

World Ranking: Times -801-1000, Shanghai -901-1000, URAP - 982)

Coimbatore - 641 046, Tamil Nadu, India

Program	Educational	Ohiect	ives (	PEOs)
Trogram	Euucational	Object	11003 (	I LUS/

The <b>B. So</b> program five to se	<b>c. ELECTRONICS AND COMMUNICATION SYSTEMS</b> describe accomplishments that graduates are expected to attain within ven years after graduation
PEO1	Provide graduates with a strong foundation in Electronics domain and to enable them to devise and deliver efficient solutions to challenging problems in Electronics, Communications and allied disciplines.
PEO2	Impart analytic and thinking skills to develop initiatives and innovative ideas for R&D, Industry and societal requirements.
PEO3	Provide sound theoretical and practical knowledge of Electronics, managerial and entrepreneurial skills to enable students to contribute to the wellbeing of society with a global outlook.
PEO4	Inculcate qualities of teamwork as well as social, interpersonal and leadership skills and an ability to adapt to evolving professional environments in the domains of engineering and technology.
PEO5	Motivate graduates to become good human beings and responsible citizens for the overall welfare of the society.
PEO6	Develop attitude in lifelong learning, applying and adapting new ideas and technologies as their field evolves.
PEO7	To prepare graduates who will have knowledge, ability and courage to pursue higher studies and research.
	Solution 2 Minister Contactor

95551 Q 155

Program Specific Outcomes (PSOs)							
After the SYSTEM	After the successful completion of B.Sc. ELECTRONICS AND COMMUNICATION SYSTEMS program, the students are expected to						
PSO1	Demonstrate proficiency in use of software and hardware required to practice electronics and communication profession.						
PSO2	Graduates will be able to apply fundamentals of electronics in various domains of analog and digital systems						
PSO3	Apprehend and analyze specific engineering problems of communication, electronic circuits, computer programming, embedded systems, VLSI design and semiconductor technology by applying the knowledge of basic sciences, engineering mathematics and engineering fundamentals.						
PSO4	Ability to communicate effectively with excellent interpersonal skills and demonstrate the practice of professional ethics for societal benefit						
PSO5	Graduates will be able to apply fundamentals of electronics in various domains of analog and digital systems.						
PSO6	Use embedded system concepts for developing IoT applications						

5.51- Color

Program	Outcomes (POs)
On succes SYSTEM	ssful completion of the B.Sc. ELECTRONICS AND COMMUNICATION IS program
PO1	Engineering knowledge: Apply the knowledge of mathematics, Science, Engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
PO2	Problem analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusion using principles of mathematics and Engineering sciences
PO3	Design/Development of solutions: Design solutions for complex Engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal and environmental conditions.
PO4	Conduct investigation of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and Sustainability: Understand the impact of the professional engineering solution in societal and environmental contexts, and demonstrate the knowledge of and need fire sustainable development
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual, an as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Life-Long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### BHARATHIAR UNIVERSITY: COIMBATORE 641 046 B.Sc. Electronics and Communication Systems Curriculum

Course Title of the Course		Hours		Maxi	C 1:4-		
Code	The of the Course	Theory	Practical	CIA	ESE	TOTAL	Credits
FIRST SEMESTER							
11T	Language –I	6	-	50	50	100	4
12E	English – I	6	-	50	50	100	4
13A	Core Paper I: Basic Electronics	6) 56 8	4 and	50	50	100	4
	Core Practical I: Basic Electronics Lab	-	3	6	-	-	-
	Core Practical II: Semiconductor Devices Lab	-	3 5		-	-	-
1AA	Allied I Mathematics–I	5	J-Y	50	50	100	4
1FA	Environmental Studies #	2		2	50	50	2
	Total	24	6	200	250	450	18
	S	ECOND S	SEMESTER				
21T	Language – II	6		50	<mark>5</mark> 0	100	4
22E	Engli <mark>sh – II</mark>	4	-	25	25	50*	2
2NM	Naan Mudhalvan Course-Generic Name: Language Proficiency for Employability	2	UNIV	25	25	50**	2
	Course Name: Effective English	Coim	atore	5.91	Gu		
23A	<b>Core Paper II:</b> Semiconductor Devices	BLILITG UCA5E TO	DJT <u>2</u> UE	50	50	100	4
23P	Core Practical I: Basic Electronics Lab	-	3	50	50	100	4
23Q	Core Practical II: Semiconductor Devices Lab	-	3	50	50	100	4
2AA	Allied: II Mathematics–II	5	-	50	50	100	4
2FB	Value Education – Human Rights #	2	-	-	50	50	2
	Swatch Bharat- Summer internship \$	-	-	-	-	-	
	Total	24	6	325	325	650	26
,	r -	<b>FHIRD SI</b>	EMESTER	1			1
31T	Language - III	4	-	50	50	100	4

(For the students admitted during the academic year 2022 – 23 onwards)

32E	English - III	4	-	25	25	50*	2
33A	Core Paper III:	5	_	50	50	100	4
	Electronic Circuits	_					
	Digital Electronics lab	-	3	-	-	-	-
	Core Practical IV:						
	Electronic Circuits	_	3				
	and	-	5	-	-	-	-
24.0	Instrumentation Lab						
3AD	Allied: III Object Oriented Programming	1	_	30	15	75	3
	using C++	4	-	50	45	15	5
3ZA	Skill based Subject I:						
	Digital Principles and	5	-	30	45	75	3
	Applications						
3FB/	Tamil @ / Advanced						
3FC	Tamil#(OR)						
	(Yoga for Human	2	-	-	50	50	2
	excellence #						
	Women's Rights#)						
	Total	24	6	185	<mark>26</mark> 5	450	18
	F	OURTH S	SEMESTER	2051			
41T	Language - IV	4		50	50	100	4
42E	English - IV	4		50	50	100	4
43A	Core Paper IV:	17	MOL		CA I	6 1	
	IC's and Instrumentation	199		50	50	100	4
	46L	T A	1.	50	30	100	4
		10.17	1.200		1	100	
42D	Core Practical III:	A	3	50	50	100	4
431	Core Practical IV:	Lun	Star V.		- /		
	Electronic Circuits and	1-	36	~	1/3	S 6	
43Q	Instrumentation Lab		3	50	50	100	4
	Allied: IV			-	19.7		
4AD	Internet of Things	177		1200		.5	3
	200	3	$\mathcal{Q}\mathcal{A}\mathcal{R}$	30	45	75	
	Core Practical V:		Coluiba	NUTE :		6	
43R	C++ Programming Lab	2010	2	25	25	50	2
	Skill based Subject II:	<b>A</b>	கப்பான	1 2 4	11916		
4ZB	Digital and	El	UCATE TO	ELEVAT			
	Cellular	3		30	45	75	3
	Communication						

4FB/ 4FE	Tamil @ /Advanced Tamil # (OR) Non-major elective -II (General Awareness #)	2	-	-	50	50	2
4NM	Naan Mudhalvan Course- Generic Name: Digital skills for Employability Course Name: Office Fundamentals	2	-	25	25	25 50**	
	Total	22	8	360	440	800	32
		FIFTH SP	EMESTER		•	•	
53A	CorePaperV:8085MicroprocessorandApplications	6	2 a ()	50	50	100	4
5EA/ 5EB/ 5EC/ 5ED	Elective – I	6	Y	50	50	100	4
5EE/ 5EF/ 5EG/ 5EH	Elective - II	6		50	50	100	4
	CorePracticalVI:MicroprocessorandMicrocontrollerLab		3	l <u>ŝ</u>	<u> </u>	- 0	-
	Core Practical VII: Industrial and Power Electronics Lab	IAR	3		0.6160	-	-
	<b>Core Practical VIII</b> : Electronic Communication Lab	தப்பாக	3 05 2 LUI	3. AL	-	-	-
5ZC	Skill based subject – III Internet and Java Programming	UCATE TO	ELEVALE	30	45	75	3
	Total	21	9	180	195	375	15
		SIXTH SI	EMESTER				
63A	<b>Core Paper VI</b> : 8051 Microcontroller and Embedded Systems	6	-	50	50	100	4
63P	Core Practical VI: Microprocessor and Microcontroller lab	-	3	50	50	100	4

63Q	Core Practical VII: Industrial and Power Electronics Lab	-	3	50	50	100	4
63R	Core Practical VIII: Electronic Communication Lab	_	3	50	50	100	4
67V	PROJECT	4	-	-	-	100*	4
6EI/ 6EJ/ 6EK/ 6EL	Elective- III	6	-	50	50	100	4
6ZP	<b>Skill based Subject –IV</b> Java Programming Lab	-	3	30	45	75	3
67A	Extension Activities @	-	-	-	-	50	2
6NM	Naan Mudhalvan Course: Salesforce	2	-	25	25	50**	2
	Total	18	12	330	295	775	31
	Grand Total					3500	140

@ No University Examinations. Only Continuous Internal Assessment (CIA)

# No Continuous Internal Assessment (CIA). Only University Examinations.

<sup>\$</sup> Swatch Bharat Summer internship- extra 2 credits would be given. It is mandatory

<sup>&</sup>For Project report 80 marks and viva-voce 20 marks

\* English II- University semester examination will be conducted for 50 marks (As per existing pattern of Examination) and it will be converted for 25 marks.

\* English III- University semester examination will be conducted for 50 marks (As per existing pattern of Examination) and it will be converted for 25 marks.

\*\*Naan Mudhalvan – Skill courses- external 25 marks will be assessed by Industry and internal will be offered by respective course teacher.

Naan Mudhalvan	http://kb.naanmudhalvan.in/Bharathiar_University_(BU)

List of Elective electives)	papers (Co	olleges can choose any one of the papers as
	A	ASIC Design
Elective – I	В	Remote Sensing
	C	Mobile Computing
	D	Industrial and Power Electronics
	Е	Robotics and Automation
Elective II	F	Programmable Logic Control
Elective – II	G	Automotive Electronics
	H <sup>2/5</sup> g	Satellite Communications
	Ι	Fiber Optic Communication
	J	Virtual Instrumentation
Elective – III	K	Biomedical Instrumentation
	L	VLSI Design



Course code	13A	BASIC ELECTRONICS	L	Т	P	С	
Core-	I		5	Т		4	
Pre-requi	isite	Higher secondary Physics	Sylla	bus	202	2-	
Course Object	ives:		vers	ion	202	23	
The main object	tives of the	s course are to:					
1. To become fai	miliar with	fundamentals of electronic components					
2. To learn to us	e common	electronic components					
3. To design elec	etronic circ	uits to perform realistic tasks					
Expected Cour	rse Outcor	nes:					
On the success	sful compl	etion of the course, student will be able to:			-		
1 Understand	d the basic	concepts of resistors and inductors.			K	2	
2 Understand	d the ba <mark>sic</mark>	concepts of capacitors.			K	2	
3 Differentia	ite and den	nonstrate the voltage and current source.			K	3	
4 Apply the	electronic	components in network theorems.	1		K	3	
5 Put into pr	actice and	use the electronic components			K	4	
K1 - Rememb	er; <mark>K2 -</mark> U	nderstand; K3 - Apply; K4 - Analyze; K5 - Evaluate;	<b>K6</b> – C	reate	2		
	8	A States of 10			1		
Unit:1		RESISTORS & INDUCTORS		12	nour	S	
Types of Resis	stors: Fixe	d, Variable - Brief mention of their Construction a	ınd Cha	racte	ristic	:s -	
Color Coding o	of Resistors	- Connecting Resistors in Series and Parallel		1			
Types of Induct	tors: Fixed	, Variable- Self and Mutual Inductance-Faraday's La	w and L	lenz's	s Lav	N	
of Electromagn	ietic Induc	tion-Energy Stored in an Inductor-Inductance in Se	ries An	d Pai	alle	.–	
Testing of Resi	stance and	Inductance using Multimeter.	5	/			
11:4-2	Sol	CADACITODS	-	10	<b>b</b>		
Unit:2	langaitanga	Denallal Plate Canacitan Dermittivity Definition of l	Dialaata	12	nou	rs at	
Dielectric Stre	apacitance	y Stored in a Capacitor-Types of Capacitors: Air 1	Paper N	IC CO Aica	nsta Tefl	n -	
Ceramic. Plasti	ic and Elec	ctrolytic: Construction and Application- Connecting	Capacit	ors in	ı Sei	ries	
and Parallel - F	actors Gov	verning the Value of Capacitors- Testing of Capacitor	s Using	Milli	mete	ers.	
		LOUCATE TO ELEVATE					
Unit.3		ELECTRICAL ELEMENTS AND CIRCUITS		121	our	6	
Potential Diff	erence_ F	ELECTRICAL ELEMENTS AND CIRCUITS	Kirc	hoff's		<b>5</b>	
Kirchoff'sCurr	ent Law-A	analysis of Resistance in Series Circuits. Parallel	Circuit	s and	Sei	ries	
Parallel Circuits-Concept of Voltage Source and Current Source-Voltage Source in Series and							
Current Source in Parallel-Simple Problems in DC Circuits.							
Unit:4		NETWORK THEOREMS		12ł	our	s	
Superposition 7	Theorem -	Thevenin Theorem-Thevenizing a Circuit with Tw	o Volta	ge So	ource	ès -	
Bridge Circui	t - Nort	on's Theorem - Thevenin Norton Conversion	- Co	nvers	ion	of	
VoltageandCur	rentSource	s-Millman's Theorem-StarandDeltaConversion-Maxi	mumPo	wer 7	rans	ster	
Theorem - Sim	pie Problei	ns in DC Circuits.					

Unit:5	AC CIRCUITS	12hours				
Introduction to Sinusoidal Wave - RMS Value - Average Value - AC Circuits with Resistance-						
Circuits with XL Alone–Circuits with XC Alone-Series Reactance and Resistance - Parallel						
Reactance and	Reactance and Resistance - Series Parallel Reactance and Resistance - Real Power -					
	Total Lecture hours	60 hours				
Text Book(s)						
1 S.Salivahar	aan,N.SureshKumar,A.Vallavaraj—ELECTRONICDEVICES	ANDCIRCUITSI-				
Tata McGr	aw-Hill Publishing Company Limited, New Delhi.1998					
2 B.V.Naraya	ana Rao "PRINCIPLES OF ELECTRONICS", Wiley Eastern	n Limited, 1992				
Reference Bo	ooks					
1 Bernard Gr	ob—BASIC ELECTRONICS-Tata McGraw-Hill Publishing (	Company				
Limited,9th	Edition.					
2 B.L.Theraj	a,— <b>BASICE<mark>LECTRONICS-SOLID</mark>STATEDEVICES,</b> S.Ch	andCompanyLtd.2000				
Related Onli	ne Contents [MOOC, SWAYAM, NPTEL, Websites etc.]					
1 <u>https://npte</u>	<u>l.ac.in/courses/108/104/108104139/</u>					
2 <u>https://npte</u>	Lac.in/courses/108/101/108101091/					
3 <u>https://www</u>	v.youtube.com/playlist?list=PLFF553CED56CDE25D					
4 <u>https://www</u>	v.youtube.com/watch?v=w8Dq8blTmSA					
S						
Course Desig	ned By: K.Manikantan, Assistant Professor, Government Arts	College ,Ooty&				
	Dr.N Om Muruga, Assistant Professor, Government A	rts College ,Ooty.				
	1 and 1 a					

Mappi	ing with	Program	nme Ou	tcomes				10 1		
COs	<b>PO1</b>	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	PO8	PO9	PO10
CO1	S	S	М	L	L	L	L	M	S	М
CO2	L	L?	L	L	L	M	М	S	M	S
CO3	М	M	S S	L	М	S	L	L	М	М
CO4	М	L	_≪L@	L	L	S	5 L	L	М	S
CO5	S	S	M	M	JIMOJ	M	M	М	М	М
	•	•		SUUCA	TE TO E	EVALE		•	•	· •

\*S-Strong; M-Medium; L-Low



F

Course code	23A	CEMICONDUCTOD DEVICES	L	Т	Р	C
Core	п	SEMICONDUCTOR DEVICES	5	Т		1
Pre-rea	nisite	Higher secondary <b>physics</b>	Svlls	hus	20	$\frac{+}{)22-}$
110109	uisite	ingher secondary physics	Ver	sion	20	)23
Course Object	tives:					
The main object	ctives of the	is course are to:				
1. To enable the	students to	o understand and gain the knowledge on semiconduct	or devic	es.		
2. To acquaint th	ne students	with construction, theory and characteristics of the e	lectronic	c devi	ces.	
Expected Cou	rse Autroi	nes				
On the succes	sful compl	etion of the course, student will be able to:				
1 Explain th	ne structure	of the basic electronic devices			K	1
2 Understan	d the chara	cteristics and operations of special diodes			K	2
3 Understan	d the chara	cteristics and operations of transistors			K	2
4 Understand the characteristics and operations of FET and UJT					K	2
5 Use the special diodes for various applications					K	3
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						
	CT5					
Unit:1 PN JUNCTION DIODE 12h						rs
Energy Band S	Stru <mark>ctur</mark> e a	nd Conduction in Insulator - Semiconductor, Condu	ictor - 1	Intring	sic a	ind
Extrinsic Semi	conductor	– Doping – P Type – N Type Semiconductor - Forma	ation of	PN Jı	incti	ion
Diode - Forwa	ra Bias - R	everse Blas Condition – Characteristics - Clipping an		oing.		
Unit.2		SPECIAL DIODES		12	hour	rc
ZenerDiode-V	Characteri	stics-Breakdown-BackwardDiode-VaractorDiode-St	enReco	verv I	Diod	e
- Point Contact	Diode – S	cott key Diode - Tunnel Diode - Gunn Diode – Impat	t Diode	- PIN		•
Diode – PNPN	Diode	STAP UN				
	2	2		1.01		
Unit:3	Dinalan I	BJT	0.000	12h		S
NPN and PNP	Transistor	- CB CF &CC Configuration - Bias Stability - Load	g - Oper Line - N	Action Aetho	d of	
Biasing: Fixed	Bias-Colle	ctor to Base Bias – Voltage Divider Bias–Bias Comp	ensation	1- 1-	u 01	
Thermal Runay	way – Heat	Sink				
				101		
Unit:4 FET AND UJT 12hou					'S	
Comparison of	FEI - CO	Distruction and Operation of N-Channel JFE1 - Dr	ain Cha SFFT -	racter	ISUIC detic	s- on
MOSFET - FE	T as a Vol	tage Variable Resistor (VVR) - Introduction to UJT	– Chara	acteris	stics	_
UJT as Relaxat	tion Oscilla	tor - Introduction to PUT – SCR – TRIAC –DIAC				
Unit:5		OPTOELECTRONIC DEVICES		12	ioui	rs
Principles, Ope	eration and	Characteristics of Opto Electronic Devices: LDR-Ph	oto Dio	de-Ph	oto	
Transistor – Ph	oto Voltai	c Cell – Solar Cell – Photo Emissive Sensors – Vacu	Im Photo	o Tub	e–	
Gap Filled Pho	10 1  ube - 1	Total Lecture hours	-Couple	:15 60h	0111	·s
		Total Decture nours		001	Jul	3

## Text Book(s)

1 S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, —ELECTRONICSDEVICESAND CIRCUITSI,

Tata McGraw Hill Publishing Company Limited, New Delhi, 8th edition.

