Marks 50 End Semester Examination Marks 50 Course Objectives: The subject aims to provide the student with an understanding to analyse any given electrical network with help of fundamental techniques such as Kirchoff's laws, mesh and node analysis, network theorems, etc. Also aims to provide necessary background for understanding of various circuits and networks. Course Outcomes: 1. Able to apply the nodal and mesh methods of circuit analysis. Cut with the point of th	EC-228													
LLLCurrents3104Sessional Marks50End Semester Examination Marks50Objectives:Objectives:The subject aims to provide the student with an understanding to analyse any given electrical network with help of fundamental techniques such as Kirchoff's laws, mesh and node analysis, network theorems, etc. Also aims to provide necessary background for understanding of various circuits and networks.CourseOutcomes:A bale to apply the nodal and mesh methods of circuit analysis.Course outcomes with program outcomesMapping of course outcomes with program outcomesUnit-IPO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12CO3Vinit-IUnit-ILunit-IIntroduction: Voltage and current sources, relation between current, voltage, power and energy of DC sources, source transformation of branch, node and loop, Applications of Kirchoff's Current Law (KCL) by using nodal current method and Kirchoff's Voltage Law (KVL) using loop current method and branch current method for solving network problems, star-delta conversion.Unit-II12 hrs.Resonance and Magnetically Coupled Circuits: Introduction to resonance, Series resonance, Series resonance, Reallel resonance, Concept of self-inductance and mutual inductance, coupling coefficient, magnetically coupled circuits, Simple series and parallel circuits, Dot convention. <td coa<="" td=""><td></td><td></td><td></td><td></td><td>r</td><td>NEIW</td><td></td><td>HEORY</td><td>1</td><td>)</td><td></td><td>Crodite</td><td></td></td>	<td></td> <td></td> <td></td> <td></td> <td>r</td> <td>NEIW</td> <td></td> <td>HEORY</td> <td>1</td> <td>)</td> <td></td> <td>Crodite</td> <td></td>					r	NEIW		HEORY	1)		Crodite	
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Construction Solution End Semester Examination Marks 50 Course The subject aims to provide the student with an understanding to analyse any given electrical network with help of fundamental techniques such as Kirchoff's laws, mesh and node analysis, network theorems, etc. Also aims to provide necessary background for understanding of various circuits and networks. Course 1. Able to apply the nodal and mesh methods of circuit analysis. Outcomes: 2. Analyze the circuit using Kirchhoff's law and Network simplification theorems. 3. Able to use Laplace transformation to solve various circuits and use of test signals. Mapping of course outcomes with program outcomes Mapping of course outcomes with program outcomes CO1 V V V Image: CO3 V Image: CO3 CO2 V V V Image: CO3			Session	al Mark	5 'S		1			,	50			
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Course The subject aims to provide the student with an understanding to analyse any given electrical network with help of fundamental techniques such as Kirchoff's laws, mesh and node analysis, network theorems, etc. Also aims to provide necessary background for understanding of various circuits and nesh methods of circuit analysis. Course 1. Able to apply the nodal and mesh methods of circuit analysis. Outcomes: 2. Analyze the circuit using Kirchoff's law and Network simplification theorems. 3. Able to use Laplace transformation to solve various circuits and use of test signals. Mapping of course outcomes with program outcomes PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO11 PO12 CO3 V V V V Image: Comparison of the comparison. Unit-II 12 hrs. Network Theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, reciprocity theorem, maximum power transfer theorem and Tellegen's theorem for the solution of networks with DC excitation and AC excitation. 10 hrs.	C		The subject size to provide the student with an understanding to analyze and											
Objectives: The electrical network with help of fundamental techniques such as Kirchoff's laws, mesh and node analysis, network theorems, etc. Also aims to provide necessary background for understanding of various circuits and networks. Course 1. Able to apply the nodal and mesh methods of circuit analysis. Outcomes: 2. Analyze the circuit using Kirchhoff's law and Network simplification theorems. 3. Able to analyze resonant circuits and magnetically coupled circuits. 4. Able to use Laplace transformation to solve various circuits and use of test signals. Mapping of course outcomes with program outcomes CO1 $\sqrt{10}$ <	Cours	e	The subject aims to provide the student with an understanding to analyse any given											
Index analysis, network metorems, etc. Also anns to provide necessary background for understanding of various circuits and networks. Course 1. Able to apply the nodal and mesh methods of circuit analysis. Outcomes: 2. Analyze the circuit using Kirchhoff's law and Network simplification theorems. 3. Able to analyze resonant circuits and magnetically coupled circuits. 4. Able to use Laplace transformation to solve various circuits and use of test signals. Vertice Mapping of course outcomes with program outcomes PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 CO2 V <t< td=""><td>Object</td><td>lives:</td><td>electri</td><td colspan="10">electrical network with neip of fundamental techniques such as Kirchoff's laws, mesh and</td></t<>	Object	lives:	electri	electrical network with neip of fundamental techniques such as Kirchoff's laws, mesh and										
Course 1. Able to apply the nodal and mesh methods of circuit analysis. Outcomes: 1. Able to apply the nodal and mesh methods of circuit analysis. 2. Analyze the circuit using Kirchhoff's law and Network simplification theorems. 3. Able to analyze resonant circuits and magnetically coupled circuits. 4. Able to use Laplace transformation to solve various circuits and use of test signals. Mapping of course outcomes with program outcomes CO1 VO PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 CO2 V V V V V V V V CO3 V V V V V V V V CO4 V			under	understanding of various circuits and networks										
Course 1. Able to apply the house and means methods or check marysis. Outcomes: 2. Analyze the circuit using Kirchhoff's law and Network simplification theorems. 3. Able to analyze resonant circuits and magnetically coupled circuits. 4. Able to use Laplace transformation to solve various circuits and use of test signals. Mapping of course outcomes with program outcomes PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 CO1 $$	Cours	0	1 Able to emply the nodel and mathematical of circuit enclusic											
J. Analyze the circuit using Kitchinor s raw and retrieves simplification directions. 3. Able to analyze resonant circuits and magnetically coupled circuits. 4. Able to use Laplace transformation to solve various circuits and use of test signals. Mapping of course outcomes with program outcomes PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 CO1 $$	Outco	t mes:	1.	Analyze	the circ	uit using	Kirchh	off's law	and Net	un anary work sir	515. nnlificati	on theor	ems	
A. Able to use Laplace transformation to solve various circuits and use of test signals.Mapping of course outcomes with program outcomesPO1PO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12CO1 $\sqrt{1}$ <td>Outco</td> <td>mes.</td> <td>2.</td> <td>Able to</td> <td>analyze</td> <td>resonant</td> <td>circuits</td> <td>and mag</td> <td>and Net netically</td> <td></td> <td>d circuits</td> <td></td> <td>cills.</td>	Outco	mes.	2.	Able to	analyze	resonant	circuits	and mag	and Net netically		d circuits		cills.	
Mapping of course outcomes with program outcomesPO1PO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12CO1 $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ CO2 $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ CO3 $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ CO4 $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ CO4 $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ $\sqrt{1}$ Unit-I14 hrs.Introduction: Voltage and current sources, relation between current, voltage, power and energy of DC sources, Source transformation, formation of branch, node and loop, Applications of Kirchoff's Current Law (KCL) by using nodal current method and Kirchoff's Voltage Law (KVL) using loop current method and branch current method for solving network problems, star-delta conversion.12 hrs.Network Theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, reciprocity theorem, maximum power transfer theorem and Tellegen's theorem for the solution of networks with DC excitation and AC excitation.12 hrs.Economic Unit-III12 hrs.Resonance and Magnetically Coupled Circuits: Introduction to resonance, Series resonance, Parallel resonance, Concept of self-inductance and mutual inductance, coupling coefficient, magnetically coupled circuits, Simple series and parallel circuits, Dot convention.Unit-IV10 hrs. <t< td=""><td></td><td></td><td>3.</td><td></td><td>use Lank</td><td>ace trans</td><td>formati</td><td>on to soly</td><td>ve variou</td><td>is circuit</td><td>s and use</td><td>of test</td><td>signals</td></t<>			3 .		use Lank	ace trans	formati	on to soly	ve variou	is circuit	s and use	of test	signals	
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CO1 V V V V V CO2 V V V V V V CO3 V V V V V V CO4 V V V V V V V CO4 V V V V V V V V Unit-II 14 hrs. 14 hrs. 14 hrs. 14 hrs. Introduction: Voltage and current sources, relation between current, voltage, power and energy of DC Sources, Source transformation, formation of branch, node and loop, Applications of Kirchoff's Current Law (KCL) by using nodal current method and Kirchoff's Voltage Law (KVL) using loop current method and branch current method for solving network problems, star-delta conversion. 12 hrs. Network Theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, recip		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO2 V V V Image: CO3 V V Image: CO3 V V V V Image: CO3 V V V V V V Image: CO4 V V V V V V V V Image: CO4 V V V V V V Image: CO4 V V V V V Image: CO4 V V V V V Image: CO4 V V V V Image: CO4 Image: CO4 <thimage: co4<="" th=""> Image: CO4</thimage:>	CO1													
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Introduction: Voltage and current sources, relation between current, voltage, power and energy of DC sources, Source transformation, formation of branch, node and loop, Applications of Kirchoff's Current Law (KCL) by using nodal current method and Kirchoff's Voltage Law (KVL) using loop current method and branch current method for solving network problems, star-delta conversion.Unit-II12 hrs.Network Theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, reciprocity theorem, maximum power transfer theorem and Tellegen's theorem for the solution of networks with DC excitation and AC excitation.Unit-III12 hrs.Resonance and Magnetically Coupled Circuits: Introduction to resonance, Series resonance, Parallel resonance, Concept of self-inductance and mutual inductance, coupling coefficient, magnetically coupled circuits, Dot convention.Unit-IV10 hrs.Standard Test Signals: Unit step, ramp, impulse, gate and shifted functions and their Laplace transforms, Filters: Introduction to low pass, high pass, band pass and band elimination filters, prototype LC and RC		•	•	•	Un	it-I		•	•				14 hrs.	
sources, Source transformation, formation of branch, node and loop, Applications of Kirchoff's Current Law (KCL) by using nodal current method and Kirchoff's Voltage Law (KVL) using loop current method and branch current method for solving network problems, star-delta conversion. Unit-II 12 hrs. Network Theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, reciprocity theorem, maximum power transfer theorem and Tellegen's theorem for the solution of networks with DC excitation and AC excitation. 12 hrs. Resonance and Magnetically Coupled Circuits: Introduction to resonance, Series resonance, Parallel resonance, Concept of self-inductance and mutual inductance, coupling coefficient, magnetically coupled circuits, Simple series and parallel circuits, Dot convention. 10 hrs. Standard Test Signals: Unit step, ramp, impulse, gate and shifted functions and their Laplace transforms, Filters:	Introd	uction:	Voltage	and cur	rent sou	rces, rela	ation be	tween cu	rrent, vo	oltage, p	ower and	l energy	of DC	
(KCL) by using nodal current method and Kirchoff's Voltage Law (KVL) using loop current method and branch current method for solving network problems, star-delta conversion. 12 hrs. Network Theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, reciprocity theorem, maximum power transfer theorem and Tellegen's theorem for the solution of networks with DC excitation and AC excitation. 12 hrs. Resonance and Magnetically Coupled Circuits: Introduction to resonance, Series resonance, Parallel resonance, Concept of self-inductance and mutual inductance, coupling coefficient, magnetically coupled circuits, Dot convention. 10 hrs. Standard Test Signals: Unit step, ramp, impulse, gate and shifted functions and their Laplace transforms, Filters: Introduction to low pass, high pass, band pass and band elimination filters, prototype LC and RC Gircuits	source	s, Source	e transfor	mation, f	formation	n of bran	ch, node	and loop	o, Applic	ations of	f Kirchof	f's Curre	ent Law	
branch current method for solving network problems, star-delta conversion.Unit-II12 hrs.Network Theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, reciprocity theorem, maximum power transfer theorem and Tellegen's theorem for the solution of networks with DC excitation and AC excitation.Unit-III12 hrs.Resonance and Magnetically Coupled Circuits: Introduction to resonance, Series resonance, Parallel resonance, Concept of self-inductance and mutual inductance, coupling coefficient, magnetically coupled circuits, Simple series and parallel circuits, Dot convention.Unit-IV10 hrs.Standard Test Signals: Unit step, ramp, impulse, gate and shifted functions and their Laplace transforms, Filters: Introduction to low pass, high pass, band pass and band elimination filters, prototype LC and RC	(KCL)	by usin	g nodal c	current m	nethod ar	nd Kirch	off's Vo	ltage La	w (KVL) using l	oop curr	ent meth	nod and	
Unit-II12 hrs.Network Theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, reciprocity theorem, maximum power transfer theorem and Tellegen's theorem for the solution of networks with DC excitation and AC excitation.ItemsImage: Image:	branch	current	method f	for solvin	ig netwo	rk proble	ems, star	-delta co	nversior	1.				
Network Theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, reciprocity theorem, maximum power transfer theorem and Tellegen's theorem for the solution of networks with DC excitation and AC excitation.Unit-III12 hrs.Resonance and Magnetically Coupled Circuits: Introduction to resonance, Series resonance, Parallel resonance, Concept of self-inductance and mutual inductance, coupling coefficient, magnetically coupled circuits, Simple series and parallel circuits, Dot convention.Unit-IV10 hrs.Standard Test Signals: Unit step, ramp, impulse, gate and shifted functions and their Laplace transforms, Filters: Introduction to low pass, high pass, band pass and band elimination filters, prototype LC and RC					Uni	t-II							12 hrs.	
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and AC excitation. Unit-III 12 hrs. Resonance and Magnetically Coupled Circuits: Introduction to resonance, Series resonance, Parallel resonance, Concept of self-inductance and mutual inductance, coupling coefficient, magnetically coupled circuits, Simple series and parallel circuits, Dot convention. Image: Total Series and Parallel Circuits and Par	maxim	um pow	er transfe	er theore	m and T	ellegen's	theorer	n for the	solution	of netw	orks with	h DC ex	citation	
Unit-III12 hrs.Resonance and Magnetically Coupled Circuits:Introduction to resonance, Series resonance, Parallel resonance, Concept of self-inductance and mutual inductance, coupling coefficient, magnetically coupled circuits, Simple series and parallel circuits, Dot convention.Unit-IV10 hrs.Standard Test Signals:Unit step, ramp, impulse, gate and shifted functions and their Laplace transforms, Filters:Filters:Introduction to low pass, high pass, band pass and band elimination filters, prototype LC and RC	and AC	C excitat	ion.											
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Line 10 hrs. Standard Test Signals: Unit step, ramp, impulse, gate and shifted functions and their Laplace transforms, Filters: Introduction to low pass, high pass, band pass and band elimination filters, prototype LC and RC	resonance, Concept of self-inductance and mutual inductance, coupling coefficient, magnetically coupled													
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Standard Test Signals: Unit step, ramp, impulse, gate and shifted functions and their Laplace transforms, Filters: Introduction to low pass, high pass, band pass and band elimination filters, prototype LC and RC	G4 7		a • •	TT •	Unit	t <u>-IV</u>		1 1 1 0	1.6	1	1 • • •		<u>10 hrs.</u>	
Filters: Introduction to low pass, high pass, band pass and band elimination filters, prototype LC and RC	Standa	ard Test	t Signals:	Unit st	ep, ramp	, impuls	e, gate a	nd shifte	a functio	ons and t	neir Lap	lace tran	storms,	
	filtor:	: Introc	iuction to	o low pas	s, nigh p	bass, ban	u pass a	nd band	emmnat	ion filter	s, protot	ype LC a	and KC	



