RGPV (DIPLOMA WING) BHOPAL			/ING)	OBE CURRICULUM FOR THE COURSE			FORMAT	-3	Sheet No. 1/5	
Branch		I	Electron	ics & Tele-commur	nication	S	emester		3	
Course	Code			Course Name	e Analog Communica			tion		
Course Outcome 1		ome 1	Explai various	n basic block of consistent & r	mmunication system an	nd o	classify	Teac Hrs	h Marks	
Learning Outcome 1		Descril concep	Describe basic components of communication system and concept of modulation, its needs. (Cognitive)6							
Contents		Block diagram of electronic communication system, distinguish between analog and digital communication, Modulation, Need for modulation and types of analog modulation techniques. (Theory)								
Method of Assessment		essment	External							
Learning Outcome 2		Compare different signals, systems and noise. (Cognitive) 10								
Contents		S	Definition of signal and system <b>Signal:</b> Analog, digital, deterministic, random, energy, power, odd, even, periodic and aperiodic <b>System</b> : Linear & non-linear, time variant & invariant, causal & non-causal system. <b>Noise:</b> Classification of noise, noise measurement – SNR, Noise figure, Equivalent noise temperature, Probability of error (basic definition no derivation) <b>(Theory)</b>							
Method	of Asse	essment	Interna	al						
Learnin	g Outo	come 3	Perfori param	orm spectrum analysis of signal and evaluate different 6 meters. <i>(Psychomotor)</i>						
Contents		Classification of EM spectrum Measure amplitude and frequency of different signals using CRO or Spectrum Analyser.								
Method of Assessment		Extern	al							

RGPV (DIPLOMA WING) BHOPAL			OBE CURRICULUM FOR THE COURSE		FORMA	.3	Sheet No. 2/5	
Branch	E	lectron	ics & Tele-commur	nication	Semester		3	
Course Code			Course Name	Analog	Communica	tion		
Course Outco	ome 2	Comp	are analog modulat	ion techniques.		Teach Hrs	<sup>1</sup> Marks	
Learning Outo	come 4	Exami differe	ne various aspect c ent domains. <i>(Psycl</i>	f amplitude modulatio nomotor)	on in	12		
Contents		(Theory) Definition, waveform of AM, expressions of modulated signal, modulation index in terms of various voltage components (modulating voltage, carrier voltage, maximum voltage and minimum voltage), modulation index in case of simultaneous modulations, LSB and USB, Bandwidth, Power in AM wave. Solve elementary problems on modulation index, bandwidth and power. (Practical) To modulate a high frequency carrier with sinusoidal signal to obtain AM signal. Measure modulation index of an AM envelope						
Method of Asse	essment	Intern	al					
Learning Outo	come 5	Explain block diagram of AM transmitter and suppression of carrier methods. (Cognitive)				8		
Content	S	Block diagram and description of AM transmitter using low level and high level modulation. Suppression of carrier: BalancedModulator (using diode), Suppression of Sideband using filter method						
Method of Asse	essment	Intern	al					
Learning Outcome 6		Distinguish various analog modulation techniques. (Cognitive)				8		
Contents		<b>SSB</b> : Power and Bandwidth requirement, Generation using filter method and phase shift method. Concept of VSB. Comparison and application of AM, DSB-SC, SSB and VSB.						
Method of Assessment		Extern	al					

RGPV (DIPLOMA WING) BHOPAL

# OBE CURRICULUM FOR THE COURSE

2	Sheet
FORMAT-	No. 3/5

Branch		E	lectron	onics & Tele-communication			Semester	3	
Course (	Code			Course Name	ne Analog Communication				
Course Outcome 3		Analy	ze waveform of A	Angle N	Iodulation.		Teach Hrs.	Marks	
Learning Outcome 7		come 7	Explai with p	n frequency moc bhase modulatior	dulation n. <i>(Cogn</i>	schemes and it <i>itive)</i>	s relation	8	
Contents		<ul> <li>Phase and frequency modulation and relation between phase and frequency modulation.</li> <li>Frequency Modulation: definition and waveform, expressions of frequency deviation, modulation index. Relationship between frequency deviation and modulation index. Narrowband and wideband FM, Carlson's rule for bandwidth, SNR and bandwidth trade-off.</li> </ul>							
Method	of Asse	essment	External						
Learning Outcome 8		come 8	Describe the FM generation using direct & indirect method. (Cognitive)			8			
Contents		S	Direct method for FM generation: Block diagram and basic description Indirect method for FM generation: Block diagram and description of Armstrong method Block diagram and description of FM transmitter.						
Method	of Asse	essment	Exterr	nal					
Learning Outcome 9		Install and operate angle modulation circuits on kits/simulation software. ( <i>Psychomotor</i> )			6				
Contents		Modulate a high frequency carrier with sinusoidal signal to obtain FM signal. Determine Modulation Index of Frequency Modulated wave.							
Method	of Asse	essment	Intern	al					

