SGT University, Chandu-Budhera, Gurugram Faculty of Engineering & Technology Department of Electrical & Electronics Engineering





B. Tech. Electrical & Electronics Engineering Scheme & Syllabus (2021-22)

Vision of SGT University

"Driven by Research & Innovation, we aspire to be amongst the top ten Universities in the Country by 2022"



Scheme of Examination for B.Tech. (EEE) Program, 1st year SEMESTER WISE COURSE STRUCTURE 2021-2022

		First Semester												
S. No.	Subject Code	Course Title	L	Т	Р	C	Exami ma	nation rks	Subject Total					
1100							Int.	Ext.						
1		Applied Physics	3	0	0	3	40	60	100					
2		Fundamental of Electrical & Electronics Engineering	3	0	0	3	40	60	100					
3		Digital Electronics	3	0	0	3	40	60	100					
4		Electrical Technology	3	0	0	3	40	60	100					
5		Signal and System			0	3	40	60	100					
6		Fundamental of Electrical & Electronics Engineering lab	0	0	2	1	60	40	100					
7		Digital Electronics lab	0	0	2	1	60	40	100					
8		Electrical Technology Lab	0	0	2	1	60	40	100					
9		Object Oriented Programming Lab	0	0	2	1	60	40	100					
10.		Value Addition Course-I		0	0	2	40	60	100					
11		Ability Enhancement Courses (Mandatory Course)	2	0	0	2	40	60	Grade*					
		Total	19	0	8	23	480	520	1000					

Grade*

Score	Grade
90 marks and above	O (Outstanding)
80 marks and above but less than 90 marks	A+ (Excellent)
70 marks and above but less than 80 marks	A (Very Good)
60 marks and above but less than 70 marks	B+(Good)
50 marks to 60 marks	B (Above Average)
Below Minimum Pass marks	F(Fail)

S.	Subject Course Title		L	T	Р	С	Exami ma	nation rks	Subject Total
No.	Code						Int.	Ext.	
1		Applied Mathematics	3	0	0	3	40	60	100
2		Design Thinking	3	0	0	3	40	60	100
3		Electronics Devices	3	0	0	3	40	60	100
4		Basic Analog & digital Communication300					40	60	100
5		Analog Electronic Circuits	3	0	0	3	40	60	100
6		Electronics Devices Lab		0	2	1	60	40	100
7		Analog & digital Communication Lab	0	0	2	1	60	40	100
8		Analog Electronics Circuits Lab	0	0	2	1	60	40	100
9		Workshop Technology Lab	0	0	2	1	60	40	100
10		Engineering Graphics and Design Lab	0	0	2	1	60	40	100
11		Ability Enhancement Courses (Mandatory Course)		0	0	2	40	60	Grade*
12		MOOC Course*	0	0	8w	4*	-	-	-
		Total	17	0	11	22/26*	500	500	1000

Grade*

Score	Grade
90 marks and above	O (Outstanding)
80 marks and above but less than 90 marks	A+ (Excellent)
70 marks and above but less than 80 marks	A (Very Good)
60 marks and above but less than 70 marks	B+(Good)
50 marks to 60 marks	B (Above Average)
Below Minimum Pass marks	F(Fail)

Note:-

1. 4weeks mandatory Industrial Internship of 2 credits after completetion of 1^{st} year.

* A student will be eligible to get Under Graduate degree with **Honours**, if he/she completes an additional 16 credits. These can be acquired through SWAYAM MOOCs. For that, one MOOC Course of atleat 8

weeks (4 credits) must be completed during First Year. The list of MOOC courses will be provided by the Departement to the students before commencement of the semester.

Exit Point

Certificate Course in Basics of Electrical & Electronics Engineering.

Entry Point

Three years Diploma or One year Certificate Course in Basics of Electrical & Electronics Engineering and in lieu of Industrial Internship of 4 weeks student has to complete MOOC Course of 4 weeks (2 Credits) in 3^{rd} semester.