RECOMMENDED BOOKS											
Title	Author	Publisher									
1. Fundamentals of Electric Circuits	Charles K. Alexander and Matthew N.O. Sadiku	Tata McGraw Hill									
2. Network Analysis	Van Valkenburg	Prentice Hall of India									
3. Networks and Systems	D. Roy Choudhary	New Age International									
4. Circuit and Networks: Analysis and Synthesis	A. Sudhakar and S. Palli	Tata McGraw Hill									

	EC-229												
			Tre	oublesho	ooting of	f Electro	onics Eq	uipmen	t-II				
		L				Т		Р		Credits			
		0				0		4		2			
Course	e	The cou	urse prov	vides the	students	with ne	cessary k	knowled	ge and co	ompetenc	y to diag	gnose	
Object	tives:	the faul	ts for tro	uble sho	oting an	d for sys	stematic	repair ar	nd mainte	enance of	electron	iic	
		equipm	ent and t	esting of	f compoi	nents.							
Course 1. Find faults as well as repair various electronic equipment like								like mobi	ile teleph	iones,			
Outco	mes:		C.R.O,	function	generato	or, powe	r supplie	s, digita	l multim	eter			
		2.	Analyse	e the deta	iled fun	ctioning	, fault fir	nding an	d repair o	of UPS a	nd home		
			inverter	system.					4				
		[Mapping of course outcomes with program outcomes										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1													
CO2		\checkmark											
CO3													
		List of 1. Dem 2. Dem 3. Dem 4. Dem 5. Dem 6. To s 7. To m UPS sy 8. To st 9. To n home in 10. Der 11. Der 12. Tes 13. Use	Experim onstratio onstratio onstratio onstratio onstratio onstratio onstratio onstratio tudy the heasure the neasure the neasu	nents: in and pro- in and pro- in and pro- in and pro- in and pro- block dia he AC/D ner. block dia he AC/D ystem tra- on, pract- negrated al tools f	actice of actice of actice of actice of actice of agram an C voltag iner. tice of fa tice of fa l Circuits or troubl	fault fir fault fir fault fir fault fir fault fir d worki ge and w ad working and working and working and working for and w and working and working for and w and working for and working for any for any fo	nding and nding and nding and nding and nding princ aveform ng princi aveform ng and re ng and re ng digital	l repair of l repair of l repair of l repair of l repair of l repair of at differ epair of epair of l equipm	of mobile of C.R.O of Functi of Power of Digita JPS syste ent point ome inve ent point UPS syst home inve	e telephor on Gener supplies I multime em traine t in Diffe erter syste t in Diffe tem.	nes. rator. eter. r. rent secti rent secti tem.	ion of r. ion of	

