		Sub	ject: ľ	Mapr	ping o	f Cor	urse (	Outc	omes	with	Dro		-	comes of	unication i	Engineering	Department of E
	Ref No					T		7460	Miles	VICII	Prog	gram	Outc	omes of	B1	Date:	Department of E
		Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long Learning				Sent to :
CO No.	(BTEC-301-18: Electronic Devices)	1	PO 2	PO 3								PO 11			Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of	
CO1	Understand physics of semiconductors and behavior of charge carriers within semiconductors	v												Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO2	Understand the working of semiconductor diodes supported with mathematical explanation.	v	V			٧							V	Apply	No	MSTs, ESE, Class/Quiz Tests	
003	Understand the working of BJT and MOSFET with their equivalent small signal models.		v		v	V							V	Analyze	No	MSTs, ESE, Class/Quiz Tests	

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cc	Understand the chemical processes used in fabrication of integrated circuits.	4	V		٧	٧							v	Apply	No	MSTs, ESE, Class/Quiz Tests	
CON	o. (BTEC-302-18: Digital System Design)	PO 1	PO 2	PO 3	PO 4	PO 5	P0 6	PO 7	P0 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs	Assessment Tools to Measure Attainment of	
CO1	thorough understanding of the fundamental concepts and techniques used in digital electronics.	٧	V											Understand	No	MSTs, ESE, Class/Quiz Tests	
CO2	To understand and examine the structure of various number systems and its application in digital design.					V								Understand	No	MSTs, ESE, Class/Quiz Tests	
CO3	The ability to understand, analyze and design various combinational and sequential circuits.	V	V			V							Aı	nalyze	No	MSTs, ESE, Class/Quiz Fests	
CO4	Ability to identify basic requirements for a design application and propose a cost effective solution.		v			٧							Un	derstand N	lo (	//STs, ESE, Class/Quiz ests	

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C	005	The ability identify and prevent var hazards an timing problin a digital design.	ious	٧	v			V									Understand	No	MSTs, ESE, Class/Quiz Tests	
CO	No.	(BTEC-303- Electromagn c Waves)	eti	PO 1	PO 2	PO 3	PO 4	P0 5	PO	PO	7 PO 8	POS	PO	10 PC	) 11 F	PO 12		Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of	
CO	1 p th tra- lir	characteristics vave propagation prough ansmission nes	8 &	v	v												Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO2	eq ele	nderstand axwell's quations fo ectromagnetic aves	or		v		V	٧								V	Apply	No	MSTs, ESE, Class/Quiz	
CO3	uni	Characterize					V	٧	1		-				-	٧			Tests	
		Calculate ection and	V		٧	+	V	٧		-		1	Lib			v A	nalyze	No	MSTs, ESE, Class/Quiz Tests	
CO4	tran	esmission of res at media rface	٧		,		V	V								A	pply	No	MSTs, ESE, Class/Quiz Tests	
	(UC	-BTAM-303-													-	V				
O No.	Engi	ineering nematics-	PO 1	РО	2 PO	3 PC	)4 P	0 5 PC	) 6 P(	) 7 P(	08 P	09 P	0 10	PO 11	PO ·	12	Skill E	imployability /	Assessment Tools to Measure Attainment of	
:01	tools n evalua multipl	athematical needed in ting le integrals eir usage	<b>V</b>	1		1										App	oly N	nip	MSTs, ESE, Class/Quiz Tests	

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C	The effective mathematic tools for the solutions of differential equations the model physic processes.	al at	√	٧		√ /								Apply	No	MSTs, ESE, Class/Quiz Tests	
CO.	that are used in various techniques dealing engineering problems	n of ble n	V	4		٧								Apply	No	MSTs, ESE, Class/Quiz Tests	
CO4	Differential Equations with applications in engineering		1		1									Understand	din No	MSTs, ESE, Class/Quiz Tests	
CO5	To provide an overview of probability and statistics to engineers	<b>√</b>	٧		<b>V</b>									Understand	in No		
CO No.	(BTEC-304-18: Network Theory)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability /	Assessment Tools to Measure	
CO1	Analyze linear networks using network														Entrepreneurs hip	Attainment of CO	
CO2	theorems Use Laplace transform to analyze transient &	٧	_ V		٧	V							٧	Analyze	No	MSTs, ESE, Class/Quiz Tests	
s	steady state response of inear networks	V	v		V									Apply	No	MSTs, ESE, Class/Quiz Tests	

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	Digital System Design Laboratory)	P0 1	PO	2 PO	3 P(	04 P	O 5 P	06	PO 7	PO 8	PO 9	PO	10 PO	11 PO	12 Sk	ill	Focus on Employability / Entrepreneurs	Assessment Tools to Measure Attainment of	
	(BTEC-312-18:														√ im	plementatio	Yes		ternal viva,End sem external viva
CO4	design working circuits based on resistors,diodes, transistors and MOSFETs	V				٧	V									nderstanding		Practical notebooks,In	ternal viva,End sem external viva
CO3	characteristics working of MOSFET in circuits Think and	8.		٧			V									Jnderstanding			nternal viva,End sem external viva
CO2	characteristics working of transistor in different configurations. Understand		,				V									Implementa		Practical notebooks,Ir	nternal viva,End sem external viva
CO1	diodes in circu with proper understanding their working Understand	its to	٧	٧		V	V												
COI	(BTEC-311 Electronic Devices Laboratory)		PO 1	PO 2	PO:	3 PO	4 PO	5 F	206	207	PO 8	PO 9	PO 10	PO 11	PO 12	: Skill	Focus on Employability Entrepreneurs		
C	O4 networks u Foster's an Cauer's methods.	sing d	٧	V			v		,						V	Apply	No	MSTs, ESE, Class/Quiz Tests	
	network parameter analyze tw networks. Realize on	e port	٧	V	_		v								\ \ \ \ \	Analyze	No	MSTs, ESE, Class/Quiz Tests	

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C	Realize combinational circuits using logic gates	V		,		/											
CC	logic gates	V							1					/ Implementa	atio no	Practical notebooks, in	ternal viva,End sem external viva
CO	combinational & sequential circuits.		V		V	<b>▼</b>								Implementa	tio no	Practical notebooks,In	ternal viva,End sem external viva
CO4	Think and design working projects using digital 74XX lcs		V	V	V	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \							V	Understandi	ng Yes	Practical notebooks,Int	ternal viva,End sem external viva
								-	-		-	100		Implementat	io Yes	Practical notebooks,Int	ernal viva,End sem external viva
CO No	( HSMC101-18: Devlopment of Societies)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 1	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	
CO1	Origin of Family, Clan and Society. Understand the								<b>V</b>				1	Understand	No	MSTs, ESE, Class/Quiz Tests	
CO2	Forms of Government, like Democracy, Monocracy, Dictatorship and others								<b>V</b>				<b>V</b>	Understand	No	MSTs, ESE, Class/Quiz Tests	
003	Understand the Basic concepts of Economic, Barter system and Jajmani system : Socialism, Capitalism, and Marxism								4				√ A	Analyze	No	MSTs, ESE, Class/Quiz Tests	
D4   P   d   B	Know about the Development Process before, Juring and after Fritish Rule in India.							,	v				√ U	nderstand		MST,s ESE, Class/Quiz Tests	



co	No. 4-Weeks Institutio Training)	nal	P01	PO	2 PO	3 PO	4 PO 5	PO 6	PO 7	PO 8	POS	PO 10	PO 11	PO 12	Skill	Focus on Employability Entrepreneurs	Measure
C	Exposure Practical Aspects of Discipline	- 1														hip	Attainment of CO
CO	Realization common a	nd uits	V	٧		V	٧				٧			٧	Analyze	Yes	Practical notebooks,Internal viva,End sem external viva
	to their wor	king	٧	٧		V	V								Apply		
COS	design worl	∋d	v	٧		V					V			V	Analyze	Yes	Practical notebooks,Internal viva,End sem external viva
							٧				٧			٧		Yes	Practical notebooks,Internal viva,End sem external viva
O No	(BTEC-331- Mentoring al Professional Developmen	nd P	01 P	02	PO 3	PO 4	PO 5 P	06 P	0 7 P(	08 P	0 9 P	0 10 PC	) 11 PC	) 12 S	kill	Focus on Employability / Entrepreneurs	Assessment Tools to Measure
CO1	Development Overall Personality an Aptitutde													A.	nalyze	hip	Attainment of CO
002	General Awareness bo Current affairs GK	th &		1				٧	V ,	/	V	V		V	amine		Aptiitude Skills Tests, Viva
:О3	Development of Communication Skills	f			+			V	V V	,	1	V	-	_			Aptitude Skills Tests, Viva
04	Development of Presentation		+		+		-	+	/ v	V	,	v	V		alyze	Yes	Aptitude Skills Tests, Viva
	Skills				+	-	V	V	V	V	v		V	App	oly	Yes	Aptitude Skills Tests, Viva
	(BTEC-401-18:																
No.	Analog Circuits)	PO 1	PO 2	PO:	3 PC	)4 PC	5 PO 6	PO 7	PO 8	PO 9	PO 1	0 PO 11	PO 1	2 Skill		Focus on	Assessment Cools to C