2 B.L.Theraja,—BASIC ELECTRONICS – SOLID STATE DEVICESI,S. Chand & Company Ltd.

# **Reference Books**

1 S.L.Kakani,K.C.BhanDai—ATEXTBOOKOFELECTRONICSI. S.Chand& Company Ltd.2000

2 Bernard Grob—BASIC ELECTRONICSI-Tata McGraw-Hill Publishing Company Limited, 9thEdition.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1 https://nptel.ac.in/courses/108/108/108108122/

2 https://nptel.ac.in/courses/108/108/108108112/

3 https://nptel.ac.in/courses/115/102/115102103/

Course Designed By: K.Manikantan, Assistant Professor, Government Arts College, Ooty& Dr.N Om Muruga, Assistant Professor, Government Arts College, Ooty

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10
<b>CO1</b>	S	S	L	М	L	М	M	M	S	Μ
CO2	L	L	L	L	< D	М	М	M	L	L
<b>CO3</b>	L	М	L	L	S	M		L	М	M
<b>CO4</b>	L	Μ	M	L	L	S	М	L	M	S
CO5	M 🤊	M	S	L	М	L	S	M	M	M

\*S-Strong; M-Medium; L-Low Combeture DISSLILITEOUT 2-WITE FDUCATE TO ELEVATE

Course code	23P	BASIC ELECTRONICS LAB	L	Т	Р	С
Core			3		Р	4
Practical - I	• • • •		G 11		202	<u>.</u>
Pre-req	uisite	Higher secondary Physics	Sylla Vora	bus	202	22-
Course Object	tivos		vers	ion	202	23
The main object	tives of thi	s course are to:				
1 To underst	and the fund	damental principles of circuit theory				
2. To make us	se of circuit	laws and theorems and measuring the circuit parameter	ers.			
Expected Cou	rse Outcor	nes:				
On the succes	sful comple	etion of the course, student will be able to:				
1 Apply the	concept of	hasic circuit and theorems			K	3
2 Simplify the	be airquite	using series and perallel equivalents and using Theyen	in'a			2
2 Simplify t	n's equivale	asing series and paramet equivalents and using Theven	III S		Л	.5
		And Chedrics.				
3 Design res	sonance cire	cuits.			K	4
4 Use the os	scilloscope	for the display and measurements of signals.			K	2
5 Apply the	electronic	components in network theorems.			K	3
K1 - Rememb	oer; <mark>K2</mark> - U	nderstand; K3 - Apply; K4 - Analyze <mark>; K5</mark> - Evaluate; I	<b>K6 -</b> C	reate		
	2				1	
	E	ANY 16 EXPERIMENTS			1	
1. Study of Mu	ıltim <mark>eter – (</mark>	Checking of Components				
2. Measuremen	nt of <mark>Ampli</mark>	ude, Frequency & Phase Difference using CRO				
3. Verification	of Ohm's I	Law				
4. Voltage sour	rces in Serie	es, Parallel and Series–Parallel				
5. Resistance ii	n Series, Pa	rallel and Series–Parallel				
6. Voltage and	of Kirchof	Pa Law		1		
7. Verification	Bridge	I S Law				
9 Verification	of Norton'	Theorem				
10 Verification	n of Theyer	in's Theorem				
11. Verification	n of Millma	n's Theorem				
12. Verification	n of Superp	osition Theorem LIII 6017 2-14				
13. LCR Bridg	e	SUUCATE TO ELEVAIE				
14. Series Reso	onance Circ	uit				
15. Parallel Re	sonance Ci	rcuit				
16. Transient F	Response of	RC Circuit				
17. Transient F	Response of	RL Circuit				
18. Capacitors	& Inductor	s in Series & Parallel				
19. Frequency	Response c	if R, L&C				
20. Low Pass F	filter & Hig	h Pass Filter				
21. Band pass a	and Band R	ejection Filter um Bower Transfer Theorem				
22. Verification 23. Measureme	n of resist	ance and capacitance in series and parallel				
Course Desig	aned Rv. K	Manikantan Assistant Professor Government Arts C	ollege	Ootv	8	
	$\mathbf{D}_{1}$	N Om Muruga, Assistant Professor, Government Arts C	s Colle	, ge.	a	
	0	otv		<i>.</i> .,		

# Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

- 1 <u>https://nptel.ac.in/courses/122/106/122106025/</u>
- 2 <u>https://nptel.ac.in/courses/122/106/122106026/</u>

Mapping with Programme Outcomes										
COs	<b>PO1</b>	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	PO10
CO1	L	L	М	М	М	L	L	М	S	М
CO2	L	L	L	L	L	М	М	S	М	S
CO3	М	М	М	М	L	L	S	L	М	М
<b>CO4</b>	М	L	L	L	L	S	L	L	М	S
CO5	L	М	S	S	М	L	L	L	М	М

# \*S-Strong; M-Medium; L-Low



Course code	23Q	SEMI	CONDUCTOR D	DEVICES LAB	L	Т	P	С
Core practical	l – II				3		Р	4
Pre-requisite	•	High	er secondary Phys	ics	Sylla	bus	2022	2-
					Versi	on 2	2023	
Course Objec	tives:							
The main object	ctives of thi	course are to:	aromatara of alact	ronia daviana				
2 To construct	t few applie	ations using semic	anductor devices	tonic devices.				
2 10 construc	tiew uppin	ations using series						
Expected Cou	rse Outcor	es:						
On the succes	sful comple	tion of the co <mark>urse,</mark>	student will be abl	e to:				
1 Experime	nt the funda	nental operations of	of the main semico	nductor electron	ic devi	ces.	K	3
2 Design an	d construct	electronic circuits u	sing semiconduct	or devices.			K	3
3 Understan	d the tr <mark>ansi</mark>	tor characteristics		8.			K	2
4 Understan	d the chara	teristics of LDR an	nd solar cell	18			K	2
5 Use the sp	ecial diode	for various application	ations	No.			K	3
K1 - Rememb	oer; <mark>K2 - U</mark>	derstand; K3 - Ap	oly; <b>K4 -</b> Analyze:	; K5 - Evaluate; 1	K6 - C	reate		
	95	ANY 16	EXPERIMENTS	3 10.				
1. Band Gap E	ner <mark>gy of Si</mark>	con /Germanium I	Diode					
2. V-I Characte	eristics of Ju	nction Diode	The state					
5. V-I Characte	haracteristi	s of CE Configuration	ion					
5 Transistor C	haracteristi	s of CB Configura	tion	1.				
6. Transistor C	haracteristi	s of CC Configura	tion	R				
7. Clipping Cir	cuits	8			3			
8. Clamping C	ircuits			S		/		
9. Measuremen	nt of Stabili	y Factor of Fixed E	lias	15				
10. Measureme	ent of Stabil	ty Factor of Self B	ias	600				
11. V-I Charac	teristics of	FET		G				
12. V-I Charac	teristics of	JJT		SIL				
13. UJT as Osc	cillator	S Sain	ITCOIT 9_1118					
14. FET as Vo	ltage Varial	le Resistor (VVR)	TICON FLENATE					
15. Characteris	stics of LDF	OCAI	E IU ELEVIS					
16. Characteris	tics of Sola	Cell						
17. Study of IR	R(Tx & Rx)							
18. Study of L	ED and 7Se	gmentdisplay						
19. Temperatur	re Co-effici	nt of Junction Dio	de					
20. Zener as a $21.$ ON / OFF	voltage reg	llator						
21.  ON / OFF	control of re	iay using Opto-Co	upiers					
22. Unaracteris	aractoristic							

### Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1 https://nptel.ac.in/courses/108/108/108108122/

2 https://nptel.ac.in/courses/108/108/108108112/

3 https://nptel.ac.in/courses/115/102/115102103/

Course Designed By: K.Manikantan , Assistant Professor, Government Arts College ,Ooty & Dr.N Om Muruga , Assistant Professor, Government Arts College ,Ooty

Mappi	Mapping with Programme Outcomes									
COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10
CO1	L	L	М	L	L	L	L	М	S	М
CO3	L	М	М	М	L	М	L	S	М	L
CO3	М	L	S	L	L	S	L	L	L	М
CO4	М	М	L	L	L	S	M	L	М	L
CO5	L	М	S	М	М	М	L	L	М	М

\*S-Strong; M-Medium; L-Low





Cours	se Code	33A	ELECTRONIC CIRCUITS	L	Т	P	C
Core	paper III			5	Т		4
Pre-Requ	uisite:		Basic Electronics	Syllat Versio	ous on	2022-	2023
Course (	<b>)</b> bjectives:						
The Main The Main ar ar The the Expected	n Objectiv o enable the nplifiers an o Acquaint e electronic l Course O	es of this of e students in d oscillato the studen c amplifier Putcomes:	course are to: to understand and gain the knowledge on rs. ts with construction, theory and characte circuits and types of multivibrators.	n power	· supp	olies,	
On the su	ccessful co	mpletion o	of the course, student will be able to:				
1	Understan	d the conc	epts of Rectifiers and regulators	) 	K2	2	
2	Study abo	ut Small si	gnal amplifiers		K1	-	
3	Analyze th	<mark>he func</mark> tior	s of Power amplifiers		K4	Ļ	
4	Analyze th circuits Design os	he perform cillators ar	ance of negative as well as positive feed	back	K4 K6	5	
K1:Rem	nember;	K2-Unders	stand; <b>K3</b> -Apply; <b>K</b> 4-Analyze; <b>K5</b> -Ev	valuate	; F	<b>K6</b> -Cre	ate
Unit:1	1	RECT	TIFIERS AND REGULATORS		1	2 hou	rs
Half wa – Ripple Filter – Zener I Protecti	ve, Full wa e Factor – I Capacitor Diode Shu on – Const	ves and br Efficiency Filter – L nt Regula ruction of J	idge Rectifiers – Calculation of RMS Va – Transformer Utility Factor – Peak Inve C Filter – Pi Filter - Voltage Doubler tor – Transistor Shunt and Series R DC Power Supply.	ilue – A erse Vo – Volta legulato	ltage age R	ge Val – Indu egulat Over	ue ictor or – load
Unit:2		SMA	ALL SIGNAL AMPLIFIERS		1	2 hou	rs
CE, CB Voltage Amplifi Impedar	, CC ampl Gain–Powe er – Gain nce Matchin	ifiers – Ca erGain–Sir Frequency ng – FET A	alculation of I/P Resistance, O/P Resistance, O/P Resistance, DC and AC Response – Bandwidth – Transformer Amplifier.	ance – Cloadlin Coup	Curre le–RC led A	ent Ga C Cou amplifi	in – pled er –
Unit:3			POWER AMPLIFIERS		1	12 hou	rs
Operatio Amplifi Dissipat Distortio	on and Gr ers – Max tion Curve on – Comp	aphical Ro kimum Co – Harmo lementary	epresentation of Class A, Class B, C llector Efficiency of Class A Power nic Distortion – Class B Push Pull A Symmetry Push Pull Amplifier	lass C Amplif Amplifi	and ier – er –	Class Colle Cross	AB ector over
Unit:4		F	EEDBACK AMPLIFIERS		-	12hou	rs
Basic co feedbac Shunt F	oncepts of k on Gain, eedback – (	feedback– Bandwidt Current Se	Positive Feedback– Negative Feedback h and Distortion – Noise – Voltage Seri ries Feedback – Current Shunt Feedback	– Effe es Fee	ects o dback	f Nega - Vol	ıtive tage

Unit:5	OSCILLATORS AND MULTIVIBRATORS	12 hours
Barkhar Wein H	usen Criterion – Hartley Oscillator – Colpitts Oscillator – Phase Sh Bridge Oscillators –Piezo Electric Crystal and its Effects – Cryst	iift Oscillator – tal Oscillator -
Astable Trigger	Multivibrator–Monostablemultivibrator–BistableMultivibrator–Schm	itt
Unit:6	Contemporary Issues	2 hours
https://np	otel.ac.in/courses/108/102/108102097/#Introduction to Electronic circu	uits NPTEL.
https://np	otel.ac.in/courses/108/102/108102095/Analog Electronic circuits NPT	EL.
	Total Lecture hours	60 hours
Text Boo	ok(s)	
1	S.K.Sahdev,-ELECTRONIC PRINCIPLES, Dhanpat Rai & Co (P)L Edition, 1998	.td,2nd
2	B.L. Theraja, -BASIC ELECTRONICS, Chand Company Ltd, 2000	
Referen	ice Books	
1	V.K.Metha, Rohit Metha, PRINCIPLES OF ELECTRONICS. S C	hand, 2006.
2	B.Sasikala, C.Poornachandra, ELECTRONIC DEVICES AND CIRCUITS,SciTech 2003.	
Related	Online Contents [MOOC, SWAYAM, NPEL, Website etc.]	
1	http://www.ee.iitm.ac.in/~ani/2012/ec5135/lectures.htmlLecture Note	es
2	https://nptel.ac.in/courses/108/102/108102097/#Introduction to Electric circuits NPTEL.	ronic
3	https://nptel.ac.in/courses/108/102/108102095/Analog Electronic circ	cuits NPTEL.
Course D	Designed By: R.Ar <mark>chana, Assistant professor, Nehru Arts an</mark> d Science Dr.N Om Muruga, Assistant Professor, Government Arts Colle	College & ge ,Ooty

		29		0	Constant of			୍ବି		·
Mappi	ng with P	rogramn	ne Out	comes			- 81			
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	S	S	М	М	М	М	S	М	М	S
CO2	S	М	М	М	М	М	S	L	L	L
CO3	S	S	S	М	М	L	L	L	М	М
CO4	М	М	М	S	S	S	L	L	М	М
CO5	М	М	S	S	М	L	М	М	S	М

\*S-Strong;M-Medium;L-Low

Cours	se Code	3ZA	DIGITAL PRINCIPLES AND APPLICATIONS	L	T	Р	С	
Skill B Subjec	ased t: I			5	Т		3	
Pre-Requ	iisite:		Higher secondary Physics	Sylla Versi	bus ion	202	2-2023	
Course O	bjectives	:						
The Main	a Objective construction of outline to desequent of learn the Course O	ves of this cou he basic know the formal pr ial circuits. e concepts of Dutcomes:	<b>Frse are to:</b> Hedge of Number system, Digital logic circedures for the analysis and design of A/D, D/A conversions and their type	rcuits of cor es.	and i nbina	ts app ationa	lication. l	
On the su	ccessful co	ompletion of t	he course, student will be able to:					
1	Understa	nd the basics of	of Number system and gates				K2	
2	Realize to outputs	the operation	of various logic gates and analyzing	the			K1	
3	Analyze	and design t	he combinational logic circuits				K4	
4	Analyze	and design t	he Sequential logic circuits				K4	
5	Design va	arious synchro	nous and asynchronous sequential circuit	ts		K6		
K1:Rem	ember;	K2-Understar	nd; <b>K3</b> -Apply; <b>K</b> 4-Analyze; <b>K5</b> -Evalu	iate;	K6	-Creat	te	
Unit:1		NUMBE	R SYSTEM AND CODES			]	2 hours	
Decimal Binary A (BCD) - Codes –	, Binary, Addition, S - Weighte Hamming	Octal and He Subtraction ar d Codes and g Codes – ASC	xa Decimal Numbers – Conversion – F d Multiplication – 1's and 2's Complim Non-weighted Codes – Excess Three – CII Codes – EBCDIC Codes – Hollerith C	loating ents - Grey Code –	g Poi Bina Code Pari	nt Rep ry Co – Err ty Adv	oresentation– ded Decimal or Detection /antages.	
Unit:2		BOOI	LEAN ALGEBRA AND LOGIC GATES			1	12 hours	
Boolean – Sum o NOR, E	an logic operations – Boolean functions – Truth Tables – Basic Laws – DeMorgan's Theorem of Products and Products of Sums – Karnaugh map – Logic Gates – OR, AND, NOT, NAND, EX-OR and EX-NOR Gates – Code Conversion – VHDL Coding for Logic Gates.							
Unit:3		COMBIN	NATIONAL LOGIC CIRCUITS			1	2 hours	
Half Add Adder / Generate	der – Full Subtractor ors / Checl	Adder – Half – BCD adder kers – Magnit	Sub tractor – Full Sub tractor – Parallel F – Multiplexer – Demultiplexer – Decode ude Comparators – VHDL Coding for Co	Binary ers – E ombina	Add Encod ationa	er – 4 lers – 1 1 Circ	bit Binary Parity uits	
Unit:4		Clocked DS	UUENTIAL LOGIC CIRCUITS	000	<b>CL:</b>	Por:	12 hours	
Types–F Counter	ps – KS, Ring Coun s – Decade	ters– Ripple Counter – Ap	Counters–Synchronous Counter–Up Doplications.	ops – wn co	ounter	–Mod	-3,Mod- 5	

Unit:5	D/A AND A/D CONVERTERS	12 hours
Digital t	to Analog Converters: Resistive Divider Type - Ladder Type – Accuracy a	and Resolution -
Analog	to Digital Converters: Counter – Ramp Type – simultaneous Conversion – De	ual Slope Type –
Successi	ve Approximation Type – Accuracy and Resolution.	
	Total Lecture hours	60 hours
Text Boo	k(s)	
	Malvino & Leech, -DIGITAL PRINCIPLES AND APPLICATIONS, Tata M	lcGraw Hill
1	Edition V, 2002.	
2	M.MorrisMano-DIGITAL LOGIC AND COMPUTER DESIGN, PHI 2005.	
Reference	e Books	
1	Floyd and Jain, <b>Digital Fundamentals</b> , Prentice Hall2010	
	M. Morris Mano Charles Kime, Digital Logic and Computer Design Funda	mentals,
2	Pearson Education Limited, 2014	
Related (	Online Contents [MOOC, SWAYAM, NPEL, Website etc.]	
1	https://soaneemrana.org/onewebmedia/DIGITAL%20PRINCIPLES%20AND ON%20BY%20LEACH%20	%20APPLICATI
	<u>&amp;%20MALVINO.pdf</u> E book, Malvino& Leech, -DIGITALPRINCIPLESANI	D
	APPLICATIONS, Tata McGraw Hill Edition X!,2011	
2	https://nptel.ac.in/courses/117/106/117106086/Introduction to digital circuits	
3	https://www.youtube.com/watch?v=CL3ups78jrs/Introduction to digital Desig	gn
Course D	esigned By: R.Archana, Assistant professor, Nehru Arts and Science College	&
1	Dr.N Om Muruga, Assistant Professor, Government Arts College, Ooty	

Mappi	Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	
CO1	S	S	М	EDMCA	TE M	LEVMTE	S	М	М	S	
CO2	S	М	М	М	М	М	S	L	L	L	
CO3	S	S	S	М	М	L	L	L	М	М	
CO4	М	М	М	S	S	S	L	L	М	М	
CO5	М	М	S	S	М	L	М	М	S	М	

\*S-Strong;M-Medium;L-Low

Cours	se Code	3AD	OBJECT ORIENTED	L	Т	Р	C		
			PROGRAMMING USING C++						
Allie	ed: III			4	Т	-	3		
Pre-Requ	uisite:	Students sł	nould have basic Computer Knowledge	Sylla Versi	bus on	2022-	2023		
Course (	)bjectives:					1			
The Main           ◆ In           ◆ En           ◆ Eco           of           ◆ Ex	n Objectiv npart knowle nable to diff quip with the inheritance kplain the in	es of this of edge of obje erentiate pro- e knowledg	course are to: ect-oriented programming concepts and implect-oriented programming concepts and implect-oriented concept e of concept of Inheritance so that learner up f data hiding in object-oriented programmin	lement t ots. nderstan g.	hem in ids the	n C++. need			
Expected	l Course O	outcomes:							
On the Su	accessful co	ompletion	of the course, student will be able to:						
1	1 Define the different programming paradigm such as procedure oriented and object-oriented programming methodology and conceptualize elements of OO methodology.								
2	Illustrate and model real world objects and map it into programming objects for K2 a legacy system.								
3	Identify the concepts of inheritance and its types and develop applications using K3 overloading features.								
4	Discover the	he usage of	pointers with classes.		0	K4			
5	Explain the exception	e us <mark>age of</mark> F Handling.	iles, templates and understand the importan	ce of	5	K5			
K1:Ren	nember;	K2-Unders	stand; K3-Apply; K4-Analyze; K5-E	valuate	; k	K6-Cre	ate		
Unit:1		U.S.	INTRODUCTION TO C++			9 h	ours		
Key Con Structure Case Sta Functions	cepts of OC s – Decision tements – I s – Function	DP – Advar n Making S Loops in C n Overloadin	ntages – OO Languages – I/O in C++ - C tatements – IfElse – Jump – GOTO – B ++ - For – While – DoWhile loops – I ng.	++ Decl Break – ( Functior	aration Contin ns in C	ns - Co ue – S C++, In	ontrol witch 1 line		
Unit:2			CLASSES AND OBJECTS			9 he	ours		
Declaring objects – Destructo static met	Declaring objects – Defining member functions – Static member variables and functions – Array of objects – Friend functions – Overloading member functions – Bit fields and Class – Constructor and Destructors – Characteristics – Calling constructor and Destructors – Constructor and Destructor with static member.								
Unit:3			OPERATOR OVERLOADING			9 h	ours		
Overload Types of Virtual B	ing unary, I inheritance ase classes	Binary opera : Single, M – Abstract (	ators – Overloading friend functions – Type ultilevel, Multiple, Hierarchical, Hybrid an Classes.	e conver d Multi	sion - path ii	Inherit hheritai	ance: nce –		

Unit:4	POINTERS	9 hours						
Declarati Arrays – Dynamic	on – Pointer to class, object – THIS pointer – Pointer to derived classes and base c Characteristics – Arrays of classes – Memory models – New and delete operators objects – Binding, Polymorphisms and Virtual functions.	lasses — —						
Unit:5	FILES	9 hours						
File strea Random string obj	m classes – File Modes – Sequential read/write operations – Binary and ASCII file access operation – Templates – Exception handling – Strings – Declaring and initiatects – String attributes – Miscellaneous functions.	es – alizing						
	Total Lecture hours	45 hours						
Text Boo	k(s)							
1	Ashok N Kamthane, Object-Oriented Programming with Ansi And Turbo C++, Pearson Education, 2003.							
Reference	e Books							
1	E. Balagurusamy, Object-Oriented Programming with C++, TMH, 1998.							
2	Maria Litvin& Gray Litvin, C++ for you, Vikas publication, 2002.							
Related	Online Contents [MOOC, SWAYAM, NPEL, Website etc.]							
1	shorturl.at/mruW9							
2	https://www.w3schools.com/cpp/							
Course D	esigned By:							
1. Dr. K.	Venmathi, A <mark>ssistant</mark> Professor, LRG Government College for Women, Tiru	ıppur.						
2. Mr. M.	Arun Prasad, Assistant Professor, KG College of Arts and Science, Coimba	atore.						