RGPV (DIPLOMA WING) BHOPAL			'ING)	OBE CURE THE	FORMA	-3	Sheet No. 4/5			
Branch		I	Electron	ics & Tele-commu	nication	Semester				
Course	Code			Course Name Analog Communication						
Course Outcome 4		ome 4	Compa	are demodulation te	chniques of AM signals		Teac Hrs.	h Marks		
Learning	g Outc	ome 10	Descri	becharacteristics of	f radioreceivers. <i>(Cogni</i> i	tive)	8			
Contents		Characteristic of radio receiver, Concept of sensitivity, selectivity, fidelity, Image frequency and its rejection. Characteristic of RF amplifier, selection of IF, Double Spotting, Noise Figure.								
Method of Assessment		essment	External							
Learning	g Outc	ome 11	Categorize differenttypes of radioreceivers.(Cognitive)				8			
Contents		S	Detection of AM using Diode detector and practical diode detector. AM receiver- Block diagram of TRF, Super heterodyne and double super-heterodyne.							
Method	of Asse	essment	External							
Learning	g Outc	ome 12	Set up and select particular analog de-modulation8techniques circuits. (Psychomotor)8							
Contents		Check the demodulated AM signal waveform using envelope detector and draw its input output waveform. Construct AM demodulator using diode circuit Locate various sections of AM radio super heterodyne receiver and draw the waveforms at input and output side of each section.								
Method of Assessment		Interna	al							

RGPV (DIPLOMA WING) BHOPAL			'ING)	OBE CURI THE	FORMA	r- <b>3</b>	Sheet No. 5/5	
Branch		E	Electron	ics & Tele-commu	nication	Semester		
Course	Code			Course Name	Analog (	Communicat	ion	
Course	e Outco	ome 5	Compa	are the functioning	of angle de-modulators.		Teac Hrs.	h Marks
Learning Outcome 13		ome 13	Classify different FM de-modulators methods and outline need of pre-emphasis & de-emphasis circuits. <i>(Cognitive)</i>				10	
Contents		S	Block diagram of FM receiver with description <b>FM demodulators:</b> Slope detection, Balanced slop detection, Foster Seeley discriminator and Ratio detector. Need for pre-emphasis and de-emphasis circuits, SNR improvement, concept of AFC, Merits and demerits of FM over AM					
Method	of Asse	essment	Extern	al				
Learning Outcome 14		ome 14	Explain different various multiplexing techniques.6(Cognitive)					
Contents		S	Concept of Frequency Division Multiplexing and Time Division Multiplexing and their comparison					
Method	of Asse	essment	Interna	al				
Learnin	g Outco	ome 15	Opera	te different analog	radio receiver. (Psychol	motor)	8	
Contents		Locate various sections of FM receiver and examine its working. Obtain the frequency response of Pre-emphasis and De-emphasis circuit. Demonstration of fault finding of FM radio receivers.						
Method of Assessment		Extern	al					

### Suggested List of Experiment

S.N.	Experiment	CO
1.	Measure amplitude and frequency of different signals using CRO or Spectrum Analyser.	CO303.1
2.	To modulate a high frequency carrier with sinusoidal signal to obtain AM signal.	CO303.2 & CO303.4
3.	Measure modulation index of an AM envelope	CO303.2 & CO303.4
4.	Simulate and realise a simple AM transmitter on bread board.	CO303.2 & CO303.4
5.	Check the demodulated AM signal waveform using envelope detector and draw its input output waveform.	CO303.2 & CO303.4
6.	Construct AM demodulator using diode circuit.	CO303.2 & CO303.4
7.	Locate various sections of AM radio super heterodyne receiver and draw the waveforms at input and output side of each section.	CO303.2 & CO303.4
8.	To study & observe the amplitude response of automatic gain controller (AGC).	CO303.2 & CO303.4
9.	Demonstration of fault finding of AM radio receivers	CO303.2 & CO303.4
10.	To modulate a high frequency carrier with sinusoidal signal to obtain FM signal.	CO303.3 & CO303.5
11.	Determine Modulation Index of Frequency Modulated wave.	CO303.3 & CO303.5
12.	Locate various sections of FM receiver and examine its working.	CO303.3 & CO303.5
13.	Obtain the frequency response of Pre-emphasis and De-emphasis circuit.	CO303.3 & CO303.5
14.	Demonstration of fault finding of FM radio receivers.	CO303.3 & CO303.5
15.	Study of frequency division multiplexing	CO303.3 & CO303.5

16.	Simulate AM, FM and SSB signal using simulation software	CO303.3 & CO303.5

10 Practical in a semester, as per the discretion of subject teacher.

## Suggested Activity:

S.N.	Activity
а	List the nearby sources of manmade noise.
b	Collect detail of frequency used in AM/FM broadcasting.
с	Demonstrate Amplitude modulation and demodulation.
d	Present and simulate how radio works
e	Explore working of HAM radio and CB radio
f	Collect details of Frequency, Standards, Company, Model & Range of Walky-Talky, Cordless phone and Wireless set used by Police department and other security service provider.
g	Discover working of radio transmitting station
h	Explore how communication perform in state electricity board (Power line communication).
i	Online exploration of Air Traffic Control mechanism at airport. Online exploration of how Air Traffic Control work at airport.