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biasing of transistors an analyze BJT/FET amplifiers			v										Analyze	No	MSTs, ESE, Class/Quiz Tests		
rectifier and amplifier circuit													Apply	No	MSTs, ESE, Class/Quiz		
sinusoidal and non-sinusoidal oscillators	V											\		No	MSTs, ESE,		
				V	V									No	Tests MSTs, ESE, Class/Quiz		
(BTEC-402-18: Microprocesso rs and Microcontroller s)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11		Skill	Focus on Employability / Entrepreneurs	Assessment Tools to Measure		
Understand architecture &functionalities of different building block of 8085 microprocessor.													Analyze	No	MSTs, ESE, Class/Quiz Tests		
Understand working of different building blocks of 8051 nicrocontroller.				٧	٧								Apply	No		111	
Comprehend nd apply rogramming spects of 8051 icrocontroller.				٧								V	nalyze	No			
2 Coor	transistors an analyze BJT/FET amplifiers  Analyze various rectifier and amplifier circuit. Analyze sinusoidal and non-sinusoidal oscillators. Understand various types of Power Amplifiers.  (BTEC-402-18: Microprocessors and Microcontroller shullding block of 8085 microprocessor. Understand various types of 8085 microprocessor. Understand vorking of lifferent building blocks for 8051 microcontroller.	transistors and analyze BJT/FET amplifiers  Analyze various rectifier and amplifier circuits various inusoidal and non-sinusoidal oscillators various types of Power Amplifiers various types of Pour Amplifiers various types of Pour Amplifiers various types of Bos and Microprocessor and Microprocessor and Microprocessor various place of different building block of Bos and type of Bos a	transistors and analyze BJT/FET amplifiers   Analyze various rectifier and amplifier circuits    Analyze sinusoidal and non-sinusoidal oscillators    Understand various types of Power   Amplifiers    (BTEC-402-18: Microprocesso rs and Microcontroller s)  Understand architecture & functionalities of different building block of 8085 microprocessor.    Understand vorking of lifferent building blocks f 8051 nicrocontroller.    omprehend and apply ogramming pects of 8051 crocontroller.	transistors and analyze BJT/FET amplifiers    Analyze various rectifier and amplifier circuits    Analyze sinusoidal and non-sinusoidal oscillators    Understand various types of Power Amplifiers    Wicroprocesso rs and Microcontroller s)  Understand architecture & functionalities of different building block of 8085 microprocessor.    Jnderstand vorking of lifferent building blocks f 8051 nicrocontroller.    womprehend apply ogramming pects of 8051 crocontroller.	transistors and analyze BJT/FET amplifiers    Analyze various rectifier and amplifier circuits    Analyze sinusoidal and non-sinusoidal oscillators    Understand various types of Power Amplifiers    (BTEC-402-18: Microprocesso rs and Microcontroller s)  Understand architecture & functionalities of different building block of 8085 microprocessor.    Understand various types of PO 1 PO 2 PO 3 PO 4 point of different building block of 8085 microprocessor.    Understand various fifterent building blocks of 8051 microcontroller.    Omprehend did apply ogramming pects of 8051 crocontroller.	transistors and analyze BJT/FET amplifiers    Analyze various rectifier and amplifier circuits    Analyze sinusoidal and non-sinusoidal oscillators    Understand various types of Power Amplifiers    (BTEC-402-18: Microprocesso rs and Microcontroller s)  Understand architecture &functionalities of different building block of 8085 microprocessor.    Understand various types of Po 1 Po 2 Po 3 Po 4 Po 5 microprocessor.    Understand architecture &functionalities of different building blocks of 8085 microprocessor.    Understand various processor.    Understan	transistors and analyze BJT/FET amplifiers  Analyze various rectifier and amplifier circuits v  Analyze sinusoidal and non-sinusoidal oscillators Understand various types of Power Amplifiers  V  (BTEC-402-18: Microprocesso rs and Microprocesso rs and Microprocesso of different building block of 8085 microprocessor.  V  V  V  V  V  V  V  V  V  V  V  V  V	transistors and analyze BJT/FET amplifiers    Analyze various rectifier and amplifier circuits    Analyze sinusoidal and non-sinusoidal oscillators    Understand various types of Power Amplifiers    (BTEC-402-18: Microprocesso rs and Microprocesso rs and Microprocesso of different building block of 8085 microprocessor.    Understand various types of Po 1 Po 2 Po 3 Po 4 Po 5 Po 6 Po 7 Po 7 Power Sinusoidal oscillators    Understand various types of Po 7 Po 8 Po 7 Po 8 Po 8 Po 7 Po 9	transistors and analyze BJT/FET amplifiers  Analyze various rectifier and amplifier circuits  Analyze sinusoidal and non-sinusoidal oscillators  Understand various types of Power Amplifiers  V  V  V  V  V  V  V  V  V  V  V  V  V	transistors and analyze BJT/FET amplifiers  Analyze various rectifier and amplifier circuits  Analyze sinusoidal and non-sinusoidal coscillators  Understand various types of Power Amplifiers  V V V V V V V V V V V V V V V V V V V	transistors and analyze BJT/FET amplifiers  Analyze various rectifier and amplifier circuits  Analyze various sinusoidal and non-sinusoidal oscillators  Understand various types of Power Amplifiers  (BTEC-402-18: Microprocessor sand Microcontroller s)  Understand various types of Power Amplifiers  PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO 8 PO 9 PO 10  Understand various types of Power sand Microcontroller s)  Understand various types of Power various types o	transistors and analyze BJT/FET amplifiers  Analyze various rectifier and amplifier circuits  Analyze sinusoidal and non-sinusoidal oscillators  Understand various types of Power Amplifiers  W V V V V V V V V V V V V V V V V V V	Iransistors and analyze BJT/FET amplifiers    Analyze various rectifier and amplifier circuits    Analyze sinusoidal and non-sinusoidal oscillators    Understand various types of Power Amplifiers    (BTEC-402-18: Microprocessor sand Microcontroller s)    PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO 8 PO 9 PO 10 PO 11 PO 12 PO 12 PO 13 PO 14 PO 15 PO 6 PO 7 PO 8 PO 9 PO 10 PO 11 PO 12 PO 13 PO 14 PO 15 PO 6 PO 7 PO 8 PO 9 PO 10 PO 11 PO 12 PO 15 PO	transistors and analyze BJT/FET amplifiers    Analyze various rectifier and amplifier circuits    Analyze various rectifier and amplifier circuits    Analyze sinusoidal and non-sinusoidal oscillators    Understand various types of Power    Amplifiers    Apply    Analyze    Controller    Sinuscionalities of different    Building block of 8085    Bost icroprocessor.    Apply    Apply    Analyze    Analyze    Apply    Analyze    Apply    Analyze    Apply    Apply    Apply    Apply    Analyze    Apply     Appl	transistors and analyze BJT/FET amplifiers	transistors and analyze BJT/FET amplifiers	Iterasistors and analyze BJT/FET analyties V V V V V V V V V V V V V V V V V V V

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	004	interface & interact with different peripherals and devices.	1	٧	٧		٧									Apply	No	MSTs, ESE, Class/Quiz Tests	
СО	No. S	(BTEC-403-18: Signals and Systems)		01	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 1	1 PO	12 Skill	Focus on Employability Entrepreneurs	Attainment of	
CC	01 di of sy	haracterize ifferent types f signals and vstems. nalyze the	٧		٧		v									Understan		MSTs, ESE, Class/Quiz Tests	
CO	2 line	ehavior of ear-shift variant stems.	٧		v											Analyze	No	MSTs, ESE, Class/Quiz	
CO3	of F Lap Trai ana cont sign	ply concepts courier and blace nsforms to lyze tinuous-time lals and ems.	٧				V									Apply	No	MSTs, ESE, Class/Quiz Tests	
004	discr signa syste Discr Fouri	bility	/	V	V	V	<b>V</b>									Analyze	No	MSTs, ESE, Class/Quiz Tests	
	Univer	C-122-18: rsal n Values-	1	PO 2	PO:	3 PO	4 PO:	5 PO 6	PO 7	PO	B PO	9 PO	10 PO	11 P	0 12	Skill	Employability / Entrepreneurs	Assessment Tools to Measure Attainment of	
. 1	Underst core of Human \	and the Universal Values.								1					v	Understand	No	MSTs, ESE, Class/Quiz Tests	

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СО	Harmony and Se Exploration.	elf							1				V	Understand	No	MSTs, ESE, Class/Quiz	
CO:	Understand the Basic Human Aspiration.								1	+		-				Tests MSTs, ESE,	
CO4	Know about the Professional Ethics.								1				1	Analyze	No	Class/Quiz Tests MST,s ESE, Class/Quiz Tests	
CO No	(EVS-101- 18:Environmen tal Sciences)	PO 1	PO 2	PO 3	P0 4	PO 5	P0 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12		Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	
CO1	Students will enable to understand environmental problems at local and national level through literature and general awareness							<b>V</b>					<b>V</b>		No	MSTs, ESE, Class/Quiz Tests	
D2	The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental esues												<b>V</b>	Undertsand N	lo (	MSTs, ESE, Class/Quiz Fests	

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CO3	The students apply interdisciplina approach to understand ke environmental issues and critically analyz them to explore the possibilities to mitigate thes problems	ry y e e							<b>V</b>						No	MSTs, ESE, Class/Quiz Tests	
CO4	Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world							1					1	Apply	No	MSTs, ESE, Class/Quiz Tests	
00 No.	(BTEC-411-18: Analog Circuits Lab)	P01	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12		Focus on Employability / Entrepreneurs	Tools to Measure	
CO1	Study and verify the characteristics of BJTs in circuits with proper understanding to their working.	v	V												hip	Attainment of CO	
O2 Fi	Understand requency esponse & vorking of arious types of escillators	V			٧	V							V (	Understanding	no	Practical notebooks,	nternal viva,End sem external viva
D3 dif	Inderstand haracteristics & orking of fferent types Power hplifiers				٧	٧							U	Inderstanding r	00	Practical notebooks,I	nternal viva,End sem external viva