Scheme of Examination for B.Tech. (EEE) Program 2nd year SEMESTER WISE COURSE STRUCTURE 2021-2022

S.NO.	Subject	Course Title	L	Т	Р	C	Exam	ination	Subject
	Code						ma	irks	Total
							Int.	Ext.	
1.		Microprocessor and microcontroller	3	0	0	3	40	60	100
2.		Distribution of Electrical system		0	0	3	40	60	100
3.		Network Analysis & Synthesis	3	0	0	3	40	60	100
4.		Department Electives-I 3		0	0	3	40	60	100
5.		Open Elective-I		0	0	4	40	60	100
6.		Microprocessor and microcontroller Lab		0	2	1	60	40	100
7.		Distribution of Electrical system lab	0	0	2	1	60	40	100
8.		Network Analysis & Synthesis Lab	0	0	2	1	60	40	100
9.		Department Electives Lab-I	0	0	2	1	60	40	100
11.		Industrial Internship	0	0	4w	2	60	40	100
12		Ability Enhancement Courses (Mandatory Course)		0	0	2	40	60	100
		Total	18	0	8	24	540	560	1100

Third Semester

Fourth Semester

S.NO.	Subject	Course Title	L	Т	Р	С	Exam	ination	Subject
	Code						ma	arks	Total
							Int.	Ext.	
1.		Measurements & Instrumentation	3	0	0	3	40	60	100
2.		Power Electronics	3	0	0	3	40	60	100
3.		Research Methodology and IPR	3	0	0	3	40	60	100
4.		Department Electives-II 2		0	0	3	40	60	100
5.		Department Electives-III	3	0	0	3	40	60	100
6.		Open Elective-II	4	0	0	4	40	60	100
7.		Measurements & Instrumentation Lab	0	0	2	1	60	40	100
8.		Power Electronics lab	0	0	2	1	60	40	100
9.		Department Electives Lab-II	0	0	2	1	60	40	100
10.		Department Electives Lab-III	0	0	2	1	60	40	100
11.		Research Methodology and IPR Lab		0	2	1	60	40	100
13.		MOOC Course*	0	0	8w	4*	-	-	-
		Total	19	0	10	24/ 28*	540	560	1100

Note: -

- 1. 6weeks mandatory Industrial Training-I of 3 credits after completetion of 2nd year.
- 2. Student can opt for any of the Open Elective subject outside from the Parent Institute leading to Holistic development of student. It may include Yoga, Dance, Fashion, Agriculture, Medicine, etc.
- 3. Hours for open elective may vary as per course but not credits.
- 4. The Department has liberty to vary Credits of Core CoursesLab but not for Department Electives Lab. The Department Elective Labs are significant. So, there hours not to be reduced.
- 5. Department Electives must be selected such that they should not have any year-wise dependency.

* A student will be eligible to get Under Graduate degree with **Honours**, if he/she completes an additional 16 credits. These can be acquired through SWAYAM MOOCs. For that, one MOOC Course of atleat 8 weeks (4 credits) must be completed during Second Year. The list of MOOC courses will be provided by the Departement to the students before commencement of the semester.

**2nd Year Core Courses along with 4 Department Elective Courses should make a capsule program with some specialization.

Exit Point

Advanced CertificationCourse in Electrical & Electronics Engineering with minor specialization in_____.

Entry Point

Advanced CertificationCourse in Electrical & Electronics Engineering and in lieu of Industrial Training-I of 6 weeks student has to complete MOOC Course of atleast 6 weeks (3 Credits) in 5thsemester.



Scheme of Examination for B.Tech. (EEE) Program SEMESTER WISE

COURSE STRUCTURE 2021-2022

S.NO.	Subject Code	Course Title	L	T	Р	C	Exami ma	nation rks	Subject Total
							Int.	Ext.	
1.		Automation in Machinery	3	0	0	3	40	60	100
2.		Arduino	3	0	0	3	40	60	100
3.		Internet of Things	3	0	0	3	40	60	100
4.		Department Electives-IV	3	0	0	3	40	60	100
5.		Open Elective-III	4	0	0	4	40	60	100
6.		Automation in Machinery Lab	0	0	2	1	60	40	100
7.		Arduino lab	0	0	2	1	60	40	100
8.		Internet of Things lab	0	0	2	1	60	40	100
9.		Department Electives Lab-IV	0	0	2	1	60	40	100
11.		Ability Enhancement Courses (Mandatory Course)	2	0	0	2	40	60	100
12.		Industrial Training-I		0	6w	3	60	40	100
	Total		18	0	8	25	540	560	1100