EC-221												
		1		Fundan	ientals (of Electr	onics Ei	ngineeri	ng		<u>a</u> 14	
				L			<u>T</u>		P		Credits	
				3			0		2		4	
		Sessio	nal Mai	<u>ks</u>							<u>50</u>	
		End S	emester	Exami	nation N	larks					50	
Course	9	The c	ourse in	tends to	provide	e the bas	sic conce	ept and	characte	ristics of	the ele	ctronics
Object	ives:	device	s such a	s diode,	BJT, FE	ET, etc. A	Also aims	s to prov	vide the u	ınderstan	ding app	olication
		of diff	erent ele	ctronics	devices	and sim	ple circu	its.				
Course	e	1.	To acq	uire kno	owledge	about s	emicond	luctor pl	hysics fo	or intrins	ic and e	extrinsic
Outco	mes:		materia	ls.								
		2. This course gives an overview of various semiconductor devices.										
	3. Acquired knowledge about active and passive components, voltage and current											
	sources.											
	4. Able to understand the working principles of electronic circuits e.g., Rectifiers,											
	Filters, Regulated circuits, etc.											
	1	1	Mappi	ng of co	urse ou	tcomes v	with pro	gram o	utcomes	1	n	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
				Un	it-I							10 hrs.
Active	and Pa	ssive C	ompone	nts: Int	roductio	n to act	ive and	passive	compon	ents; fix	ed and	variable
resistar	nces, their	r various	s types fi	xed and	variable	capacito	rs, their	various	types and	l importa	nt specif	ications
and col	or codes.		51			1	,		51	1	I	
Voltag	e and cu	rrent so	ources –	concept	of const	ant volta	iges and	constant	t current	sources.	symbol a	and
graphic	al renres	entation	charact	eristics	of ideal	and prac	tical sour	rces			symeet	
grapine	ai repies	cintation	, charact	In:	4 TT	and prac	lical sou	1005.				10 hm
Introd	notions	Close	Section	of moto	<u>1-11</u>	o condi	atora a		duatana	and inc	1104040	Atomio
Ιπιγοά	ucuon:	Classii		of mate	riais int	lo condu	ictors, s	emi-con	ductors,	and ins	ulators,	Atomic
structu	re of Ger	manıum	and Sili	con sem	1-conduc	ctors; int	rinsic an	d extrins	sic semic	conductor	ſS.	
	Unit-III 12 hrs.											
Semico	Semiconductor Diodes: PN junction, basic principles of operation and VI characteristics of PN junction											
diode,	static and	l dynam	ic resista	ince of a	diode. U	Jse of a	diode in	rectifier	s, half w	ave, full	wave and	l bridge
rectifie	r with sh	nunt car	acitor fi	lter, ser	ies indu	ctor filte	r, Zener	diode a	and its a	pplicatio	ns, as a	voltage
regulat	or, light e	emitting	diode (I	LED).							,	U
Ŭ	. 0	U	Ň	,								



	<u>Unit-IV</u>		12 hrs.								
Transistors: Introduction of BJT	, working of PNP and NPN transist	or, input a	nd output characteristics,								
transistor configurations, biasing of a transistor, amplifying action of a transistor, comparison of different											
configurations, MOSFET, their characteristics and applications.											
RECOMMENDED BOOKS											
Title	Author	Publisher									
1. Basic Electronics and Linear	N. N. Bhargava and Kulshreshta	McGraw	Hill								
Circuits	Circuits										
2. Electronics Devices and Miliman and Halkias McGraw Hill											
Circuits											

			Fu	ndamen	tals of E	lectroni	cs Engin	neering l	Lab				
Course	e	To rei	nforce 1	learning	througl	h hands	on exp	perience	by ex	amining	the el	ectrical	
Object	ives:	characte	eristics of	of variou	is semic	onducto	r devices	s, such	as diode	es, BJTs	and FE	Ts. To	
		provide	the stude	ent with	the capa	bility to a	measure	and reco	rd the ex	perimen	tal data, a	analyze	
		the resu	lts of var	rious ser	niconduc	ctor devi	ces.						
Course	e	4.	To unde	erstand t	he functi	ioning of	f various	electror	nic instru	iments li	ke CRO	, signal	
Outco	mes:		generato	or and m	ultimeter	r.							
		5.	To unde	erstand th	ne charac	cteristics	of diode	and BJ7	Γ and ver	rify their	response	es.	
		6.	To cons	truct var	ious elec	tronic ci	rcuits on	the bread	d board a	and analy	ses their	output.	
			Mappi	ng of co	urse out	comes v	vith prog	gram ou	tcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1													
CO2						\checkmark							
CO3													
		List of	List of Experiments:										
		1.	1. To measure values of different resistors by using the color coding chart.										
		2.	 To calculate the value of various passive components using multimeter. 										
		3.	3. To observe the front panel of CRO.										
		4.	 To observe the front panel of signal generator. 										
		5.	5. To observe the VI characteristics of semiconductor diode in forward bias.										
		6.	6. To observe the VI characteristics of Zener diode in reverse bias.										
		7.	7. To verify the NPN and PNP transistors.										
		8.	8. To construct half-wave rectifier, wave shape of the electrical signal and calculate										
			its ripple	e factor.									
		9.	To cons	truct full	l-wave re	ectifier, v	wave sha	pe of the	e electric	al signal	and calc	ulate	
			its ripple factor.										
		10.	To stud	ly the ap	plication	of Zene	r diode a	is a volta	ge regul	ator.			



		EC-311 Electromagnetic Field Theory										
L T P Credits												
				<u>L</u> 3		0)		3	
		Sessio	nal Ma	rks		v			,		50	
		End S	emester	· Examin	nation N	Iarks					50	
Course		The o	objective	e of this	s course	e is to	impart	fundame	ental co	ncepts i	n the a	area of
Objectiv	ves:	electro	magnet	ic field a	and wav	e propag	ation. V	arious p	arameter	rs related	to a fie	eld like
		potent	ial, flux,	, charge o	density,	field inte	nsity and	d energy	density	is covere	d. Next f	focus is
		to give	e the brid	ef descrij	ption abo	out Maxy	well's eq	uation fo	or electro	magneti	c field ai	nd their
		propag	gation. E	Basic idea	a about t	ransmiss	ion lines	is also c	overed.			
Course		1.	Under	stand fur	ndament	al terms	related to	o electroi	magnetic	field.		
Outcom	nes:	2.	Apply	Maxwel	l's equat	tions for	electrom	agnetic v	wave pro	pagatior	l.	
		3.	Under	stand fur	ndament	al terms	related to	o transmi	ission lin	les.		
		4.	<u>U</u> nder	stand fur	idament	als of wa	ve trans	mission i	n differe	ent media	ι.	
	PO1	PO2			PO5	PO6	PO7	PO8	POQ	PO10	PO11	PO12
CO1	101	$\frac{102}{}$	105	$\sqrt{104}$	$\frac{105}{}$	100	10/	100	10)	1010	1011	1012
CO2		V		V.	, √							
CO3												
CO4						\checkmark						
				Un	it-I							12 hrs.
vectors, different Static E potential capacito	differen t co-ordi Electric l, charge r, diverg	t co-ord nate sys Field: F e density gence th	fr Analy linate sy stems, lin Force be y, gradie eorem.	stems, ca ne integra tween po ent of po	artesian, al, surfac bint char tential, c	cylindric ce integra ges, cou electric f	cal and sp al and vo lombs la lux, flux	pherical plume int w, electric density	systems, ægral. ric field , Gauss'	in and in transfor intensity s law, er	mation b r, electric nergy der	etween c scalar nsity in
				Uni	t-II							12hrs.
Static M magnetic potential Time V	Aagneti c flux c l. arying	c Field: lensity, Fields:	Biot-S Ampero Faraday	avart law es law, 's law, r	w, force Maxwel	on mov l equation	ing char ons, ener r in a ch	rge and rgy dens nanging 1	current sity in in magnetic	element, nductor, e field, S	magneti magneto toke's th	ic flux, o static neorem,
Maxwel	l equation	on from	n Farada	ay's law	, displac	cement c	current,	Maxwell	's equat	ion fron	n amper	es law,
				Unit	t-III							12 hrs.
Wave T wave eq for wave pointing	ransmis uation f es in spa vector,	ssion: Mor a con ace, plar reflectio	laxwell of ducting the waves on of wa	equations medium s at inter ve.	s, plane v , sinusoi faces, gr	waves, El idal time coup velo	M wave i variatio ocity, pha	in a homo ns, reflec ase veloc	ogeneous ction coe city, pow	s mediun fficient, ver and e	n, uniforr wave eq nergy re	n plane uations lations,
	· · · -		r	Uni	<u>t-IV</u> .	• •						12 hrs.
Transm distribut	tission l	L ines:] racterist	Introduc	tion, bas dance, pr	sic princ opagatic	ciples, te on consta	ermination Int attenu	on lines ation co	with loa nstant, p	ad, volta hase con	ige and istant, rei	current flection

Page 42

coefficient, VSWR, open and short circuited transmission lines and their impedances, stub matching, types of high frequency transmission lines.