### Learning Resources:

#### a) Reference Books

S.N.	Title	Author
1	Electronic Communication Systems	George Kennedy and Bernard Davis Tata McGraw Hill
2	Principles of Digital Communication	Taub and Schilling Tata McGraw-Hill" 28th reprint, 2003
3	Analog and Digital Communication	Singal, T. L. Tata Mcgraw Hill, India latest edition
4	Communication System	R P Singh S D Sapre Tata Mcgraw Hill, India
6	Electronics Communication	Dennis Roddy and John Coolen Pearson Eductation

7	Electronics Communication System	WayenTomasi Pearson Education
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## b) Software/Learning Websites:

- <u>nptel.ac.in</u>
- <u>swayam.gov.in</u>

## Major Equipment/Materials:

а	CRO
b	Function generator
с	Spectrum analyser
d	RF generator/wideband oscillator
e	AM/FM radio receiver trainer Kit
f	AM Modulator/Demodulator
g	FM Modulator/Demodulator
h	Frequency division multiplexer/de-multiplexer
i	Simulation Software

DC	ייט/ /ום		ling ) Dhanal	SCHEME FOR	LEARNING	Branc	h Code	Course Co	ode	CO Code	LO Code	Format
KG	PV (DIP	noma vv	ing) Bhopai	OUTCO	OME	Ε	0 3	3 0	2	1	1	No. <b>4</b>
COURS	SE NAME	Analog Co	ommunication		·					-		
CO Des	cription	Explain bas	ic block of communicat	ion system and classify v	various signal, systen	n & noise	;					
LO Des	cription	Describe ba	sic components of com	munication system and c	concept of modulation	on, its nee	eds.					
				SCHE	ME OF STUDY							
S. No.		Learning	J Content	Teaching – Learning Method	Description o Process	f T-L	Teach Hrs.	Pract./ Tut Hrs.	l	LRs Ree	quired	Remarks
LO-01	Block dia commun between commun modulati modulati	gram of electication system analog and ication, Moo on and type on techniqu	ctronic em, distinguish digital dulation, Need for es of analog ies.	Interactive classroom lecture, PPT, demonstration, quiz,assignments.	Teacher will expla contents and pro handouts to stud Teacher will conc quiz/ assignment tutorial	ain the wide lents. duct ss/	6		Text Han boa	t Books douts, rd, cha	, PPT, chalk rts.	
				SCHEME	OF ASSESSMENT	•	<u></u>					·
S. No.	Met Asse	hod of ssment		Description of Asses	sment		Max Ma	imum arks	Reso	ources	Required	External / Internal
LO-01	End S Theo	emester ry Exam	<ul> <li>Student will be aske</li> <li>1. Draw and expla</li> <li>2. List out advanta communication</li> <li>3. Basics and need</li> <li>4. Classification of</li> </ul>	ed to(and/or) in block diagram of con ages and disadvantages I of modulation f analog modulation ten	mmunication syste s of analog and dig chniques.	em. ital	1	10	Qu	uestion Rating	paper, scale	External
			ADDIT	IONAL INSTRUCTION	IS FOR THE HOD/	FACUL	TY (IF AN	Y)				1

			Ming) Dhonal	SCHEME FOR	LEARNING	В	ranch Co	de		Course Co	ode	CO Code	LO Code	Format
KGI	PV (DIP	ioma	wing) Bhopai	OUTCO	OME	Ε	0	3	3	0	2	1	2	No. <b>4</b>
COURS	E NAME	Analo	g Communication	·					I	I	-			
CO Des	cription	Explain	basic block of communication	on system and classify v	various signal, syster	n & no	oise							
LO Des	cription	Compa	re different signals, systems	and noise.										
				SCHE	ME OF STUDY									
S. No.		Lea	arning Content	Teaching – Learning Method	Description Proce	n of Ta ss	-L	1	ſeach Hrs.	Pra /T Hi	nct. Tut rs.	LRs F	Required	Remarks
LO-02	Definition Signal: An energy, p aperiodic System: L invariant, Noise: Cla measurer noise tem	n of sign nalog, di ower, o : Linear & , causal assificat ment – S nperatui	al and system igital, deterministic, rando dd, even, periodic and non-linear, time variant & & non-causal system. ion of noise, noise SNR, Noise figure, Equivale re, Probability of error	m, Interactive classroom lecture, PPT, demonstration , quiz, assignments, tutorial nt	Teacher will exp contents and pro handouts to stud Teacher will con quiz/assignment to make student their knowledge	lain th ovide dents. duct s/ tute s prac	orial tice		8		2	Text B PPT, I chalk I charts, Numer Proble Workb	ooks, Handouts, board, rical ms ook	
	-			SCHEME	OF ASSESSMENT	Γ								
S. No.	Metho Assessi	od of ment		Description of Asses	sment				Maxi Ma	mum rks		Resou Requ	urces lired	External / Internal
LO-02Mid Semester Theory ExamStudent will be asked to(and/or): 1. Draw and explain various type of signals and calculate given parameter. 2. Classify, explain and identify different types of system 3. Classify the noise. 4. Define and calculate various parameters related to noise10Question Rating								n paper, scale	Internal					
			ADDITI	ONAL INSTRUCTION	IS FOR THE HOD	FAC	ULTY	(IF /	ANY)					