Fifth Semester

Course Title S.NO. Subject L Т Р С Examination Subject Total Code marks Int. Ext. Electrical Machines 1. Analog and Linear Integrated Circuit 2. 3. Python Department Electives-V 4. **Open Elective-IV** 5. Electrical machines lab 6. Analog and Linear Integrated Circuit 7. lab 9. Python Lab 10. Department Electives Lab-V Value Addition Course-II 11. MOOC Course* 13. 8w 4* _ _ _ 23/ Total 27*

Sixth Semester

Note:-

- 1. 6weeks mandatory Industrial Training-II of 3 credits after completetion of 1st year.
- 2. Student can opt for any of the Open Elective subject outside from the Parent Institute leading to Holistic Development of student. It may include Yoga, Dance, Fashion, Agriculture, Medicine, etc.
- 3. Hours for open elective may vary as per course but not credits.
- 4. The Department has liberty to vary Credits of Core CoursesLab but not for Department Electives Lab. The Department Elective Labs are significant. So, there hours not to be reduced.
- 5. Department Electives must be selected such that they should not have any year-wise dependency.

* A student will be eligible to get Under Graduate degree with **Honours**, if he/she completes an additional 16 credits. These can be acquired through SWAYAM MOOCs. For that, one MOOC Course of atleat 8 weeks (4 credits) must be completed during Third Year. The list of MOOC courses will be provided by the Departement to the students before commencement of the semester.

**3rd Year Core Courses along with 4 Department Elective Courses should make a capsule program with some specialization.

*******Students entring directly in 2nd and 3rd year with CertificateCourse and AdvancedCertification Course will be given Undergradute Diploma considering their credits of previous courses after successfully completion of 3rd year but the student need to submit his original previous certificate.

Exit Point

Undergraduate Diploma in Electrical & Electronics Engineering with specialization in_____.

Entry Point

Undergraduate Diploma in Electrical & Electronics Engineering and and in lieu of Industrial Training of 6 weeks student has to complete MOOC Course of atleast6 weeks (3 Credits) in 7thsemester.



Scheme of Examination for B.Tech. (EEE) Program 4th year

Seventh Semester											
S.NO.	Subject	Course Title	L	Т	Р	С	Exami	ination	Subject		
	Code						ma	rks	Total		
							Int.	Ext.			
1.		Control System	3	0	0	3	40	60	100		
2.		Java	3	0	0	3	40	60	100		
3.		Department Electives-VI	3	0	0	3	40	60	100		
4.		Control System lab	0	0	4	2	40	60	100		
5.		Java Lab	0	0	4	2	60	40	100		
6.		Department Electives	0	0	4	2	60	40	100		
		Lab-VI									
7.		Capstone Project	0	0	4	2	60	40	100		
		Total	09	0	16	17	360	340	700		

SEMESTER WISE COURSE STRUCTURE 2021-2022

Eighth Semester

S.NO.	Subject	Course Title	L	Τ	Р	С	Examination		Subject
	Code						тагкя		Total
							Int.	Ext.	
1.		Major Project (Industrial oriented/Research oriented)	-	-	20W	10	100	100	200
2.		MOOC Course*	-	-	8w	4*			
	Total Cr	redits = 10/14*							
	Overall	Total Credits = I to VIII= 168/184*							

* A student will be eligible to get Under Graduate degree with **Honours**, if he/she completes an additional 16 credits. These can be acquired through SWAYAM MOOCs. For that, one MOOC Course of atleat 8 weeks (4 credits) must be completed during Fourth Year. The list of MOOC courses will be provided by the Departement to the students before commencement of the semester.

Exit Point

Under Graduate Degree in Electrical & Electronics Engineering with specialization in_____.