	RECOMMENDE	D BOOKS
Title	Author	Publisher
1. Electromagnetic Engineering	Hayt	Mcgraw Hill
2. Field theory	Gangadhar	Khanna
3. Electromagnetic	Karus	Mcgraw Hill
4. Electromagnetic Fields and	K.D. Prasad	Satya Prakashan
Waves		

EC-312 Linear IC's & Applications												
		1			mear ic	ν δα Αμ Τ	plication	115 T)		Crodite	
				<u>L</u> 2		1			1		Greans	
		Secto	nal Mar	J		L		4	•		<u> </u>	
		Sessio End S		rks . F	4°	r1					50	
		Ena S	emester	Exami	nation M	larks					50	
Course	e	Learni	ng op-a	mp and i	ts charac	eteristics	. Ability	to desig	n differe	ent config	gurations	s of op-
Object	ives:	amp c	ircuits a	and desig	gn linear	and no	on-linear	op-amp	applica	tions, ac	tive filte	ers, and
		detecto	ors. Also	o analyse	s of 555	timer IC						
Course	e	1.	Acqui	red know	vledge of	fundam	ental cha	aracterist	tics of op	o-amps.		
Outco	mes:	2.	To ana	alyze op-	amps wi	th and w	vithout us	sing feed	back and	d determ	ine how	
			negati	ve feedb	ack effec	ts the pe	erforman	ce of op-	-amps.			
		3.	To lea	rn the lir	near appl	ications	of operat	tional an	plifiers.			
		4.	To stu	dy vario	us applic	ations u	sing 555	timer.				
			Mappi	ng of co	urse out	comes v	vith prog	gram ou	tcomes			-
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
				Un	it-I							14 hrs.
Introd	uction: E	Basic Op	o-amp ar	nd its sch	nematic s	symbol,	Block di	iagram o	of a typic	cal Op-A	mp, inte	grated
circuits	s and the	eir type	s, IC p	ackage t	types, 74	41 pin	configura	ation, ch	naracteri	stics and	l perfor	mance
parame	eters of O	p-Amp,	equivale	ent circui	it of an Io	deal and	practical	l Op-Am	p and its	s voltage	transfer	curve.
Practio	cal Op-A	mp: Inp	ut offset	voltage.	. Input bi	as curre	nt. Input	offset cu	irrent, to	tal outpu	t offset v	voltage.
Therma	al drift, V	^v ariation	of op-a	mp para	meters w	with supp	oly volta	ge and te	emperati	ure, Nois	e, CMR	R, slew
rate.	,		1					C	I	,		,
				Uni	t-II							14 hrs.
Opera	tional an	plifier	applicat	tions: O	p-amp as	s inverti	ng amplit	fier, non	-invertir	ig amplif	ier, Diff	erential
amplifi	ier, voltag	ge follov	ver, com	parator,	adder, su	ubtractor	, integra	tor, diffe	rentiato	r, zero cr	ossing d	etector,
level de	etector, so	quare wa	ave gene	erator, vo	ltage to	current c	converter	, current	to volta	ge conve	rter.	
Negati	Negative feedback in op-amps: Block diagram representation of feedback configurations, Voltage-current,											
Voltage- voltage, Current-current, Current- voltage topologies.												
				<u>Unit</u>	t-III							10 hrs.
Voltag	Voltage regulator ICs: Concept of regulation, principal of series and shunt regulator, three terminals											
voltage	e regulato	r ICs (po	ositive, a	and nega	tive) and	their ap	plication	is (78XX	and 792	XX).		



<u>Unit-IV</u>		10 hrs.								
Specialized IC applications: 555 timer IC and i	Specialized IC applications: 555 timer IC and its pin configuration, Block diagram, application of 555 as									
Monostable and Astable Multivibrator.										
RECOM	MENDED BOOKS									
Title	Author	Publisher								
1. Op Amps & Linear Integrated circuits	Ramakant Gayakwad	Pearson Education								
2. Operational Amplifiers and linear integrated	R.F. Coughlin & F.F.	Prentice Hall								
circuits	Driscol									
3. Design with Operational Amplifiers and	S. Franco	Tata Mc-Graw Hill								
Analog Integrated Circuits										

				Line	ar IC's a	and App	olication	s Lab						
Course	e	This lat	o aims to	study th	ne basic	principle	es, config	guration	s, and pr	actical li	mitations	s of op-		
Object	tives:	amp. To	o underst	and the	various l	inear an	d non-lir	ear appl	ications	of op-am	ıp.	1		
Course	e	1.	Analyse	and dei	gn basic	op-amp	circuits,	particul	arly vario	ous linea	r and noi	n-linear		
Outco	mes:		circuits.	active f	ilters, sig	gnal gen	erators, a	ind data	converte	rs.				
		2.	Analyse	e and de	eign op-	amp os	cillators.	single	chip os	cillators	and fre	quency		
			generate	ors.	0 1	1		U	1			1 2		
		3.	Examin	e the ope	ration of	f a PLL a	and verifi	cation o	f hardwa	re results	in using	SPICE		
			Mappi	ng of co	urse out	tcomes v	with prog	gram ou	itcomes		<u> </u>			
	PO1	PO2	D2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12											
CO1														
CO2														
CO3														
		List of 1. To 2. To 3. Ap 4. Ap 5. To 6. To 7. Ap 8. Ap 9. Ap 10. De at nea 11. To 12. To 13. To 14. To 15. To	Experi study co measure oplication use the Design oplication oplication oplication oplication sign seri a load co cessary t Design Design design	ments: omparato e the perf n of Op a n of Op-a Op-Amp different n of Op A n of Op A es regula urrent o ransistor a delay c a +5V un +5V reg dual regu	or using of formance imp as Ir amp as No as sumi iator and amp as L Amp as Z Amp as Z ators with f 1.5 An gain and bircuit us oregulated polated pol alated pol o curren	op amp. e parame nverting lon Inve ming, sc. l Integra ow-pass quare w Zero Cro h an erro np. Use d the ma ing555. ed power ower sup ower sup t and cu	eters of a amplifier rting amp aling & a tor using a and Hig ave gene ssing det or amplif a 741 (ximum p r supply. ply. ply. rrent to V	n Op-am r. plifier. averaging g Op-Am h-pass fi- rator. sector an ier to pro Dp-Amp bower dis	ap. g amplifi p. ilter. d windov ovide an and spe ssipation	er. w detecto output vo cify the of the tra-	or. oltage of Zener v ansistor.	5 volt oltage		

	EC-313 Digital Communication											
				T	Digital		nication	1			Cuadita	
								1				
		G		<u> </u>				4	2		5	
		Sessio			. N	r 1					50	
		End S	emester	· Exami	nation M	larks					50	
Course	e	The c	ourse ai	ms at stu	dying th	e concej	ots of dig	ital com	municati	ion with	the intro	duction
Object	tives:	to vai	ious cor	nponents	s of digi	tal com	nunicatio	on syster	ns. The	students	will und	erstand
		the pi	ocedure	s and mo	dulation	technia	ues invol	ved in d	evelopin	g digital	commur	nication
	system and explore the utility of digital signals for extended applications.											
Cours	0	1 G	in know	vladga ak	out the f	Sindomo	ntal conc	popts of	ligital or	mmunio	otion sus	atoma
Outco	t mas:	1.00	ann Know	vieuge at	nal into	digital si	anal and	apply of C	iighai ce	na codas	ation sys	sterns.
Outco	3. Identify the benefits of digital signals for applying suitably in multiple access											
	techniques											
	4. Acquire knowledge about digital modulations schemes.											
	Mapping of course outcomes with program outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	101	10−	100 V	10 . √	100	100	10/	100	10,	1010	1011	1012
CO2		V		v v								
CO2		V	J	,	V							
CO4		V	بر ا		,							
		,	•	Un	it-I							12 hrs.
Eleme	nts of T	Dioital	Commu	nication	n: Block	diaora	m of Γ	Divital (ommun	ication s	system	Divital
represe	entation of	f Analos	y signals	Advant	ages and	l Disadv	antages c	of Digita		unication	system	Digitai
Conce	nt of am	ount of	Inform	ation a	nd entro	nv. Rat	e of info	rmation	Shanno	n Fano	Source (Coding
Huffm	an source	coding	morm			py. Kat		mation	, Shanne	JI T allo	Source V	Journe,
IIuIIII		coung.		Uni	t-II							14 hrs
Samul	ing Theo	rem• Sa	mnling	Natural	samnling	That to	n samnlii	ng Samr	ling Rat	te Aliasi	nσ	14 11 5.
Pulse	Code Mo	dulatio	n• Block	k diagrai	n of PC	M syste	m Quan	tization	Delta M	lodulatio	n conti	nuously
variabl	ruse Coue Modulation; Diock diagram of PCW system, Quantization, Delta Modulation, continuously											
variation	Unit-III 12 hrs											
Line C	Coding: L	ine Coc	ling & it	ts prope	rties NF	RZ & R7	types s	ionalino	format f	for unipo	lar Pola	r
bipolar	r (AMI) ai	nd Man	chester o	oding.			, Pes, s	-9	- or mut 1	or unpo	, 1 010	-,
Multi	plexing T	echnio	ues: Fun	damenta	ls of tim	e and fre	equency of	division	multiple	xing.		
Multir	Multiple Access Techniques: Basics of TDMA FDMA and CDMA											