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	S	S	S	M.A	TE MO E	LE MIE	М	М	М	L
CO2	S	S	S	S	S	S	S	М	М	М
CO3	S	S	S	S	S	S	S	М	М	М
CO4	S	S	S	S	S	S	S	М	М	S
CO5	S	S	S	S	S	S	S	М	М	S

all all

\*S-Strong;M-Medium;L-Low



Cour	se Code	43A	IC'S AND INSTRUMENTATION	L	Т	Р	C			
Core p	paper IV			4	Т		4			
Pre-Req	uisite:		Basic Electronics	Sylla	bus	2022-	·2023			
-				Versi	on					
Course (	Objectives:	1								
The Mai	The Main Objectives of this course are to:									
◆ T	o impart	the know	vledge on IC fabrication, Timer, PL	L, and e	electro	nic				
	struments	o atudanta	to acquire the knowledge of On amp t	ronadua	ore on	d ita				
• I a1	applications in electronic circuits and know the technique of measurements									
u:	usingelectronic instruments									
<b>F</b>			and the second							
Expected	1 Course O	utcomes:	60° 0							
On the S	uccessful co	ompletion	of the course, student will be able to:							
1	Recognize	e t <mark>he stan</mark> d	ards in IC Fabrication Technology.			K1				
2	Understand the working of Timer and PLL									
3	3 Design simple circuits using Op Amp.									
4	Understand the principle of various types of transducers									
5	5 Study the construction and working of frequently used equipment's like K4 CRO, Digital Voltmeter etc.									
K1:Ren	nember;	K2-Under	stand; <b>K3</b> -Apply; <b>K</b> 4-Analyze; <b>K5</b> -I	<mark>Eva</mark> luate	e; K	<b>6</b> -Cre	ate			
Unit:1		IC	FABRICATION TECHNOLOGY		N	12 h	ours			
Fundam	entals of M	lonolithic	IC Technology – Basic Planar Process –	Wafer	Prepa	ration				
Epitaxia	l Growth-O	Oxidation–	-Photolithography–Diffusion of Impurit	ies–Isola	ation 7	Гесhni	ques			
– Metall	lization $-N$	Ionolithic	Transistors – Integrated Resistors – Inte	grated (	Capaci	itors -				
Integrate	ed Inductor	s - Thin ai	TIMED AND DL	<u>s</u>		12 h				
Eurotic	al Diask I	Diagnama	1 IVIER AND FLL	Annli	action		incor			
Ramp (	lal DIOCK I	Pulse W	idth Modulator A stable Operation	- Appli Appli	cation	is: -L	nmitt			
Trigger-	-ESK Gene	rator- Pha	se Locked Loop: Functional Block Dia	oram –	Phase	Detec	tor /			
Compar	ator –Volta	ge Contro	lled Oscillator – Low Pass Filter – Appl	ications	: Freq	uency				
Multipli	er / Divisio	n – AM D	Detection		1					
Unit:3			OPERATIONAL AMPLIFIER			12 h	ours			
Ideal C	haracteristi	cs - Inve	rting and Non-inverting Amplifier –	Op-am	np Par	amete	ers –			
Summin	ig Amplifie	er – Diffei	rence Amplifier – Integrator – Differen	tiator –	Instru	ument	ation			
Amplifi Wave R	er – Voltag ectifiers – I	ge to Curr Precision I	ent Converter – Current to Voltage Co Full Wave Rectifiers	nverter	– Pre	cision	half			
Unit:4			TRANSDUCERS			12 h	ours			
Introduc	tion–Electi	ricalTranso	lucer-BasicrequirementsofTransducer-	Classifi	cation	1	of			
Transdu Thermis Transdu	cers – Se tors – The cers – Phot	lection of rmocouple oelectric 7	f Transducers – Resistive Transduce e – LVDT – RVDT – Piezoelectric Tr Fransducers – Digital Displacement Transducers	ers – F ansduce nsducers	Potenti ers – I s	omete Hall E	rs – Iffect			

Unit:5	ELECTRONIC INSTRUMENTS	12 hours
Q Meters Measurei DVM–D Measurei	- CRO: Block Diagram – Cathode Ray Tube – Measurement of Frequency nent of Voltage and Current–Digital Oscilloscope–Digital voltmeter: Ramp ual Slope Integrating Type DVM – Digital Multimeter – Humidity and Hum nent – Measurement of PH.	- • Type nidity
	Total Lecture hours	60 hours
Text Boo	ok(s)	
1	D.Roy Choudhury and Shahil B Jain, -LINEAR INTEGRATED CIRCUI' Edition New Age International Publishers, 2004	TS, Second
2	K.R. Botkar-INTEGRATED CIRCUITS,10th Edition Khanna Publishers,	2006
Referenc	e Books	
1	J.B.GUPTA-ACOURSE IN ELECTRONICAND ELECTRICAL MEASUREMENTS AND INSTRUMENTATION, 12th Edition, S.K Ka & Sons	ataria
2	A.K. Sawhney, ELECTRICAL & ELECTRONIC MEASUREMENTS INSTRUMENTATION, Dhanpath Rai & Co (P) Ltd, 2004.	AND
Related	Online <mark>Contents</mark> [MOOC, SWAYAM, NPEL, We <mark>bs</mark> ite etc.]	
1	https://nptel.ac.in/courses/108/108/108/108108111/Integrated circuits, op- ampsand their applications	
2	https://nptel.ac.in/courses/117/106/117106030/Analog IC Design	
Course D	esigned By: R.Archana, Assistant professor, Nehru Arts and Science Colle Dr.N Om Muruga, Assistant Professor, Government Arts Col	ge& lege ,Ooty.

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	S	S	М	EDMCA	TE TO E	LEVMTE	S	М	М	S
CO2	S	М	М	М	М	М	S	L	L	L
CO3	S	S	S	М	М	L	L	L	М	М
CO4	М	М	М	S	S	S	L	L	М	М
CO5	М	М	S	S	М	L	М	М	S	М

\*S-Strong;M-Medium;L-Low

N.

Cour	so Codo	4AD	INTERNET OF THINGS	L	Т	P	С					
	se Code			3			3					
Ante	1 7			5			5					
Pre-Requ	uisite:	Basic Ele	ctronics	Sylla Versi	bus on	2022-	2023					
Course (	Objectives:											
The Mai	n Obiectiv	es of this	course are to:									
* To	o enable the evices and In	students to terfacing s	learn about IoT and also to understand the ensors	concept	of eml	oedded						
Expected	Expected Course Outcomes:											
On the Su	accessful co	ompletion	of the course, student will be able to:	(								
1	Study the	concept of	basic IoT			K1	K1					
2	Familiarize the principle of connected devices											
3	Gain knowledge about embedded devices											
4	Analyze different sensor Interface technology											
5	Analyz <mark>e tl</mark>	ne IoT app	lications	5	18	K4						
K1:Ren	nember;	K2-Under	stand; K3-Apply; K4-Analyze; K5-	<mark>Ev</mark> aluate	; •	<b>K6</b> -Cre	ate					
Unit:1	E	IOI	FUNDAMENTALS		3	6 ho	ours					
Introduc IoT – Te	tion to IoT chnologies	: Definitio for IoT –	n & Characteristics of IoT – Architectu Developing IoT Applications – Securit	re of y in IoT		/						
Unit:2		DESIGN P	<b>PRINCIPL<mark>ES FOR CON</mark>NECTED DEVI</b>	ICES		6 ho	urs					
Introduct consolida	ion - IoT / ation and De	M2m syste vice manag	ms - Communication Technologies - Data gement.	i manage	ment,	data						
Unit:3	PROGRAMMING FUNDAMENTALS WITH C USING ARDUINO IDE 6 hours											
Arduino Loops–	IDE- Data Strings.	a Types /	Variables / Constant – Operators–Con	nditional	State	ements	and					

Unit:4	SENSORS AND ACTUATORS	6 hours
Analog Buzzer v	and Digital Sensors – Interfacing temperature sensor with Arduino – Interfacir with Arduino.	ig LED and
Unit:5	SENDING SENSOR DATA OVER INTERNET	6 hours
Introduc WiFi and	ction to ESP8266 NODEMCU WiFi Module – Programming NODEMC d NODEMCU to transmit data from temperature sensor to Open Source IoT cloud	U - Using platform.
	Total Lecture hours	30 hours
Text Bo	ok(s)	
1	Arshdeep Bahga, Vijay Madisetti, "Internet of Things: A Hands-On Approach", 2014.ISBN: 978-0996025515	
2	Boris Adryan, Dominik Obermaier, Paul Fremantle, "The Technical Foundations Artech Houser Publishers, 2017.	of IoT",
Referen	ce Books	
1	Michael Margolis, "Arduino Cookbook", O" Reilly, 2011	
2	Marco Schwartz, "Internet of Things with ESP8266", Packt Publishing, 2016	
Related	Online Contents [MOOC, SWAYAM, NPEL, Website etc.]	
1	https://nptel.ac.in/courses/106/105/106105166/ Introduction to IoT Part I – Lectur	e 1
2	https://o <mark>cw.cs.pub.</mark> ro/courses/iot/courses/02 Electronics for Internet of Things – L	ecture II
Course I	Designed By:	
1. Dr. K.	Venmathi, Assistant Professor, LRG Government College for Women, Tiru	ppur.
2. Mr. M	I. Arun Prasad, Assistant Professor, KG College of Arts and Science, Coimba	atore.

Mappi	Mapping with Programme Outcomes									
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	S	S	М	M	TE MO E	LE M	S	М	М	S
CO2	S	М	М	М	М	М	S	L	L	L
CO3	S	S	S	М	М	L	L	L	М	М
CO4	М	М	М	S	S	S	L	L	М	М
CO5	М	М	S	S	М	L	М	М	S	М

\*S-Strong;M-Medium;L-Low

Cours	se Code	4ZB	DIGITAL AND CELLULAR COMMUNICATION	L	T	P	C				
Skill base	ed Subject			3	Т		3				
- 11											
Pre-Requ	uisite:	Basic Elec	ctronics	Sylla Versi	bus on	2022-	-2023				
Course C	)bjectives:			1							
The Main	The Main Objectives of this course are to:										
	✤ To en	nhance the	knowledge in communication with digi	tal and							
• To learn the digital and cellular technology											
Expected	Course O	outcomes:	, and and contain coomonogy								
		1									
On the St	iccessful co	ompletion	of the course, student will be able to:								
1	Know the	concepts of	of data transmission systems			K1					
2	Analyze the Model of Communication system										
3	Familiarize Digital carrier Modulation Schemes										
4	Understand pulse modulation and quantization techniques										
5	Analyze the	he cellular	system design and technical challenges		~	K4					
K1:Rem	ember;	K2-Under	stand; K3-Apply; K4-Analyze; K5-F	<mark>valuate</mark>	· ·	<b>6-</b> Cre	eate				
Unit:1	G G		DATA TRANSMISSION	1	~	10 h	ours				
Introduct 20milli A Signallin	tion – Rep Amps Loop 1g Speed –	presentatio and Line Noise and	n of Data Signal – Parallel and Seria Drivers – Transient Noise – Data Sign Error Analysis – Repeaters.	al Data al – Sig	Tran gnal S	smissi haping	on – g and				
Unit:2			COMMUNICATION SYSTEM			10 h	ours				
Model of Informat Demodu of Comm	Model of Communication System – Elements of Digital Communication System: Information Source, Source Encoder/Decoder, Communication Channel, Modulator, Demodulator, Channel Encoder/Decoder, Other Functional Blocks – Analysis of Communication System – Design of Communication System										
Unit:3		DIGITAL	CARRIER MODULATION SCHEM	IES		10 h	ours				
Binary P Quadratu – Freque	Binary Phase Shift Keying – Differential Phase Shift Keying – Differentially Encoded PSK – Quadrature Phase Shift Keying – Base Band Signal Receiver – Phase Shift Keying – Frequency Shift Keying – Non-Coherent Detection of FSK.										
Unit:4		PULSE	E MODULATION AND QUANTIZA	ΓΙΟΝ		10 ho	ours				
Pulse A Quantiza Represen Different	mplitude 1 ation of ntation of 1 tial PCM –	Modulation Signals Binary Dig Delta Mo	n - Pulse Width Modulation - Pulse -Quantization Error–Pulse Code its–PCM System – Companding– Mult dulation – Adaptive Delta Modulation	Positic Modu iplexing	on Mo ilation g PCN	odulati –Elec I Sign	ion - trical als –				

Unit:5	DIGITAL CELLULAR SYSTEMS	10 hours
GSM A	architecture – Layer Modeling – Transmission – Data Service – Multip	le Access
Scheme	- Channel Coding Inter Leaving - Radio Resource Management -	Mobility
Manage	ement – Communication Management – Network Management -	- TDMA
Archite	cture–TransmissionandModulation–CDMA–TermsofCDMASystems–Call F	Processing
– Hand	Over Procedures	
	Total Lecture hours	0 hours
Text Bo	ok(s)	
	Sam K. Shanmugam, —DIGITAL AND ANALOG COMMUNICATIO	N
1	SYSTEMS, John Wiley Publications, 2005	
2	John G.Proakis,—DIGITAL COMMUNICATIONS, Tata Mc Graw Hill	
	International,2001.	
Referen	ce Books	
	W.C.Y.Lee, -MOBILE CELLULAR TELECOMMUNICATION, MO	Graw Hill
1	Publications, 1995	
2	Ke-Lin Du, M.N.S.Swamy, "WIRELESS COMMUNICATIONSYSTEM	MSI,
	Cambridge University Press, 2010.	
Related	Online Contents [MOOC, SWAYAM, NPEL, Website etc.]	
1	https://nptel.ac.in/courses/106/106/106106167/Wireless and Cellular Comr	nunication
2	https://nptel.ac.in/courses/117/105/117105077/Digital Communication	
Course I	Designed By: R.Archana, Assistant professor, Nehru Arts and Science Colle Dr.N Om Muruga, Assistant Professor, Government Arts Col	ge.& lege ,Ooty.

Mapping with Programme Outcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	S	S	M	5M EDUC		T 2ML	S	М	М	S
CO2	S	М	М	М	М	М	S	L	L	L
CO3	S	S	S	М	М	L	L	L	М	М
CO4	М	М	М	S	S	S	L	L	М	М
CO5	М	М	S	S	М	L	М	М	S	М

S

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\*S-Strong;M-Medium;L-Low

Course Code	43P	DIGITAL ELECTRONICS LAB	L	Т	P	C	
Core practical III:			3		3	4	
Pre-Requisite:	Digital Electronics			Syllabus 2022 Version		-2023	
Course Objectives:							
<ul> <li>The Main Objectives of</li> <li>✤ To understand th</li> <li>✤ To develop varion</li> </ul>	o <b>f this c</b> one logication digit	ourse are to: al operation of various gates and theorems cal circuits					
Expected Course Outc	omes:	Leonara Bar					
On the Successful comp	o <mark>letion</mark> o	f the course, student will be able to:					
1 Understand the	e logical	operation of various gates & theorems				K2	
2 Analyze the cir	rcuit usi	ng Boolean laws				K4	
3 Design the Ad	der and	subtractor circuit using logic gates		_		K6	
4 Design and and	alyze Co	ombinational and Sequential circuits				K6	
5 Acquire knowl circuits	ledge ab	out VHDL code for design and simulate of	f digi	tal log	gic	K2	
DIGITAL ELECTRONICS LAB							
	19.15g	(ANY 16 EXPERIMENTS)					
<ol> <li>Verification of</li> <li>Verification of</li> <li>2-bit Compara</li> <li>4. Half Adder and</li> <li>5. Half Subtract</li> <li>6. 4-bitBinaryAd</li> <li>7. Multiplexer and</li> <li>8. Encoder and 1</li> <li>9. BCD to 7-Seg</li> <li>10. Study of Flip</li> <li>11. Binary to Grave</li> <li>12. Shift Register</li> <li>13. Analog to D</li> <li>14. Digital to A</li> </ol>	of Basic of Demo ator usin of Full A or and F dder nd Dem Decoder gmentDi p Flops ey and C ers and I igital Co nalog C	Gates and Universal Gates rgan's Theorem ng Gates Adder Full Subtractor ultiplexers splay Grey to Binary Conversion Ring Counter onverter Converter					

16. Op-Amp: Integrator and Differentiator	
17. Current to Voltage and Voltage to Current Converter	
18. Realize Basic gates from universal gates	
19. Synchronous and Asynchronous Counter	
20. Magnitude Comparator.	
21. Design and Simulation of Basic Logic Gates using VHDL	
Coding.	
22. Design and Simulation of adder using VHDL Coding.	
23.Design and Simulation of subtractor Circuit using VHDL Coding	
Total Lecture hours	90 Hours
Course Designed By: R.Archana, Assistant professor, Nehru Arts and Science	ce College.&
Dr.N Om Muruga, Assistant Professor, Government A	Arts College ,Ooty.

		6	1000			1000				
Mapping with Pro <mark>gramme Outcomes</mark>										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	S	S	М	М	M	М	S	М	М	S
CO2	S	М	М	М	М	М	S	<u></u>	L	L
CO3	S	S	S.	М	M	D	Ľ	L	М	М
CO4	М	М	М	S	S	S	L	L	M	М
CO5	M	М	S	S	М	L	М	M	SS	М

ம்து இந்தப்பாரை

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\*S-Strong;M-Medium;L-Low

Course Code			ELECTRONIC CIRCUITS	L	Т	Р	С			
			AND							
		43Q	INSTRUMENTATION							
			LAB				-			
Core /F	Elective /		Core Practical IV			3	4			
Supp	ortive:					202	2			
Pre-Re	equisite:	Ľ	SASIC ELECTRONICS LAB	Syllabus		202	2022-			
Course	Objective			ver	sion	202	.5			
Course	Jujectives	5.								
The Mai	in Objecti	ves of this o	course are to:							
* T	o understa	and the conc	ept of w <mark>orking of regul</mark> ated power suppli	es,						
re	ectifiers,ar	nplifiers and	l oscillators.							
* T	'o experim	ent the mod	ulation and detection techniques.							
Expected	d Course	Outcomes:								
On the S	uccessful o	completion	of the course, student will be able to:							
1	sign po	wer supply	and rectifier circuits			K6				
2	sign Ai	nplifier circ	uits			K6				
3	sign dif	fferent Oscil	lator circuits			K6				
4	sign dif	fferent Instru	imentation circuits			K6				
5	sign cir	<mark>cuits w</mark> ith T	ransducers			K6				
K1:Rer	nember;	K2-Unders	tand <mark>; K3-Apply; K4-An</mark> alyze; K5-Ev	aluate'	; K	6-Cre	ate			
		3 6	(Any 16 Experiments)	1						
	1. DC	C Regulated	Power Supply using Zener Diode							
	2. VC	oltage Doubl	er		3					
	J. Fe 4. En	aitter Follow		C.	5 /					
	5. Tr	ansformer C	oupled Amplifier	1 AS						
	6. Ha	rtlev Oscilla	itor	õ .						
	7. Co	lpitts Oscill	ator							
	8. Ph	ase shift Os	cillator							
	9. We	ein Bridge C	Scillator Li Lingon 2-11							
	10. R	C Coupled	Amplifier ATE TO ELEVATE							
	11. H	lalf Wave ar	d Full Wave Rectifier							
	12. F	liter Circuits	amont Convertor							
	13. V 14 C	Surrent to Vo	litage Converter							
	15. C	haracteristic	s of Piezoelectric Transducer							
16. Summing Amplifier										
17. Difference Amplifier										
18. Inverting and Non Inverting Amplifier										
	19. T	emperature	berature measurement using thermistor.							
	20. D	. Displacement measurement using LVDT.								
	21. Instrumentation Ampimer 22. Weighing machine using load cell									
	22. V 23. C	haracteristic	chine using load cell es of photo voltaic cell (solar cell)							
	23. C									
	Total Lecture hours	90								
---------------------	---------------------	-------								
	A REPORT	hours								
Course Designed By:	COLOR COLOR									

1. Dr. K. Venmathi, Assistant Professor, LRG Government College for Women, Tiruppur.

2. Mr. M. Arun Prasad, Assistant Professor, KG College of Arts and Science, Coimbatore.

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r					A CONTRACT OF					
Mappi	ng with <mark>P</mark> i	rogramn	ne Outo	comes			1			
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
6 C	7	ú		the second	2	-	58 1	26		
CO1	S	S	М	М	М	M	S	M	М	S
			R.	S.S.		27.1	27	3.		
CO2	S	М	М	М	М	М	S	L	L	L
		3		~	JL.	-			N	
CO3	S	S	S	М	М	L	L	L	M	M
	5			1			0.7	1	nin a	
CO4	М	М	М	S	S	S	L	L	М	М
		2		4	R			G		
CO5	М	M	S	S	М	L	М	М	S	М
		$\widetilde{\mathcal{P}}'$	500				-91-			

\*S-Strong; M-Medium; L-Low LITGOT 2-WIP

Course cod	<b>e</b> 43R	C++ PROGRAMMING LAB	L	Т	Р	С						
Core Prace	ical V		2		Р	2						
Pre-requi	site	Basic computer skills and familiarity with	Syllabi	ıs	2022	2-2023						
_		Microsoft Windows.	Versio	n								
Course Ob	jectives:											
The main objectives of this course are to:												
1. Impart kno	1. Impart knowledge of object oriented programming concepts and implement them in C++											
2. Enable to d	ifferentiate proc	edure oriented and object-oriented concepts.	1 6 .									
3. Equip with	the knowledge	of concept of Inheritance so that learner understands the ne	eed of 1r	herit	ance.	i.						
4. Explain the	importance of c	lata niding in object oriented programming.										
Expected (	'ourse Outcor	nes:										
On the su	cessful comple	etion of the course student will be able to:										
	a the different of		ant autor		L	71						
I Defin	e the different p	ology and conceptualize elements of OO methodology	ect orier	nea	r	<b>1</b>						
	atta and madal	al world akiests and man it into many main a shireta for	1		Т	70						
2 Illust	ate and model r	eal world objects and map it into programming objects for	r a legac	зy	K	~2						
Syste.	11. C 1		1	1.								
3 Ident	fy the concepts	of inheritance and its types and develop applications using	g overloa	adıng	K	3						
featur	es.	a sister with shows	<u> </u>		L	T A						
4 Disco	ver the usage of	pointers with classes.			r	<b>x</b> 4						
5 Evel	in the years of	Files, templetes and understand the importance of example	n Hand	1.00	L	75						
J Expla	5 Explain the usage of Files, templates and understand the importance of exception Handling.											
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create												
Programs	Programs 36 hou											

1. Create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the stack to 0. Write a member function POP() to delete an element. Check for overflow and underflow conditions.