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С	O4 Design wo circuits of oscillators, er follower circuit and power amp	emitt	٧	V		٧	٧							V	Implementa	tio Yes	Practical notebo	poks,Internal viva,End sem external <b>vi</b> v
COI	(BTEC-412 Microproce rs and Microcontro s Lab)	sso	PO 1	PO 2	PO 3	PO 4	P0 5	PO 6	PO 7	PO8	PO 9	PO 16	PO 11	PO 1:	2 Skill	Focus on Employability Entrepreneurs		
CO1	of different building block of 8085 microprocesso	re les		v														
CO2	Programming for controlling stepper and Do motors using 8085 Microprocessor s).	.(		V		V	V								Understandin	g yes	Practical notebook	ss,Internal viva,End sem external viva
СО3	Programs to generate waveforms and interface ADC and DAC using 8051 Microcontroller.	V				v	v								Implementatio			s,Internal viva,End sem external viva
										+				-   1	nplementatio	Yes		s,Internal viva,End sem external viva
No.	(UC-BTEC-501- 18: Analog and Digital Communicatio n)	PO	PO	2 PO	3 PO	4 PO	5 PO	6 PO	7 PO	B PO	9 PO	10 PC	) 11 PC	12 5		Employability /	Assessment Tools to Measure Attainment of	



C	Analyze and compare different and modulation schemes for their efficient and bandwice	alog cy lth				edina.								Understa	nd No	MSTs, ESE, Class/Quiz Tests	
co	system in presence of noise.		V	v			٧							Understan	d No	MSTs, ESE, Class/Quiz Tests	
COS	analyze their system performance.	V	٧											Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO4	Analyze different digital modulation schemes and can compute the bit error performance.	٧	٧			V							V	Understand	No	MSTs, ESE,	
O No.	(UC-BTEC-502- 18: Digital Signal Processing)	PO 1	PO 2	PO 3	PO 4	P0 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 1:	2 Skill	Focus on Employability /		
CO1	Represent signals mathematically in continuous and discrete time and frequency domain	<b>v</b>	V											Understand		Attainment of CO	
02	Get the response of an LSI system to different signals	,				٧							٧	Understand		MSTs, ESE, Class/Quiz	
03 80	Design of different types of digital filters or various	٧	V									1	v	Analyze		MSTs, ESE, Class/Quiz Tests	

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СО	Circuits)	\$ 15.77	PO 1	PC	) 2 F	203	PO 4	PO 5	PO 6	PO	7 PO 8	PO	9 PC	) 10	PO 11	PO 12	Skill	Focus on Employability Entrepreneurs	Assessment Tools to Measure	
СО	Represent signals mathematic in continuou and discrete time and frequency domain	s	٧	V													Understand	hip No	Attainment of CO  MSTs, ESE, Class/Quiz Tests	
CO2	Get the response of a LSI system to different sign		٧					٧						-		V	Understand	No	MSTs, ESE, Class/Quiz	
C03	Design of different types of digital filters for various applications	•	V	√ √				V								٧		No	Tests  MSTs, ESE, Class/Quiz Tests	
O No.	(UC-BTEC-50 18: Control Systems)	4- P(	01	PO 2	PO 3	POA	PO	5 P(	) 6 PC	07 F	208 P	0 9 1	PO 10	PO	11 PO	12 51	cill	Focus on Employability /	Assessment Tools to Measure	
CO1	Characterize a system and find its steady state behaviour																	hip	Attainment of CO  MSTs, ESE, Class/Quiz	
.02	Investigate stability of a system using different tests	V		v v	V V	V										-		lo (	Tests  MSTs, ESE, Class/Quiz	
	Design various controllers Solve linear,	٧	-	٧	V	٧									V	Ana	llyze N	0 0	Tests MSTs, ESE, Class/Quiz	
	non-linear and optimal control problems	٧	1	v	٧	٧										App	ly No	0	Tests  MSTs, ESE, Class/Quiz Tests	

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co	DC Motors)	. &	PO 1	PO.	2 P	03 F	04	PO 5	PO 6	PO 7	PO 8	POS	PO 1	0 PO 1	1 PO 1	12 Skill	Focus on Employability Entrepreneurs	weasure	
CC	Understand principle of energy conversion	the	٧													Analyze	hip No	CO Attainment of	
CO	Explain the working principle, construction a applications o DC motors	nd f		V				٧								Apply	No	MSTs, ESE, Class/Quiz Tests	
CO3	Explain the working principle, construction ar applications of AC motors	d						٧								Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO4	Gain knowledge about the fundamentals of Special motors	1		V		V	v									Apply	No	MSTs, ESE, Class/Quiz Tests	
O No.	(UC-BTEC- 901C-18: Satellite Communicatio n)	PO	l PC	)2 P	О 3	PO 4	PO 5	PO	5 PO	7 PO	B PO	9 PC	) 10 P	0 11 P	PO 12 8	škill	Employability / Entrepreneurs	Assessment Tools to Measure Attainment of	
O1 	Interpret & define basics of Satellite communication, understand the complete link design along with and the nterference effects on it		V												U	nderstand	No (	MSTs, ESE, Class/Quiz Fests	

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CC	Understand various fixed and demand assignment multiple acce techniques		٧												Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO	Understand special purpo communicatio satellites.	se	٧				V								Analyze	No	MSTs, ESE, Class/Quiz	
CO4	Have knowledge of laser satellite communication and CATV system.		٧	٧			V								Apply	No	MSTs, ESE, Class/Quiz Tests	
CO No.	(UC-BTEC- 901F-18: JAVA Programming)	PC	)1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 1	2 Skill	Focus on Employability / Entrepreneurs	Assessment Tools to Measure Attainment of	
CO1	Apply the concepts and basics of JAVA															hip	MSTs, ESE,	
CO2	Demonstrate the knowledge of operators and control statements	V		٧			٧								Analyze	No	Class/Quiz Tests MSTs, ESE, Class/Quiz	
003	Ability to learn about Inheritance, Interface, Applets			٧			V								Analyze		MSTs, ESE, Class/Quiz	
04	Learn about JAVA database connectivity	٧					V		1						Apply	No	Class/Quiz Tests  MSTs, ESE, Class/Quiz Tests	



co	No. Digital Commun Labor	nicatio	PO 1	PO	PO:	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability Entrepreneurs	Assessment Tools to Measure Attainment of	
cc	waveform AM, FM,	istics it s of PCM	v	<b>V</b>												hip	СО	
со	Study and compare in AM and systems	oise	٧	٧		V	V								Understandin	g no	Practical notebook	s,Internal viva,End sem external viva
COS	Investigate output responses PAM, PCM PSK, FSK, and QAM.	of MSK	V	V			٧								Understandin	g no	Practical notebook	s,Internal viva,End sem external viva
CO4	Digital link simulation 8 error estima in a digital li using MATL (SIMULINK) communicati simulation packages.	tion nk AB				٧	٧								mplementatio			s,Internal viva,End sem external viva
No.	(UC-BTEC-5 18: Digital Signal Processing Laboratory)	12- PO	1 PC	2 PC	) 3 P(	) 4 PC	) 5 PO	6 PO	7 PO 8	POS	9 PO	10 PO			in	Focus on Employability /	Assessment Tools to Measure	,internal viva,End sem external viva
	Develop a MATLAB program to generate standard sequences and various signals	V	V													uln.	Attainment of CO	
2	Configuring Audio Codec of C6xxx Boards				1	V							\ \ \	impl	ementatio n	D F	Practical notebooks,	Internal viva,End sem external viva

The John

	Develop programs to verify convolution and design & IIR filters.	I FIR	V	v			V	V												
Co	Implementa of Audio De Line, Echo a Audio Reverberatio	lay ind	٧	V			v	٧				V				V	implements			ks,Internal viva,End sem external viva
COM	Circuits Laboratory) Study the		PO 1	PO 2	РО	3 PC	) 4 P(	0.5	PO 6	PO 7	PO 8	POS	PO	10 P	011	PO 1	2 Skill	Focus on Employability Entrepreneurs	Assessment Tools to Measure Attainment of	
CO1	configurations of Differential amplifiers Determine the		v	٧		V		v				V							СО	
CO2	performance parameters of an OP-Amp	-	v	٧			V									٧	Understandin	resi,		s,Internal viva,End sem external viva
CO3	Design various applications using Op-Amps					V											Understandin	gno	Practical notebook	s,Internal viva,End sem external viva
CO4	Examine the operation of a Phase lock loop				٧	V	V			1	1	٧				٧	Implementatio	yes	Practical notebooks	s,Internal viva,End sem external viva
										+					+	٧	Understanding	no		s,Internal viva,End sem external viva
O No.	(UC-BTEC-601- 18: Wireless Communication)	PO 1	PC	) 2 P(	03	PO 4	PO 5	РО	6 PO	7 PC	)8 P	0 9 P	O 10	PO 1	1 PC	12 8		bin	Assessment Tools to Measure	
01	the basic elements of Cellular Radio Systems and ts design	٧	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			V	٧									A	nalyze	No	MSTs, ESE, Class/Quiz	

As of

CO	Learn about the concepts Digital communicati through fadir multipath channels	on		v										Apply	No	MSTs, ESE, Class/Quiz Tests	
CO3	techniques for Wireless communication		V			/ V							V	Analyze	No	MSTs, ESE, Class/Quiz Tests	
	Know about	1		_	V	٧							V				
CO4	the Wireless standards and systems	٧	٧		V	√							V	Apply	No	MSTs, ESE, Class/Quiz Tests	
CO No.	(BTCS-504-18: Computer Networks)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of	
CO1	functions of the different layer of the OSI Protoco															MSTs, ESE, Class/Quiz Tests	
CO2	Describe the function of each block of widearea networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)													Understand		MSTs, ESE, Class/Quiz Tests	
O3   r	Develop the network programming for given problem elated TCP/IP rotocol												A	nalyze		MSTs, ESE, Class/Quiz Fests	