RGI	PV (Din	loma Wi	ing ) Bhopal	SCHEME FOR	LEARNING	G Brand	ch Code	Cou	irse Cod	e	CO Code	LO Code	Format
			ing / Briopai	OUTCO	OME	E	0 3	3	0	2	1	3	No. <b>4</b>
COURS	E NAME	Analog Co	mmunication										
CO Des	cription	Explain basi	c block of communicati	on system and classify v	arious signal, sys	stem & noise	e						
LO Desc	cription	Perform spe	ctrum analysis of signal	and evaluate different p	parameters.								
				SCHE	ME OF STUDY								
S. No.		Learning	Content	Teaching – Learning Method	Description Proce	n of T-L ess	Teach Hrs.	Pra /Tu Hr	ct. ut s.	LF	Rs Rec	luired	Remarks
LO-03	Classificat Measure different Analyser.	tion of EM spe amplitude and signals using C	ctrum I frequency of RO or Spectrum	Interactive classroom lecture, PPT, Lab demonstration, hands on practice, lab assignments.	<ul> <li>Teacher will the content class/lab.</li> <li>Teacher with from lab sta demonstrate procedure o experiments</li> <li>Student will lab assignme on these exp</li> </ul>	explain in h support ff will e the of lab s. conduct ent based periments.		6		Text I manu Spect with r instru comp releva softw speed	books, ual, cha measu ument: outer v ant sin vare ar d inter	PPT, Lab arts, CRO, nalyzer, iring s, vith nulation nd high net.	
				SCHEME	OF ASSESSME	NT							
S. No.	Explain basic block of communication system and classify various signal, system & noise         Berform spectrum analysis of signal and evaluate different parameters.         SCHEME OF STUDY         Scheme of Study         N       Learning Content       Description of T-L Process       Teaching – Learning Method       Description of T-L Process       Teach Hrs.       Pract.       LRs Required Hrs.       R         a       Classification of EM spectrum Measure amplitude and frequency of different signals using CRO or Spectrum Analyser.       Interactive classroom lecture, PPT L ab demonstration, hands on practice, lab assignments.       • Teacher will explain the content in class/lab.       • Teacher with support from lab staff will demonstrate the procedure of lab experiments.       • G       Text books, PPT, Lab manual, charts, CRO, Spectrum Analyzer, with measuring instruments, computer with relevant simulation software and high speed internet.       • Student will conduct lab assignment based on these experiments.       • Student will conduct lab assignment based on these experiments.       • Student will conduct lab assignment based on these experiments.       • Resurces Required       End formation         b.       Method of Assessment       Description of Assessment       Maximum Marks       Resurces Required       End formation								External / Internal				

LO-03	Practio labo	cal test in pratory	Student will be ask 1. Measure ampl	<b>ed to</b> itude and frequency of a RO or Spectrum Analyze	different	1(	)	R	ubrics/	Rating	scale	External
			ADDITIC	ONAL INSTRUCTION	S FOR THE HOD/	FACUL	ty (if an	Y)				
										0		-
RG	GPV (Diploma Wing) Bhopal			SCHEME FOR	LEARNING	Brand	ch Code	Course	Code	Code	LO Code	Format
	GPV (Diploma Wing ) BhopaIRSE NAMEAnalog CommunicationDescriptionCompare analog modulation text		nig) bilopai	OUTCO	OME	Ε	0 3	3 (	2	2	4	No. <b>4</b>
COURS	E NAME	Analog Co	ommunication									
CO Des	cription	Compare an	nalog modulation techniq	ues.								
LO Desc	cription	Examine va	rious aspect of amplitude	e modulation in differer	nt domains.							
				SCHEI	ME OF STUDY							
S. No.		Learning	y Content	Teaching – Learning Method	Description o Process	of T-L	Teach Hrs.	Pract /Tut Hrs.		LRs Ree	quired	Remarks
LO-04	No.Learning Content0-04(Theory) Definition, waveform of AM, expressions of modulated signal, modulation index in terms of various voltage components (modulating voltage, carrier voltage, maximum voltage an minimum voltage), modulation index in case of simultaneous modulations, LSB and USB, Bandwidth, Power in AM wave. Solve elementary problems on modulation index, bandwidth and power. (Practical) To modulate a high frequency carrier with sinusoidal signal to obtain AM signal.			Interactive classroom lecture, PPT, Lab demonstration, hands on practice, lab assignments.	<ul> <li>Teacher will ex the content in class/lab.</li> <li>Teacher with s from lab staff v demonstrate th procedure of la experiments.</li> <li>Student will co lab assignment on these experi-</li> </ul>	plain upport vill ne ab nduct based iments.	6	6	Tex mar Han exp inst mea inst com rele soft	t books nual, ch douts, erimen rument suring rument puter v vant sir ware a	, PPT, Lab arts, tal trainer s/kit with s, with nulation nd high	