List of Departmental Electives (B.Tech)											
Specialization	Communication Technology	mmunication Technology System		Smart Device	Medical Electronics						
DE-I	5G: Architecture & Communication Technology	VLSI Fabrication Technology	Transmission and Distribution	Robotics	Bio Medical Instrumentation						
DE-II	Network Security	Digital VLSI	Turbine based Power Generation System	PLC & SCADA	Bio Signal Analysis						
DE-III	Electromagnetic Field Theory	Analog VLSI	Wind And Solar Electrical Systems	Industrial Automation	Pattern recognition and machine learning						
DE-IV	Adhoc Network	VHDL & Verilog	Thermal & Hydro Power Plant	Mechatronics	Medical sensors						
DE-V	Antenna Design	Fundamentals of VLSI CAD	Power Switching Converters	Micro computing system	Hospital Utility						
DE-VI	Green Wireless Sensor Network	Sensor & Interfacing	High Voltage Engineering	Distribution system automation	Operation Theater Environment Monitoring						

B.Tech EEE_2021

Semester 1

1. Nan	ne of the L)epar	tment: Electrica	al and Electror	tics Engineerin	ng		1				
2. Cou Name	irse	Appl	ied Physics			L		Т		Р		
3. Cou	rse Code					3		0		0		
4. Typ	e of Cour	se (us	e tick mark)	Core ()	EAS ()	BSC $()$	OF	2.0		OE ()		
5. Pre-	-requisite		Intermediate courses	6. Fre quency	Even ()	Odd $()$	Eit Ser	her n ()	Ever	y Sem ()		
				(use tick marks)								
7. Tot	al Number	r of L	ectures, Tutori	als, Practical	(assuming 14	weeks of on	e sen	nester)				
Lectures =	42			Tutorials	= 0	Practical	= 0					
8. Cou	irse Descr	iption	:									
Engineering these conceeded emphasizes	Engineering physics course provide an opportunity to students to learn fundamental concepts of physics and apply these concepts in today's rapidly changing and highly technical/engineering environment. This course also emphasizes the solid foundations of modern scientific principles.											
9. Cou	irse Obje	ctives	•									
 i) To give students a basic exposure to Physics that will better prepare them for more rigorous courses that will be taken later on. ii) To make students learn about the concepts of physics iii) To understand basic concepts of physics to analyze practical engineering problems iv) To understand basic principles of physics and apply its solutions effectively and meaningfully. 												
10. Course Outcomes (COs):												
i) Describe ii) Apply band theory iii) Underst iv)To lectures.	fundament fundament of solids, and the im have	ntal p quant portar	orinciples of pum physics and nee of record-keep practiced	physics to special theory eping.	solve problem of relativity.	ns relating	to du	ring	cryst	al structure, labs and/or		
11. Uni	t wise deta	ailed o	content			0.4						
Unit-1 Interference Division of	Number ce: Cohere Amplitude	nt sou e- Nev	urces, conditions vton's Rings, ap	for sustained plications.	interference.	ve Optics Division of '	Wave	-Front - I	Fresn	nel's Biprism,		
Diffraction diffraction grating.	through a	ice be single	etween interfere e slit, Plane tran	ence and diff nsmission diff	fraction, Fraum fraction grating	nhofer and g, dispersive	Fresn pow	el diffra er and re	ction solvi	. Fraunhofer ing power of		
Polarizatio wave plates	n: Polariz , Detection	ed and	d unpolarised li production of di	ght, uniaxial fferent types o	crystal, doubl of polarized lig	e refraction, ht.	Nico	l prism,	Qua	rter and Half		
Unit - 2	Number	of lect	ures = 12	Title of	the unit: Cry	stal Structu	re an	d Band t	heor	ry of solids		
Crystal Sta law, defect	ructure: S in solids.	pace	lattice, unit cell	and translation	on vector, Mil	ler indices, s	simple	e crystal	struc	cture, Bragg's		
Free Electron Theory : Elements of classical free electron theory and its limitations. Drude's theory of conduction, quantum theory of free electrons, Fermi level, density of states, Fermi-Dirac distribution function.												
Band Theo effective m	ory of solid ass and he	ls: Ori oles, (igin of energy background backgr	ands, Kroning f solids into 1	-Penney mode netals, semico	l ,E-K diagra	ams, I d insu	Brillouin 1lators, H	zone Iall e	s, Concept of effect and its		
Unit - 3	Number	of lect	ures = 10	Title of Quantu	the unit: Spe Im Physics	cial Theory	of Re	elativityL	aser	and		

Special Theory of Relativity: Postulates of special theory of relativity, Lorentz transformations. Consequences of LT (length contraction and time dilation). Variation of mass with velocity, Mass energy equivalence.