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EMAIL, File Transfer Protoco (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.	ol .												Understand	No	MSTs, ESE, Class/Quiz Tests	
(UC-BTEC-602- 18: Optics! Fibres and Communicatio n)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs	Assessment Tools to Measure	
Recognize and classify the structures of Optical fiber and types.	٧	V											Understand	hip No	MSTs, ESE, Class/Quiz	
Discuss the channel impairments like losses and dispersion and analyze various coupling losses.	V				V							٧	Understand	No	MSTs, ESE,	
Classify the Optical sources and detectors and to discuss leir principle.												v A	ınalyze	No	Class/Quiz	
amiliar with esign unsiderations fiber optic stems and urces and			v	V	V							V Ui	nderstand I	No (	MSTs, ESE, Class/Quiz	
cilidda a con nee a e or f s	Transfer Protoco (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  (UC-BTEC-602-18: Optics! Fibres and Communication)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel impairments like obsess and lispersion and inalyze various oupling losses.  classify the ptical sources and to discuss eir principle.  amiliar with esign insiderations fiber optic stems and urces and urces and urces and urces and discuss eir principle.	Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  (UC-BTEC-602- 18: Opticsl Fibres and Communicatio n)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel impairments like osses and lispersion and inalyze various oupling losses.  V  classify the ptical sources and detectors and to discuss eir principle.  williar with esign insiderations fiber optic stems and arctors and actors and ac	Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  (UC-BTEC-602- 18: Opticsl Fibres and Communicatio n)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel mpairments like cosses and lispersion and inalyze various oupling losses.  V V  Ilassify the ptical sources and detectors and to discuss eir principle.  Imiliar with esign insiderations fiber optic stems and urces and ectors	Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  (UC-BTEC-602- 18: Opticsl Fibres and Communication n)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel mpairments like cosses and lispersion	Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  (UC-BTEC-602- 18: Opticsl Fibres and Communicatio n)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel mpairments like osses and lispersion and inalyze various oupling losses.  V V  lassify the prical sources and detectors and to discuss eir principle. williar with esign insiderations fiber optic stems and urces and ectors	Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  (UC-BTEC-602-18: Optics! Fibres and Communication)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel mpairments like osses and lispersion and inalyze various oupling losses.  V V  classify the ptical sources and detectors and to discuss eir principle.  williar with esign insiderations fiber optic stems and urces and ectors  v V	Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  (UC-BTEC-602-18: Optics! Fibres and Communication)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel mpairments like osses and lispersion and inalyze various oupling losses.  V V V V V V V V V V V V V V V V V V V	Transfer Protocol (FTP), WWW, HTTP, SMMP, Bluetooth, Firewalls using open source available software and tools.  (UC-BTEC-602- 18: Opticsl Fibres and Communicatio n)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel mpairments like osses and lispersion and malyze various oupling losses.  V  V  Ilassify the ptical sources and to discuss eir principle.  williar with esign nsiderations fiber optic stems and urces and ectors  V  V  V  V  V  V  V  V  V  V  V  V  V	Transfer Protocol (FFP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  (UC-BTEC-602-18: Optics! Fibres and Communication)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel impairments like osses and inalyze various oupling losses.  V V V Isassify the ptical sources and detectors and to discuss ein principle.  will assify the principle.	Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  (UC-BTEC-602- 18: Opticsl Fibres and Communication n)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel mpairments like osses and lispersion and malyze various oupling losses.  V  V  V  V  Idassify the ptical sources and detectors	Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  (UC-BTEC-602- 18: Optics! Fibres and Communicatio n)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel manylar various oupling losses.  V  V  Idassify the ptical sources and detectors and	Transfer Protocol (FTP), WWW, HTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  [UC-BTEC-602-18: Optical Fibres and Communication)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel mpairments like osese and lispersion and malyze various oupling losses.  V  Jassify the ptical sources and detectors do discusse ir principle.  W  V  V  V  V  V  V  V  V  V  V  V  V	Transfer Protocol (FTP), WWW, HTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  (UC-BTEC-602-18: Optics! Fibres and Communication)  Recognize and classify the structures of Optical fiber and types.  Discuss the channel mpairments like osses and ilspersion and malyze various oupling losses.  V  Lassify the ptical sources did detectors did to discuss eir principle.  William with esign siderations fiber optic stems and arces and ectors  V  V  V  V  V  V  V  V  V  V  V  V  V	Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.  PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO 8 PO 9 PO 10 PO 11 PO 12 Skill  Understand  Communicatio n) Recognize and classify the structures of Optical fiber and types.  Understand  Understand  Understand  Understand  Understand  V V Analyze  V Analyze  W Understand  V Understand  Understand  V Understand  Understand  V Understand  Understand  Understand  Understand  V Understand  V Understand  V Understand  V Understand  V Understand  V Understand  Understand  Understand	Transfer Protocol (FTP), WNW, HTTP, SNMP, Bluetooth, Ficrewalls using open source available software and tools.  (UC-BTEC-802-18: Optical Fibres and Communication)  Recognize and classify the structures of Optical fiber and types.  Understand No  Understand No  Understand No  Understand No  Understand No  Analyze No  Understand No	Transfer Protocol [FTP), WWW, HTTP, SMMP, Bluetooth, Firewalls using Open source available software and tools.  [UC-BTEC-602- 18: Optics   Fibres and Communication in

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CO	and Antenn Engineering	ave a a)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	2 Skill	Focus on Employability Entrepreneurs	weasure	
со	Tubes and Microwave Solid-state devices.	on	V	V											Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO2	Learn about various important Microwave Components and the Microwave measurement that can be carried out			V		V	V							٧	Apply	No	MSTs, ESE, Class/Quiz Tests	
CO3	Explain the basic concepts and types of Antennas and its regions.	s v												A	nalyze	No	MSTs, ESE, Class/Quiz Tests	
CO4	Describe the important concepts of Antenna Arrays and Antenna Aperture	٧	V			V								A	pply	No	MSTs, ESE, Class/Quiz Tests	
NO.	(UC-BTEC- 902B-18: Power Electronics)	PO 1	PO	2 PO:	3 PO 4	PO	PO 6	PO 7	PO 8	PO	9 PO	10 PO	11 PO		301	Employability /	Assessment Tools to Measure Attainment of	



CO1	Understand the principles of mobile ad hoc networks, and their models.	v	V											Analyze	No	MSTs, ESE, Class/Quiz Tests	
	nETWORKS)	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of	
CO4	Simulate power electronic converters and their control scheme.	٧	٧		٧	•							V	Apply	No	MSTs, ESE, Class/Quiz Tests	
CO3	Illustrate the operating principle and construct a various types of DC-DC converters	V	V		V	V								Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO2	phase AC-DC power converte circuits and understand thei applications													Apply	No	MSTs, ESE, Class/Quiz Tests	
со	Attain the ab and to handle the concept of construction of characteristic of Power semiconductor devices and fundamental of thyristors and family	e of and s	,	٧		V	v							Analyze	No	MSTs, ESE, Class/Quiz Tests	

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No.	(UC-BTEC-611- 18: Optical Fibres and Communicatio 1 Laboratory)	PO 1	PO	2	PO 3	P0 4	PO	5 PC	6 PC	) 7 PC	0 8 P	0 9 Pc	0 10	PO 11	PO 12	Skill	-	mployability / ntrepreneurs	Assessment Fools to Measure Attainment of	
			-																	
	Have a broad knowledge in Fuzzy logic principles and will be able to determine different methods of Defuzzification	٧		٧	٧	V		v								Ana	alyze	No	MSTs, ESE, Class/Quiz Tests	
CO2	mathematical foundations of neural network models	f		٧	\ \ \ \ \		v	v								Ap	pply	No	MSTs, ESE, Class/Quiz Tests	
CO1	Understand generic machir learning terminology		v	٧		v	v	V								A	nalyze	No	MSTs, ESE, Class/Quiz Tests	
CO No	(UC-BTEC- 902E-18: Artificial Neur Networks)	al	PO 1	PO.	2 P(	03 P	204	PO 5	PO 6	PO 7	PO 8	PO 9	PO 1	10 PO	11 PO	12 8	kill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of	
CO	challenges designing, routing security	in and in hoc	٧	1	v			٧								٧	Analyze	No	MSTs, ESE, Class/Quiz Tests	
CC	protocols for mobile adhors	on or	٧		٧		٧	V									Apply	No	MSTs, ESE, Class/Quiz Tests	

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CO	BER and Q factor using simulator.	ion f its	٧															
CO2	Study variou types of option sources and light detectors	al					٧	V					-		V Implementa	tio no	Practical notebool	ks,Internal viva,End sem external viva
C03	Familiarization with the methods of	n	√ √	V										,	/ Understandi	ng no	Practical notebook	ss,Internal viva,End sem external viva
CO4	Study different types of losses in optical fibres		v			٧								V	Implementati	o yes	Practical notebook	s,Internal viva,End sem external viva
CO5	Design various applications of optical fiber communication sysytem			V		V	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \							V	Understandin	g no	Practical notebook	s,Internal viva,End sem external viva
CO No.	(UC-BTEC-612- 18: Microwave and Antenna Engineering Laboratory)	РО	1	PO 2	PO 3	PO 4		PO 6	PO 7	P0 8	PO 9	PO 10	PO 11	PO 12		Focus on Employability / Entrepreneurs		s,Internal viva,End sem external viva
CO1	Learn about general Microwave components and Microwave bench															hip	CO CO	
O2 P	Measure Common Darameters elated to Microwave Dscillator(s).	٧	20.0	V		٧	٧								Understanding	no	Practical notebooks,	Internal viva,End sem external viva
	(-).		1	/			٧							v L	nderstanding n			

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CO3	Determine frequency and wavelength of waveguides. Measure and	v			V	V							<b>V</b>	Implementatio	) yes	Practical notebooks, internal viva, End sem external viva
CO4	plot radiation patterns of various types of Antennas		٧		٧								V	Implementatio	yes	Practical notebooks, Internal viva, End sem external viva
CO No.	(UC-BTEC-631- 18: Project-I)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO
CO1	Understand the Survey and study of published literature on the assigned topic	٧	٧		٧	v				V			٧	Understanding	Ver	Practical notebooks, Internal viva, End sem external viva
	Working out a preliminary Approach to the Problem relating to the assigned topic	٧	٧		٧	٧				٧				Understanding		
CO3	preliminary Analysis/Model ling/Simulation/ Experiment/De sign/Feasibility	V	٧		٧	V				٧				Implementatio		Practical notebooks,Internal viva,End sem external viva  Practical notebooks,Internal viva,End sem external viva
CO4	Preparing a Written Report on the Study conducted for presentation to the Department	V	٧		٧	V										
	- sparanont	V	V	-	V	٧				٧			٧	Implementatio	yes	Practical notebooks, Internal viva, End sem external viva