	envelope									spee	ed inter	met.	
				SCHEME	OF ASSESSMEN	T							
S. No.	Met Asse	hod of ssment	Descri	ption of Assessment		Maximur	n Marks		Res	ource	es Requ	uired	External / Internal
LO-04	Practic labo	cal test in pratory	<ol> <li>Student will be ask</li> <li>Derive express</li> <li>Solve simple no</li> <li>To modulate h baseband sinus</li> <li>Measure modu</li> </ol>	<b>ced to</b> (and/or): ion for AM signal umerical of AM igh frequency carrie soidal signal. ulation index of an A	<sup>-</sup> with M envelope	1(	D		Rul	brics/F	Rating	scale	Internal
			ADDITI	ONAL INSTRUCTION	S FOR THE HOD	/ FACUL	ty (if an	IY)					
DCI	DV (Din	Joma M	ling) Bhonal	<b>SCHEME FOR</b>	LEARNING	Brand	ch Code	Co	urse Co	de	CO Code	LO Code	Format
KÜ			ning ) bhopai	OUTCO	OME	Ε	0 3	3	0	2	2	5	No. <b>4</b>
COURS	E NAME	Analog Co	ommunication										
CO Des	cription	Compare a	nalog modulation techniq	ues.									
LO Des	cription	Explain blo	ck diagram of AM transm	nitter and suppression of	carrier methods.								
				SCHEI	ME OF STUDY								
S. No.		Learning	g Content	Teaching – Learning Method	Description Process	of T-L	Teach Hrs.	Pra /1 H	act. Tut rs.	L	Rs Red	quired	Remarks

LO-05	Block dia transmitte modulatio Suppressi (using dio of Sidebar	gram and des r using low h on. on of carrier: ide), Suppress nd using filte	cription of AM evel and high level BalancedModulator sion r method	Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will e contents and p handouts to st Teacher will e assignments/ quiz/tutorial te students pract knowledge.	explain the provide udents. conduct o make ice their	8		Tex Han boar lect othe	t Books douts, d rd, char ure- npt ers.	s, PPT, chalk ts, Video tel and	
				SCHEME	OF ASSESSME	NT	1					•
S. No.	Met Asse	hod of ssment	Descrij	ption of Assessment	t	Maximur	n Marks	Re	esource	es Requ	uired	External / Internal
LO-05	0-05 Mid Semester Theory Exam Mid Semester Theory Exam ADD			and/or): aplain block diagram using low level and/or diagram of balanced working of it to gene carrier signal.	of AM or high level d modulator erate	10	)	Quest	ion pa	per, Ra	ting scale	Internal
			ADDITIO	ONAL INSTRUCTION	IS FOR THE HC	D/ FACUL	ty (if an	Y)				
		1	(in a ) Dk	SCHEME FOR	LEARNIN	<b>G</b> Branc	h Code	Course	Code	CO Code	LO Code	Format
KGI	20 (Dib		ing) Bhopai	OUTCO	OME	E	0 3	3 0	) 2	2	6	No. <b>4</b>
COURS	E NAME	Analog Co	ommunication									
CO Des	cription	Compare an	nalog modulation techniq	ues.								
LO Desc	cription	Distinguish	various analog modulation	on techniques.								
				SCHEI	ME OF STUDY		1					
S. No.		Learning	J Content	Teaching – Learning Method	Descriptio Proce	n of T-L ess	Teach Hrs.	Pract /Tut	·   I	Rs Rec	quired	Remarks

								Hrs	5.			
LO-06	SSB: Pow Generatio method. Concept o Comparis SSB and	ver and Band on using filter of VSB. on and applie VSB.	width requirement, method and phase shift cation of AM, DSB-SC,	Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will e contents and p handouts to s Teacher will e quiz /assignm /tutorial to ma students pract knowledge.	explain the provide tudents. conduct ents/ ike ice their	6	2	T H bo le of	ext Book andouts, oard, cha cture- ng hers.	s, PPT, chalk rts, Video otel and	
				SCHEME	OF ASSESSME	NT						
S. No.	Met Asse	hod of ssment	Descri	ption of Assessmen	t	Maximu	m Marks		Resoui	rces Req	uired	External / Internal
LO-06	End S Theo	Semester ry Exam	<ol> <li>Student will be ask</li> <li>Describe the ger phase shift meth</li> <li>Derive various p</li> <li>Explain the cond</li> <li>Compare variou out its application</li> </ol>	ed to(and/or): neration of SSB using nod arameters of SSB ept of VSB. s modulation technion	g filter and iques and list	1	0	Ques	stion pa	aper + Ra	ting scale.	External
			ADDITI	ONAL INSTRUCTION	IS FOR THE HO	D/ FACUL	.ty (if an	Y)				
				SCHEME FOR		G Bran	ch Code	Cour	se Code	CO Code	LO Code	Format
RGI	RGPV (Diploma Wing ) Bhopal			OUTCO	OME	E	0 3	3	0	2 3	7	No. <b>4</b>
COURS	E NAME	Analog C	ommunication						1		•	
CO Des	cription	Analyze wa	aveform of Angle Modula	ation.								
LO Des	cription	Explain fre	quency modulation scher	nes and its relation with	h phase modulati	on.						
				SCHE	ME OF STUDY							
S. No.	No. Learning Content Teaching – Desc						Teach	Prac	xt.	LRs Re	quired	Remarks