Unit-IV 10 hrs.											
Digital Carrier Modulation Techniques: In	ntroduction, Amplitude S	hift Keying (ASK), ASK Spectrum,								
ASK Modulator, Frequency Shift Keying (FSK), PSK.											
Digital Carrier Demodulation Techniques	: Coherent ASK Detector	, Non-cohere	ent ASK Detector, Non-								
coherent FSK Detector, Coherent FSK Detector	ctor.										
RECO	OMMENDED BOOKS										
Title	Author	Publis	sher								
1 Principles of Communication Systems	Taub and Schilling	Tata McGr	aw-Hill Education								
2. Introduction to Communication Systems	Gary M. Miller	6 th edit	ion, Prentice-Hall, 1999								
3. Modern Electronic Communication	D. Roy Choudhary	New Age I	nternational								
4. Modulation and Coding Techniques in	Evgenii	WILEY, 20)11.								
Wireless Communications	Krouk, Sergei										
	Semenov										
5. Digital Communication	E.A. Lee and D.G.	Kluwer	r Academic								
	Messerschmitt	Publish	ners,1994								

					Digital	Commu	nicatio	n Lab				
Cours Object	e tives:	This la and to unders	ab aims prepa tand ar	s to und re math nd analy	derstand nematication ses the	the bu al back signal	iilding ground flow in	blocks for cor a digita	of digit mmunic al comn	cal comm cation signunicatio	unicatio gnal ana n system	n system lysis. To
Cours	e	1. Anal	yze the	perform	nance of	a baseb	and and	pass bar	nd digita	al commu	nication s	ystem.
Outco	mes:	2. Unde	erstand	and ana	lyze the	various	data for	mats use	ed in dig	gital comm	nunication	n.
	1	1	Map	ping of o	course o	outcome	s with p	orogram	outcor	nes		
001	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
$\frac{\text{CO1}}{\text{CO2}}$			N	N		N						
002				,	I	,	l					
		List of	f Expe	riments	5:							
	1. Study of Sampling and reconstruction techniques.											
		2. Study of Pulse code modulation and demodulation.										
		3.	Study	of Delta	modula	ition and	d democ	dulation.				
		4.	Study	of differ	ent data	a format	s/line co	odes.				
		5.	Study	of data	coding t	echniqu	es.					
		6.	Study	of ASK r	nodulati	ion and	demodu	lation.				
	7. Study of FSK modulation and demodulation.											
	8. Study of PSK modulation and demodulation.											
	9. Study of TDM PCM receiver and transmitter.											
	10. Study of Adaptive Delta modulation and demodulation.											

						EC	-314						
					Elec	tronic [•]	worksh	op-II					
				L			Т		Р		Cred	lits	
				0			0		4		2		
Cours	se	To ma	ake stud	ents fan	niliar wi	th diffe	rent typ	es of fil	ters, tra	nsistors a	nd electro	onic circuits	
Objec	etives	and de	esigning	various	s electron	nic circu	uit.						
Cours	se	1.	Able to	analyze	e output	of diffe	erent ele	ectronic	devices	and circu	iits.		
Outco	t <u>comes</u> 2. Design and analyze application of transistor as an amplifier and as a switch.												
	3. Design and analyze various electronic circuits												
			Map	ping of	Course	Outco	nes wit	h progr	am out	comes			
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	
CO1	3	3	2	3	1	3	2	1	2	0	1	3	
CO2	3	3	3	3	2	3	2	1	1	0	1	3	
CO3	3	3	2	3	3	3	2	1	2	0	2	3	
Lista	fErnor	imonta	•	•	•	•	•	•	•	•	•	•	

List of Experiments:

- 1. To observe the waveform for different types of clipper circuit.
- 2. To observe the waveform for different types of clamper circuit.
- 3. To observe and analyse the waveform for low pass filter.
- 4. To observe and analyse the waveform for high pass filter.
- 5. To observe and analyse the waveform for band pass filter.
- 6. To observe and analyse the waveform for band stop filter.
- 7. To observe and analyse V-I characteristics of BJT transistor in common collector configuration.
- 8. To observe and analyse V-I characteristics of JFET in common source configuration
- 9. To observe and analyse V-I characteristics of MOSFET.
- 10. Design and analyse the output of CE amplifier using voltage divider biasing.
- 11. Design and analyse the output of CC unity gain amplifier.
- 12. To study the switching action of transistor.
- 13. To study the effect of load on gain of voltage amplifier.
- 14. Design and fabrication of relaxation oscillator using UJT.
- 15. Design electronic circuit to generate the waveform using IC-555 timer/IC 741 op-amp.

	EC-315											
		1		Prin -	ciples of	Microv	wave En	gineeri	ng		~	
				<u>L</u>			<u>T</u>		<u>P</u>		Credit	S
		Carrie	malMa	<u>2</u>			1		0		<u> </u>	
		Sessio End S	onal Ma	rks • Fvam	ination I	Marks					<u> </u>	
Carro		The									50 40 loom	different.
Cours	e tivos	The o	bjective	of this	course 1	is to pro	ovide stu	idents v	vith opp	ortunities	to learn	different
Objec	uves	applic	ations	owave	uevices,	compor	ients, the	en chai	acteristic	cs, men v	working, a	ind then
Cours	e		knowled	ge aboi	it the mi	icroway	e freque	ncies a	nd the u	vavenuide	s that are	used to
Outco	me:	Carry 1	them	ge abot	at the fill	leiowav	e neque	neres a	nu the w	aveguide	s that are	used to
			knowled	ge abo	ut isolate	or circu	ulator c	ounler	microws	ave solid	state dev	vices and
		2. Aci	wave str	ige aboi		, chec	nator, co	Supier,	merowa	ive sonu	state uev	ices and
		3 Stu	dy the co	ip inc.	ive nerfo	rmance	analysi	s of Mic	rowave	Tubes an	d Circuits	
	Mapping of course outcomes with program outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01		102	105	104	105	100	10/	100	10)	1010	TOIL	1012
CO1		√ √		V								-
CO3		, √	V	Ń								
			·	U	nit-I							12 hrs.
Introd	luction:	Microw	ave freq	uency	spectrun	n, famil	iarizatio	n with	bands a	nd wave	length. E	ffects of
microv	wave and	RF radi	ation on	animal	s and pla	nts, Mic	crowave	heating	effect.			
Micro	wave Co	mponer	nts: Wav	ve guide	s and its	parame	ters, isol	lators, a	nd circul	lators.		
				Uı	nit-II							12hrs.
Micro	wave Co	ouplers	and Tu	ibes: D	Direction	al coup	lers, int	roductio	on to S	paramete	ers. Probl	em with
conver	ntional tu	bes, lum	ped eler	nents at	microw	ave freq	uencies,	velocit	y modul	ations, tw	o cavity l	clystrons
and its	paramete	ers, Trav	elling w	ave Iu								10 h
Samio	anduate	n Miar		<u>Un</u> Dovice	<u>11t-111</u>	istona	internet	ad aire	wite od	vontogog	ofMione	12 nrs.
Integr	conductor entrod Circ	or when	owave	Device	step rec	sistors,	linegrai		ults, au	vantages	of where	Jwave
Integr		unts, va		illues,	step iec	overy	lioue, n	equent	<i>y</i> mun	phers.		
				Un	<u>it-IV</u>							12 hrs.
Semic	onductor	ctor Microwave Diodes: Gunn diode application, avalanche effect, IMPATT diode, TRAPATT										
diode,	character	istics an	d applic	ation of	avalanc	he diode	e, princij	ple of pi	in diodes	s & its app	olication,	Schottky
barrier	diode.											
				I	RECOM	IMEND	ED BO	OKS				
Title				Au	thor				Publis	sher		
	rowaves		- E		Gupta	•			New A	ge Intern	ational	
2.Mici	rowave an	id Kadai	r Engg.		Kulkarn	1			Umesh	1 Publicat	ions, Dell	11
3.Mici	rowave	Dev ₁ c	es a	nd Lia	ao S Y				Prentic	ce Hall of	India	



4.	Foundation	of	Microwave	R. E. Collin	McGraw-Hill
Eng	gg.				

	TP-301E															
	TP-301E Industrial Training															
					Ind	ustrial [Frainin	5								
Cours	e	To pr	ovide h	ands-on	experi	ence in	variou	s doma	ins suc	h as ha	ardware,	software,				
Object	tives:	mainte	nance a	nd testir	ng in In	dustry /	Trainin	g Centre	e's/ Cor	porate C	offices so	that they				
_		becom	e aware	of the p	ractical	applicati	ion of th	eoretica	l concep	ts studie	d in the c	lassrooms				
		and to	expose	student	s to the	e 'real' v	vorking	environ	ment ar	nd get a	cquainted	with the				
		organiz	zation st	ructure,	business	s operati	ons and	adminis	trative fu	unctions.	- -					
Cours	e	1.	1. Generate a report based on the experiences and projects carried out with the ability to apply knowledge of Mathematics. Science, and Engineering Fundamentals													
Outco	mes:		to apply knowledge of Mathematics, Science, and Engineering Fundamentals.													
		2.	 Demonstrate competency in relevant engineering fields through problem identification formulation and solution 													
			 Demonstrate competency in relevant engineering fields through problem identification, formulation, and solution. 													
		3.	3. Effectively implement skills in communication, in writing and using multimedia													
			3. Effectively implement skills in communication, in writing and using multimedia tools.													
		4.	tools. 4. Develop the ability to work as an individual and in group with the capacity to be a													
			4. Develop the ability to work as an individual and in group with the capacity to be a leader or manager as well as an effective team member													
		5.	Master	the prot	fessiona	l and eth	nical rest	onsibili	ties of a	n engine	er					
		5.	Man	ning of a			s with n	rogram								
	T	1	map	Jing OI (s with p	i ugi ani	outcom			1				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12				
CO1																
CO2																
CO3																
CO4																
CO5		\checkmark														