CO No.	(BTEC-907A- 18: Internet of Things (IOT) & Cloud Computing)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P07	PO 8	PO 9	PO 10	PO 11	PO 12	2 Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	
CO1	Understanding concept of cloud computing and analyze trade-off between deploying application on cloud and using local infrastructure		V		٧	٧							٧	Understand	No		
CO2	Identify issues and design challenges in IoT applications.	٧												Understand	No	MSTs, ESE, Class/Quiz Tests	
CO3	Select appropriate hardware and software components for IoT applications	V	V		√ √	٧							V	Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO4	Conceptual knowledge will help students to build IOT applications	٧	٧		٧	٧							٧	Apply	yes	MSTs, ESE, Class/Quiz Tests	
CO No.	(BTEC-907C- 18: Robotics and Embedded systems)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	
CO1	Ability to understand basic concept of robotics.	٧	٧		٧	v								Understand	No	MSTs, ESE, Class/Quiz Tests	



CO2	To analyze Instrumentation systems and their applications to various	l √	V		V	V								Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO3	To know about the differential motion, add statics in robotics		٧		٧	٧								Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO4	To know about the dynamics and control in robotics industries	٧	٧		٧	٧							٧	Apply	Yes	MSTs, ESE, Class/Quiz Tests	
CO No.	(BTEC-908C- 18: VLSI Design)	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of	
CO1	Understand the concepts and various processes related to VLSI	٧	v		<b>v</b>	V							V	Understand	No	MSTs, ESE, Class/Quiz Tests	
CO2	Understand the VLSI Circuit Design processes and Gate level design	V	V		<b>V</b>	V								Understand	No	MSTs, ESE, Class/Quiz Tests	
CO3	Learn about VHDL Synthesis and the tools involved	٧	٧		٧	v								Learn	No	MSTs, ESE, Class/Quiz Tests	
CO4	Describe about CMOS Testing techniques		٧		٧	٧							٧	Describe	No	MSTs, ESE, Class/Quiz Tests	
CO NO.	(BTEC-909C- 18: Embedded Systems Design)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	

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O No.	(BTMC-101-18: Indian Constitution)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	
CO4	Understand Embedded Networking concepts based upon connected MCUs		٧			٧								Understand	No	MSTs, ESE, Class/Quiz Tests	
CO3	Reviews and implement the protocols used by microcontroller to communicate with external sensors and actuators in real world	٧			٧								٧	Revieweing	No	MSTs, ESE, Class/Quiz Tests	
CO2	Understand hardware interfacing concepts to connect digita as well as analog sensors while ensuring low power considerations.				V	V								Understand	No	MSTs, ESE, Class/Quiz Tests	
CO1	Learn abouthe basicarchitecture of 32-bit microcontrollers	c of	V		V	V							V	Learning	No	MSTs, ESE, Class/Quiz Tests	



CO No.	CO Statements (BTMC-102-18: Essence of Indian Traditional Knowledge)	PO-a	РО-ь	РО-с	PO-d	РО-е	PO-f	PO-g	PO-h	PO-I	PO-J	PO-k	PO-I	Learning Lev	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	
	The Course will also helpful in prepration of Competitive exams National wide and state level, like IAS, IPS and others.								٧				٨	Understand		MST,s ESE, Class/Quiz Tests	
CO3	Examine the Forms of government, Parliamentary form of Govt. & Presidential Form of Govt, powers and position of President and Prime Minister.								٧				1	Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO2	Understand the Rights and Duties of Citizens, Fundmantal Rights and Human Rights.								1				1	Understand	No	MSTs, ESE, Class/Quiz Tests	
CO1	Understand the Philosophy of Indian constitution, like Sovereignty, Secular, Republic, Socialist and Democracy.								1				1	Understand	No	MSTs, ESE, Class/Quiz Tests	



		т—	_	-													
CO1	Understand the Philosophy of Indian Knowledge system and and its Basic Structure.								٧				1	Understand	No	MSTs, ESE, Class/Quiz Tests	
CO2	Understand the Ancient India Culture, Society and Religion.								1				1	Understand	No	MSTs, ESE, Class/Quiz Tests	
CO3	Examine the areas of Indian Linguistic Tradition.								1				1	Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO4	Know the contrubtion of scientists of different eras.								١				٧	Understand		MST,s ESE, Class/Quiz Tests	
CO No.	(BTEC-909E- 18: Bio Medical Signal Processing)	P0 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	
CO1	Understand the fundamentals of signal processing for various bio- signal analysis	٧	٧		٧	٧							V	Understand	No	MSTs, ESE, Class/Quiz Tests	
CO2	Learn the Infinite impulse response (IIR) filter and study its applications	٧			٧	٧							٧	Learning	No	MSTs, ESE, Class/Quiz Tests	
CO3	Attain in-depth knowledge about the basic concepts of finite impulse response (FIR) filter and study its applications	٧			٧									Understand	No	MSTs, ESE, Class/Quiz Tests	

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CO4	Apply different methods of signal processing techniques in analyzing the various biosignals such as Electro cardiogram (ECG), Electro myogram (EMG) and Phonocardiogram (PCG)	٧											٧	Apply	No	MSTs, ESE, Class/Quiz Tests	
CO No.	(BTEC-907B- 18: Antenna Radiating Systems)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	
CO1	To understand the basic concepts of radiation	٧	V		v	<b>V</b>							٧	Understand	No	MSTs, ESE, Class/Quiz Tests	
CO2	To analyse the radiation pattern of antenna arrays.	٧	٧											Analyze	No	MSTs, ESE, Class/Quiz Tests MSTs, ESE, Class/Quiz Tests	
CO3	To understand the concept of various wave propagation techniques												٠	Understand	No	MSTs, ESE, Class/Quiz Tests	
CO4	To understand the concept of radiating systems on environment	٧	٧		٧	٧							٧	Understand	No	MSTs, ESE, Class/Quiz Tests	

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CO No.	(BTEC-908B- 18: Mobile Communicatio n Networks)	P0 1	PO 2	PO 3	PO 4	P0 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of	
CO1	Understand the working principles of the mobile communication systems	V	V		٧	V								Understand	No	MSTs, ESE, Class/Quiz Tests	
CO2	Understand the relation between the user features and underlying technology	V				·								Understand	No	MSTs, ESE, Class/Quiz Tests	
CO3	Analyze mobile communication systems for improved performance	٧	V		٧	٧								Analyze	No	MSTs, ESE, Class/Quiz Tests	
							1/4-4										
CO No.	(BTEC-908A- 18: Artificial Intelligence)	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of	
CO1	Learn about the basic understanding of Artificial Intelligent system	٧	<b>V</b>		V	<b>V</b>								Learning	No	MSTs, ESE, Class/Quiz Tests	
CO2	Explain about various types of Artificial Neural Networks & their models	٧	V		V	V								Explain	No	MSTs, ESE, Class/Quiz Tests	
CO3	Describe Artificial Neural networks methods, operation and parameters	٧	٧		٧	V								Describe		MSTs, ESE, Class/Quiz Tests	

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CO4	Explore Neural Network MATLAB Toolbox	٧	V		٧	٧								Explore	No	MSTs, ESE, Class/Quiz Tests
CO No.	(BTEC-909D- 18: Artificial Intelligence and Machine Learning)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO
CO1	Understand the concept of information and entropy	٧	V		٧	٧								Understand	No	MSTs, ESE, Class/Quiz Tests
CO2	Understand Shannon's theorem for coding				٧	٧								Understand	No	MSTs, ESE, Class/Quiz Tests
соз	Calculation of channel capacity													Calculate	No	MSTs, ESE, Class/Quiz Tests
CO4	Apply coding techniques	٧	٧			٧								Apply	No	MSTs, ESE, Class/Quiz Tests MSTs, ESE, Class/Quiz Tests
CO No.	(BTEC-909B- 18: Information Theory and Coding)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO
CO1	To learn the difference between optimal reasoning Vs human like reasoning	٧	V		V	٧							٧	Learning	No	MSTs, ESE, Class/Quiz Tests



CO2	To understand the notions of state space representation, exhaustive search, heuristic search along with the time and space complexities	f	V		V	V								Understand	No	MSTs, ESE, Class/Quiz Tests	
C03	To learn different knowledge representation techniques		V		V								V	Learning	No	MSTs, ESE, Class/Quiz Tests	
CO4	To understand the applications of AI namely, Game Playing, Theorem Proving, Expert Systems, Machine Learning and Natural Language Processing	V			٧	٧							٧	Understand	No	MSTs, ESE, Class/Quiz Tests	
CO No.	(BTEC-907D- 18: Python Programmimg)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	
CO1	Read and write simple Python programs.	٧	٧		٧	V							٧	Apply	No	MSTs, ESE, Class/Quiz Tests	
CO2	Develop Python programs with conditionals and loops.	٧	٧		<b>v</b>	٧								Develop	No	MSTs, ESE, Class/Quiz Tests	

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CO3	Define Python functions and to use Python data structures-lists , tuples, dictionaries.	V	V		V	V							V	Learning	No	MSTs, ESE, Class/Quiz Tests	
CO4	Perform input/output operations with files in Python.	٧	v		V	V							V	Perform	No	MSTs, ESE, Class/Quiz Tests	
CO5	Execute Searching, sorting and merging in Python.	٧		٧		<b>V</b>							V	Excecute	Yes	MSTs, ESE, Class/Quiz Tests	
CO No.	(BTEC-907E- 18: Adaptive Signal Processing)	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of	
CO1	Understand the non-linear control and the need and significance of changing the control parameters with respect to real-time situation	٧	٧		V	٧								Understand	No	MSTs, ESE, Class/Quiz Tests	
CO2	Mathematically represent the 'adaptability requirement'.	٧	٧	v	٧	٧							٧	Apply	No	MSTs, ESE, Class/Quiz Tests	
СОЗ	Understand the mathematical treatment for the modeling and design of the signal processing systems.	٧	٧	v	V	V								Analyze	No	MSTs, ESE, Class/Quiz Tests	