Quantum Physics: Inadequacies of classical physics, introduction to quantum mechanics-simple concepts, Black body radiations Discovery of Planck's constant, wave particle duality, phase velocity and group velocity. Schrodinger wave equations-time dependent and time independent, Expectation value, particle in a one-dimensional box.

Unit - 4Number of lectures = 10Title of the unit: LASER and Electromagnetic theory

LASER: Spontaneous and Stimulated emission, characteristics of laser beam, principle of laser, lasing action, three level laser, four level laser, He-Ne laser, applications.

Fiber Optics: Propagation of light in optical fibers, numerical aperture, V-number, single and multimode fibers, attenuation, dispersion, applications.

Electromagnetic theory: Gradient, divergence and curl, stokes theorem, gauss- divergence theorem, gauss law, faraday law, ampere circuital law, displacement current, Maxwell's equation.

12. Brief Description of self-learning / E-learning component

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

13.Books Recommended

Text Books:

i. Modern Physics for Engineers – S.P.Taneja (R. Chand)

Reference Books:

- i. Engineering Physics SatyaPrakash (PragatiPrakashan)
- **ii.** Modern Engineering Physics A.S. Vasudeva (S. Chand)
- iii. Perspectives of Modern Physics Arthur Beiser (TMH)
- iv. Optics AjoyGhatak (TMH)
- v. Fundamentals of Physics Resnick & Halliday (Asian Book)
- vi. Introduction to Electrodynamics- <u>David J. Griffiths (PEARSON)</u>

1.	1. Name of the Department : Electrical and Electronics Engineering									
2.	Course	Fundamental	of	L		Т	Т		Р	
	Name	Electrical & E	lectronics							
3.	Course	Engineering		3		0			0	
	Code			5		Ū			Ŭ	
4.	Type of	Core $()$	EAS ()		BSC ()		OE ()		PE ()	
	Course (use tick									
	mark)									
5.	Pre-	Knowledge	of Basic	6.	Frequenc	Eve	en ()	Odd	Either	Every
	requisite any)	(if Algebra,	Basic		y (use tick			(√)	Sem ()	Sem ()
	any)	Electronics			marks)					
7.	Total Nur	mber of Lectures	, Tutorial	s, Practi	cal (assum	ing 14 w	veeks o	f one sen	nester)	
Lectur	res = 42		Tu	torials =	00	Prac	tical =	00		
8. Br	ief Syllabu	s: This course air	ns to (1) e	quip the	students wi	ith an un	derstan	ding of th	he fundame	ental
pri	nciples of e	electrical engineer	ing(2) pro	vide an o	verview of	evolutio	on of ele	ectronics	, and introc	luce the
WC	orking princ	ciple and examples	s of fundar	nental ele	ectronic de	vices and	d circui	ts (3) pro	ovide an ov	erview
9. Le	arning obj	ectives:	systems, a				pis m i		mumcatio	
	i. Ur	nderstand the basic	essential	terms in	electricity.					
	ii. Kr	now the concept of	f series and	d parallel	circuits.					
	iv. K	now the basic idea	AC funda as about ba	interies.						
10	. Course O	outcomes: On com	pletion of	this cour	se, the stud	lents wil	l be abl	e to		
i.	Solve prol	blems based on cu	rrent divis	ion rules	& Wye-De	elta Tran	sforma	tion.		
11. iii	Problems	on parallel magne	tic circuits	8 mits						
iv.	Define op	perating point in the	e context	of a PN J	unction Di	ode				
Unit-1	Numb	er of lectures = 1	0 Tit	tle of the	unit: Elen	nentary	concep	ts of DC	electric ci	rcuits:
Basic '	 Terminolog	y including volta	ge, current	, power.	resistance.	emf: Re	sistance	es in serie	es and para	llel;
Currer	nt and Volta	age Division Rule	s; Capacito	ors & Ind	uctors: V-I	relation	s and e	nergy sto	red. Ohm's	Law
and Ki	and Kirchhoff's laws-Problems; Star-delta conversion (resistive networks only-derivation not required)-									
proble	problems. Analysis of DC electric circuits: Mesh current method - Matrix representation - Solution of									
netwo	network equations. Node voltage methods-matrix representation-solution of network equations by matrix									
metho	methods. Numerical problems									
TT *4										
	Jnit - 2 Number of lectures = 12 Title of the unit: Magnetic Circuits: Basic Terminology:									
MMF,	field streng	gth, flux density,	eluctance	- compar	ison betwe	en electi	ric and	magnetic	circuits- S	Series and
paralle	el magnetio	c circuits with	composite	materia	ls, numeri	cal prol	blems.	Electron	nagnetic I	nduction:
rarada mutua	iy's laws, pi	ce. coefficient of	w- statical coupling	Alternat	ing Curren	anncany nt funda	mentals	a emrs - s: Gener	ation of a	lance and
voltag	es-Represei	ntation of sinusoi	dal wavefo	orms: free	quency, pe	riod, Av	erage,	RMS val	ues and fo	rm factor