			Learning Method	Proce	ess	Hrs.	/Tut Hrs.				
LO-07	Phase and frequency between phase and fr <b>Frequency Modulatio</b> waveform, expression deviation, modulation between frequency de index. Narrowband an Carlson's rule for band bandwidth trade-off.	modulation and relation equency modulation. on: definition and is of frequency in index. Relationship eviation and modulation ind wideband FM, dwidth, SNR and	Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will e contents and p handouts to st Teacher will e quiz/assignme tutorial to main students pract knowledge.	explain the provide tudents. conduct ents/ ke ice their	6	2	Tex Han boat lect othe	t Books adouts, d rd, char ure- np ers.	s, PPT, chalk ts, Video tel and	
			SCHEME	OF ASSESSME	INT						
S. No.	Method of Assessment	Descri	ption of Assessment	t	Maximur	n Marks	R	esource	es Requ	uired	External / Internal
LO-07	End Semester Theory Exam	<ul> <li>Student will be ask</li> <li>1. Describe the and between freque</li> <li>2. Drive expression and relation bet</li> <li>3. Classify FM - Nai</li> <li>4. Explain Carlson's bandwidth trade</li> </ul>	ked to(and/or): gle modulation and r ncy and phase modu n for various parame ween them. rrowband and widek s rule for bandwidth e-off.	relation ulation. ters of FM band FM , SNR and	1(	0	Questi	on pape	er + Rat	ing scale.	External
	1	ADDITI	ONAL INSTRUCTION	IS FOR THE HO	D/FACUL	ty (if an	Y)				
חסם	DV (Diplome )	ling) Phonal	SCHEME FOR	LEARNIN	G Brand	ch Code	Course	Code	CO Code	LO Code	Format
KG	ev (Dipioma v	ину) впораг	OUTCO	OME	E	0 3	3 (	2	3	8	No. <b>4</b>

COURS	E NAME	Analog Co	mmunication										
CO Des	cription	Analyze way	veform of Angle Modula	ntion.									
LO Desc	cription	Describe the	e FM generation using di	rect & indirect method.									
				SCHE	ME OF STUDY								
S. No.		Learning	Content	Teaching – Learning Method	Description Proces	n of T-L ss	Teach Hrs.	Pract. /Tut Hrs.	L	Rs Rec	luired	Remarks	
LO-08	Direct me diagram a Indirect m diagram a Block diag transmitte	thod for FM g and basic desc nethod for FM and descriptio gram and desc er.	generation: Block cription I generation: Block n ofArmstrong method cription of FM	Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will ex- contents and pu- handouts to stur Teacher will co- assignments/ quiz/tutorial to students practic knowledge.	xplain the rovide idents. onduct o make ce their	8		Text Hand boar lectu othe	Books douts, d d, char ire- npt rs.	, PPT, chalk ts, Video el and		
	SCHEME OF ASSESSMENT												
S. No.	Met Asse	hod of ssment	Descrij	otion of Assessment		Maximun	n Marks	Res	ource	s Requ	uired	External / Internal	
LO-08	End S Theoi	emester ry Exam	Student will be ask 1. Draw &/or d generation u 2. Explain Block	<b>ed to</b> (and/or): lescribe block diagra using direct and indir k diagram of FM trar	m for FM ect method nsmitter.	10	)	Question	ı pape	r + Rat	ing scale.	External	
	·		ADDITIC	ONAL INSTRUCTION	S FOR THE HOI	D/ FACUL	ty (if an	Y)					
חסו	ייט/ /ונ		ing) Dhonal	SCHEME FOR	LEARNING	Branc	h Code	Course Co	de	CO Code	LO Code	Format	
KGł	יי (ער		шу) впора	OUTCO	OME	E	0 3	3 0	2	3	9	No. <b>4</b>	

COURS	E NAME	Analog Co	ommunication							
CO Des	cription	Analyze wa	veform of Angle Modul	ation.						
LO Deso	cription	Install and c	operate angle modulatio	n circuits on kits/simula	tion software.					
		·		SCHEI	ME OF STUDY	,				
S. No.		Learning	Content	Teaching – Learning Method	Descriptio Proce	on of T-L ess	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
LO-09	Modulate sinusoidal Determine Modulate	a high freque l signal to obt e Modulation d wave.	ncy carrier with ain FM signal. Index of Frequency	Lab demonstration, PPT , hands on practice, lab assignments.	<ul> <li>Teacher will the content class/lab.</li> <li>Teacher will from lab sta demonstrat procedure of experiment</li> <li>Student will lab assignm on these experiment</li> </ul>	Il explain t in th support aff will te the of lab ts. I conduct nent based speriments.		6	Lab manual, charts, Handouts, experimental trainer instruments/kit with measuring instruments, computer with relevant simulation software and high speed internet.	
				SCHEME	OF ASSESSMI	ENT			·	•
S. No.	Met Asse	hod of ssment	Descri	ption of Assessment		Maximun	n Marks	Res	ources Required	External / Internal
LO-09	Assessment Practical test in laboratory Student will be a 1. Obtain FM parameter			<b>ked to</b> signal and calculate g	iven	10	)	Ru	brics/Rating scale	Internal
	·		ADDITI	ONAL INSTRUCTION	S FOR THE HO	DD/ FACUL	TY (IF AN'	Y)		·