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CO No.	(BTEC-908D- 18: Soft Computing)	P0 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	
CO1	Understand the concepts of Soft Computing and Algorithms involved therein	٧	V		V	V								Understand	No	MSTs, ESE, Class/Quiz Tests	
CO2	Understand Genetic Algorithms with its operators and applications		V			V							<b>∨</b>	Understand	No	MSTs, ESE, Class/Quiz Tests	
CO3	Learn about the Neural Network models and its applications	٧	٧		٧	<b>V</b>								Applying	Yes	MSTs, ESE, Class/Quiz Tests	
CO4	Describe the Fuzzy systems and Swarm Intelligence	٧			٧									Describe	No	MSTs, ESE, Class/Quiz Tests	
CO No.	(BTEC-909A- 18: Big Data Fundamentals)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs	Assessment Tools to Measure Attainment of	
CO1	Understand the Evolution and basics of Big Data.	<b>v</b>	٧		٧								V	Understand	No	MSTs, ESE, Class/Quiz Tests	
CO2	Understand the Architecture of Hadoop with its file system and its Programming.	٧			٧	٧								Understand	No	MSTs, ESE, Class/Quiz Tests	
CO3	Explain the Advanced analytical theory and methods.		٧		v	v							V	Explain	No	MSTs, ESE, Class/Quiz Tests	

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CO4	Describe the challenges in handling streaming data from the real world.	٧	V			٧							V	Describe	No	MSTs, ESE, Class/Quiz Tests	
CO No.	(BTEC-908E- 18: Digital Image and Video Processing)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	P0 8	PO 9	PO 10	0 PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	
CO1	Mathematically represent various types of images and analyze them.	V	V		٧	V							٧	Analyze	No	MSTs, ESE, Class/Quiz Tests	
CO2	2. Process these images for the enhancement of certain properties or for optimized use of the resources.	٧	V		٧	v							V	Apply	Yes	MSTs, ESE, Class/Quiz Tests	
CO3	Develop algorithms for image compression and coding.	٧	٧		٧	٧							٧	Design	Yes	MSTs, ESE, Class/Quiz Tests	
CO No.	(BTEC-731-18: Project-II)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepreneurs hip	Assessment Tools to Measure Attainment of CO	
CO1	Review and finalization of the Approach to the Problem relating to the assigned topic	٧	٧		V	V							<b>V</b>	Review	Yes	Report Submission, Internal Viva, Project Submission, Semester-End Viva	

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CO2	Detailed Analysis/Model ing/Simulation/ Design/Proble m Solving/Experi ment as needed	V	٧		V	V			V	Apply	Yes	Report Submission, Internal Viva, Project Submission, Semester-End Viva	
CO3	Final development of product/proces s, testing, results, conclusions and future directions:	٧	V	<b>V</b>	٧	٧			V	Design	Yes	Report Submission, Internal Viva, Project Submission, Semester-End Viva	
CO4	Prototyping or Product development/P atent and Video demonstration;	٧	٧	V	٧	V			V	Design	Yes	Report Submission, Internal Viva, Project Submission, Semester-End Viva	
CO5	Preparing a paper for Conference presentation/P ublication in Journals;	٧	٧		٧				V	Prepare	No	Report Submission, Internal Viva, Project Submission, Semester-End Viva	
CO6	Preparing a Dissertation in the standard format for being evaluated by the Department	٧	٧		٧	٧			v	Prepare	Yes	Report Submission, Internal Viva, Project Submission, Semester-End Viva	

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# Department of ELE TRONICS & COMMUNICATION EN INEERING

Department of E Master of Technology ECE (Wireless Communication ) Ref No. 132 | Date . 09/49/202) Sent to: MTWC-101-18- Wireless Communication Focus on **Assessment Tools to** Skill Employability / **Measure Attainment of Course Outcome** PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO 8 PO 9 PO 10 Entrepreneurship CO CO1: Implement physical models of wireless Implementation MSTs, Class Tests, Quizes, channels V V ٧ V V V V ESE yes CO 2: Gain knowledge of Understanding key concepts of wireless MSTs, Class Tests, Quizes, communication V V V V V V V ESE no CO 3:Measure capacity of AWGN channel, LTI **Analysis** Gaussian channels and MSTs, Class Tests, Quizes, various fading channels V V V V V ESE yes CO4: Study uplink and downlink model of AWGN **Understanding** channel, fading channels MSTs, Class Tests, Quizes, and multiuser diversity Yes ESE MTWC-102-18- Information Theory & Coding **Assessment Tools to** Focus on Skill Employability / **Measure Attainment of** PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO 8 PO 9 PO 10 **Course Outcome** co Entrepreneurship CO1: Understand the fundamentals of Understanding MSTs, Class Tests, Quizes, information theory. V V V V V V ESE Yes CO 2: Encode text, audio, speech, image and video Implementation signals through various coding and compression

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techniques.

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**ESE** 

MSTs, Class Tests, Quizes,

CO 3: Detect and correct errors in the received signals through error					(						Analysis		
detecting and correcting codes	V	V	V	V	V	V				V		No	MSTs, Class Tests, Quizes, ESE
MTWC-PE1-18- Wireless S	ensor l	Vetwo	rks										
Course Outcome				PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Gain insights of Wireless Sensor Network(WSN) background, its challenges, constraints along with its advantages and applications.	V	V	V	V	V	V	V	٧	V	v	Understanding	no	MSTs, Class Tests, Quizes, ESE
CO 2: Know the architecture of WSN and ts sub-systems.	٧	٧	٧	٧	٧					V	Understanding	No	MSTs, Class Tests, Quizes, ESE
CO 3: Explain node structure along with the echnologies used in WSN.	٧	٧	٧		٧		٧	٧	٧	٧	Learning	No	MSTs, Class Tests, Quizes, ESE
CO 4: Study various Wireless Propagation Models and discuss the rarious MAC protocols, communication protocols and routing protocols	٧	٧	٧	٧	٧					٧	Discussing	no	MSTs, Class Tests, Quizes, ESE
MTWC-PE1B-18- RF MEMS Course Outcome								PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of

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COL: 1. Understand the key concepts in RF based MEMS wireless communication system.	٧	V					V	V	٧	V	Understanding	no	MSTs, Class Tests, Quizes, ESE
CO 2: Design RF based circuits through modelling.	٧	٧	٧	٧	٧	v				v	Implementation	yes	MSTs, Class Tests, Quizes, ESE
CO 3: Understand the usage of RF based circuit elements to reconfigure the circuit design.	V	V	V		v				٧	V	Understanding	No	MSTs, Class Tests, Quizes,
CO 4: Study various oscillators and filters.	٧	V	V	V	V					V	Understanding	no	MSTs, Class Tests, Quizes, ESE

# MTWC-PE1C-18- ADVANCED DIGITAL SIGNAL PROCESSING

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Apply digital													
transform techniques on signals.	٧		٧		٧	٧	٧	٧	٧	V	Implementation	no	MSTs, Class Tests, Quizes, ESE
CO 2: Design digital FIR and IIR filters.	٧		٧	٧	٧	٧	٧			٧	Implementation	yes	MSTs, Class Tests, Quizes, ESE
CO 3: Predict and estimate errors in digital signal processing systems.	v							v	٧	v	Analysis	yes	MSTs, Class Tests, Quizes, ESE
CO 4: Handle multirate DSP and use adaptive filters.	٧	٧	٧	٧	٧	٧				V	Understanding	no	MSTs, Class Tests, Quizes, ESE

## MTWC-PE1D-18- AUDIO AND VIDEO SIGNAL PROCESSING

		Skill	Focus on Employability /	Assessment Tools to Measure Attainment of
Course Outcome	PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO		Entrepreneurship	co

signals.	٧	-		٧	٧	-		٧	Implement	yes	ESE
the image, audio and video									Implement		MSTs, Class Tests, Quizes,
CO1: Learn the audio and video signal processing systems.	٧			V	٧	V	٧	٧	Understanding	no	MSTs, Class Tests, Quizes, ESE

#### MTWC-PE2A-18-ADVANCED COMMUNICATION SYSTEM

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Differentiate between analog and digital communication systems.	V				٧	V		V	٧	V	Understanding	no	MSTs, Class Tests, Quizes,
CO 2: Transmit data through various digital modulation techniques	v				٧	٧				٧	Understanding	no	MSTs, Class Tests, Quizes, ESE
CO 3: Understand optical and satellite communication systems.	٧				٧			v	٧	V	Understanding	no	MSTs, Class Tests, Quizes
CO 4: Recognize mobile communication systems, access techniques and transmission protocols.	٧	٧	٧	٧	٧	٧				v	Analysis	no	MSTs, Class Tests, Quizes,

## MTWC-PE2B-18-DETECTION AND ESTIMATION THEORY

		Skill	Focus on Employability /	Assessment Tools to Measure Attainment of
Course Outcome	PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO 8	PO 9 PO 10	Entrepreneurship	co

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After

COL: Know the background of the signals, variables and processes.	٧					٧			٧	V	Understanding	no	MSTs, Class Tests, Quizes, ESE
CO2: Test the data through statistical tools.	V		V	V		V			V	V	Analysis	no	MSTs, Class Tests, Quizes, ESE
CO3: Learn the ways to defect non-parametric, random and deterministic signals.	٧						V	V	V	v	Understanding	no	MSTs, Class Tests, Quizes, ESE
CO 4: Familiarize with the estimation of signal parameters	V	٧	V	V	V	V				V	Understanding	yes	MSTs, Class Tests, Quizes, ESE