2. Create a class ARITH which consists of a FLOAT and an integer Variable . Write member ADD(), SUB (), MUL (), DIV (), MOD () to perform addition, multiplication, division and modulus respectively . Write member functions to get and display values.

3. Create a class MAT has a 2-d matrix and R&C represents the rows and columns of the matrix . Overload the operators +, -, \* to add subtract and multiply two matrices. Write member functions to get and display MAT object values.

4. Create a class STRING . Write member function to initialize, get and display strings. Overload the operator + to concatenate two strings, = = to compare two strings and a member function to find the length of the string.

5. Create a class which consists of EMPLOYEE detail like employee number, employee name, dept, basicsalary, grade. Write member functions to get and display them. Derive a class PAY from the above class and write a member function to calculate da, hra, pf depending on the grade and Display the Payslip in a neat format using console I/O.

6. Create a class SHAPE which consist of two VIRTUAL FUNCTIONS Cal\_Area() and Cal\_PERI to calculate AREA and PERIMETER of various figures. Derive three classes SQUARE,RECTANGLE and TRIANGLE from the class SHAPE and calculate AREA and PERIMETER of each class separately and Display the result.

7. Create two classes which consists of two private variables, one float And one integer variables in each class.

Write member functions to get and display them . Write FRIEND function common to arguments. And the integer and float values of both the objects separately and Display the result.

8. Write a user defined function USERFUN() which has the formatting commands like setw(), showpoint, showpos precision(). Write a program which prints an multiplication table and uses USERFUN() for formatting.

9. Write a program to perform Insertion, Deletion and Updation using files.

10. Write a program which takes a file as argument and copies in to another file with line numbers using Command Line Arguments.

1 Ashok N Kamthane, Object-Oriented Programming with Ansi And Turbo C++, Pearson Education, 2003.

**Reference Books** 

1 E. Balagurusamy, Object-Oriented Programming with C++, TMH, 1998.

2 Maria Litvin& Gray Litvin, C++ for you, Vikas publication, 2002.

# Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1 shorturl.at/mruW9

2 https://www.w3schools.com/cpp/

Course Designed By:

1. Dr. K. Venmathi, Assistant Professor, LRG Government College for Women, Tiruppur.

2. Mr. M. Arun Prasad, Assistant Professor, KG College of Arts and Science, Coimbatore.

					A constant								
Mappi	Mapping with Programme Outcomes												
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10			
CO1	S	S	S	М	M	М	М	М	М	L			
CO2	S	S	S	S	S	S	S	М	М	М			
CO3	S	S	S	S	S	S	S	М	M	М			
CO4	S	S S	S	S	S	S	S	M	М	S			
CO5	S	S	S S S S	S	S	S	is SI	М	М	S			
			1 A 2			100							



Course	Course code 53A		8085	MICROPR APPLIC	OCESSOR AN ATIONS	D	L	T	P	С		
Core V	τ						6	Т		4		
Pre-re	equisite	:	Requires the Programming	basic of Dig	gital circuits and		Sylla Vers	bus 2	2022	-2023		
Course	Object	tives:	11081411111	Shingunges			VCIS					
The ma	in object	tives of this	course are to	):								
1. To ena	able the	students to	learn the Mic	roprocessor	Architecture.							
2. To lea	rn the i	nstruction se	t of 8085 and	l to develop	programming sk	ills.						
3. To kno	ow vari	ous peripher	al devices and	d to interfac	e themwith8085.							
Expect	Expected Course Outcomes:											
On the successful completion of the course, student will be able to:												
1 E	Explain	the 8085 mic	croprocessor	architecture	and its instructio	n set.			K	1		
2 U	Jndersta	and and reali	ze the Interfa	cing of men	nory & various I/	O device	s with	8085	K	2		
N	Micropro	ocessor	N /									
3 I	3 Interface the 8085 microprocessor with various peripheral devices.									3		
4 U	4 Understand the operation of Programmable Interface Devices and realize the											
p	programming & interfacing of it with 8085 microprocessor.											
5 E	5 Explain the need for different interfacing devices									5		
6 Program the microprocessor for various applications.									K	6		
K1 - F	Rememb	ber; <mark>K2 -</mark> Un	derstand; K3	- Apply; K	I - Analyze; K5 -	Evaluate	; K6 –	Creat	e			
Unit:1	1		Introduction	n to 8085		197		14	-h	ours		
Pin Dia Fetchin	gram – g,Deco	Architecture	e – Demultiple ecution of Ins	exing the Buttruction – In	us – Generation on Instruction Timing	o <mark>f Co</mark> ntrol g and Ope	l Signa ration	ls – Status				
Unit:2	2	2	Instruction	Set and Ad	dressing Modes		6	15	5—h	ours		
Instruct	tion Set	<ul> <li>Addressin</li> </ul>	g Modes – In	struction Fo	rmat – Simple Pi	rogram –	Memo	ry Rea	d			
Machin	e Cycle	– Memory V	Vrite Machine	e Cycle		0.010		5				
Unit:3	3		SIE	Interfacing	Concepts			14	—h	ours		
Periphe	ral I/O	Instructions	- Device Sele	ection and D	ata Transfer – In	put Inter	facing -	- Prac	tical			
Input In	nterfacir	ng Using De	coders – Inter	rfacing O/P	Devices: LED an	d 7 Segm	ent Di	splay -	-			
Interfac	ing Me	mory – Men	nory Time and	d Unit State	SLEVATE							
Unit:4	4		Parallel	and Serial	Interface			14	<u> </u>	ours		
Introdu	ction to	Programma	ble Periphera	l Interface 8	255 - Pin Diagra	um – Arch	nitectur	e – M	odes	of		
Operation	on: $I/O$	and $BSK - A$	Architecture a	and Operation	on of 8251 (USA	KI)						
IN LEK	KUPI A	And Thitecti	LUGIC reofProgram	mahleInterr	untController825	0						
Archite	ctureof	- Alemiceut 8254Program	nmable Interv	val Timer / (	Counter – Modes	of Operat	tion of	8254 -	_			
Generating Square WaveUsing8254												
Unit:5	5			Applic	ations			15	—h	ours		
Time D	elay Pro	ogram – Tra	ffic Light Con	ntrol System	n – Water Level (	Controller	- Step	per M	lotor			
Control	l – Inter	facing DAC	<ul> <li>Interfacing</li> </ul>	ADC – Ter	nperature Measur	rement						
					Total Lecture	hours		72	hour	S		

T	ext Book(s)
1	R.S.Gaonkar,—MicroprocessorArchitecture,ProgramAndItsApplicationWith8085I,
	New Age International (P)Ltd,
2	S.Malarvizhi,—MicroprocessorandItsApplicationI,-AnuradheAgenciesPublications–I
	edition, March1999.
R	eference Books
1	Doughlas V. Hall, "Microprocessors and Interfacing, Programming and Hardware",
	TMH,2012
2	M. Rafi Quazzaman, "Microprocessors Theory and Applications: Intel and Motorola", :
	Prentice Hall of India, Pvt. Ltd., New Delhi, 2003.
R	elated Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]
1	https://nptel.ac.in/courses/108/103/108103157/
2	https://www.youtube.com/watch?v=t0Z8P_hpbFk&vl=en
3	https://www.youtube.com/watch?v=fS7FFOaC_iQ
Cou	rse Designed By: M.Baskaran, Assistant Professor, KSG College of Arts and
	Science&Dr.N Om Muruga, Assistant Professor, Government Arts

36

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College ,Ooty.

	A		I Pane	1. C. C. M. Y								
Mapping with Programme Outcomes												
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10		
CO1	SUG	S	S	М	М	М	S	L	97) 1	S		
CO2	S	S	S	М	М	М	S	L	L	L		
CO3	S	S	S	М	М	L	L	ુજ્	S	М		
CO4	М	М	M	் தத்ப	S LIIGO	5 2_LLI	5P	Ĺ	М	М		
CO5	М	М	S	EDSICA	te so e	LEVE	M	М	S	S		

Cour	se code	5ZC	INTERNET AND JAVA PROGRAMM	AING	L	Т	P	С				
Skill b	acad Sub	viact			3	т		3				
– III	aseu sui	Jeci			5	1		5				
Pre	requisite		This course requires that the students are fa	miliar	Syllab	us 2	022	-2023				
	_		with programming language such as C/C++	- and	Versi	on						
			lata structures, algorithms									
Cour	se Obiec	tives:										
The r	nain objec	ctives of this	course are to:									
1. To c	design of	the subject is	to provide knowledge about internet, Java	data type	es, clas	ses						
andfiles.												
2. To learn the internet concept and Java programming systems.												
Expected Course Outcomes:												
On t	the succes	sful comple	on of the course, student will be able to:				1					
1 Gain knowledge about the concepts of Internet and able to program the												
	applications using Java.											
2 Design, create, build, and debug Java applications and applets												
3	3 Implement object oriented programming concepts in Java.											
4	4 Demonstrate use of Multithreading in Java application.											
5 Enhance logical reasoning and programming skills.												
6	Develop	application	ncorporating features like Package, Except	ion Hand	lling, I/	0	K	6				
K1 ·	- Rememi	per: <b>K2</b> - Un	erstand: K3 - Apply: K4 - Analyze: K5 - I	Evaluate:	K6 – (	Create	<u> </u>					
Uni	t:1		Introduction to Internet			7	-hou	rs				
Inter	net – Intro	oduction- Ur	lerstanding Internet- Internet Addressing -	Hardwa	re Requ	irem	ents	to				
conn	ect to the	Internet.	-		_							
Uni	t:2		Basics of java			7-	-hou	rs				
Data	Types, A	rrays, Opera	ors, Flow Control – Branching, Looping									
Uni	t:3	I	heritance and Interfaces				7ŀ	ours				
Class	ses – New	Operator, I	ot Operator, Method Declaration and Callin	ng, Cons	tructors	s, Thi	s in					
Cons	tructors, 1	Inheritance,	uper, Method Overriding Final, Finalize, S	Static, Pa	ckage a	and In	npor	t				
State	ment, Into	erface and Ir	plements									
Uni	t:4		<b>Exception Handling and Multithreading</b>				7ŀ	ours				
Exce	ption Har	ndling – Exc	ption Types, Uncaught and Calling, Nested	d Try Sta	tement	s, Jav	a Th	read				
Mode	ei, and Th	iread, Kunna	ble, 1 nread Priorities, Synchronization, Des	adlock								
Uni	t:5	Ν	anaging I/O Operation and Applet				8h	ours				
File -	- Input St	ream, Outpu	Stream, and File Stream. Applets-Tag, Or	der of Ap	plet In	itializ	atio	n,				
Repa	inting, Si	zing Graphic	s- Introduction to AWT Programming									
	Total Lecture hours         36hours											
Tex	t Book(s)											
1 H	arley Hał	ın, — <b>The in</b>	ernet complete reference,Tata McGraw p	ublicity,	2nd Ed	ition .	,199	7				
2 Pa	atrick Nau	ughton., — I	atrick Naughton, Then Java hand book, Ta	ata McG	raw.19	97						

Reference Books							
1 Herbert Schildt, "The Complete Reference, Java", McGraw-Hill.							
2 E.Balaguruswamy, "Programming with Java A Primer", McGraw-Hill.							
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]							
1 <u>https://www.youtube.com/watch?v=pWusFlk747Y</u>							
2 <u>https://www.youtube.com/watch?v=M9G_VeQgy7I</u>							
3 <u>https://www.youtube.com/watch?v=3u1fu6f8Hto</u>							
Course Designed By: M.Baskaran, Assistant Professor, KSG College of Arts and							

Science&Dr.N Om Muruga, Assistant Professor, Government Arts College ,Ooty.

Mappi	Mapping with Programme Outcomes												
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10			
CO1	S	S	S	М	M	М	S	L	L	S			
CO2	S	S	S	М	М	М	S	L	L	L			
CO3	S	S	S	М	М	L	L	S	S	М			
CO4	М	М	М	S	S	S	L	L	M	М			
CO5	M	М	S	S	S	L	М	М	S	S			
*	*S-Strong;M-Medium;L-Low												



Course	e code	63A	8051 MICROCONTROLLER AND EMBEDDED SYSTEMS	L	Т	Р	С					
Core V	νī			6	Т		4					
Pre-r	<u>-</u> eauisite	<u>,</u>	Digital	Syllab	us 2	2022	-2023					
	equisite	•	Electronics.	Versi	n -		2020					
			8085		_							
			Microprocessor									
Course	e Objec	tives:										
The ma	ain obje	ctives of this	course are to:									
1. Study the architecture and addressing modesof8051.												
2. Impart knowledge about assembly language programsof8051.												
3.Helps	to unde	rstand the $1$ m	portance of different peripheral devices &									
their ii	nteriacii	ng to8051. Iadaa af diffe	ment types of external interference including LEDS									
4. Impar	kovpod	Motrix Swi	tabes & Savan sagment display									
LCD,	,кеурац	Mailix, Swi	tenes & Seven segment display.									
Expect	ted Cou	rse Outcom	es:									
On the	e succes	ssful comple	tion of the course, student will be able to:									
1 D	Describe	architecture	and operation of Microcontroller 8051.			K	1					
2 F	2 Foster ability to understand the design concept of Microcontroller.											
3 D	Design v	arious applic	ations using its peripherals.			K	3					
4 Analyze the data transfer through serial and parallel ports. K4												
5 L	earn bas	sic ha <mark>rdware</mark>	of various microcontrollers.			K	2					
6 F	Foster ab	oility t <mark>o unde</mark>	rstand the role of embedded systems in industry			K	6					
K1 - ]	Rememl	ber; <b>K2</b> - Un	derstand; K3 - Apply; K4 - Analyze; K5 - Evaluate	e; K6 – (	Creat	e						
Unit:	1		Overview and Instruction Set		14	h-h	ours					
Microc of 8051	controlle 1 Family	ers and Emb <mark>e</mark> y – 8051 Inst	edded Processors – Microcontrollers for Embedded ruction Set and Registers.	Systems	s – O	verv	iew					
Unit:	2	Son	Assembly Programming and Addressing Modes		15	5—h	ours					
Introdu	ictionto	8051Assemb	lyProgramming-The Program Counter and ROM-	Data Ty	pes							
and Di	rectives	-Flag Bits a	nd PSW Register-Register Bank and Stack-Loop a	nd Jum	5							
Instruc	tions – I	I/O Port Prog	gramming – Addressing Modes.	-	-							
Unit:	3	A	rithmetic and Logical Operations In AIP and C		14	h	ours					
Arithm	etic In	structions a	nd Programs – Unsigned Addition and Subt	raction	and	Uns	signed					
Multip	lication	and Divisi	on – Logic Instructions and Programs – Single	e Bit Iı	nstru	ction	s and					
Program	mming.	Programmin	g with C: Data Types–Time Delay Programming–	I/O Prog	grami	ming						
– Logic	c Operat	tions Arithm	etic Operations		-	U						
Unit:	4	8	051 Interrupts and Peripherals		14	—h	ours					
Basic I	Register	s of Timer	– Programming 8051 Timer – Counter Programm	ning – E	Basic	s of	Serial					
Comm	unicatio	n-8051 Con	nnection to RS232-8051 Serial Communication	Program	nmin	ıg –	8051					
Interru	pts – Pr	ogramming l	External Hardware Interrupts									
Unit:	5	R	eal World Applications		15	5—h	ours					
Interfac	cingLCI	Dtothe8051-	InterfacingADC-InterfacingSensorsto8051-Interfa	cingStep	oper ]	Moto	)r –					
8051 In	nterfacir	ng to the Key	board – Interfacing DAC to the8051									
			Total Lecture hours	72	2ho	urs						
L		1										

ext Book(s)
Muhammad Ali Mazidi, Janice GillispieMazidi and Rolin D. McKinlay, "The 8051
Microcontroller And Embedded Systems Using Assembly And C", PHI, 2nd edition 2006.
Ayala J.K., The 8051 Microcontroller: Architecture, programming and applications,
Penram International (2005) 3rd ed.
eference Books
Mazidi, E. and Mazidi, F., The 8051 Microcontroller and Embedded Systems, Prentice-Hall of
India (2004) 2nd ed.
Peatman L Embedded system Design using PIC18Exxx Prentice Hall 2003
r eathan s., Embedded system Design asing r re for xxx, r rendee rian, 2003.
elated Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]
https://www.youtube.com/watch?v=84YUQu8tE4w
https://www.youtube.com/watch?v=GPz_mR7Flas
https://www.youtube.com/watch?v=uFhDGagZzjs
rse Designed By: M.Baskaran, Assistant Professor, KSG College of Arts and
Science&Dr.N Om Muruga, Assistant Professor, Government Arts
College . Ooty.

100	12		1 A 10		and the second second	the second				
Mappi	ng with P	rogramn	ne Outo	comes	-	GYR.	3.1	S.		
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	S	S	S	М	М	M	S	L	L S	S
CO2	S	S	S	М	М	М	S	L	) L	L
CO3	S	S	S	М	М	L	L	ુંંડ	S	М
CO4	М	М	Sew 2	S Besi	S	S.	5 LI	L	М	М
CO5	М	М	S	EDSICA	TE TO E	EVATE	М	М	S	S

Course code 63P	Microprocessor and Microcontroller Lab	L	Τ	P	С
Core Practical-VI				3	4
Pre-requisite	Requires the basic of Digital circuits and	Syllab	ous 2	022	-2023
	Programming languages	Versi	on		
Course Objectives:					
The main objectives of th	is course are to:				
1. To introduces the assem	bly language programming of Microprocessor and N	Aicrocor	ntrolle	r.	
2.It develops the student's of interfacing the periphe	Assembly language programming skills and gives p eral devices with the Microprocessor and Microcon	ractical t	rainir	ıg	
Expected Course Outcon	mes:				
On the successful compl	etion of the course, student will be able to:				
1 Learn assembly lange with interfacing the r	uage programming of Microprocessor and Microcon	ntroller		K	3
2 Program the micropre	ocessor for various applications.			K	6
3 Interface the 8085 mi	icroprocessor with various peripheral devices.			K	3
4 Analyze the data tran	sfer through serial and parallel ports.			K	4
5 Program the micrcon	troller for various applications.			K	.6
<b>K1</b> - Remember; <mark>K2</mark> - U	nderstand; K3 - Apply; K4 - Analyze <mark>; K5</mark> - Evaluat	<mark>e;</mark> K6 –	Creat	e	
<ul> <li>8085 MICRO</li> <li>1. Addition / Subtra</li> <li>2. Multiplication / J</li> <li>3. Block Data Tran</li> <li>4. Smallest / larges</li> <li>5. To arrange in aso</li> <li>6. Sum of N 8 bit N</li> <li>7. 1's and 2's Comp</li> <li>8. UP/DOWN Cour</li> <li>9. Traffic Light Co</li> <li>10.Data Transfer us</li> <li>11. Square wave ge</li> <li>12. ADC Interface</li> <li>13. DAC Interface</li> <li>14. Stepper Motor T</li> <li>8051 MICROO</li> <li>15. Arithmetic and</li> <li>16. Key Interface</li> <li>17. LED Interface</li> <li>18. Solid State Rela</li> <li>20.Square Wave Go</li> <li>21. ADC Interface</li> <li>22. DAC Interface</li> <li>23. Stepper Motor T</li> </ul>	Action of 8 / 16 bit Data Division 8 bit Data Sifer t of N Numbers cending / Descending Order Numbers pliment of an Array(8bit) nter using 7 Segment Displays ntrol Interface sing 8255(PPI) meratorusing8255 Unterface Logical Programs hyInterface eneration	Contraction of the second seco			

Course Designed By: M.Baskaran, Assistant Professor, KSG College of Arts and Science&Dr.N Om Muruga, Assistant Professor, Government Arts College, Ooty.