of waveforms-Numerical Problems Unit - 3 | Number of lectures = 10 Title of the unit: Introduction to Semiconductor devices: Evolution of electronics – Vacuum tubes to nano electronics. Resistors, Capacitors and Inductors (constructional features not required): types, specifications. Standard values, color coding. PN Junction diode: Principle of operation, V-I characteristics, principle of avalanche breakdown. Bipolar Junction Transistors: PNP and NPN structures, Principle of operation, relation between current gains in CE, CB and CC, input and output characteristics of common emitter configuration Title of the unit: Basic electronic circuits and instrumentation Number of lectures = 10Unit 4 Rectifiers and power supplies: Block diagram description of a dc power supply, Working of a full wave bridge rectifier, capacitor filter (no analysis), working of simple zener voltage regulator. Amplifiers: Block diagram of Public Address system, Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response, Concept of voltage divider biasing. Electronic Instrumentation: Block diagram of an electronic instrumentation system. **11. Brief Description of self learning / E-learning component:** The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University. The link to the E-Learning portal. http://sgtlms.org Journal papers; Patents in the respective field. 12. Books Recommended (Text Books): i) Text books: D P Kothari and I J Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010. **Reference Books :** 13. i. Del Toro V, "Electrical Engineering Fundamentals", Pearson Education. ii. T. K. Nagsarkar, M. S. Sukhija, "Basic Electrical Engineering", Oxford Higher Education. iii. Hayt W H, Kemmerly J E, and Durbin S M, "Engineering Circuit Analysis", Tata McGraw-Hill Hughes, "Electrical and Electronic Technology", Pearson Education. iv.