## MTWC-PE2C-18- MOBILE ADHOC NETWORKS

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Know the features, applications, models and characteristics of adhoc networks.	٧	٧	٧	٧					٧	V	Understanding	No	MSTs, Class Tests, Quizes, ESE
CO 2:Learn the protocols followed in MAC layer, Network layer, Transport layer, Security layer and Cross layer design.	٧				٧	٧	٧	٧	٧	٧	Understanding	yes	MSTs, Class Tests, Quizes, ESE
CO 3: Learn how to integrate adhoc networks with mobile-IP networks.	V	٧	V	٧						٧	Understanding	yes	MSTs, Class Tests, Quizes, ESE

MTWC-PE2D-18- OPTICAL NETWORK AND PHOTONIC SWITCHING

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C <b>≼</b> urse Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CC1: Know the optical transmission and reception	٧	v	٧	V					V	٧	Understanding	No	MSTs, Class Tests, Quizes, ESE
CO2: Apply the conpensation techniques to the lost data/signals.	٧	V	٧	V	٧	٧	٧	٧	V	٧	Implementation	yes	MSTs, Class Tests, Quizes, ESE
architecture and protocols of passive optical networks.		٧	٧	٧				٧	٧	٧	Learning	No	MSTs, Class Tests, Quizes, ESE
CO4: Learn the process of wire line techniques.	٧	V	V	V				٧	٧	٧	Understanding	No	MSTs, Class Tests, Quizes, ESE
MTRM-101-18 RESEARCH	METHO	DOLO	GY & II	PR									
Course Outcome					PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: 1. Understand research, research process, define and redefine research problem through literature survey.	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	Understanding	Yes	MSTs, Quizes, ESE
	V	V	√	V	V	<b>&gt;</b>	>	<b>&gt;</b>	٧	V	Implementation	yes	MSTs, Quizes, ESE
CO 3: Utilize the resources efficiently.	٧	٧	٧	٧	٧			٧	٧	V	Implementation	no	MSTs, Quizes, ESE

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	T	Τ	T		1	Π	Г	Г		T			
CO4: Critically analyse the data through various statistical measures, perform experiment, gather data and reach to a conclusion based on some thy pothesis.		V	V	V	V	V	V	V	V	V	Implementation	Yes	MSTs, Quizes, ESE
CO5:5. Know the ntellectual property rights									٧	V	Understanding	Yes	MSTs, Quizes, ESE
CO6:6. Write up the report			٧	٧	٧	٧		٧	٧	v	Implementation	Yes	MSTs, Quizes, ESE
MTAC-AO1-18-English for	resear	ch pape	er writi	ng									
Course Outcome					PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand that how to improve your writing skills and level of readability		V	V	V					v	V	Understanding	No	MSTs, Class Tests, Quizes,
CO 2: Learn about what to write in each section	٧	V	٧	٧	V	٧	٧	٧	v	v	Understanding	No	MSTs, Class Tests, Quizes, ESE
CO 3:Understand the skills needed when writing a Title	٧	٧	٧	٧				٧	٧	v	Understanding	No	MSTs, Class Tests, Quizes, ESE
O 4: Ensure the good quality of paper at very irst-time submission.	٧	v	٧	٧	V	٧	v	٧	٧	٧	Implementation	No	MSTs, Class Tests, Quizes, ESE
MTAC-A02-18-Disaster Ma	nagem	ent											
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
MTWC-103-18 Advanced	Wirele	ss Com	munic	ation									
CO 4: Critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in.		V	V	V	V	V	v	V	V	V	Understanding	No	MSTs, Class Tests, Quizes, ESE
CO3:Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.		٧	V	٧				٧	٧	V	Implementation	yes	MSTs, Class Tests, Quizes, ESE
CO2: Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.	٧	٧	٧	٧	٧	٧	٧	٧	٧	V	Analysis	No	MSTs, Class Tests, Quizes, ESE
CO1: Learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.	٧	V	V	٧					٧	V	Understanding	No	MSTs, Class Tests, Quizes, ESE

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CO1: Study basic concept of soft computing and differentiate between supervised, unsupervised and reinforced learning methods.													MSTs, Class Tests, Quizes,
Course Outcome				PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
system, its operation and applications.  MTWC-104-18- Soft Comp	√ outing T	√ echnic	√ uues	V	V					<b>V</b>	Understanding	No	MSTs, Class Tests, Quizes, ESE
CO3: Design OFDM system and data transmission through multicarrier modulation. CO4: Describe OFDMA	٧	٧	٧	٧	V	٧	٧	√	٧	V	Implementation	yes	MSTs, Class Tests, Quizes, ESE
CO 2: Compare the performance of different digital modulation techniques over wireless channels.	v	٧	٧	٧	٧	٧		٧			Understanding	No	MSTs, Class Tests, Quizes, ESE
CO1: Review the fundamentals of wireless communication	v	v	٧	V	V					V	Understanding	No	MSTs, Class Tests, Quizes, ESE

CO 2: Learn various artificial neural network techniques, fuzzy sets, fuzzification and

defuzzification.

CO 3: Optimize solutions

using Genetic Algorithm

the

Impementation

Understanding

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yes

yes

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MSTs, Class Tests, Quizes,

MSTs, Class Tests, Quizes,

CO 4: Use hybrid soft					1							MSTs, Class Tests, Quizes,
computing techniques.	٧	٧	٧	٧	V		٧	٧	٧	Impementation	Yes	ESE

## MTWC-105-18- SIMULATION OF WIRELESS COMM. SYSTEMS

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Study the role of													
simulation in													
communication system													Practical File, Internal Viva,
and random processes	V	٧	٧	V	٧					V	Understanding	No	Semester End External Viva
CO 2: Review stochastic													
processes and parameter	1									Market 1			Practical File, Internal Viva,
estimation	V	٧	٧	V	V	٧	٧	V	٧	V	Understanding	yes	Semester End External Viva
CO 3:Model wireless			1										
communication systems					-								
through numerical					A. M				agratio.	No.			Practical File, Internal Viva,
methods.	٧	٧	٧	٧	٧	٧	٧	٧	٧	٧	Impementation	yes	Semester End External Viva
CO 4: Study						657							
communication channel	-		1	4 7	10-1					Branch Committee	Sales and the sales		
models and perform													Practical File, Internal Viva,
Monte Carlo Simulation.	V	٧	V	٧	V			V	٧	V	Understanding	Yes	Semester End External Viva

# MTWC-PE3A-18- Smart Antennas

Course Outcome	PO 1	PO 2	PO 3	P0 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the													
significance of smart antennas and its historical					6.4			lete:			100		MAGT. Cl. T O.
development.	V	V									Understanding	No	MSTs, Class Tests, Quizes, ESE
CO 2: Know the													Munin 1
architecture of Smart										12.			
antennas, types,					1.16.4								MSTs, Class Tests, Quizes,
applications	V	٧	٧	٧	V	٧			٧	V	Learning	No	ESE

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CO 3: Learn antenna array fundamentals criteria and beam forming basics		V				٧	V	v	Understanding	no	MSTs, Class Tests, Quizes, ESE
CO 4: Explain the Spatial Processing techniques for CDMA Smart Antennas	<b>V</b>	V	v	V	v		V	V	Understanding	no	MSTs, Class Tests, Quizes,

MTWC-PE3B-18 Wireless Network Planning, Optimization and Management

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO 1: Understand the											P. STATE STATE		
Radio Network planning			THE REAL PROPERTY.										MSTs, Class Tests, Quizes,
and optimization	٧	٧									Understanding	No	ESE
CO 2: Know the											H-12-11-11-11-1		
technologies of WCDMA							De la						MSTs, Class Tests, Quizes,
and GSM	٧	٧	٧	٧		٧	4		٧	٧	Understanding	Yes	ESE
CO 3: . Learn the			STATE OF										
fundamentals of Radio		0.14								BR J.			MSTs, Class Tests, Quizes,
Resource Management		٧							V	٧	Understanding	No	ESE

MTWC-PE3C-18 Microwave and RF Design

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the significance of Microwave and RF designs	V	V	v							٧	Understanding	No	MSTs, Class Tests, Quizes,
CO 2: Know the fundamentals behind Microwave Amplifiers/Oscillators designs.	٧			V		V		V			Understanding	No	MSTs, Class Tests, Quizes,

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CO3: Technical know-how of Microwave and RF					•								MSTs, Class Tests, Quizes,
antennas concepts.	V	STATE OF	٧	V	A TOP	٧	٧	√	٧	V	Understanding	yes	ESE
MTWC-PE3D-18- Multime	dia Cor	nunica	ition ar	nd Tech	nologi	es							
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Learn multimedia system design techniques.	V	V	v	v	V	V	V			V	Understanding	No	MSTs, Class Tests, Quizes, ESE
CO 2: Implement compression and decompression techniques on data.	٧	v	V	٧	٧	٧	v	٧	٧	V	Implementation	yes	MSTs, Class Tests, Quizes, ESE
CO 3: Understand the concepts of storage and retrieval technologies.	v	v	V	٧	V				٧	V	Understanding	No	MSTs, Class Tests, Quizes,
CO 4: Learn multimedia design application.	٧	٧	٧	٧	V			٧	٧	٧	Understanding	No	MSTs, Class Tests, Quizes, ESE
MTWC-PE4A-18- Cryptogra	phy ar	nd Wire	eless										
				PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of
CO1: Understand the significance of Cryptography.	٧	٧	٧	٧	V	٧	٧			v	Understanding	No	MSTs, Class Tests, Quizes, ESE
CO 2: Know its Integrity, Authentication and Management.	٧	v	٧	٧	V	٧	٧	v	٧	٧	Understanding	No	MSTs, Class Tests, Quizes, ESE
CO 3: Learn the concepts of Security and threats to vireless systems.	٧	٧	٧	٧	٧				٧	V	Understanding	yes	MSTs, Class Tests, Quizes,