						EC-321									
		<u> </u>		T	Indust	<u>rial Elec</u>	tronics	T			Cradita				
				<u>L</u> 3					1		<u>Creans</u>				
		Sessio	nal Mai	J rks				-	P		50				
		End S	emester	· Examir	nation N	Iarks					<u> </u>				
Course	<u>e</u>	The o	biective	of this of	course is	to prov	ide in-de	epth kno	wledge	of the ba	asics of	various			
Object	ives:	power	semico	nductor	devices.	analyses	s and de	sign of v	various 1	power co	onverter	circuits			
9		using	power s	emicond	uctor de	vices an	d their a	pplicatio	ns in co	mmercia	al and ine	dustrial			
		areas.													
Course	е	1. Ac	quire ki	nowledge	e about	fundam	ental co	oncepts a	and tech	nniques	used in	power			
Outco	mes:	electro	onics.												
		2 . Ana	ilyses va	rious sin	gle phas	e and the	ee phase	e power o	converte	r circuits	and und	erstand			
	3. Develop skills to build and troubleshoot power electronics circuits.														
	3. Develop skills to build and troubleshoot power electronics circuits.4. Foster ability to understand the use of power converters in commercial and industrial														
	4. Foster ability to understand the use of power converters in commercial and industrial applications.														
	Applications. Mapping of course outcomes with program outcomes														
	Mapping of course outcomes with program outcomes PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 CO1 √ √ √														
CO1	101	$\sqrt{102}$	$\sqrt{100}$	104	105	100	107	100	107	1010	1011	1012			
CO2	1	V.	Ń		,					1					
CO3		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$													
CO4						\checkmark									
				Un	it-I							12 hrs.			
Power	Devices:	Symbo	ols, speci	fications	s, and tes	sting of	SCRs, D	IACS, T	RIACS,	, UJT, C	haracteri	stics of			
the abo	ve device	ès.													
Introd	uction to) Thyri	stors: T	hyristor	ratings,	thyristor	construe	ction, pr	inciple of	of operat	ion of a	n SCR,			
workin	g of SCR	using t	ransistor	analogy	. Turn or	n method	ls-DC ga	ite, AC g	ate and]	Pulse gat	e trigger	ing and			
R-C tri	gger circi	11ts. Tur	n off me	thods- n	atural an	id forced	turn off	methods	s. thyrist	or protec	tion, Cir	cuit for			
over vo	litage and	l over ci	irrent pr	otection.	4 TT				1			12hma			
Dhasa	Controll	od Doot	ifiors: E	<u>UIII</u> Vyplanati	<u>1-11</u> on of the	- workin	g of sing	la phasa	unconti	rollod ha	If wovo	12mrs.			
1 mase		eu Keci	mers. E	Apianan	loode) w	s WOIKINg	g OI Shig	,ie-pilase	mag Err		II wave a	ling of			
wave I	led mostif			(magiative)	ioaus) w	ductive I		wave 101	of wow	forme	ond one	King Of			
control		ier usm	.g SCR	(resistive			.0aus) w		of wave			opriate			
mathen	natical ex	pression	n (no dei	rivations): three-p	pnase co	ntrolled	nair wav	e, full w	vave and	bridge re	ectifier,			
Princip	le of dual	conver	ters & th	ieir appli	cations.										
	T .	1		<u>Unit</u>	t-111		1 .	1	1	1.	1	<u>12 hrs.</u>			
Chopp	ers: Intr	oductio	n, types	of cho	oppers, s	step-up	and step	p-down	chopper	s. volta	ge and	current			
commu	itated type	e chopp	er.							C 1-					
Cycloc	onverter	s: Introc	juction a	ind princ	iple of o	peration	of conve	erter, up	and dow	'n Cycloo	converter	rs.			
Invert	ers: Princ	aple of o	operation	1 of basic	2 inverter	rs circuit	, basic se	eries and	parallel	commut	ated inve	erters.			



Unit-IV 12 hrs.

Thyristor Applications: Advantages of electronic control of devices, basics of DC motor speed control, speed control of DC and small AC motors using thyristor technology, principal of operation and working of the following switching circuits using SCRs: Automatic battery charger, Voltage regulator, Time delay relay circuit, Emergency, light, Burglar alarm circuit, Light operated alarm, AC phase control circuit using **TRIAC and its applications** : Illumination control, Fan speed control, Temperature control.

	RECOMMENDED BOOKS	
Title	Author	Publisher
1. Industrial Electronics and Control	S K Bhattacharya and S Chatterji	Tata McGraw Hill
2. Power electronics	P. S. Bimbhra.	Khanna Publishers, New Delhi
3. Power electronic	M Rama Murthi	New age

	Industrial Electronics Lab Durse The objective is to analyses V-I characteristics various power semiconductor devices biectives: biectives: bits SCP_DIAC and TRIAC and to study various basic power control circuit using														
Course Object	e ives:	The ob like SC power	jective i CR, DIA semicor	s to anal C and T iductor	lyses V- TRIAC a devices.	I charac and to st	teristics tudy var	various vious ba	s power s sic powe	semicon er contro	ductor o ol circui	devices it using			
Course Outcor	e nes:	1. 2.	 Analyse the V-I characteristics of various industrial electronic devices like SCR, DIAC, TRIAC and UJT. Analyse the waveforms of half-wave, full-wave controlled rectifier, relaxation oscillator, chopper circuit etc. Mapping of course outcomes with program outcomes YO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 V V V V V 												
	1	1	2. Analyse the waveforms of half-wave, full-wave controlled rectifier, relaxation oscillator, chopper circuit etc. Mapping of course outcomes with program outcomes O2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 √ √ √ √ √												
~ ~ 1	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
CO1			$\begin{array}{c c c c c c c c c c c c c c c c c c c $												
		List of 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12	Experi To test currents To test To test to test To test To test To draw average To draw its avera To draw rectifier To stud time-per To trigg To draw average	ments: and draw and draw and draw and draw and draw w the di the diffe age. w the diffe age. ger the So w the diffe age. ger the So w the diffe age.	w the c the char w the char the char the char fferent w erent way fferent w CR using fferent w cR using fferent w fferent w	haracteristi aracteristi aracteristi vaveforms waveform g relaxati waveform g relaxati	astics of DI cs of DI tics of T cs of UJ ns of full w ns of full w ns of ful ns of rela on oscill ns of ha	SCR and AC and TRIAC a T and fin If-wave ave mid- ave mid- autor. all-wave axation of lator. alf wave	nd find i find its b and find nd its intr controll point cor bridge oscillator e voltage and draw	its latchi preak ove its latchi rinsic sta ed rectif ntrolled r configura r using U e control	ng and a r voltage ing and a undoff ratifier and rectifier a ation co JJT and ler and ury wave	holding es. holding tio. find its and find ntrolled find its find its			
		13.	Choppe To draw	r circuits / the diff	s and find erent wa	d their du veforms	ity cycle of Serie	e. es and Pa	rallel Inv	verter cir	cuits.				

			WIR	FI FSS		EC-322	COMM	UNICA	ΓΙΟΝ				
			VV IIX	L			COMM				Credits		
				3		0		()		3		
		Sessio	nal Mar	·ks							50		
		End S	emester	Examir	nation M	Iarks					50		
Course	e	Aim o	of the cou	urse is to	study th	ne basics	of cellu	lar syste	m. It also	o gives a	deep in	sight in	
Object	tives:	to the	various	types of	of fading	g effects	. It discu	usses the	e differe	ent types	of mod	lulation	
		techni	ques use	d for mo	bile cor	nmunica	tion. Fin	ally, it i	ntroduce	es the CI	OMA an	d GSM	
Course	0	techni 1	<u>ques use</u> Undor	a for mo	basics t	orma role	1011. atod to yu	virologg o	ommuni	option av	stom		
Outco	c mes:	1.	Under	stand the	basics t	of collulo		incless c		cation sy	stem.		
outeo	ines.	2. 2	Under	stand the	modula	tion took		and in m	obile co	mmunia	tion		
		2. Understand the basics of cellular communication system. 3. Understand the modulation techniques used in mobile communication. Mapping of course outcomes with program outcomes 'O1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 V V V V V V V V V											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1		$\sqrt{100}$	$\sqrt{\frac{1}{\sqrt{2}}}$	101	100	200		200	2 0 /	1010			
CO2													
CO3													
		V V Image: Non-State Unit-I 12hrs. o Wireless Communication Systems: Concept of cellular communication system, basics of											
wireles quality determ and sys	ss cellular , service ining the stem capa	r system quality, frequen city.	n, mobile coverag	e unit, b e and re distance	ase stati quired g e, channe	on, mob rade of s el assign	ile switc service, c ment str	ching cei co-chann ategies,	nter, per el interf hand-off	formance erence, f	requency e criteria requency es, inter	i, voice y reuse, ference,	
				Uni	t-II							12 hrs.	
Mobile	e Radio I	Propaga	tion: In	troductio	on to radi	io wave	propagat	tion, free	e space p	ropagati	on mode	l, basic	
propag	ation med	chanism	s, reflect	tion, diff	raction,	scatterin	g, types	of small	-scale fa	iding, fac	ling effe	cts due	
	pier spiez	iu aliu u	eray spre	u. Unit	-111							12 hrs.	
Modul minim	l ation Te um shift k	chniqu ceying, s	es: Intro	duction 1 bectrum 1	to linear nodulati	modula on techn	tion tech iques.	niques,	minimur	n shift k	eying, g	aussian	
				<u>Unit</u>	t-IV							12 hrs.	
Advan	ced Tra	nsceive	r Schen	nes: Cell	lular coo	de divisi	ion mult	iple acc	ess syst	ems, GS	M, IS-9	€, and	
introdu	iction to f	ourth ar	nd fifth g	eneration	n wireles	ss comm	unicatior	ı standar	ds.				
				R	ECOMN	AENDE	D BOOI	KS					
Title					Aut	hor			Publ	isher			
1. Wire	eless com	municat	ions		T.S	s Rappap	ort		Pear	son Edu	cation, 2	003.	
2. Prin	ciples of I	Mobile	Commur	nication	Go	rdon L. S	Stuber		Spri 2001	nger Inte I.	rnationa	l Ltd.,	
3. Wire	eless Con	munica	tions		An	drea Gol	dsmith		Cam	bridge U s 2007	Jniversit	У	