RGI	PV (Dip	loma W	ing ) Bhopal	SCHEME FOR	LEARNING	G Brand	ch Code 0 3	Course Co	ode	CO Code 4	LO Code	Format No. <b>4</b>
COURS	E NAME	Analog Co	mmunication									
CO Des	cription	Compare de	modulation techniques	of AM signals.								
LO Des	cription	Describecha	racteristics of radiorece	eivers								
				SCHE	ME OF STUDY							
S. No.		Learning	Content	Teaching – Learning Method	Description Proce	n of T-L ess	Teach Hrs.	Pract. /Tut Hrs.	L	.Rs Red	quired	Remarks
LO-10	Character sensitivity frequency RF amplifi Noise Figu	istic of radio ( , selectivity, f , and its rejec ier, selection ( ure.	receiver, Concept of idelity, Image tion. Characteristic of of IF, Double Spotting,	Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will e contents and p handouts to stu Teacher will c assignments/ quiz/tutorial to students practi knowledge.	explain the provide udents. conduct o make ice their	8		Text Hand boar lectu othe	Books douts, d d, char ure- npt rs.	s, PPT, chalk ts, Video tel and	
				SCHEME	OF ASSESSME	NT						
S. No.	Met Asse	hod of ssment	Descri	ption of Assessmen	t	Maximur	n Marks	Res	source	es Requ	uired	External / Internal
LO-10	End S Theo	emester ry Exam	Student will be as 1. Characterize ra 2. Explain the giv receiver - sens frequency and Spotting, Noise	ked to(and/or): adio receiver and RF een terms that used i itivity, selectivity, fic its rejection & selec e Figure.	amplifier n radio lelity, Image tion, Double	1(	)	Questic	on pape	er , Rat	ing scale.	External

			ADDITIO	ONAL INSTRUCTION	S FOR THE HO	D/ FA	CULI	Y (IF AN	Y)					
RCI	DV (Din	loma W	ing ) Rhonal	SCHEME FOR	LEARNING	6	Branch	n Code	Cou	rse Code	c	CO Code	LO Code	Format
			ing / Driopai	OUTCO	OME	E	(	) 3	3	0	2	4	11	No. <b>4</b>
COURS	E NAME	Analog Co	ommunication											
CO Des	cription	Compare de	emodulation techniques o	f AM signals.										
LO Desc	cription	Categorize o	differenttypes of radiore	ceivers										
	SCHEME OF STUDY													
S. No.		Learning	Content	Teaching – Learning Method	Description Proce	n of T- ss	L	Teach Hrs.	Pra /Tu Hr:	ct. ut s.	LRs	s Req	juired	Remarks
LO-11	Detection practical AM recei Super het heterodyn	n of AM usir diode detect iver- Block of terodyne and ne.	ng Diode detector and or. diagram of TRF, l double super-	Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will e contents and p handouts to stu Teacher will c assignments/ quiz/tutorial to students practi knowledge.	xplain rovide udents. onduct o make ce thei	the t	8		T H b le o	ext B ando bard, cture hers.	Books outs, c chart e- npt	, PPT, chalk ts, Video el and	
				SCHEME	OF ASSESSME	NT								
S. No.	Met Asse	hod of ssment	Descrij	otion of Assessment		Maxi	mum	n Marks		Resou	ces	Requ	iired	External / Internal
LO-11	End S Theor	emester ry Exam	<ul> <li>Student will be ask</li> <li>1. Explain detection detector.</li> <li>2. Describe block</li> </ul>	a <b>ed to</b> (and/or): on of AM signal usin diagram of AM rece	g diode ivers		10		Que	stion pa	.per ⊣	+ Rat	ing scale.	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												
RGF	PV (Dip	oloma W	ing ) Bhopal	SCHEME FOR	Branch Code		Course Co	de	CO Code	LO Code	Format	
				OUTCO	;OME E 0			3 0 2 4		4	12	No. <b>4</b>
COURS	E NAME	Analog Co	mmunication									
CO Des	cription	Compare der	modulation techniques of	of AM signals.								
LO Desc	ription	Set up and s	elect particular analog o	de-modulation technique	es circuits							
		1		SCHE	ME OF STUDY							
S. No.		Learning	Content	Teaching – Learning Method	Description Proce	n of T-L ss	Teach Hrs. Hrs. Hrs.			Required Remarks		
LO-12	Check the demodulated AM signal waveform using envelope detector and draw its input output waveform. Construct AM demodulator using diode circuit Locate various sections of AM radio super heterodyne receiver and draw the waveforms at input and output side of each section.			Lab demonstration, PPT , hands on practice, lab assignments.	<ul> <li>Teacher will explain the content in class/lab.</li> <li>Teacher with support from lab staff will demonstrate the procedure of lab experiments.</li> <li>Student will conduct lab assignment based on these experiments</li> </ul>			8	Lab manual, charts, Handouts, experimental traine instruments/kit with measuring instruments, computer with relevant simulation software and high speed internet.		I, charts, tal trainer s/kit with s, vith nulation nd high met.	
	·			SCHEME	OF ASSESSME	NT	·		-			
S. No.	Met Asse	hod of ssment	od of Description of Assessment			Maximum Marks Resource				sources Required Externa		