1. Name of the Dep	partment- Ele	ectrical and Electronic	s Engineering					
2. Course Name		Fundamental of Ele		Р				
		Electronics Engine	Electronics Engineering lab					
3. Course Code			3 0					
4.Type of Cours	e (use tick	Core (√)	EAS ()	BSC ()	OE ()	PE	20	
mark)								
5. Pre-requisite		Knowledge of Basic Algebra, Basic 6. Ever						
(if		Electro	onics	Frequency	0	(•	Sem	Sem
any)				(use			0	0
				marks)				
7. Total Number o	f Lectures, Ti	L Itorials, Practical (as	suming 12 weeks o	f one semest	er)			
Lectures $= 0$	<u>1 2000ar 03, 1 (</u>	(ub		Tutorials	Pract	ical =	: 28	
				= 0	11400	icui –	_0	
8. Course Descript	tion							
Course introduces	to fundamenta	l of Electrical & Elect	tronics lab: students	will learn to	use Tł	nis co	urse ain	ns to
(1) equip the studer	nts with an und	lerstanding of the fund	lamental principles	of electrical e	ngineer	ing(2) provic	le an
overview of evolu	tion of electr	conics, and introduce	the working prin	ciple and ex	amples	of	fundame	ental
electronic devices a	and circuits (3)	provide an overview	of evolution of com	munication sy	/stems,	and i	ntroduc	e the
basic concepts in ra	dio communic	ation.						
9. Learning Ol	ojectives:							
i. To De	esign Electrica	l Systems.						
ii. To A	nalyze A Giver	n Network By Applyin	ng Various Network	Theorems.				
iii. To Ex	pose The Stuc	lents VOLTMETER, A	AMMETER, WAT	IMETER.				
iv. To Ex	pose The Stud	lents To The Operation	n Of PN Junction D	lode.				
v. 10 E	xamine Hall v	vave Reculters.						
10. Course Outcor	nes (COs):							
The student	s will be able t	0:-						
i. Knowledge a	bout PN junct	ion diodes and study a	bout basic equipme	nts				
ii. Solve proble	ems with Mesn	/node analysis.						
iv Problems on	series magneti	c circuits						
11 S No	List of Expe	riment				C		red
1 1	Verific	eation of KVL and KC	۲			C 		lu
1	v crine		<i>ـــ</i> .			11		
2	To stu	To study Star delta conversion						
2	10 310	1 o study Star-delta conversion.						
3	To study PN Junction diodes							
	10 study PN Junction diodes.							
4	To study voltmeter, ammeter, wattmeter & multimeter							
5	Plot th	Plot the forward and reverse V-I Characteristics of a PN junction i						
	Diode.				-			
6	To plo	ot and study the inp	ut and output char	racteristics of	f BJT	in ii		
	Common Emitter Configuration.							

7	To determine resonant frequency, bandwidth and Q-factor for series and parallel RLC circuits.	iii
8	To determine the Transmission and Hybrid parameters of a Two-port network.	iii
9	To find the resonant frequency, quality factor and bandwidth of a given series and parallel resonant circuits.	iv
10	To study Light Emitting Diodes.	i
11	To get familiar with the working and use of a seven segment display.	i
12	To Study Half – Wave Rectifier.	i

1. Name of the Department : Electrical and Electronics Engineering									
2.Course Name Digital Electronics			L		Т		Р		
3.Course Code			3		0		0		
4.Type of Course (use tick mark)	Core (V)	EAS ()		BSC ()	OE ()		OE ()	
5.Pre-requisite (if any)	Knowledge of Basic Algebra, Basic Electronics		Basic etronics	6.Frequency (use tick marks)		Even $()$	Odd ()	Either Sem ()	Every Sem ()
Lectures = 42	of Lecture	es, i utoria	us, Fraci	Tutorials	$\frac{11111}{12} = 00$	Practical =	00		
8.Brief Syllabus logic gates. Know course further tea	The cours: vledge of d ches about	e introduce igital syste PLD, Mer	es Boolea ems desig nories an	n algebra, n based or d Logic F	Reduction techn a combinational a amilies.	iques and de and sequentia	emonstrat al logic is	es the desig also impar	gn of rted. This
 i. Understanding the different number systems used in computerized system and ii. Understanding the different codes used to represent the digits and fundamental of arithmetic operation using each number system and codes. iii. Understanding the minimization of logic expression and designing combinational and sequential digital circuits iv. Enabling students to take up application specific sequential circuit to specify the finite state machine and designing the logic circuit. 9.Course Outcomes: On completion of this course, the students will be able to i. Verify and analyze the input/output data of each logic gates. ii. Verify and analyze the input/output data of logic circuits such as adders, counters, coders, etc iii. Apply the digital circuit design concept in developing basic component of computer organization, 									
10 .Unit wise det	tailed cont	ent			x x x				
Unit-1	Number of	f lectures =	= 12	Title of t	the unit: Number	r System and	l Boolean	algebra	
Review of number functions, Prime variables & Quin	Review of number system; types and conversion, codes. Boolean algebra: De-Morgan's theorem, switching functions, Prime Implicants and Essential Prime Implicants definition and simplification using K-maps up to 5 variables & Quine McCluskey method.								
Unit - 2	Number of	f lectures =	= 10	Title of t	t he unit: Combir	national Circ	uits		
Introduction to Logic Gates: AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR and their combinations. Design of adder, subtractors, comparators, code converters, encoders, decoders, multiplexers and de-multiplexers, Function realization using gates & multiplexers.									
Unit - 3	Number of	f lectures =	= 10	Title of t	the unit: Synchro	onous Seque	ntial Circ	uits	
Introduction to Latches and Flip flops - SR, D, JK and T. Design of synchronous sequential circuits – Counters, shift registers. Finite State Machine Design, Analysis of synchronous sequential circuits;, state diagram; state reduction; state assignment with examples. Analysis of asynchronous sequential machines, state assignment, asynchronous design problem.									