Mappi	ng with P	rogramn	ne Out	comes						
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	М	М	S	S	S	М	S	М	М	S
CO2	S	S	S	М	М	М	S	М	L	L
CO3	S	S	М	М	М	L	L	L	S	М
CO4	S	S	M	S	S	S	L	L	S	М
CO5	М	М	S	S	S	L	L	L	S	М



Cou	irse code	63Q	IN	DUSTRIAL	AND POWER	ł	L	Т	P	С
				ELECT	RONICS LAB					
Cor	re Practica	l-VII							3	4
Pr	e-requisite	e	Basic knowle	dge of Electr	onic Circuits or		Syllab	us 2	2022	-2023
			permission of	instructor			Versie	on		
Cou	Course Objectives:									
The	main obje	ctives of this	course are to	: · ·,	( COD					
1. 10	o make the	students to (	esign triggeri	ng circuits o	f SCR.					
2.10	) understan	d the charact	ensues of pov	ver electroni	c devices.					
Exp	ected Cou	Irse Outcom	es:							
Or	the succes	ssful complet	ion of the cou	irse, student	will be able to:					
1	Design tri	ggering circu	its of SCR	ക്രക്ഷ്യ	2611				K	2
2	2Understand the characteristics of power electronic devices.K3									
3	Acquire kr	nowledge abou	t fundamental	concepts and	techniques used i	<mark>n pow</mark> er el	ectronic	s.	K	2
4	Foster abil	ity to identify	basic requirem	ents for powe	r electronic based	l design ap	plicatior	1.	K	4
5	To develop	skills to buil	l, and troubles	noot power ele	ectronics circuits	2			K	5
K	l - Remem	ber; <mark>K2</mark> - Un	derstand; K3	- Apply; K4	- Analyze; K5 -	Evaluate	; K6 – (	Creat	e	
	(ANY	( 16 EXPER	MENTS)			101-				
	1. Trigg	ering of SCF	by R, C and	Diac.						
	2. Desig	gn of snubber	circuit.	1						
	3. Fan r	egula <mark>tor usin</mark>	g Triac.	See. 1	3 minut					
	4. Thyri	stor chopper	1.0.	0						
	5. TRIA	C Flasher.	2 LC	se	_//					
	6. Com	nutationTecl	niques.	A A A	may is		19			
	7. Speed	d control of I	C motor usin	g SCR.	1.82		<u>a</u>	- 7		
	8. Autor	matic street 1	ght controller	The second second			× /	/		
	9. Burg	lar Alarm				16				
	10. Sequ	uencer Circu	t.			Co				
	11.Pow	er Inverter	215:00		91					
	12.Swit	ching Regula	tors							
	13.Auto	matic Batter	Charger	தப்பால	J 2					
	14.Firea		EU	CATE TO E	LEVALE					
	15.ON /	OFF relay c	ontrol using o	pto – couple	r					
	10.Serve	o stabilizer								
	1. Layout and Art Work preparation for PCB									
	10. Example and Component mounting of FCB									
	19.10mg	trature com	more using A	D 390/ LIVI .	55.					
	20. COIIS	a Control Ci	mergency La	mp.						
	21. Filds 22 Cycl	o converter	cuit							
	22.Cycle 23 Thu	ristor protect	on circuit							
	23. Thy									
Cour	se Designe	ed By: M.Bas	karan, Assista	ant Professor	, KSG College	of Arts ar	nd			
		Scien	æðr.N Om	Muruga, As	ssistant Professo	r, Govern	ment A	rts		
		Colleg	ge ,Ooty.							

Mappi	ng with P	rogramn	ne Outo	comes						
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	М	М	S	S	S	М	S	М	М	S
CO2	S	S	S	М	М	М	S	М	L	L
CO3	S	S	М	М	М	L	L	L	S	М
CO4	S	S	М	S	S	S	L	L	S	М
CO5	М	М	S	S	S	L	L	L	S	М



Cou	ırse code	63R	Electronic Communication Lab	L	Т	Р	С
Cor	e Practica	l-VIII				3	4
Pr	e-requisite	9	Basic knowledge of Electronic Communication	Syllab Vansi	us 2	022-	-2023
Сог	ırse Ohiec	tives:		versi	n		
The	main objec	ctives of this	course are to:				
1. To	Understar	id the concept	ot of Digital Communication				
2. To	o experimen	nt the Modul	ation and Detection techniques				
3. To	study abo	ut wireless c	ommunication technologies.				
Exp	ected Cou	rse Outcom	les:				
Or	the succes	ssful comple	tion of the course, student will be able to:				
1	Understan technolog	d the concepies.	ot of Digital Communication and wireless communic	cation		K	2
2	Obtain ex	periment kno	owledge about the Modulation and Detection technic	ques		K	3
3	Familiarize	e Digital carri	er Modulation Schemes			K	4
4	Analyze th	e Model of <mark>C</mark>	ommunication system			K	4
5	Analyze th	e cellular syst	em design and technical challenges.			K	4
<b>K</b> 1	I - Rememl	ber; <mark>K2</mark> - Un	<mark>de</mark> rstand; <b>K3</b> - Apply; <b>K4</b> - Analyze <mark>; K5</mark> - <mark>Evaluate</mark>	<mark>; K6 – (</mark>	Create	)	
	<ol> <li>Pulse</li> <li>Pulse</li> <li>Pulse</li> <li>Gener</li> <li>Gener</li> <li>Gener</li> <li>Gener</li> <li>Frequ</li> <li>Frequ</li> <li>Phase</li> <li>QPSF</li> <li>OStudy</li> <li>Full</li> <li>Study</li> <li>Study</li> <li>Full</li> <li>Study</li> <li>Study</li> <li>Full</li> <li>Study</li> <li>Study</li></ol>	Amplitude I Width Mod ration and D ration of delt itude Shift K ency Shift K e Shift Keyin X y of TDM/Fl duplex com- ment of sate y of GPS Ha ly of GSM N DiodeChara r Diode cateristics r Optics TX al Sampling IN diode Osc ex Klystron C ation pattern ation pattern	Modulation (PAM) and Detection ulation (PWM) and Pulse Position Modulation (PPM etection of PCM a and Adaptive delta modulation Keying g g DM munication model ellite receiver ndset Iodule cteristics and Rx and Reconstruction eillator Characteristics using micro wave bench of HORN antenna. of Dipole & Yagi Uda antennas Loop & array antennas				

Course Designed By: M.Baskaran, Assistant Professor, KSG College of Arts and Science&Dr.N Om Muruga, Assistant Professor, Government Arts College ,Ooty.

Mappi	ng with P	rogramn	ne Out	comes						
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	М	М	S	S	S	М	S	М	М	S
CO2	S	S	S	М	М	М	S	М	L	L
CO3	S	S	М	М	М	L	L	L	S	М
CO4	S	S	М	S	S	S	L	L	S	М
CO5	М	М	S	S	S	L	L	L	S	М



Course code 6Z	ΈP	JAVA PROGRAMMING LAB	L	Т	Р	С				
Skill Based Subj	ect: IV	Practical.			3	3				
Pre-requisite       Basic computer skills and familiarity with       Syllabus       2022-20         Microsoft Windows. students are familiar with       programming       language such as C/C++ and data structures,       Syllabus       2022-20										
Course Objective	es:									
The main objectiv 1. The main objectiv on programming of 2.Gain knowledge programs.3.To impless handling.	ves of this ve of JAVA concepts a about bas lement and	Course are to: A Programming Lab is to provide the students a strong for nd its applications through hands-on training. Sic Java language syntax and semantics to write Java I gain knowledge in Arrays, functions, Structures, Pointe	oundation u ers and F	n ile						
Expected Course	e Outcom	les:								
On the successfu	il com <mark>ple</mark>	tion of the course, student will be able to:								
1 Understand the professional co	e basic cor oding.	ncepts of Java Programming with emphasis on ethics and	l principl	es of	K	1, K2				
2 Demonstrate the constructor, m	he creation nethods over	n of objects, classes and methods and the concepts of erloading, Arrays, branching and looping.			K	2				
3 Create data file programming	es and Des Implemen	sign a page using AWT controls and Mouse Events in Ja t the concepts of code reusability and debugging.	va		K	2, K3				
4 Develop applie	cations usi	ing Strings, Interfaces and Packages and applets	~		K	.3				
5 Construct Java	a programs	s using Multithreaded Programming and Exception Hand	ling	4	K	.3				
K1 - Remember:	; <b>K2</b> - Un	derstand; K3 - Apply; K4 - Analyze; K5 - Evaluate	; K6 – (	Creat	e					
	<ol> <li>Prog</li> <li>Define</li> <li>n wline</li> <li>xdati</li> <li>Write</li> <li>find</li> <li>prog</li> <li>Prog</li> <li>Prog</li> <li>Prog</li> <li>Prog</li> <li>Java</li> <li>moth</li> <li>and and</li> <li>moth</li> <li>Java</li> <li>qual</li> <li>Prog</li> </ol>	JAVA PROGRAMMING (ANY 12 PROGRA ram to print the following triangle of numbers 1 12 iningaclasswiththefollowingattributes 1.xname2.Data hich leg injection has to be given (sixty days from te on which polio drops is to be given (45 days from te a constructor to construct the baby object. The of out the leg and polio drops dates from the date of b gram define a baby and display its details rram to create and display a message on the window, gram to draw several shapes in the created window. The create an applet and draw gridlines. program to create a frame with two buttons can her. When we click the father button the name of the designation must appear. When we click mother s her appear. program to create a frame with four text fields for ification and a text field of multiple lines for address ram to draw circle, ellipse, square and rectangle at	AMS) 1231234 eofBirth date of n Date of construc irth. In t alled fat e father imilar d r name, s. the mou	3.Da birth of bir tor n he m he m	teo ) 4. th). nust nain and age s of and lick					

- 9. Java program to create four text fields for the name, street, city and pin code with suitable labels. Also add a button called my details, when you click the button your name, street, city and pin code must appear in the text fields.
- 10. Java program to demonstrate the multiple selection list boxes.
- 11. Program to create a canvas which displays a clock with hour hand and a minute hand depending upon an int variable minutes. Write another program with a frame, which displays the clock canvas. It must also have three buttons, tick, reset and close. When we click reset, the clock must reset to 12 hrs. When we click close, the frame closes.
- 12. Java program to create a menu bar and pull down menus.
- 13. Java program to create a window when we press M or m the window displays Good Morning, A or a the window displays Good Afternoon, E or e the window displays Good Evening, N or n the window displays Good Night.
- 14. Java program to move different shapes (Circle, Ellipse, Square, and Rectangle) according to the arrow key pressed.
- 15. Program to handle the divide by zero exception.
- 16. Program to explain the multithreading with the use of multiplication tables. Three threads must be defined and each one must create one multiplication table; they are 5 tables, 7 tables and 13 table.
- 17. Program to illustrate thread priority. Create three threads and assign three different priorities.

Course Designed By:

1. Dr. K. Venmathi, Assistant Professor, LRG Government College for Women, Tiruppur.

2. Mr. S. Venkatesan, Assistant Professor, KSG College of Arts and Science, Coimbatore.

Mappi	ng with P	rogramn	ne Out	comes						
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	М	М	S	S	S	М	S	М	М	S
CO2	S	S	S	М	М	М	S	М	L	L
CO3	S	S	М	М	М	L	L	L	S	М
CO4	S	S	M	S	S	S	L	L	S	М
CO5	М	М	S	S	S	L	L	Ĺ	S	М



Cours	e Code	5EA	ASIC DESIGN	L	Т	Р	C
Elective 1	[ - A		l	6			4
Pre-Requ	uites	Basic Elect	ronics	Syllal Versi	bus on	2022-	2023
Course (	Objective	es:					
The Mai	n Object	ives of this	course are to:				
	* 10 FP	prepare the GA designer	student to be an entry-level industrial star	idard A	ASIC	or	
	✤ To	understand	the issues and tools related to ASIC/FPG.	A desig	gn and	b	
	im	plementation	and basics of System on Chip and Platfo	rm bas	sed		
T	des	sign.					
Expected	i Course	Outcomes:	- AND				
On the Su	uccessful	completion	of the course, student will be able to:				
1	Know th	he concepts	of data transmission systems			K1	
2	analyze	the Model o	f Communication system			K6	
3	Familia	riz <mark>e Digit</mark> al o	carrier Modulation Schemes .			K4	
4	Underst	<mark>and pul</mark> se m	odulation and quantization techniques	6 1		K2	3
5	Analyze	the cellular	system design and technical challenges.			K4	1
K1:Ren	nember;	K2-Under	stand; <b>K3</b> -Apply; <b>K4</b> -Analyze; <b>K5</b> -Ev	v <mark>aluate</mark>	; •	<b>X6</b> -Cre	eate
Unit:1	4	E.	INTRODUCTION TO ASICS		N	18 h	ours
Types of Channel	f ASICS: led Gate	Ful <mark>l-Cu</mark> stor Array - Stru	n ASIC–Standard Cell-Based ASIC–Gate ctured Gate Array – Programmable Logic	Array Devic	Base ces – l	d ASI FPGA	C ,
Unit:2	10w - Ca	ase Study	CMOS LOGIC	Ser les	1	18 h	ours
CMOS	Transiste	ors Design	Rules Combinational Logic Cells	· Ducl	ning	Bubbl	00
DriveStr Data Pat	ength–Ti h Logic (	ransmission Cells: Data I	Gates-EX-ORCell,SequentialLogicCells: Path Elements	FF–Cl	ocked	I Invo	erter,
Unit:3			ASIC DESIGN			18 H	ours
Program Program Program Software	mable A mable A mable A e: Logic S	ASICS: Anti SIC Logic C ASIC I/O C Synthesis – I	fuse – Static RAM – EPROM and E Cells: Actel ACT - Xilinx LCA and Altera Cells: DC Output –DC Input, Program FPGA Synthesis.	EPRO FLEX nmable	OM T X Arc e AS	echnol hitectu IC De	logy- 1res - esign
Unit:4		VHDL				18h	ours
Introduc Objects	tion to V - Data Ty	HDL – Beha /pes - Design	avioral, Data Flow and Structural Model - n Examples	• Opera	ators	– Data	,
Unit:5		VERII	LOG			18 h	ours
Introduc Modelin	tion - La g – Mode	nguage Elen eling Examp	nents- Gate-Level modeling- Data Flow-	Behavi	ioral-	Struct	ural
	-	- 1	Total Lect	ture h	ours	90 h	ours

Text Bo	ok(s)
1	Michael John Sebastian Smith,—APPLICATION SPECIFIC INTEGRATED CIRCUITS'', Addition-Wesley, 2nd reprint,2000.
2	Bhasker. J, "VHDL PRIMER", BS Publications, 2001
3	Bhasker.J. <b>IA VERILOG HDL PRIMER</b> , BS Publications, 2001
	<b>Reference Books</b>
1	Charles. J. Roth,— <b>DIGITAL SYSTEM DESIGN USING VHDL</b> , PWS Publishing (Thomson learning), 2002.
2	Stephen Brown, Zvonko Vranesic,—FUNDAMENTS OF DIGITAL LOGIC WITHVHDL DESIGNI Ta <mark>ta McGraw-Hil</mark> l,2002
Related	Online Contents [MOOC, SWAYAM, NPEL, Website etc.]
1	https://nptel.ac.in/courses/106/105/106105161/VLSI Physical Design
Course I C. N Om	Designed By: R.Archana, Assistant professor, Nehru Arts and Science College.& Dr.N Om Muruga, Assistant Professor, Government Arts College, Ooty, aprakash Anand, Assistant Professor, Government Arts College, Ooty.

				1 Y		1	29			
Mappi	ng with P	rogramn	ne Outo	comes	1 1000	010				
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	S	S	М	M	М	M	S	М	M	S
CO2	S	М	М	М	М	М	S	L	L	L
CO3	S	S	S	М	М	L	L	ુન	М	М
CO4	М	М	<sup>®</sup> M <sub>Ø</sub>	் தேப	S	S.	5 PL	L	М	М
CO5	М	М	S	EDSCA	M	EVLTE	M	М	S	М
*	S-Strong;N	I-Mediu	n;L-Lo	W	15 10 E					

Cours	se Code	5EB	REMOTE SENSING	L	Т	P	С
Elective	I - B						4
				6			4
Pre-Requ	uites:	Basic Elec	etronics	Sylla Versi	bus on	2022-	2023
Course (	Objectives	:					
The Mai	n Obiectiv	ves of this o	course are to:				
	* To d	lesign fully	equipped with concepts, methodologies a	and			
	appl	ications of I	Remote Sensing Technology.				
	🛠 To I	Define and o	lescribe remote sensing and explain its ap	oplicat	ions,		
	histo	ory, electroi	nagnetic spectrum and interactions with v	variou	s type	S	
	ofme	edia. 🦯	の新毎日の				
Expected	l Course (	Dutcomes:					
On the Su	uccessful c	ompletion	of the course, student will be able to:				
1	Know the	e concepts o	of data transmission systems			K1	
2	analyze tl	h <mark>e Mode</mark> l o	f Communication system			K6	
3	Familiari	ze Dig <mark>ital c</mark>	arrier Modulation Schemes.			K4	
4	Understar	nd pulse mo	odulation and quantization techniques			K2	
5	Analyze t	the cellular	system design and technical challenges.	7		K4	
K1:Rem	nember;	K2-Unders	stand; K3-Apply; K4-Analyze; K5-Ev	aluate	; K	<b>K6</b> -Cre	eate
Unit:1	5	PRI	NCIPLES OF REMOTE SENSING		3	18 h	ours
Remote	Sensing S	System and	its Components - Electromagnetic Spe	ectrum	- De	efinitic	on of
Emissivi	ity - Reflec	ctance - Ab	sorbance and Transmittance - Spectral S	ignatu	re - A	tmosp	heric
Window	- Active	and Passiv	ve Remote Sensing Systems - Interaction	on of	Electi	romag	netic
Energy v	with Atmo	sphere and	Earth Features - Factors Affecting the Re	eflecta	nce	1	
Unit:2			PLATFORMS AND SENSORS			18 h	ours
Airborne	e and Spa	ice Platfor	ms - Advantages and Disadvantages of	of eac	h Pri	nciple	and
Function	ning of Car	mera - Film	is, Multi-Spectral, Thermal & Line Scan	ners, S	Side L	ooking	g Air
Borne H	Radars - 1	Hyperspect	ral Sensors - Different Satellite and	Sensor	r Con	nbinat	ions:
LANDS	AT – SPO	T - IRS Sei	ries of Satellites and Sensors.				
Unit:3	IMA	AGE CHA	RACTERISTICS AND INTERPRETA	TION	N	18 h	ours
Differen	cesbetwee	nAerialand	SpaceBorneImagery-ElementsofVisualIn	terpre	tation	of Im	ages
- Radio	metric Pro	ocessing In	cluding Correction of Instrumental A	tifacts	s - A	tmosp	heric
Correcti	ons; Geor	netric Cor	rections - Registration. Geometric Er	hance	ment	inclu	iding
Spatial I	filtering - I	Edge Detec	tion and Enhancement.			10 -	
Unit:4		D.	IGITAL IMAGE PROCESSING		~ .	18 h	ours
Image '	Transform	ations -	Subtraction – Rationing - NDVI an	nd PC	CA -	The	natic
Classific	ationandC	lusteringto	IncludeUnsupervisedandSupervisedClass	ificati	onBas	ed	on
Classific	in Distance	ncepts of H	ximum Likelinood Classification - Active Applysis	curacy	ASSE	essmei	10 11
Lassing	anon - CO	1100013 01 11	iyperspectral image milarysis				

Unit:5	ANCILLARY DATA SOURCES AND INTEGRATION 18 hours
GroundT GIS -Dig	ruth-GeographicandRadiometric-IntroductionofGIS-IntegrationofRemote Sensing and ital Terrain Models - GPS and its Role to Remote Sensing Data.
	Total Lecture hours 90 hours
Text Boo	<b>bk</b> (s)
1	Lillesand, T.M. and Kiefer, R.W., <b>REMOTE SENSING AND IMAGE</b> INTERPRETATION.
2	Curran, Paul J., PRINCIPLES OF REMOTE SENSING
3	Campbell, J.B., INTRODUCTION OF REMOTE SENSING
Reference	ce Books
1	Sabins, F.F., <b>REMOTE SENSING: PRINCIPLES AND INTERPRETATIONS</b>
2	Reddy, M. Anji, <b>REMOTE SENSING AND GEOGRAPHIC INFORMATION</b>
Related	Online Contents [MOOC, SWAYAM, NPEL, Website etc.]
1	https://www.coursera.org/lecture/gis-applications/remote-sensing-basics- wr6KdRemote sensing Basics
Course E C. N Om	besigned By: R.Archana, Assistant professor, Nehru Arts and Science College.& Dr.N Om Muruga, Assistant Professor, Government Arts College, Ooty, prakash Anand, Assistant Professor, Government Arts College, Ooty

Mappi	ng with P	rog <mark>ram</mark> n	ne Outo	comes	IL	2	5	1	2116	
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	S	S	М	М	М	M	S	M	M	S
CO2	S	М	M	мб S	M പ്രത		5 S	L	L	L
CO3	S	S	S	M	TE MO E	LEVEIE	L	L	М	М
CO4	М	М	М	S	S	S	L	L	L	L
CO5	М	L	S	S	М	Ĺ	L	L	S	М