						EC-323	•							
		1	Micro	process	sor & N	<u>Aicroco</u>	ntroller	· Applic	ations		<u>a</u> 14			
			I	<u>ــــــــــــــــــــــــــــــــــــ</u>					P		<u>Credits</u>			
		Contor	al Maril) ~		1			2		5			
		Session End So	mostor L	s 'vomine	tion Ma	anka					50			
~		End Se	mester r								50			
Cours Objec	e tives:	This co microco	ourse 1s a	imed to with diff	provide ferent pe	e knowle ripherals	dge abo s viz., ke	ut the 1n yboard, l	terfacing LCD, me	g of mici	coproces	sor and		
Cours	e	1. Unde	rstand th	e interfa	cing of o	different	peripher	als with	micropro	ocessor.				
Outco	me:	2. Write	e the prog	rams an	d interfa	acing of p	periphera	als with a	nicrocor	ntroller.				
		3. Desi	gn the cir	cuit for	interfact	ing.								
	•		Mapping of course outcomes with program outcomes'O2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12\begin{aligned} & \sqrt{1}											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
CO1														
CO2														
CO3														
				Uni	it-I							12 hrs.		
Memo	ory Inter	facing: I	cing: Details of interfacing of PIC8259, Interfacing of memory chips ROM (2732, 2764)											
and RA	AM (611	6).	Programmable Peripherals Interfacing Chips: Block concepts control function											
Gener	al Purp	ose Prog	Programmable Peripherals Interfacing Chips: Block concepts control function											
modes	and app	lication p	se Programmable Peripherals Interfacing Chips: Block concepts control function ication peripheral chips -8255.											
				Uni	<u>t-11</u>							12hrs.		
Line d Interfa	lrivers: acing Da	MC 1488 ata Conv	8, 1489, 8 r erters: E	3250, 82 DAC 080	51(in de)0.	etail)								
				Unit	t-III							12 hrs.		
Interfa Interfa keyboa	acing of acing of ard.	Microco f Microc	ontroller controlle	with Mo r with	emory: Externa	Interfaci al Devic	ng of ext es: Inte	ternal me rfacing	emory RA of sense	AM & E ors, step	PROM, per mot	or, and		
				Unit	t-IV							12 hrs.		
Interfa with 8 Micro	acing: I 255 & T controll	nterfacing of Microcontroller Data Converters, Interfacing to enhance 8051 capabilities imer chips. er Ports: connection to RS 232.												
		RECOMMENDED BOOKS												
Title	Author Publisher													
1. Mic progra with 8	croprocessor Architecture, ramming, and application 8080/8085 Ramesh s Gaonker, Willey eastern ltd New Delhi													
2. The Embed	8051 M Ided Sys	icrocontr tems	oller and	Ali I	Mazidi			P	earson E	Education	1			

		Ν	Micropr	ocessor	· & Mic	roconti	oller A	pplicati	ions La	b						
Course	e	This lat	o aims to	design	various a	pplicatio	ons based	l on mic	roproces	sor and 1	nicrocor	ntroller.				
Object	ives:	It inclu	des the	interfaci	ng of m	icrocont	roller wi	th dc st	epper m	otor, AE	DC, LEE), LCD				
0		display.	, relays <i>e</i>	tc.	U					,	,					
Course	e															
Outco	mes:	1.	Design	various r	eal time	applicat	ions base	d on mi	croproce	ssor and	microco	ntroller				
			such as	traffic li	ght, temp	berature	control e	tc.	•							
		2.	Control	the spee	d as well	l as step	size of D	C stepp	er motor	•						
		3.	Interfac	e various	s periphe	ral devic	es to mi	croproce	ssor and	microco	ntroller.					
			Mapping of course outcomes with program outcomes PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 V													
	PO1	PO2	Napping of course outcomes with program outcomesPO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12 $\sqrt{10}$ $\sqrt{10}$ $\sqrt{10}$ $\sqrt{10}$ $\sqrt{10}$ $\sqrt{10}$ $\sqrt{10}$ $\sqrt{10}$													
CO1			'O2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12 $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$													
CO2			$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$													
CO3			$ \begin{array}{c c c c c c c c c c c c c c c c c c c $													
		List of 1. Write micropn 2. Write 3. Write 8255 Pl 4. Write 8255 Pl 6. Write 8255 Pl 6. Write 8. Write 9. Write 10. Wri 11. Inte LCD di	Experi e a progra cocessors e a progra e a progra PI. e a progra e a progra e a progra e a progra e a progra e a progra te a progra te a progra	ments: am to co am for fi am for fi am to co am to co am to co am of Fl am to ge am to int am to co gram to co gram to co	ntrol the 55 PPI. nding sq ntrol the ntrol the ntrol spe ashing L nerate a terface the ntrol a st ontrol tho ower dev	operation uare of a temperative traffic life ed of DO ED contr Ramp w the ADC. tepper m e speed of vices to N	on of step a number iture usin ight syste C motor i nected to aveform otor in d of DC m Micro-co	oper mot using lo g 8085// em using using 80 port 1 o using D irection, otor. ntroller	or using bok-up ta 8086 mid 8085/80 85/8086 f the Mid AC with speed an port-line	8085/803 able and v croproces 086 micro micropro cro Conti a micro co nd numbo s, LED, 1	86 verify. ssors and oprocess ocessors coller ontroller er of step relays, an	l ors and ps.				

				٨	ntanna	EC-324 Waya P	ronagat	ion								
]	L	mema	T	Tupagai		P		Credits					
				3		0		(0		3					
		Session	al Mark	s							50					
		End Se	mester l	Examina	ation Ma	arks					50					
Cours	e	The obj	ective of	this cou	rse is to	provide	students	with opp	ortunitie	es to leari	n differei	nt types				
Objec	tives:	of anter	nna. Thi	s course	provide	s an intr	oduction	to the ba	asic ante	nna para	meters, a	antenna				
~		arrays,	aperture	type ante	ennas an	d wave j	propagati	ion.								
Cours	e		1. Unc	lerstand	fundame	ental terr	ns related	d to ante	nna para	meters.						
Outco	mes:		2. Und	licotions	ng of dil	iterent ty	pes of a	ntenna st	ructure I	or differ	ent					
			app 3 Und	lerstand	fundame	ntals of	wave nr	nagatio	n							
			Mapping of course outcomes with program outcomesPO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12				
CO1																
CO2																
CO3		Unit-I 12 h														
D •	• •	Unit-I 12 hr								<u>12 hrs.</u>						
Basic	Antenn	a Param	Parameters: Introduction, radiation mechanism, radiation patterns, antenna beam area, dth. radiation intensity, gain, directive gain, power gain, directivity (D), antenna bandwidth.									n area,				
antenn	a beam v	width, rac	Parameters: Introduction, radiation mechanism, radiation patterns, antenna beam area, lth, radiation intensity, gain, directive gain, power gain, directivity (D), antenna bandwidth, and height antenna impedance radiation resistance front to back ratio radiation power													
density	ve apert	vic radiat	th, radiation intensity, gain, directive gain, power gain, directivity (D), antenna bandwidth, and height, antenna impedance, radiation resistance, front to back ratio, radiation power radiators, near field and far field concept.													
- action of	,, 150 ti 0]		<u>, 11041</u>	Uni	t-II							12hrs.				
Wire	Radiato	rs: Volta	ge and c	urrent di	istributio	on, hertz	dipole a	ntenna, 1	adiation	from a l	nalf wav	elength				
dipole	and its r	adiation	resistanc	e. monoj	pole radi	ator, loo	p antenn	a.				-				
Anten	na Arra	ys: Intro	duction,	linear ur	niform a	rray isot	ropic sou	irces, pri	nciples of	of pattern	multipl	ication,				
broads	ide arra	ys, end fi	re arrays	, antenna	a for rece	eiving ar	nd transn	nitting T	V signal	s e.g., Ya	igi-Uda	and log				
period	ic anteni	1a.		Unit	+ TTT							12 hrs				
Apert	ure Tvr	e Anten	nas. An	erture ar	tennas	F & H	nlane h	orns nyr	amidal l	horn ref	lector an	12 III S.				
antenn	a measu	rements,	microstr	ip anteni	nas & the	eir advar	tages.	Jins, pyr	annuar i			termas,				
				Uni	t-IV							12 hrs.				
Propa	gation o	of Radio	Waves:	Differei	nt modes	s of proj	pagation,	ground	waves p	propagati	on, spac	e wave				
propag	gation ov	ver flat and curved earth, optical and radio horizons, surface waves and troposphere waves,														
path lo	oss calci	ulation, s	e frequency (MUF), skip distance and virtual height, effect of earth's curvature.													
шахш	iuiii usai	ne neque	RECOMMENDED BOOKS													
Title			Author Publisher													
1. Ant	ennas		Author Fublisher Kraus Mc Graw Hill													
2. Ant	enna ar	nd Wave		KI) Parsac	1		P	arkash	Publicat	ions					
Propa	gation															