			Student will be ask	ked to(and/or):								
LO-12	Practi	cal test in	1. Demodulated and draw inpu	AM signal using envelop It output waveform	be detector			Ru	brics	Rating	scale	Internal Format No. <b>4</b>
20 12	laboratory		2. Identify various sections of AM radio super heterodyne receiver and draw input and output side						,	8		
				each section.			ТV /IГ Л.NI	NA				
			ADDITI	UNAL INSTRUCTION		J/ FAUUL	IY (IF AN	Y)				
										00		
RGI	PV (Dir	oloma W	(ing.) Bhopal	SCHEME FOR	LEARNING	Bran	ch Code	Course Co	ode Code		LO Code	Format
				OUTCO	E	0 3	3 0	2	5	13	No. <b>4</b>	
COURS	E NAME	Analog Co	ommunication									
CO Des	cription	Compare th	e functioning of angle de	e-modulators.								
LO Des	cription	Classify diff	erent FM de-modulators	methods and outline ne	eed of pre-empha	sis & de-en	nphasis circ	cuits.				
				SCHE	ME OF STUDY							
S. No.		Learning	J Content	Teaching – Learning Method	Description Proces	of T-L s	Teach Hrs.	Pract. /Tut Hrs.	L	.Rs Red	quired	Remarks
LO-13	Block diagram of FM receiver with description FM demodulators: Slope detection, Balanced slop detection, Foster Seeley discriminator and Ratio detector. Need for pre-emphasis and de-emphasis circuits, SNR improvement, concept of AFC, Merits and demerits of FM over AM			Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will explain contents and provide handouts to students Teacher will conduct quiz/ assignments/ tutorial to make students practice the knowledge.		10		Text Bool Handouts, board, cha lecture- n others.		s, PPT, chalk ts, Video tel and	
	1			SCHEME	OF ASSESSMEN	IT						
S. No.	Met Asse	Method of AssessmentDescription of AssessmentMaximum MarksResources					sources Required Extern Inter			External / Internal		

LO-13 End Semester Theory Exam 3. List out meri				ked to(and/or): ck diagram of differen s. eed and concept of p e-emphasis circuits, S t, AFC. ts and demerits of FN	nt FM ore- NR /I over AM	1(	)	Quest	ion pape	er + Rat	External	
			ADDITI	IONAL INSTRUCTION	S FOR THE HOD	FACUL	ty (if an	Y)				
RGI	PV (Dip	oloma W	ing) Bhopal	SCHEME FOR	LEARNING DME	Branc	th Code	Cours 3	e Code	CO Code 5	LO Code 14	Format No. <b>4</b>
COURS	E NAME	Analog Co	ommunication									
CO Des	cription	Compare the	e functioning of angle d	e-modulators.								
LO Dese	cription	Explain different various multiplexing techniques.										
		•		SCHEI	ME OF STUDY							
S. No.	Io. Learning Content			Teaching – Learning Method	Description o Process	of T-L Teach ss Hrs.		Prac /Tu Hrs	LRs Required		quired	Remarks
LO-14	LO-14 Concept of Frequency Division Multiplexing and Time Division Multiplexing and their comparison			Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will exp contents and pro- handouts to stude Teacher will con assignments/ quiz/tutorial to n students practice knowledge.	lain the vide ents. duct nake their	6	Text Books, PPT, Handouts, chalk board, charts, Video lecture- nptel and others.			s, PPT, chalk ts, Video tel and	
				SCHEME	OF ASSESSMENT							

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	<b>Resources Required</b>	External / Internal							
LO-14	Seminar presentation	<ul><li>Student will be asked to</li><li>1. Present on FDM or TDM or on their comparison</li></ul>		Rubrics/Rating scale	Internal							
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												

DCDV (Diploma Wing) Phonal			SCHEME FOR LEARNING			Branch C	ode	Course Code			CO Code	LO Code			
KGPV		oma vv	ing) вг	iopai	OUTCOME			E 0	3	3	0	2	5	15	Format No. 4
COURS	E NAME	Analog	Communi	ication				' '							
CO Des	cription	Compare	e the function	ators.											
LO Dese	cription	Operate	different an	alog radic	o receiver.										
						SCHEME O	F STUDY								
S. No.	No. Learning Content			Tea Learnir	ching — ng Method	Description of 1	<b>I-L Process</b>	Teach Hrs.	Pract /Tut Hrs.	:	LRs Required			Remarks	
LO-15	<ul> <li>Locate various sections of FM receiver and examine its working.</li> <li>Obtain the frequency response of Pre-emphasis and De-emphasis circuit.</li> <li>Demonstration of fault finding of FM radio receivers.</li> </ul>			Lab dem PPT, har practice, assignm	ionstration, ids on , lab ents. V-Lab.	<ul> <li>Teacher will exp content in class/</li> <li>Teacher with sup lab staff will den procedure of lab experiments.</li> <li>Student will con- assignment base experiments.</li> </ul>	lain the lab. oport from nonstrate the duct lab ed on these		8	L H ir n c s a ir	Lab manual, charts, Handouts, experimental trainer instruments/kit with measuring instruments, computer with relevant simulation software and high speed internet.				
						SCHEME OF A	SSESSMENT								
S. No.	Meth Asses	od of Descrip			tion of Asse	essment	Maximum	um Marks Resources					uired	External / Internal	
LO-15	Practica labor	al test in ratory 2. Plot frequency r emphasis circuit 3. Demonstrate fa			asked to(an section of FM response of Pr t (or) ult finding of F	d/or): receiver (or) e-emphasis and De- M radio receiver	10			Rubrics/Rating scale					External
	1			AD	DITIONAL I	NSTRUCTIONS FO	R THE HOD/ I	FACULTY	(IF ANY	()					