Course Code     5EC     MOBILE COMPUTING     L     T     P					C			
Elective	I - C			6			4	
Pre-Req	uisite:	Basic Elec	etronics	Syllal	ous	2022-	2023	
Course	hianting	-		Versi	on			
Course ( The Mai	n Objectives	vos of this d	course are to.					
	To I	Learn the co	intext of wireless network systems such as	s2G/30	G/4G			
	mob	ile telephor	ny, Data networks, and other wireless net	works	and			
	infra	structure.	he interfects between mehile commuting d					
	and	programmi	ng those devices	evices				
Expected	l Course (	Dutcomes:						
On the St	uccessful c	completion	of the course, student will be able to:					
1	Mobile e	nvi <mark>ronm</mark> ent	s and communications systems.			K1		
2	Hardware devices and interacting with these devices.       K6							
3	Mobile operating systems available.							
4	Programming applications on a mobile system.							
5	Data a <mark>nd</mark>	knowledge	management			K4		
K1:Ren	nember <mark>;</mark>	K2-Unders	stand; <b>K3-</b> Apply; <b>K4-</b> Analyze; <b>K5-</b> Ev	r <mark>aluate</mark>	; I	K6-Cre	eate	
Unit:1		5 10	INTRODUCTION			18 Ho	ours	
Mobile a Wireless Access	and Wirele Transmis Control–SI	ess Devices ssions – M DMA–FDM	– Simplified Reference Model – Need for ultiplexing – Spread Spectrum and Cell IA–TDMA–CDMA-Comparison of Acce	or Mot ular S ss Me	oile C ysten chani	omput 1s–Me sms	ing – dium	
Unit:2	5	1. 19	WIRELESS NETWORKS			18 Ho	ours	
Wireless Network Services Manage	s LAN: I ks- IEEE - Referen ment- Add	nfrared Vs 802.11– H ce Model lressing Mo	Radio Transmission – Infrastructure HPERLAN – Bluetooth- Wireless AT – Functions – Radio Access Layer – bile Quality of Service- Access Point Co	Metwork M: W Hand Martol P	vorks Vorki dover Protoc	- Ad ng Gi - Loc ol	hoc roup- ation	
Unit:3		M	OBILE NETWORK LAYER			18 Ho	ours	
Mobile Advertis – Revers	IP: Goals – sement and se Tunnelin	- Assumptic l Discovery ng – Ipv6 –	ons and Requirement – Entities – IP Pack – Registration – Tunneling and Encapsul DHCP-Ad Hoc Networks	et Del lation	ivery- – Opt	Agen imizat	t ion	
Unit:4		M	DBILE TRANSPORT LAYER			18 ho	ours	
Traditio Recover TCP	nal TCP- y-Transmi	Indirect T ssion/Time	CP- Snooping TCP- Mobile TCP - out Freezing – Selective Retransmission	Fast I - Tran	Retrai sactio	nsmit/ on Orie	Fast ented	
Unit:5			WAP	_		18 ho	ours	
Archited Protocol	ture – Dat -Applicati	agram Prot on Environ	ocol- Transport Layer Security- Transact ment-Wireless Telephony Application	ion Pro	otoco	I- Sess	ion	
			Total Lecture hours			90 ho	ours	
					1			

Text Bo	ok(s)
1	J. Schiller, MOBILE COMMUNICATION, Addison Wesley, 2000.
2	William Stallings, <b>WIRELESS COMMUNICATION AND NETWORKS</b> , Pearson Education, 2003.
Referen	ce Books
1	William C.Y.Lee, Mobile Communication Design Fundamentals, John Wiley,

1	William C.Y.Lee, Mobile Communication Design Fundamentals, Jo
	1993.

2	Singhal, WAP-Wireless Application Protocol, Pearson Education, 2003.

# Related Online Contents [MOOC, SWAYAM, NPEL, Website etc.]

1 https://nptel.ac.in/courses/106/106/106106147/Mobile Computing

Course Designed By: R.Archana, Assistant professor, Nehru Arts and Science College.& Dr.N Om Muruga, Assistant Professor, Government Arts College, Ooty, C. N Omprakash Anand, Assistant Professor, Government Arts College, Ooty

								Sec. 1		
Mappi	ng with <mark>P</mark> i	rogramn	ne Outo	comes					_	_
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	S	S	М	М	М	М	S	М	М	S
CO2	S	L	М	L	М	М	S	L	L	L
CO3	S	L	S	L	М	L	L	L	a L	М
CO4	М	L	М	S	L	S	L	Los	М	L
CO5	М	M	S	S	М	L	L	Ъ°М	S	M

Cou	rse code	5ED	INDUSTRIAL AND POWER	L	Т	P	С
Cor	o/Floctivo	/Sunnartiva	ELECTIVE1 D	6	т		1
	e/Elective/	Supportive	Basic knowledge of Electronic Circuits or	0 Sylla	$\frac{1}{1}$	022	+ 2023
110	e-requisite	5	permission of instructor	Syna Vers	ion 2	UZZ	-2023
Соц	rse Ohiec	tives:	permission of instructor	VCI 5			
Cou	ise objec						
The	main obie	ctives of this	course are to:				
1. To	presents th	he principles	and applications of industrial and power electronics				
2. To	enable the	students to 1	learn and design industrial & power electronic circui	ts.			
Exp	ected Cou	rse Outcom	es:				
On	the succes	sful complet	ion of the course, student will be able to:				
1	Develope	ed the Circuit	designing skills power electronics. Understood the	concep	t	K	2
	industrial	electronics	system design.				
2	Acquire l	knowledge al	pout fundamental concepts and techniques used in po	ower		K	2
	electronic	es.					
3	Ability to	o analyze <mark> var</mark>	ious single phase and three phase power converter c	ircuits a	and	K	3
	understar	nd their appli	cations.				
4	Foster ab	ility to ident	ify basic requirements for power electronic based de	sign		K	[4
	application	on.					
5	To develo	op s <mark>kills to b</mark>	uild, and troubleshoot power electronics circuits.			K	5
6	Foster ab	ility <mark>to unde</mark> i	stand the use of power converters in commercial and	<mark>d</mark> indus	trial	K	6
	applicatio	ons. 📃 📃				1	
K1	- Rememl	per; K2 - Un	derstand; K3 - Apply; K4 - Analyze; K5 - Evaluate;	K6 – (	Create	;	
Un	it:1		Inroduction		5—h	our	S
Prine	ciples of S	ingle Phas <mark>e I</mark>	nverter, Converter, Cyclo Converter And DC Chopp	oer– UI	PS-H	VD	С
Stati	c Circuit E	Breaker – Bat	<mark>tery Charging Circuit – SCR Current Limitin</mark> g Circu	iit Brea	ker –		
Stati	cACandD	CSwitches-F	FlasherCircuits-TimeDelayCircuits-FanRegulatorusi	ngTRL	AC		
Thyr	ristor Prote	ection Circuit	s: Over Current Protection – Over Voltage Protection	n – Ga	te Pro	otect	ion
Un	it:2		Welding and Heating	1	.4—h	our	S
Resi	stance We	lding – Type	s of Resistance Welding – Electronic Control in Res	istance	Weld	ling	•
Ignit	ron Contra	actor – Heat	Control – Non-Synchronous Timer	т 1	<i>.</i>		<i>.</i> .
Sync	chronous v	veld I imer –	Sequence Timer – Energy Storage Welding Systems	s – Indi	iction	Hea	ating
- Ap	plications	of induction	Heating – Dielectric Heating –Application of Dielec			,	
Un	<u>it:3</u>		vaves and Measurement		<u>4—h</u>	$\frac{\mathbf{ours}}{1}$	5
Gene	eration of	Ultrasonic W	aves – Applications of Ultrasonic – Production of X	Rays -	– App Magar	licat	tions
	vel Measu	rements – Fl	ow Measurements – Measurement of Thickness		vieasi	леп	lents
Un	it:4	A A	nnlication in Industrial Systems	1	4h	<u>-</u> 01117	5
Ther	mistor Co	ntrol Of Que	nch Oil Temperature – Proportional Mode Pressure	Contro	Svst	em -	
Strip	Tension (	Controller – A	Automatic Weighing System – Control Of Relative F	Humidi	tv In	A	
Text	ile Moiste	ning Process	– Warehouse Humidity Controller		J /		
		<u> </u>	•				
Un	it:5	II	ndustrial Robotic Systems	1	5—h	our	S
Parts	s of Roboti	ic Systems –	Classifications of Robotic Systems - Robotic System	n Conf	ïgura	tion	S
Degi	rees of Fre	edom of Rob	ootic System – Programming Robotic Systems – Mo	tions of	f Rob	otic	

Systems– Sensor for Robotic Systems – Mechanical Parts – Control Systems. Microprocessor Based Industrial Applications: Speed Control of DC Motor–Measurement of Physical Quantities Water Level Indicator – Firing Angle Control of Thyristor

### Total Lecture hours 72—hours

### Text Book(s) 1 Harish C Rai, —Industrial and Power Electronics 10th edition, Umesh publications 2002

# 2 Timothy J Maloni,—Industrial Solid State Electronic Devices and Circuits, 2<sup>nd</sup> edition 1986

# **Reference Books**

1 P S Bimbhra, "Power Electronics", Khanna Publishers.

2 M.H. Rashid, "Power Electronics Circuits, Devices& Applications, Pearson Education.

# Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1 <u>https://www.youtube.com/watch?v=1Auay7ja2oY</u>

2 https://www.youtube.com/watch?v=oqnLQVFaqYI

3 https://www.youtube.com/watch?v=naxnRkOfh2Q

Course Designed By: M.Baskaran, Assistant Professor, KSG College of Arts and Science& Dr.N Om Muruga, Assistant Professor, Government Arts College, Ooty, C. N Omprakash Anand, Assistant Professor, Government Arts College, Ooty

	A									
Mappi	ng with P	rogramn	ne Out	comes	·/···	3-2-1				
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1	S	S	S	М	М	М	S	L	L	S
CO2	S	N S	S	М	М	М	S	Con Lo	L	L
CO3	S	S	S	М	М	L	58L	S	S	М
CO4	М	М	М	DESLI DUCAT	JITSOJ TE TO EL	2-S-III	L	L	М	М
CO5	М	М	S	S	S	L	М	М	S	S

Cou	Course Code5EEROBOTICS AND AUTOMATIONLTPC						
Elective	II-E			6	Т		4
Pre-Rec	quisite:		Basic Electronics	Sylla	abus	2023	5-
	-			Vers	ion	2024	
Course	Objectives	:					
The Ma	in Objecti	ves of this	course are to:				
	♦ Tol	earn the co	oncepts of Robots.				
	♦ Tok	know about	t the sensors, actuators used in Robots de	signin	g.		
<b>F</b>	To t	amiliarize	the students with the applications of Rob	ots.			
Expecte	ea Course	Jutcomes:					
On the S	Successful c	completion	of the course, student will be able to:				
1	Study the	e fundamer	tals of robots ad components			K	l
2	2 Illustrate sensors and vision systems.						
3	Apply pr	ogramming	g techniques in Automation.			Ke	5
4 Familiarize programmable Logic Controllers.						K2	2
5	Analyze	Computer	Numerical Control			K∠	1
K1:Re	member;	K2-Under	stand; <b>K3</b> -Apply; <b>K</b> 4-Analyze; <b>K5</b> -E	valuat	e; l	K6-Cr	eate
Unit		CL	ASSIFICATION OF ROBOTIC			10	
UIII     CLASSIFICATION OF KOBUTIC       •1     SVSTEMS							
:1		01	SYSTEMS			Но	urs
:1 Basic S	Structure of	f a Robot	SYSTEMS - Classification of Robots: Cartesian, C	Cylindr	ical, S	Hou Boheri	urs cal,
:1 Basic S Articul	Structure of ated Acc	f a Robot curacy, Res	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots -	ylindr Robot	ical, S Appli	Hou Spheri icatior	urs cal, n in
:1 Basic S Articul Manufa	Structure of ated Acc acturing: N	f a Robot suracy, Res faterial Transformed to the second s	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - cansfers - Machine Loading and Unle d Inspection Drives and Control Systems	Cylindr Robot pading	ical, S Appli 5 – P	Hou Spheri icatior rocess	urs cal, i in sing and
:1 Basic S Articul Manufa Operati Pneuma	Structure of ated Acc acturing: M ons – Ass atic System	f a Robot puracy, Res faterial Tr sembly and s: Cylinder	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - ransfers - Machine Loading and Unled Inspection. Drives and Control Systems, Control Valves, Hydro Moto -Robot F	Cylindr Robot Dading tems: End Ef	ical, S Appli 5 – P Hydra fectors	Hou Spheri icatior rocess aulic	urs cal, n in sing and
:1 Basic S Articula Manufa Operati Pneuma Unit	Structure of ated Acc acturing: M ons – Ass atic System	f a Robot curacy, Res faterial Tr sembly and s: Cylinder SE	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - ransfers - Machine Loading and Unle d Inspection. Drives and Control Sys rs, Control Valves, Hydro Moto -Robot H NSORS AND VISION SYSTEMS	Cylindr Robot oading tems: End Ef	ical, S Appli 5 – P Hydra fectors	Hou Spheri icatior rocess aulic s. 10	urs cal, n in sing and
:1 Basic S Articul Manufa Operati Pneuma Unit :2	Structure of ated Acc acturing: M ons – Ass atic System	f a Robot suracy, Res faterial Tr sembly and s: Cylinder SE	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - ransfers - Machine Loading and Unled Inspection. Drives and Control Systems rs, Control Valves, Hydro Moto -Robot H NSORS AND VISION SYSTEMS	Cylindr Robot Dading tems: End Ef	ical, S Appli 5 – P Hydra fectors	Hou Spheri icatior rocess aulic s. 10 Hou	urs cal, i in sing and urs
:1 Basic S Articula Manufa Operati Pneuma Unit :2 Types o	Structure of ated Acc acturing: N ons – Ass atic System	f a Robot puracy, Res faterial Tr sembly and s: Cylinder SE Tactile Ser	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - ransfers - Machine Loading and Unled Inspection. Drives and Control Systems rs, Control Valves, Hydro Moto -Robot E NSORS AND VISION SYSTEMS msors- Proximity Sensors- Speed Sensors	Cylindr Robot Dading tems: End Ef – Encc	ical, S Appli G – P Hydra fectors	Hou Spheri icatior rocess aulic s. 10 Hou Resolv	urs cal, i in sing and urs ers.
:1 Basic S Articula Manufa Operati Pneuma Unit :2 Types o Vision	Structure of ated Acc acturing: M ons – Ass atic System of Sensors: Systems: Ir	f a Robot curacy, Res faterial Tr sembly and s: Cylinder SE Tactile Ser nage Proce	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - ransfers - Machine Loading and Unled Inspection. Drives and Control Systems, Control Valves, Hydro Moto -Robot H NSORS AND VISION SYSTEMS msors- Proximity Sensors- Speed Sensors essing and Analysis – Segmentation - Fea	Cylindr Robot oading tems: End Ef – Enco ture E	ical, S Appli G – P Hydra fectors	Hou Spheri acatior rocess aulic s. 10 Hou Resolv	urs cal, n in sing and urs ers.
:1 Basic S Articul Manufa Operati Pneuma Unit :2 Types o Vision Object	Structure of ated Acc acturing: N ons – Ass atic System of Sensors: Systems: Ir Recognition	f a Robot curacy, Res faterial Tr sembly and s: Cylinder SE Tactile Ser nage Proce n.	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - ransfers - Machine Loading and Unled Inspection. Drives and Control Systems rs, Control Valves, Hydro Moto -Robot H NSORS AND VISION SYSTEMS msors- Proximity Sensors- Speed Sensors essing and Analysis – Segmentation - Fea	Cylindr Robot Dading tems: End Ef – Enco ture E	ical, S Appli Hydra fectors	Hou Spheri icatior rocess aulic s. 10 Hou Resolv ion -	urs cal, i in sing and urs ers.
:1 Basic S Articula Manufa Operati Pneuma Unit :2 Types o Vision Object Unit	Structure of ated Acc acturing: M ons – Ass atic System of Sensors: Systems: Ir Recognition	f a Robot curacy, Res faterial Tr sembly and s: Cylinder SE Tactile Ser nage Proce n.	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - cansfers - Machine Loading and Unled Inspection. Drives and Control Systems rs, Control Valves, Hydro Moto -Robot H NSORS AND VISION SYSTEMS msors- Proximity Sensors- Speed Sensors essing and Analysis – Segmentation - Feat ROBOT PROGRAMMING &	Cylindr Robot oading tems: End Ef – Enco tture E	ical, S Appli Hydra fectors	Hou Spheri acatior rocess aulic a s. 10 Hou Resolv ion -	urs cal, i in sing and urs ers.
:1 Basic S Articula Manufa Operati Pneuma Unit :2 Types o Vision Object Unit :3	Structure of ated Acc acturing: M ons – Ass atic System of Sensors: Systems: Ir Recognition	f a Robot puracy, Res faterial Tr sembly and s: Cylinder SE Tactile Ser nage Proce n.	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - ransfers - Machine Loading and Unled Inspection. Drives and Control Sys rs, Control Valves, Hydro Moto -Robot H NSORS AND VISION SYSTEMS nsors- Proximity Sensors- Speed Sensors essing and Analysis – Segmentation - Fea ROBOT PROGRAMMING & AUTOMATION	Cylindr Robot oading tems: End Ef – Enco ture E	ical, S Appli G – P Hydra fectors	Hou Spheri icatior rocess aulic s. 10 Hou Resolv ion -	urs cal, n in sing and urs ers.
:1 Basic S Articul Manufa Operati Pneuma Unit :2 Types o Vision Object Unit :3 Lead th	Structure of ated Acc acturing: M ons – Ass atic System of Sensors: Systems: Ir Recognition arough Prog	f a Robot suracy, Res faterial Tr sembly and s: Cylinder SE Tactile Ser nage Proce n. gramming -	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - ransfers - Machine Loading and Unled Inspection. Drives and Control Systems, Control Valves, Hydro Moto -Robot H INSORS AND VISION SYSTEMS - Insors- Proximity Sensors- Speed Sensors essing and Analysis – Segmentation - Feat ROBOT PROGRAMMING & AUTOMATION - Textual Programming -Programming E	Cylindr Robot Dading tems: End Ef – Enco ture E	ical, S Appli G – P Hydra fectors oder, F xtracti	Hou Spheri icatior rocess aulic a s. 10 Hou Resolv ion - 10 Hou ocial	urs cal, in in sing and urs ers. urs and
:1 Basic S Articula Manufa Operati Pneuma Unit :2 Types o Vision Object Unit :3 Lead th Econor	Structure of ated Acc acturing: M ons – Ass atic System of Sensors: Systems: Ir Recognition arough Prog nic Aspects	f a Robot suracy, Res faterial Tr sembly and s: Cylinder SE Tactile Ser nage Proce n. gramming - s of Robots tomation	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - cansfers - Machine Loading and Unled Inspection. Drives and Control Systems, Control Valves, Hydro Moto - Robot H NSORS AND VISION SYSTEMS - NSORS AND VISION SYSTEMS - Segmentation - Fea ROBOT PROGRAMMING & AUTOMATION - Textual Programming -Programming E s - Typical Layouts of Robots in Industr Puilding Placks of Automation Autom	Cylindr Robot oading tems: End Ef - Encc ture E xampl ies. Al	ical, S Appli g – P Hydra fectors oder, F xtracti es – S UTOM	Hor Spheri icatior rocess aulic s. 10 Hor Resolv ion - 10 Hor ocial ATIC	urs cal, n in sing and urs ers. urs and DN:
:1 Basic S Articul Manufa Operati Pneuma Unit :2 Types o Vision Object Unit :3 Lead th Econor Advant	Structure of ated Acc acturing: M ons – Ass atic System of Sensors: Systems: Ir Recognition arough Prog nic Aspects ages of Au	f a Robot suracy, Res faterial Tr sembly and s: Cylinder SE Tactile Ser nage Proce n. gramming - s of Robots tomation -	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - ransfers - Machine Loading and Unled Inspection. Drives and Control Systems, Control Valves, Hydro Moto -Robot F INSORS AND VISION SYSTEMS - Insors- Proximity Sensors- Speed Sensors essing and Analysis – Segmentation - Feat ROBOT PROGRAMMING & AUTOMATION - Textual Programming -Programming Essing and Layouts of Robots in Industr - Building Blocks of Automation. Automatic Instruction	Cylindr Robot Dading tems: End Ef - Enco ture E xampl ies. Al natic F	ical, S Appli Hydra fectors oder, F xtracti es – S UTON Feedin	Hou Spheri ication rocess aulic a s. 10 Hou Resolv ion - 10 Hou ocial a dATIC g Line	urs cal, in in sing and urs ers. urs and DN: es -
:1 Basic S Articula Manufa Operati Pneuma Unit :2 Types o Vision Object Unit :3 Lead th Econor Advant Materia Automa	Structure of ated Acc acturing: M ions – Ass atic System of Sensors: Systems: Ir Recognition rough Prog nic Aspects ages of Au al-Handling ation. Introd	f a Robot suracy, Res faterial Tr sembly and s: Cylinder SE Tactile Ser nage Proce n. gramming - s of Robots tomation - Devices - duction to 2	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - ransfers - Machine Loading and Unled Inspection. Drives and Control Systems, Control Valves, Hydro Moto -Robot H NSORS AND VISION SYSTEMS - NSORS AND VISION SYSTEMS - NSORS AND VISION SYSTEMS - Segmentation - Feat ROBOT PROGRAMMING & AUTOMATION - Textual Programming -Programming E s - Typical Layouts of Robots in Industr - Building Blocks of Automation. Autor ASRS - Transfer Lines - Automatic Insp Artificial Intelligence	Cylindr Robot oading tems: End Ef - Enco ture E - Enco ture E - Enco ture E - Enco	ical, S Appli g – P Hydra fectors oder, F oder, F xtracti es – S UTON Feedin a -Intel	Hor Spheri ication rocess aulic s. 10 Hor Resolv ion - 10 Hor ocial a Lind ligent	urs cal, in in sing and urs ers. urs and DN: es -
:1 Basic S Articula Manufa Operati Pneuma Unit :2 Types o Vision Object Unit :3 Lead th Econor Advant Materia Automa	Structure of ated Acc acturing: M ons – Ass atic System of Sensors: Systems: Ir Recognition arough Prog nic Aspects ages of Au al-Handling ation. Introd	f a Robot suracy, Res faterial Tr sembly and s: Cylinder SE Tactile Ser nage Proce n. gramming - s of Robots tomation - Devices - duction to A	SYSTEMS - Classification of Robots: Cartesian, C solution and Repeatability of Robots - ransfers - Machine Loading and Unled Inspection. Drives and Control Systems, Control Valves, Hydro Moto -Robot H NSORS AND VISION SYSTEMS - NSORS AND VISION SYSTEMS - NSORS AND VISION SYSTEMS - Segmentation - Feat ROBOT PROGRAMMING & AUTOMATION - Textual Programming -Programming E s - Typical Layouts of Robots in Industr - Building Blocks of Automation. Autor ASRS - Transfer Lines - Automatic Insp Artificial Intelligence	Cylindr Robot oading tems: End Eff – Enco ture E xampl ies. Al natic H pection <b>PLC</b> )	ical, S Appli G – P Hydra fectors oder, F oder, F xtracti es – S UTOM Feedin i -Intel	Hor Spheri icatior rocess aulic s. 10 Hor cocial fATIC g Lind lligent	urs cal, in in sing and urs ers. urs and DN: es -