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MTWC-PE4B-18-Software	Defined	Radio &	Cognitive Ra	J
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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the fundamental concepts of software defined radio and cognitive radio networks.	٧	V		<b>V</b>						v	Understanding	No	MSTs, Class Tests, Quizes, ESE
CO 2: Develop the cognitive radio, as well as techniques for spectrum holes detection that cognitive radio takes advantages in order to exploit it.	V	<b>V</b>	V	<b>√</b>		٧	V	<b>V</b>	٧	٧	Implementation	yes	MSTs, Class Tests, Quizes, ESE
CO 3: Understand fundamental issues regarding dynamic spectrum access, the radioresource management and trading, as well as a number of optimisation techniques for better spectrum exploitation.	>	>		>				√	V	V	Understanding	No	MSTs, Class Tests, Quizes, ESE
CO 4: Apply SDR principles to smart antennas.	V	V	٧	٧	٧	٧	٧	<b>v</b>	٧	<b>v</b>	Application	Yes	MSTs, Class Tests, Quizes, ESE

MTWC-PE4C-18- Wireless and Optical Communication Networks

Course Outcome PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO 8 PO 9 PO 10 Skill

Focus on
Employability /
Entrepreneurship

Assessment Tools to
Measure Attainment of

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CO 2: Calculate the performance parameters in millimeter wave antennas.	V	V	V	v	V	V	V	V	Analysis	yes	MSTs, Class Tests, Quizes, ESE
CO 3: Model the millimeter wave link											MSTs, Class Tests, Quizes,
budget.	<b>∀</b>	V					٧	V	Implementation	No	ESE
CO 4: Analyze the millimeter wave with multiple antennas.	V	V					V	1	Implementation	No	MSTs, Class Tests, Quizes, ESE

MTWC-PE5B-18- Space Time Wireless Communication

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1:Understand Space													
Time Channel													MSTs, Class Tests, Quizes,
Characterization.	V	٧	٧	٧					٧	٧	Understanding	No	ESE
CO 2: Explain Capacity of					18-71-9					1294			
Multiple Antenna													MSTs, Class Tests, Quizes,
Channels.	٧	٧	٧	٧		٧	٧	V	٧	٧	Understanding	yes	ESE
CO 3: Learn ST OFDM,									1				MSTs, Class Tests, Quizes,
Spread Spectrum.	٧			٧	2			٧	٧	٧	Learning	No	ESE

MTWC-PE5C-18- Advanced Techniques for Wireless Reception

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand Wireless Signaling Environment.	٧		V	٧	v				٧	V	Understanding	No	MSTs, Class Tests, Quizes, ESE
CO 2: Explain the usage of Multiuser detection.	٧		٧	٧	V			٧	٧	V	Explain	No	MSTs, Class Tests, Quizes, ESE
CO 3: Learn CDMA, OFDM, MIMO systems	٧	v	٧			٧	٧	٧	٧	٧	Learning	No	MSTs, Class Tests, Quizes, ESE





Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the													
concept of			E 1,11				11			F 7. 1			
cellular/wireless					UT 4				-61				MSTs, Class Tests, Quizes,
communication	٧	٧	٧	٧	٧				٧	٧	Understanding	No	ESE
CO 2: Explain the Mobile													
Radio Propagation and													MSTs, Class Tests, Quizes,
Multiuser systems.	٧	٧		٧	٧	٧			٧	٧	Explain	No	ESE
CO 3: Learn technologies													
of GPRS, UMTS, WiFi,													
WiMAX, Ultra Wideband										1118			
communications, 4G and	1									ENTAINE .	Alexander of the last		MSTs, Class Tests, Quizes,
beyond 4G.	V	٧					٧	٧	٧	V	Learning	Ni	ESE

WC-PE5E-18- Microstrip Anten	nas
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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the										10 20	OMI	Littlepreneuromp	
basic concept of micro-					TO AN								
strip antennas, methods of									- 11				
analysis and													MSTs, Class Tests, Quizes,
configurations.	V	٧	V	٧	٧				٧	V	Understanding	No	ESE
CO 2: Explain micro-strip													MSTs, Class Tests, Quizes,
antennas arrays.	V				٧	V	٧	٧	٧	V	Explain	No	ESE
CO 3: Understand the													
physical significance of										1			MSTs, Class Tests, Quizes,
discontinuities	٧				٧	٧			٧	٧	Understanding	no	ESE
CO 4: Learn coupled micro-												No. 10	
strip line with multiband						4.1							MSTs, Class Tests, Quizes,
and broadband behavior	٧				٧	٧	٧			V	Learning	yes	ESE





MTOE-301A-18-	Cost	Mana	agement	of	Engineer	ring	Proje	ects
	1							

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Understand the cost													
calculation for decision-			- 1	l i hi					R TH	14-7			
making about an							. 41						
engineering research					5.01								MSTs, Class Tests, Quizes,
project	٧	٧	٧	٧	٧				٧	٧	Understanding	No	ESE
CO 2: Able to define Role									15.13				
of each member in the													MSTs, Class Tests, Quizes,
project team	٧					٧	٧	٧	٧	٧	Describe	No	ESE
CO 3:Manage the project													
by applying Quantitative			Marin Control		No.							A MARIAN TONS	
techniques for cost													MSTs, Class Tests, Quizes,
management	V	-		٧	٧	٧			٧	٧	Management	Yes	ESE

# MTWC-111-18-Wireless Communication Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1:To design Path-													Practical File, Internal Viva,
Loss models	٧	V	V	٧	٧	٧			٧	٧	Implementation	Yes	Semester End External Viva
CO2:To investigate													
Fading environments in													Practical File, Internal Viva,
wireless channels	٧	٧		٧	٧	٧	٧	٧	٧	٧	Understand	No	Semester End External Viva
CO3:To develop													
MATLAB codes for													
Block codes, Cyclic													
codes and Convolutional						E							Practical File, Internal Viva,
codes.	٧	٧		٧	٧	٧		٧	٧	٧	Coding	Yes	Semester End External Viva

MTWC-112-18-Information Theory and Coding Lab

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PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
								440	Side De			
								70 0				Practical File, Internal Viva,
٧	٧	٧	٧	٧	٧				٧	Understand	No	Semester End External Viva
		1			14,5							
						<b>P F a</b>			9.00			
	E 21	11111				my l						
												Practical File, Internal Viva,
٧	٧		V	٧	٧	٧	V		V	Implementation	Yes	Semester End External Viva
27		13										
	8.44		PLIN									
												Practical File, Internal Viva,
٧	٧	٧	٧	٧	٧		٧	٧	٧	Coding	Yes	Semester End External Viva
	<b>PO 1</b> V	PO 1 PO 2	PO 1 PO 2 PO 3				V V V V	V V V V			V V V V V Implementation	PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO 8 PO 9 PO 10 Skill Employability / Entrepreneurship  V V V V V V V V V V Implementation Yes

MTWC-105-18- SIMULATION OF WIRELESS COMM. SYSTEMS Laboratory

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
To understand the programming of OFDM based Transmitter & Receiver.	V	V	V	V	v					v	Understanding	No	Practical File, Internal Viva, Semester End External Viva
To learn and practice MATLAB programming for implementing Digital modulation techniques.	٧	٧	V	٧	٧	٧	٧	٧	٧	v	Implementation	yes	Practical File, Internal Viva, Semester End External Viva
To find the vacant spaces for secondary users in Cognitive Radio Networks	V	v	V	٧	٧	v	v	٧	٧	V	Impementation	yes	Practical File, Internal Viva, Semester End External Viva

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
cor Acquire practical knowledge of the chosen field.			٧	V	٧	٧	٧		٧	v	Acquire	No	Report,Internal viva-voce and external viva-voce.
formulate & handle programming projects with systematic approach.		٧	٧	٧	٧	٧	٧	٧	٧	V	Analysis	yes	Report,Internal viva-voce and external viva-voce.
cos: Contribute as a team leader in the development of sechnical projects.	٧	٧	٧	٧	٧			٧		٧	Implementation	yes	Report,Internal viva-voce
Develop communication skills for the presentation of project related activities.		٧	٧	٧	٧			V		V	Implementation	yes	Report,Internal viva-voce and external viva-voce.

## MTWC-DS1-18 DISSERTATION PHASE I

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Critically analyse and													
evaluate existing			-	- 17	11.7%							Aller Street	
knowledge about the													Report,Internal viva-voce
chosen problem	٧	٧	٧	٧	٧	٧	٧		٧	٧	Understanding	No	and external viva-voce.

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CO 2: Find the gaps and motivation through literature survey.	V	V	V	٧	٧	V	٧	V	٧	٧	Analysis	yes	Report, Internal viva-voce and external viva-voce.
CO 3:Design the framework to optimize the solution for the problem	٧	V	٧	٧	٧			٧		٧	Implementation	yes	Report, Internal viva-voce and external viva-voce.
CO 4: Construct the research proposal.	V	V	V	v	V			V		٧	Implementation	yes	Report, Internal viva-voce and external viva-voce.

#### MTWC-DS2-18- DISSERTATION PHASE II

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	Skill	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1: Implement the proposed framework practically or through simulation	V	v	v	V	V	V	v		v	7	Implementation	yes	Report,Internal viva-voce and external viva-voce.
CO 2: Gather the results and publish in the research articles.	٧	V	V	٧	٧	٧	٧	٧	٧	٧	Implementation	yes	Report,Internal viva-voce and external viva-voce.
CO 3: Write-up the proposed work, results with conclusion and future work in the form of thesis	٧	٧	v	٧	٧			V		٧	Implementation	yes	Report,Internal viva-voce and external viva-voce.





					(						
CO4: Present the research	1										Report,Internal viva-voce
work before a committee.	٧	V	٧	٧	V	V	/	V	Presentation	yes	and external viva-voce.

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Signature of Head of Department