						EC-325						
			_	-	Mic	roelectr	onics		- 1		~	
							<u>T</u>		2		Credits	
		G	I N/	3			0		2		4	
		Session End So	iai Mark	KS E-romino	tion Ma	mlea					<u>50</u>	
Cours	0	End Se	emester I	Lxamina	at mion	Irks	ion in to	diaguast	ha daaia	n and fab	<u>50</u>	
Object	e tivos:	of thick	film the	n film ar	ect micro	l IC's It	also aim	uiscuss i	ne desigi arstandir	n and lau	nd every	step of
Object	11765.	fabricat	tion from	n min ai o crystal	growth t	to photo	lithogram	by to m	anufactu	ring and	to have	a brief
		knowle	dge of fa	brication	n process	s flow a	nd learni	ng desig	n and fa	brication	of BIT	diode
		FET. N	10S etc.	.orreation	in process	5 110 W U	ila ioailli		, ii uiia ia	oncation		, aroue,
Cours	e	1.	Underst	and the	physical	and ele	ctrical p	operties	of semi	conducto	r materi	als and
Outco	mes:		their use	e in micr	oelectroi	nic circu	its.					
		2.	Develop	o an unde	erstandin	g about	key aspe	cts of the	e microe	lectronic	s industr	y, from
			device d	lesign, to	process	ing, to p	hotolithc	graphy,	to manu	facturing	and pac	kaging.
	3. Learn in brief many of the core problems involved with MOSFET technology.											
Mapping of course outcomes with program outcomes PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		\checkmark										
CO2												
$\begin{array}{c c c c c c c c c c c c c c c c c c c $												
	I			Un	it-I			l				12 hrs.
Introd	luction:	Advanta	ges of IC	C's, Gene	eral class	ification	of IC's	(Linear/	Digital I	C's, Mo	nolithic/	Hybrid
IC's), I	Basic IC	fabricati	ion steps						C	ŕ		2
Classi	fication	of integ	rated ci	rcuits: (Classifica	tion of	integrate	d circuit	s (IC's),	thick fi	lm, thin	film &
hybrid	IC's.											
				<u>Uni</u>	t-II							12hrs.
Fabric	cation of	f Compo	nents: Fa	abricatio	n and co	mponen	t design,	resistor,	capacito	ors and ir	ductors,	design
and fal	orication	•										
Monol	lithic Te	echnique	s: Proce	ss on si	licon cry	stals, li	ne grow	th, refini	ing, sub	strate sli	cing, po	lishing,
chemic	cal vapo	ur depos	ition, the	rmal ox	idation, j	photolith	nography	, diffusio	on, impu	irities, di	ffusion	system,
10n 1m	plantatio	n, metall	ization, i	solation								101
T 1	1	. 4.	1		[-]]]	1	- f	1. (1.1.)				12 nrs.
impuri	tion on t	ation: 11 he evidet	ion roto	didation j	process (kinetics	of growt	n, thin o	xide gro	wth), eff	ect of	
Photol	lithogra	nby Da	ttorn go	noration	Mack n	nakina	Contact	and Dr	ovimity	nrinting	nhoto	recipt
photol	ithogran	hv proce	ess (lift or	ff techno	logy fin	iaking, ie line pł	otolitho	oranhy)	Oxininty	printing	, photo	105151,
photon	mogrup	ny, proce	555 (IIIt 0	Unit	t-IV	ie inie pi	iotontino	<u>51up1197.</u>				12 hrs.
Diffus	ion: Bas	ic diffusi	ion proce	ess (diffu	sion equ	ation, di	ffusion r	orofiles),	extrinsion	c diffusio	n, latera	1
diffusi	on,		I I I I		1.	, , ,	I I	, ,			,	
Ion In	plantat	ion: Ion	implanta	tion proc	cess (ion	distribut	tion, ion	stopping), implai	nt damag	e and an	nealing
proces	s (furnac	e and rta	ı)	-					<u> </u>			-
				R	ECOM	IENDE	D BOOI	KS				
Title				Auth	or			Pu	ıblisher			
1. Inte	grated C	ircuits		Mill	man and	Halkias		N	Ic Graw	Hill		

Page 60

Teaching Scheme for Integrated Certificate and Diploma (DEC-CTV) Programme

2.	Integrated	Circuits
2.	megratea	Chedito

K R Botkar

TMH

					Microe	electron	ics Lab									
Course Object	e tives:	The obj process and mo	ective of es. It also unting th	f micro-e o include ie compo	electronic es layout onents or	cs lab is designii final pr	to make 1g using epared P	the stude different CB.	ents fami t softwar	iliar with e follow	PCB de ed by etc	signing hing				
Course Outco	e mes:	1. 2. 3.	Underst Design Perform Mappi	and the the layou various ng of co	working it of elec steps in urse out	of PCB tronic ci volved in comes v	making (rcuit wit h the desi vith prog	CNC Mi h the hel ign of PO gram ou	ll-15. lp of var CB. tcomes	ious soft	ware.					
	PO1	PO2	Mapping of course outcomes with program outcomes PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 Image: Image of the second sec													
CO1			PO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12 \checkmark \land													
CO2			O2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 \checkmark													
CO3			V V V V V V V V V st of Experiments: V													
		List of 1. To S 2. To S 3. To S 4. To S 5. To da 6. To pa 7. To pa machina 8. To pa 9. To m 10. To ta	Experin tudy and tudy and tudy and esign and repare Ne erform D e. erform et nount the test or In	observe observe observe observe d Implen egative o pip Coati tching op Compose spect the	the PCB the Mac the Spri the Cop nent the I of a given ng Opera beration of nents on PCB.	B making h Mill 3 nt Layou per CAM PCB usin n artworl ation on on given preparec	Machin Softwar It Softwa A Softwa Ing PCB I k using V Copper (Printed I PCB.	e CNC M e. are. ure. making M /ertical p Clad Boa Copper (Mill- 15. Machine. process C ard by us Clad Boa	Camera. sing dip C ard.	Coating					



						EC-3	327									
						Proj	ect									
			L			Т			Р		Crec	lits				
			0			0			4		2					
Course	e	Projec	t Work	aims at	develop	oing inn	ovative	skills in	the stuc	lents whe	reby they	apply in				
Object	ives:	totality	y the k	nowledg	ge and	skills ga	ained th	rough t	he cours	se work	in the sol	ution of				
		particu	ılar pro	blem or	by unde	rtaking	a project	t. In add	ition, the	e project v	work is int	ended to				
		place	student	s for p	roject of	riented	practical	l trainin	g in act	tual work	situation	for the				
		stipula	ited per	10d with	a view	to:	• • • 1	1.1	1 1	• • 4	1	• 4				
		1.	Deve	lop unde		ng of sul	oject bas	sed knov	vledge g	iven in th	e classroo	m in the				
			conte	act tha	application	to onob	orkpiac	to use a	nd apply	i experier	nic/institu	to based				
			knowledge and skills to solve practical problems related to the world of work.													
		2	knowledge and skills to solve practical problems related to the world of work.Develop abilities like interpersonal skills, communication skills, positive attitudes and values ate													
		2.	2. Develop abilities like interpersonal skills, communication skills, positive attitudes and values etc.													
		3.	and values etc.3. Develop understanding regarding nature of fieldwork in which students are going													
			to pla	y their r	ole after	comple	ting the	courses	of study			00				
Course	e	1.	Refin	e and o	complete	e the so	elected	project	making	use of	the techn	ical and				
Outcor	mes:		engin	eering k	nowledg	ge which	n meets t	the expe	cted out	come.						
		2.	Work	with th	e moder	n tools r	equired	for the i	mpleme	ntation of	the project	et.				
		3.	Achie	eve the r	esults w	ithin in	the stipu	lated tin	ne.							
		4.	Acqu	ire probl	lem solv	ing, syst	em integ	gration, p	project n	nanageme	nt, docum	entation,				
			interp	bersonal	and con	imunica	tion skil	ls.								
			Map	ping of o	course o	outcome	s with p	orogram	outcon	nes						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12				
CO1																
CO2											,					
CO3		,		,	,						N					
CO4												\checkmark				