Basics of PLC - Architecture of PLC – Advantages - Types of PLC - Types of Programming- Simple Process Control Program's Using Relay Ladder Logic. Introduction to PLC Networking -Introduction to HMI - DCs and SCADA Systems

Unit	COMPUTER NUMERICAL CONTROL	9					
:5	(CNC)	Hours					
Block I	Diagram of a CNC Control System-Advantages-Power Supply-CPU-CNC	and PLC					
Interfacing - Control Loops - Feedback Devices in CNC Machine - Analog and Digital							
CNC S	ystems - Introduction to FMS						

Total Lecture hours	48 Hours

## Text Book(s)

	MikellP. Groover, —AUTOMATION PRODUCTION
1	SYSTEMS AND COMPUTER
	IN <mark>TEGRATED</mark> MANUFACTURINGI,
	Prentice-Hall India, New Delhi, 1987./ Pearson Education, New Delhi
	K.S. Fu, R.C. Gonzalez and C S G Lee, "ROBOTICS: CONTROL,
2	SENSING, VISION AND INTELLIGENCE", McGraw Hill, New Delhi,
	1987

### **Reference Books**

1	l	W. Bolton, —MECHATRONICSI, Pearson Education Asia, 2002.	
2	2	Mikell P. Groover, "INDUSTRIAL ROBOTICS – TECHNOLOGY,	
		PROGRAMMING AND APPLICATIONS", McGraw Hill, New Delhi,	
		1986	
Rel	ated	Online Contents [MOOC, SWAYAM, NPEL, Website etc.]	$\Lambda$ /

1 HTTPS://NPTEL.AC.IN/COURSES/112/101/112101098/ROBOTICS

த் இந்தப்பாரை உ EDUCATE TO ELEV

Course Designed By: R.Archana, Assistant professor, Nehru Arts and Science College &Dr.N Om Muruga, Assistant Professor, Government Arts College,Ooty

, C. N Omprakash Anand , Assistant Professor, Government Arts College ,Ooty.

COs	PO	PO2	PO3	PO4	PO	PO6	PO	PO8	PO9	P1
	1				5		7			0
CO1	S	S	L	М	L	М	S	L	М	S
CO2	S	L	М	М	L	М	S	L	L	L
CO3	L	S	S	L	М	L	L	L	М	М
CO4	М	L	М	S	S	S	L	L	М	М
CO5	М	М	S	S	М	L	М	М	S	М

Cou	irse code	5EF	PROGRAMMABLE LOGIC CONTROL	L	Т	P	С						
Elec	ctive –II –	F		6	Т		4						
Pr	e-requisit	е	Digital Electronics and computer Architecture and	Sylla	bus 2	2022	-						
Organization         Version         2023           Course Objectives:													
Course Objectives:													
1. To provide knowledge levels needed for PLC programming and operating input and output													
modules.													
2. To train the students to create ladder diagrams from process control description													
and understand various types of PLC registers													
3.	Apply PLO	C Timers ar	d Counters for the control of industrial processes, PLC	C funct	ions								
a	ndData Ha	andling Fun	ctions.										
<b>F</b>	a stad C												
Exp	the succe	irse Outcol	mes:										
	Cein 1	ssiui compl	Programmable Logic Controlling to 111 11 11 11			т	1						
1	Gain kno	types of D	Programmable Logic Controllers and will understand			K							
		types of D	evices to which i be input and output modules										
2	Gain kno	owledge about the secret of th	out various types of PLC registers, ladder diagrams fro	om proc	cess	K	12						
3	Develop	a coil and	contact control system and analog PLC operations			K	4						
4	Apply ti	me delay or	n PLC operations	21		K	3						
<b>K</b> 1	l - Remem	ber; <b>K2</b> - U	nderstand; K3 - Apply; K4 - Analyze; K5 - Evaluate;	<mark>K6 –</mark> (	Create								
				6									
Un	nit:1		INTRODUCTION TO PLC		<b>1</b> 0	hou	rs						
Prog	grammable	e Logic – In	troduction - Programmable Logic Structures - Program	nmable	Logi	ic A	rrays						
(PL)	AS), Prog	grammable	Array Logic (Pals), Programmable Gate Arr	ays (F	GAS	), ]  o I	Field						
Dev	ices (PLD	s) -Design	of Sequential Networks Using ROMs and Flash -Tra	offic Li	oht C	le L	oller						
Usir	ngPAL	s) Design	of bequential foctworks Using Rows and Flash The		gin C	onu							
	8		a min /	2.6		~							
Un	nit:2	HARDWA	ARE AND SOFTWARE COMPONENTS		10	1011	s						
Prog	grammable	Logic Co	ntrollers (PLCS) - Introduction Parts Of PLC - Prince	ciples o	of Op	erat	ion -						
PLC	Sizes - P	LC Hardwa	re Components - I/O Section - Analog I/O Section -	Analog	I/O 1	Mod	ules,						
Digi	ital I/O M	odules CPU	J - Processor Memory Module - Programming Dev	ices - I	Diagn	osti	cs of						
PLC	S with Co	mputers	Combatore	0									
	-	1	Some set		4.01								
Un	nit:3	·	INSTRUCTIONS AND RELAYS			nou	:S						
PLC	Program	ning -Simp	le Instructions - Programming EXAMINE ON And E.		NE OI	TF							
- Me	echanically	v Operated	and Proximity Switches - Output Control Devices - L	eu Swi atching	Relay	<i>is</i> _ ]	PI (C						
Lad	der Diagra	.m - Conver	ting Simple Relay Ladder Diagram into PLC Relay La	adder E	Diagra	.m							
	n												
Un	nit:4		COUNTER AND TIMER		9h	ours	;						
Tim	er Instruct	ions ON D	ELAY Timer And OFF DELAY Timer - Counter Instr	ructions	- Up	/Do	wn						
Cou	inters -Tim	er and Cou	nter Applications - Program Control Instructions - Da	ta Mani	ipulat	ing							
Inst	ructions -	vlath Instru	ctions										

Unit:5	APPLICATIONS	9hours							
Applications of PLC - Simple Materials Handling Applications - Automatic Control of									
Warehouse Door - Automatic Lubricating Oil Supplier Conveyor Belt - Motor Control									
Automatic Ca	r Washing Machine - Bottle Label Detection - Process Control A	Application							
	Total Lecture hours	48hours							
Text Book(s									
1 Charles H	. Roth, Jr — Fundamentals of Logic Design ", Fourth Edition, J	aico Publishing house,							
1999,		-							
2 Frank D. I	Petruzella'' Programmable Logic Controllers '', McGraw- Hill	book, company, 1989							
3 Siemens	–PLC Handbook ''.								
Reference B	Books								
1 1. Willian Ltd., New	m I. Fletcher — An Engineering Approach to Digital Design " v Delhi, 1999.	, Prentice, Hall of India							
Related On	ine Contents [MOOC, SWAYAM, NPTEL, Websites etc.]								
1 <u>https://uni</u>	tronicsplc.com/what-is-plc-programmable-logic-controller/								
Course Design	ed By: K.Manikantan, Assistant Professor, Government Arts Co Dr N Om Muruga Assistant Professor Government Art	ollege ,Ooty& s College Ooty C N							
Omprakash An	and Assistant Professor, Government Arts College, Ooty	s conege ,ooty, c. It							
Omprukusii / M	and , Assistant Professor, Government Arts conege, ooty								
	2 2 2	IS I							

Mapping with Programme Outcomes											
COs	<b>PO1</b>	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	PO10	
CO1	S	S 🔗	М	M	М	М	S	М	M	S	
CO2	S	М	M <sup>ey</sup> C	М	М	М	S	L	L	L	
CO3	S	S	S	MSU	Micol	Le_u	L	L	М	М	
CO4	М	М	M	SOUCA	S TO E	SVALE	L	L	М	М	
CO5	М	М	S	S	М	L	М	М	S	М	

Course code	5EG	AUTOMOTIVE ELECTRONICS	L	Τ	P	C						
Elective-II –G	j F		6	Т	-	4						
Pre-requisite	e		Syllał	ous	202	2-						
			Versi	on	202	3						
Course Objec	tives:											
1 ne main objectives of this course are to: 1 To understand the concepts of Automotive Electronics and its evolution and												
Trendsautomotive systems & sub systems overview.												
2. To understand sensors and sensor monitoring mechanisms aligned to automotive												
Systems, diff	Systems, different signal conditioning techniques, interfacing techniques and											
actuator			<b>r</b> 1 1									
3. To underst	and, design	and model various automotive control systems using N	/lodel									
	pinent teeni	iique.										
Expected Cou	irse Outcor	nes:										
On the succes	ssful co <mark>mpl</mark>	etion of the course, student will be able to:										
1 Obtain	an overvi	ew of automotive components and subsystems.				K2						
2 Interface	automotive	sensors and actuators with microcontrollers			-	K3						
3 Understar	nd t <mark>he desig</mark>	n cycles, communication protocols and safety systems	emplo	yed		K2						
in today's	au <mark>tom</mark> otive	e industry.			1	/						
4 Understar	nd the engin	e management systems			4	K4						
5 Understar	nd th <mark>e braking</mark>	ng and traction systems				K2						
K1 - Remem	ber; <b>K2 - U</b>	nderstand; K3 - Apply; K4 - Analyze; K5 - Evaluate;	K6 – C	reat	e							
The 24.1												
	Component	Operation Electrical Wiring Terminals and Switchi	ng M	91 ultir		rs ad						
Wiring System	ns. Circuit I	Diagrams and Symbols, Charging Systems and Startin	ng, m 19 Svst	tems		Ju						
Charging System	ems Princip	les, Alternations and Charging Circuits, New Develop	ments,	.01110	•							
Requirements	of the Starti	ing System, Basic Starting Circuit										
		SUG AN										
Unit:2		IGNITION SYSTEMS	1	$\frac{1}{1}$	<u>Oho</u>	urs						
Ignition Funda	imental, Ele	Spark Plugs, Electronic Fuel Control: Basics of Combu	bution	Les:	s ina							
Fuelling and F	Exhaust Emi	ssions. Electronic Control of Carburetion Petrol Fuel I	niectio	on. D	nie Diese	1						
Fuel Injection		,	j	,		-						
Unit:3		INSTRUMENTATION SYSTEMS		1(	)hou	irs						
Introduction to	) Instrument	tation Systems, Various Sensors Used for Different Pa	ramete	rs, S	Sens	ing						
of Visual Disp	lentation Sy	ystems, venicle Condition Monitoring Trip Computer	, Diffe	rent	. I y]	pes						
or visual Disp	lay											
Unit:4 ELECTRONIC CONTROL OF BRAKING AND 9 ho												
		TRACTION										
Introduction and	nd Descript	ion Control Elements and Control Methodology, Elect	ronic C	Contr	rol c	f						
Automatic Tra	insmission:	Introduction and Description Control of Gear Shift and	1 Torq	ue								
Converter Loc	kup, Electri	ic Power Steering, Electronic Clutch										

Combined Ignition and Fuel Management Systems, Exhaust Emission Control, Digital Control										
Techniques, Complete Vehicle Control Systems, Artificial Intelligence and Engine Management,										
Automotive Microprocessor Uses. Lighting and Security Systems: Vehicles Lighting Circuit										
Signaling Circuit, Central Locking and Electric Windows Security Systems, Airbags and Se										
Belt Tensioners, Miscellaneous Safety and Comfort Systems										
Total Lecture hours     48hou										
Text Book(s)										
1 TOM DENTON, Automobile Electrical and Electronic Systems, Edward Arnold pb., 199										
Reference Books										
1 1.DON KNOWLES, Automotive Electronic and Computer controlled Ignition System										
Don										
Knowles, Prentice Hall, Englewood Cliffs, New Jersey 1988.										
2 WILLIAM, T.M., Automotive Mechanics, McGraw Hill Book Co.,										
3 WILLIAM, T.M., Automotive Electronic Systems, Heiemann Ltd., London, 1978.										
4 Ronald K Jurg <mark>en, Automotive Electronics Handbook</mark> , McGraw Hill, Inc, 1999.										
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]										
1 https://nptel.ac.in/courses/107/103/107103084/										
2 https://nptel.ac.in/courses/107/106/107106088/										
3 <u>https://www.youtube.com/watch?v=vJ4EfyGXehg</u>										
4 https://www.youtube.com/watch?v=BG4N2dBgJrQ										
Course Designed By: K.Manikantan, Assistant Professor, Government Arts College										
,Ooty&Dr.N Om Muruga, Assistant Professor, Government Arts										
College,Ooty.										
State Combenne										

			59 6				6.000	1				
Mapping with Programme Outcomes												
COs	<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	<b>PO9</b>	PO10		
CO1	S	S	L	L	EIUH	М	S	М	М	S		
CO3	S	L	М	L	М	М	S	L	L	L		
CO3	L	S	L	М	М	L	L	L	М	М		
CO4	М	L	М	S	S	S	L	L	М	М		
CO5	М	М	S	S	М	L	М	М	S	М		

Course Code	5EH	SATELLITE COMMUNICATIONS	L	Т	Р	С					
Core/Elective/St	upportive:	ELECTIVE-II-H	6	Т		4					
	•	PRINCIPLES OF	Svl	200							
Pre-requi	COMMUNICATION version										
Course Objectives:											
The objectives of	this course ar	re:									
To provide knowledge on fundamentals of Advanced Computer design.											
<ul> <li>To understand the concept of instruction level parallelism, pipelining and memory</li> </ul>											
hierarchy associated with it.											
<ul> <li>To enhance the knowledge on advanced processors.</li> </ul>											
Empoted Course	Outcomer	AND BELLAND									
On successful con	outcomes:	a course student will be able to:									
1 Gain the kno	wledge on a	twanced computer design principles				<b>K</b> 1					
2 Able to analy	vze the parall	el computer model with instruction le	vel nara	allelist	n	K1 K4					
3 Gain the kno	wledge on pi	ipelining		incusi		K7					
4 Understand t	the memory h	hierarchy in developing an advanced c	ompute	r		K2					
5 Apply the m	ultiprocessor	concepts in advanced processors.	ompare			K3					
K1 – Remember;	K2 – Under	rstand; K3 – Apply; K4 – Analyze; 1	K5 – Ev	valuat	e: K6 -	- Create					
Unit: 1	SAT	<b>TELLITE SYSTEMS - OVERVIEW</b>	V		1	0 Hours					
Introduction- Basi	c concepts of	f Satellite communications- Frequency	alloca	<mark>tio</mark> ns f	or sate	lite					
systems. Advantag	ges and applie	cations of satellite communications ov	er othe	r com	nunicat	tions					
Unit: 2	<b>ORBITA</b>	L ASPECTS OF SATELLITE SYS	TEMS		1	0 Hours					
Orbital Mechanics	- loo <mark>k angle</mark>	determination- orbit perturbations- Or	<mark>bital</mark> de	termin	nation-						
launches and laun	ch ve <mark>hicles-</mark> o	orbital effects in communication system	ms perf	ormar	ice.	P					
Unit: 3		THE SPACE SEGMENT			1	0 Hours					
Introduction- spac	ecraft subsys	tems- attitude and orbit control system	ns- Tele	emetry	- tracki	ng and					
command- power	systems- con	munication subsystems.			0	0.11					
Unit: 4		SATELLITE LINK DESIGN		<b>f</b> 1	<u> </u>	9 Hours					
link design- design	n of satellite	link for specified C/N.	Jesign	or dov	vn links	- up					
Unit: 5	APPLI	CATIONS OF SATELLITE SYSTE	EMS		0	9 Hours					
INTELSAT Series	- INSAT- V	SAT- GSM- GPS- INMARSAT-Direc	t Broad	lcast s	atellites	s (DBS)-					
Direct to home Br	oadcast (DTI	H)- Digital audio broadcast (DAB)- W	'orld sp	ace se	rvices-						
Business TV(BTV	')-GRAMSA	Т									
		Total Lectur	e Hour	.s	4	8 Hours					
Text Books											
1 Timothy Pra willey, 2006	tt, Charles Bo	ostian,JeremyAllnutt, Satellite Commu	unicatio	ons, 2 <sup>n</sup>	<sup>d</sup> editio	n, John					
W. L. Pritcha	ard, H. G. Su	yderhoud and R. A. Nelson, Satellite	Commu	inicati	on syste	ems					
<sup>2</sup> Engineering,	$^{2}$ Engineering, 2 <sup>nd</sup> edition, Pearson educational pblishers, New Delhi, 2003.										
<b>Reference Books</b>											
1 Dennis Rodo	ly, Satellite C	Communications, 3 <sup>rd</sup> edition, Mc Graw	Hill, I	nterna	tional, 2	2001.					
Dr D.C. Agr	wal, Satellite	Communications, 4 <sup>th</sup> edition, Khanna	Public	ations	, New I	Delhi,					
$2 \begin{vmatrix} 2001. \end{vmatrix}$											
## Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1 https://nptel.ac.in/courses/117/105/117105131/

2 <u>https://www.youtube.com/watch?v=hXa3bTcIGPU</u>

3 <u>https://www.youtube.com/watch?v=BvjlBpP4zU8</u>

Course Designed by: Dr.S.Vijayakumar, Associate Professor in ECE, Sreenivasa Institute of Technology and Management Studies, Autonomous, Chittoor.&

Dr.N Om Muruga , Assistant Professor, Government Arts College ,Ooty, C. N Omprakash Anand , Assistant Professor, Government Arts College ,Ooty.

		Mapping with Program Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		
CO1	S	L	L	L	L	L	L	L	L	L		
CO2	S	M	L	М	М	L	L	L	L	М		
CO3	S	M	М	L	L	L	L	L	L	L		
CO4	S	S	М	M	М	М	L	L	L	М		
CO5	S	L	L	L		L	L	L	L	М		



Cours	se Code : 6EI	FIBER OPTIC	L	Τ	Р	С					
		COMMUNICATION		TT I							
Core/	Elective/	Elective III-I	6	Ĩ.		4					
Suppo	ortive:	Dagia Imawladga in	Sville	hua		2022 2023					
Pre-	uisito.	Dasic Knowledge III Communication Systems	Sylla Vor	ibus		2022-2023					
C		Communication Systems	V CI	51011							
Cours	e Objectives:										
The M	Iain Objectives of	this course are to:									
*	To enable the stud	ents to learn about OFC and also to unde	rstand	the							
	concept of various	optical fiber modes, configurations and varie	ous sigi	nal							
Expec	Expected Course Outcomes:										
On the	On the Successful completion of the course, student will be able to:										
1	Remember the basic	concepts in Fiber Optic Communication	ı.			K1					
2	Familiarize the prin	ciple of optical fiber cable.	21			K2					
3	Gain knowledge abo	out optical sources.	61			К3					
4	Analyze optic <mark>al co</mark> i	nmunication systems.	B.			K4					
5	5 Analyze different types of measurements. K4										
K1:Remember; K2-Understand; K3-Apply; K4-Analyze; K5-Evaluate; K6-Create											
Unit:1         BASICPRINCIPLESOFOPTICS         18 hours											
transi types circul	mission link-Basic of -Rays and Modes-S lar waveguides.	pptical law and definition-Optical fiber m tep index fiber structure-Ray optics repre	ode co esentat	onfigu ion-N	irati Irati Iode	on: Fiber e theory for					
Unit:	2	FIBER	a de la compañía de la	N.	<b>18</b> ]	hours					
Singl	e mode fiber-Grade	ed index fiber structure-Fiber material:	Glass	fiber,	Act	tive					
Glass	Fiber-Fiber fabric	ation: Outside vapor phase oxidation-	Vapor	Phas	se a	xial					
depos	sition-Plasma activ	ated chemical vapor deposition-Mecha	nical j	prope	rties	of					
Ilber.	3	OPTICAL SOURCES			18	hours					
Cint.		B B B I WE B B WIE B P			10	nouis					
diodes operat Multi	LED: Structure, I s: Modes and thresho ting characteristics: p plier tubes-Light sour	ight source material, Quantum efficiency an ld conditions, Quantum efficiency, diode stru- hoto detectors-principles of photo detection- ce linearity.	d LED acture a – PIN c	powe and ra liode-	er. La diatio – pho	ASER on pattern- oto-					
Unit:	4	OPTICALCOMMUNICATIONSYSTEM	1S		18	hours					
Basic Comp Trans	optical communication onents of Optical cor mitter-Receiver.	on systems-Receiver performance-sensitivity nmunication system-Signals in optical comn	-Selecti nunicati	ivity- ion sy	stem	]-					
Unit:	Unit:5         MEASUREMENTS         18 hours										
techn Spect	Measurement star ique, Insertion loss rum analyzer-Test	dard and test procedure-Attenuation mea method-OTDR TRACE-Fiber fault locat equipment: Tunable laser sources, Optica	asurem tion-Ey al powe	ent; ( ve pat er me	Cutb ttern ter.	ack -Optical					
		Total Lecture	e hours	5	ç	90 hours					
Text I	Book(s)										

1	Optical Fiber Communications, Tata Mc Graw-Hill international, Third edition,2000, by Gerd Keiser.
2	Optical Communications, Components and Systems-Narosa Publishing House,2000, by J.H.Franz, V.K.Jain.
Refe	rence Books
1	Optical Fiber Communications, Principles and Practice, Third edition, by John M
	Senior.
2	Fiber Optic Communication Systems, Fifth edition, by Govind P Agrawal.
Rela	ted Online Contents [MOOC, SWAYAM, NPEL, Website etc.]
1	https://onlinecourses.nptel.ac.in/noc21_ee42/preview_
2	https://onlinecourses.nptel.ac.in/noc20_ee79/preview_
3	https://www.digimat.in/nptel/courses/video/108104113/L01.html
4	https://pdfslide.net/education/optical-fiber-communication-ppt-
	591cebc1a22db.html?
Cour	se Designed By:

1. Dr. K. Venmathi, Assistant Professor, LRG Government College for Women, Tiruppur.

2. Mr. S. Venkatesan, Assistant Professor, KSG College of Arts and Science, Coimbatore. Mapping with Programme Outcomes

			100							
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
			5	-	1/2			1		
CO1	м	T.A.	S	- 5	M	S S	S	М	T.	М
	101		10	- 1		2	2	111		111
CO2	м	C	C	M	M	C	М	C	М	c
	IVI	3	3	IVI	IVI	3	IVI	3	IVI	3
CO3	м	C	N	15		М		м	C A	C
	M	2	IVI	L	L	IVI	IVI	M	2	5
CO4	C	М	M	M	М	220	M	-	C	М
	3	IVI	IVI	IVI	IVI	1.20	IVI	L	3	IVI
CO5	М	м	M			M	4	м	M	м
	IVI	IVI	IVI	L	3	IVI		IVI	IVI	IVI

\*S-Strong; M-Medium; L-Low

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LIREOUT 2\_WITH SAIL

Course code	6EJ	VIRTUAL INSTRUMENTATION	L	Т	P	C				
Elective-III –	J		6	Т	-	4				
Pre-requisite		Digital Electronics, Microprocessor and Computer	Sylla	bus	2022	<u> </u>				
		fundamentals	Versi	on	2023	,				
Course Objec	tives:									
The main object	ctives of th	is course are to:								
1. 10 provide basic concepts in virtual instruments 2. To know about the programming methods in software used in virtual instrumentation										
3. To familiarize the students with the applications of virtual instrumentation										
<i>J.</i> 10 Ialillia	The the stu	dents with the applications of virtual instrumentation								
Expected Cou	rse Outco	mes								
On the succes	sful compl	etion of the course, student will be able to:								
1 Understan	d the basic	s concepts and programming in virtual instrumentation	n		ĸ	(2				
2 Apply yirt	ual instrum	pentation tool set for a given problem				73				
2 Apply virt	ual instrum	nentation concept for a given applications				<u>13</u>				
4 Understan	d the begin	programming concept of a given applications				<u>70</u>				
4 Understan		programming concepts				<u>.</u> 2				
5 Understan		rent lab view applications	V( (	<b>r</b> ,	K	~				
KI - Rememt	ber; <b>K2</b> - U	Inderstand; K3 - Apply; K4 - Analyze; K5 - Evaluate;	K0-(	reate	3					
Unit.1		INTRODUCTION	_	01						
General Functi	ional Descr	rintion of a digital instrument - Block Diagram of a Vi	rtual In	strur	nent	5				
Physical quant	ities and A	nalog Interfaces - Hardware and Software	User In	terfa	ces-	-				
Advantages of	Virtual Ins	struments Over Conventional Instruments - Architectu	re of a	Virtu	al					
Instrument and	l its Relatio	on to the Operating System								
	5			1						
Unit:2	9	SOFTWARE OVERVIEW		9	hour	S				
Lab VIEW - C	Graphical U	Jser interfaces - Controls and Indicators - 'G' program	iming –	- Lab	els a	ind				
Perrosontation	Size and	Color - Owned and Free Labels - Data Type, For	mat, Pi	Put	on a	na				
VirtualInstrum	ent-Granhi	calProgrammingPalettesandtools-FrontPanelObjects-F	ing and Function	sand	mmg	; a				
Libraries	one orapin	55 LILITONT 2-WING AND COLOR	une tion	isuita						
		EDUCATE TO ELEVATE								
Unit:3		PROGRAMMING STRUCTURE		10	hour	rs				
FOR Loops, W	HILE Loo	ops, CASE Structure, Formula Nodes, Sequence Structure	ctures –	Arr	ays a	ınd				
Clusters - Arra	y Operatio	ns - Bundle - Bundle/Unbundle by Name, Graphs and	Charts	- Str	ing a	ind				
File I/O - Hig	h level and	d Low Level File I/O's - Attribute Modes Local and	i Globa	ul Va T	riabl	es.				
OPERATING	SYSTEM	AND HARDWARE OVERVIEW: PC Architecture, C	Surrent	Iren	ds,					
Specification –	Analog ar	ad Digital Interfaces – Power Speed and timing Consid	deration	rus – ns						
Specification -	- Allalog al	a Digital Interfaces – I ower, speed and timing const		.15						
Unit:4		HARDWARE ASPECTS		10	hou	rs				
Installing hard	ware, Insta	lling Drivers - Configuring the Hardware - Addressing	g the ha	rdwa	re					
in Lab VIEW -	Digital an	d Analog I/O function - Data Acquisition - Buffered L	/O - Re	al tin	ne Da	ata				
Acquisition										
	Γ									
Unit:5		LABVIEW APPLICATIONS		1(	hou	rs				

IMAQ-Motion Control: General Applications - Feedback Devices, Motor Drives -

Instrument Connectivity - GPIB, Serial Communication - General, GPIB Hardware & Software Specifications - PX1 / PC1: Controller and Chassis Configuration and Installation

Total Lecture hours 48hours

## **Text Book(s)**

1 Garry M Johnson, "**Labview Graphical Programming**", Tata McGraw Hill, New Delhi, 2nd Edition, 1996

2 Labview : Basics I & II Manual, National Instruments, 2005

# **Reference Books**

1 Lisa K Wells, "Labview for Everyone", Prentice Hall of India, New Delhi, 1996

2 Barry Paron, "Sensor, Transducers and Labview", Prentice Hall, New Delhi, 2000

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1 https://www.ni.com/en-in/innovations/white-papers/06/virtual-instrumentation.html

Course Designed By: K.Manikantan, Assistant Professor, Government Arts College ,Ooty&Dr.N Om Muruga, Assistant Professor, Government Arts College, Ooty.

				1								
Mappi	Mapping with Programme Outcomes											
COs	<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	<b>PO10</b>		
CO1	L	L	M	M	M	L		M	S	M		
<b>CO3</b>	L	Μ	М	L	L	M	L	S	SL /	S		
CO3	L 2	L	S	L	М	L	L	M	S M	L		
<b>CO4</b>	L	L	S	M	S	S	L	S	М	L		
CO5	L	2L	S	S	М	L	S	L	М	S		

\*S-Strong; M-Medium; L-Low



Course code	6EK	<b>BIOMEDICAL INSTRUMENTATION</b>	L	Т	P	С
Elective-III-K	K		6	Т		4
Pre-requisit	e	Higher secondary biology	Syllal	ous 2	022-	-
Carrow Ohio			Versi	on 2	023	
The main object	ctives of the	s course are to:				
1. To present	s various bi	o-potentials and working principles of medical instruction	nents			
2. To enable	the students	s to learn about bio-potentials and medical instruments	3			
Expected Cou	arse Outcon	nes:				
On the succe	ssful compl	etion of the course, student will be able to:			1	
1 Understa	nd the Conc	ept of bio-potential			K	2
2 Understan	nd the conce	ept of medical instruments			K	.4
3 Develop	the troubles	hooting Skills of medical instruments			K	.3
4 Understa	and the conc	epts of signal conditioners & diagnostic equipment's			K	2
5 Understand the concepts of various physiological assist devices						2
K1 - Remem	ber; <b>K2</b> - <mark>U</mark>	nderstand; K3 - Apply; K4 - Analyze; K5 - Evaluate;	<b>K6</b> – C	Create		
<b>T</b> T •4 4				01		
Unit:1	: Structuros	Transport of Long through Call Mambrana Pasting	and Ex	9no	State	
Transmembra	ne Potential	- Action Potential - Propagation of Bioelectric Potent	ial - Ne	rvous	State	tem
- Physiology o	of Mu <mark>scles</mark> -	Heart and Blood Circulation				
		Linnesser Vinness -				
Unit:2		ELECTRODES AND TRANSDUCERS		10	hou	Irs
Basic Electro	de Theory	- Micro Electrodes - Skin Surface Electrodes -	Needle	Elec	trod The	es -
Equivalent Cl Electrode - Bl	rcuit - Elec	ectrode - Active Transducers and Passive Transduce	rs - St	ues - rain C	i ne Saug	es –
Thermistor	Sou Gus En	centre riente riunsducers and russive riunsduce	15 50		Juug	05
	0	9				
Unit:3	SIG	NAL CONDITIONERS & DIAGNOSTIC EQUIPMENTS		10h	our	S
Instrumentatio	on Amplifier	rs - Current Amplifiers - Isolation Amplifier - Need fo	r Filter	s - Lo	W	
Pass, High Pas	ss and Band	Pass Active Filters - Notch Filters - Heated Stylus an	d Ink P	en Re	cord	lers.
and Unipolar	_ EQUIPM [ eads - Fint	ENTS: Typical Electrocardiogram (ECG) - Electroc hoven Triangle - Electrical Activities of the Brain - E	lectroe	apn - ncenh	ыр вор	ram
(EEG) - Musc	le Response	- Electromyograph (EMG)	leetioe	licepii	ulog	Tunn
	• •					
Unit:4	DIAGN	OSTIC EQUIPMENTS & BIOTELEMETRY		10h	our	S
X-ray Imaging	g - Radio F	luoroscopy - Image Intensifiers - Angiography - End	oscopy	– Dia	ather	rmy.
BIOTELEME	TRY AND	PATIENT SAFETY: Need for Biotelemetry - Ele	ements	of Te	elem	etry
System - Rad	10 Telemetr	y System - Physiological Signals used in Telemetry	- TDN	1 and	FD.	M –
	1111.5					
Unit:5	]	PHYSIOLOGICAL ASSIST DEVICES		9h	ours	
NeedforPacen	nakers-Pace	makerParametersandCircuits-DifferentModesofOpera	tion-D0	2		
Defibrillator -	Artificial H	eart Valves - Heart Lung Machines - Artificial Lung N	Machin	es -Aı	tific	ial

Kidney Machine - Nerve and Muscle Stimulator. COMPUTER APPLICATIO	NS: Data Acquisition
Systems - Analysis of ECG signals - Computerized Axial Tomography (CAT)	Scanner - Ultrasonic
Scanner - Magnetic Resonance Imaging - Computer Based Patient Monitoring	g System
Total Lecture hours	48hours
Text Book(s)	
1 Joseph J. Carr and John M. Brown, —Introduction to Biomedical Equip	pment TechnologyI,
Pearson EducationAsia, New Delhi, 4th Education, 2001	
2 Leslie Cromwell., Fred J. Webell., Erich A. Pfeffer., -Biomedic	al Instrumentation
and Measurements, Prentice Hall of India, New Delhi, 1990	
Reference Books	
1 Khandpur,—HandbookonBiomedicalInstrumentationI, TataMcGrawHi	llCompany,New
Delhi, 1989	
2 OhnGWebster,Ed., — MedicalInstrumentationApplicationandDesign I, T	ThirdEdition, John
Wiley & Sons, Singapore, 1999	
3 Arumugam, M.—BiomedicalInstrumentation. AnuradhaAgenciesPublis	hers.Chennai.1992
Related Online Contents MOOC, SWAYAM, NPTEL, Websites etc.]	
1 https://www.voutube.com/watch?y=j2mZvlgP1Fk	
2 https://www.voutube.com/watch?y=4ldy98F7Zng	
3 https://nptel.ac.in/courses/108/105/108105101/	
4 https://nptel.ac.in/courses/108/105/108105091/	
Course Designed By: K.Manikantan, Assistant Professor, Government Arts Co	ollege
,Ooty&Dr.N Om Muruga, Assistant Professor, Governm	nent Arts
College Ooty	

Mapping with Programme Outcomes												
COs	<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	PO10		
CO1	L	L	М	М	MON	L	L	М	S	М		
CO2	L	М	М	- CAL	ETDE	М	L	S	L	S		
CO3	М	L	S	L	Μ	L	L	М	М	L		
<b>CO4</b>	L	L	S	Μ	S	S	L	S	М	L		
CO5	L	L	S	S	М	L	S	L	М	S		

\*S-Strong; M-Medium; L-Low

Course Code	6EL	VLSI DESIGN	L	Т	Р	C			
Core/Elective/St	upportive:	ELECTIVE –III-L	6	0	0	4			
Pre-requi	site:	Digital Principles and Applications	Sylla vers	ibus sion	20 2	)22- 023			
<b>Course Objectiv</b>	es:								
The objectives of	this course a	are:							
To provid	e knowledge	on Fabrication Process of NMOS, PMO	S, CM	OS					
ANDBIC	MOS, Super	integration concepts.							
<ul> <li>To develo</li> </ul>	p the skill to	analyze the electrical properties of MOS	transis	stor, d	lesign				
stick diag	rams and lay	out diagrams for MOS transistors, contac	cts and	wires					
To investigate the effect of floor planning, placement, routing and power delay									
estimation in physical design of digital circuits and memory design.									
To apply the concept of Combinational and Sequential Circuit Testing.									
		COOL CONTRACT	C						
		8							
Expected Course	e Outcomes:								
On successful con	mpletion of t	he course, student will be able to:							
1 Gain the k	nowledge o	n fabrication principles.				K1			
2 Able to an	nalvze the ele	ectrical properties of MOS transistors.				K4			
3 Apply the	appropriate	layout design rule to create a VLSI layou	it for a	desig	n.	K6			
<u> </u>	d the physic	al design steps and gain the knowledge of	n types	of		K2			
4 VLSI desi	4 VI SI design styles								
Gain the knowledge, analyze and apply test principles to evaluate the VLSI K5									
5 designs									
K1 – Rememb	er: K2 _ Un	derstand: K3 - Annly: K4 - Analyze:	<b>K</b> 5 _ F	valua	te K	6_			
KI – Kellellij	$c_1, K_2 = 0$	Create	K3 – E	valua	, <b>K</b>	<b>U</b> –			
Unit 1	1 65	VI SI TECHNOLOGY			10 F	lours			
Eabrication seque	nce proces	s flow Testing Super integration con	cente	Integ	rated	louis			
Passive compone	mts = MOS F	esistors and capacitors – Crossovers – N	IMOS -	- PM(					
CMOS - BICMO	S fabrication	n processes – comparison	avios		55 -				
Unit: 2	FLECT	RICAL PROPERTIES OF MOS DEV	ICFS	-	10 F	lours			
Drain to source of	urrent (I; )	varsus Drain to source voltage (V) ) rel	nc ES	ngl		louis			
transistor thresho	ld voltage ()	$V_{\rm ds}$ ) Televice voltage ( $v_{\rm ds}$ ) Televice $V_{\rm ds}$ ) Televice $V_{\rm ds}$ ( $v_{\rm ds}$ ) Televice $V_{\rm ds}$	ctance	1 – su 1 – and	4				
outputconductance	$e_{a_{d_{a}}} = figure$	e of merit $(\omega_0)$ = nass transistor - null = ut	$t_0$ nul	$\int_{m} dn$	wn				
ratio	c gas – figur	e of merit (60) pass transistor- pun – up	b to pui	1 – <b>u</b> 0	VV 11				
Init: 3		DESIGN PROCESSES			10 F	lours			
VI SI design floy	L stick diag	rom design rules with examples Design	rulas f	or Lor		louis			
diagrams of digit	ol circuits	heat resistance <b>P</b> standard unit of capacity	itance	л La	ortor				
delays Propagat	tion delays_ s	scaling of MOS circuits limitations of s	caling	- 11100					
Unit. 1	VI S	SI PHYSICAL DESIGN AND STVLE	canng.		00 E	lours			
DUVSICAL DE		SITILSICAL DESIGN AND STILE.	3		091	louis			
FILSICAL DE	Diagoment	Pouting Dower Dolog Estimation Cl	ool: Do	atina	Don	uor			
Plot Flammig –	r lacellietit –	Routing – Fower Delay Estimation – Ch	JUK NO	uting	- FOV	vei			
NUT SI DESIGN S	TVI ES.								
VLSI DESIGN SI YLES: Full Custom Sami custom Standard Calls Gata Arraya EDG A. CDI Da									
Tun Custom - Semi custom - Standalu Cens - Oale Anays - FrOAs - CFLDS.       Unit: 5       TESTING OF VISI CIDCUITS									
Unit: 5		resting of VLSI CIRCUITS	nor4!-1	Circi	עש E ני די	IOUITS			
Test Principles-B	131-1est Be niques.	nen- Comomational Circuit Testing, Seq	uential	UITCU	n res	ung,			
		Total Lasture	Hour		19 L	lours			
				·	-10 L	10013			

Text I	Books									
1	Basic VLSI Design, Douglas ,3rd Edition, A. Pucknell, Kamran Eshraghian, PHI,									
	New Delhi, 2011.									
2	Modern VLSI design, Wayne Wolf, 3rdEdition, Pearson Education, New Delhi, 4th									
2	impression 2008.									
Refer	Reference Books									
1	Introduction to VLSI Circuits and Systems, John .P. Uyemura, John Wiley, Student									
1	Edition, New Delhi, Reprint 2006.									
2	Principles of CMOS VLSI Design, N.H.E Weste, K.Eshraghian, Adisson Wesley,									
Z	2nd Edition, NewDelhi.									
2	Application Specific Integrated Circuits, Michel John Sebastian Smith, Addison									
5	Wesley, Indian Edition, 4th Indian Reprint 2001, New Delhi.									
Relate	ed Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]									
1	https://nptel.ac.in/courses/117/101/117101058/									
2	https://www.youtube.com/watch?v=9SnR3M3CIm4									
3	https://www.youtube.com/watch?v=Y8FvvzcocT4									
Course	e Designed by: Dr.S.Vijayakumar, Associate Professor in ECE, Sreenivasa Institute of									
Techn	ology and Management Studies, Autonomous, Chittoor.&									
	Dr.N Om Muruga, Assistant Professor, Government Arts College									
,Ooty.										

					N. S. S.								
$\sim$		Mapping with Program Outcomes											
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	<b>PO10</b>			
CO1	S	L	A	L	}L_	L	L	L	L	L			
CO2	S	S	L	S	М	H	М	L	L	L			
CO3	S	М	S	L	S	L	М	M	L	S			
CO4	S	L	М	L	S	L	L	LO	M	L			
CO5	S	S	М	М	S	L	L	L.	M	S			

\*S-Strong; M-Medium; L-Low

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION SYSTEMS

### MISSION

- To develop appropriate facilities for promoting research activities
- To inculcate leadership qualities among students for self and societal growth
- To nurture students on emerging technologies for serving industry needs through industry institute interface
- To enrich teaching learning process by transforming young minds to be resourceful engineers