Unit 4	Number of lectures = 10	Title of the unit: Programming Device				
Memories: RO	Memories: ROM, RAM, PROM, EPROM, Cache Memories, And PLA, PLD, And FPGA, digital logic families:					
TTL, ECL, CM	IOS.					
11.Brief Descr	iption of self learning / E-learn	ing component: The students will be encouraged to learn using the				
SGT E- Learni	ng portal and choose the relevant	t lectures delivered by subject experts of SGT University.				
The link to th	e E-Learning portal.					
http://sgtlms.c	http://sgtlms.org					
Journal papers;	Patents in the respective field.					
12. Books	12. Books Recommended					
Text Book:						
	i) Mano, Morris. "Digital lo	ogic." Computer Design. Englewood Cliffs Prentice-Hall (1979).				
Reference Boo	ks :					
i) Floyd, T	homas L. Digital Fundamentals,	10/e. Pearson Education India, 1986.				
ii) Kumar, A. Anand. Fundamentals of Digital Circuits 2Nd Ed. PHI Learning Pvt. Ltd., 2009.						
iii) Malvine	iii) Malvino, Albert Paul, and Donald P. Leach. Digital principles and applications. McGraw-Hill, Inc., 1986.					
iv) Jain, Ra	ajendra Prasad. Modern Digital E	Electronics 3e. Tata McGraw-Hill Education, 2003.				

1. Name	1. Name of the Department : Electrical and Electronics Engineering									
2. C	ourse Na	ame	Digital Electronics	s Lab	L		Т		Р	
3. C	ourse Co	ode			0		0		2	
4.Type of	f	Core	(\style="text-align: center;">(\style="text-align: center;") ()	EAS ()	BSC ()	OE ()		OE ()	
tick mar	use k)									
5 P	к) re-	K	nowledge	of	6 F	requency (use	Even()	Odd	Either	Ever
re	eauisite (if B	Δ^{1}	lgebra	ti	ck marks)	Liven()	(y)	Sem ()	
a	ny)		asic Flectro	nice				()	Sem ()	y Sem
	•			mes						
										0
7. T	otal Nun	nber o	of Lectures,	Tutori	als, Practi	ical (assuming 1	4 weeks of or	he semes	ster)	
Lectures	= 0				Tutorial	s = 00	Practical = 2	28		
8. B	rief Sylla	abus		1 D	1	1 · 1			C 1 ·	,
The cour	se introd	uces I	Boolean alg	ebra, R	eduction t	echniques and o	lemonstrates t	he desig	gn of logic	gates.
Knowled	ge of dig	gital s	ystems desi	gn base	d on com	binational and s	sequential log	ic is als	o imparted	1. This
course fu	course further teaches about PLD, Memories and Logic Families.									
9. L	earning	object	tives:		-			_	_	
i. 	Unders	standir	ng the differ	ent num	ber systen	ns used in compu	uterized system	n and co	odes.	1
11.	To rep	resent	the digits a	and fund	damental (of arithmetic op	eration using	each nu	mber syste	em and
	Unders	tandir	ng the minin	nization	of logic	expression and d	lesigning com	hination	al and sea	uential
111.	digital	circui	ts	mzanon	of logic v	expression and c	com com	omation	iai anu seq	uciitiai
iv.	Enabli	ng stu	dents to tal	ke up a	pplication	specific seque	ntial circuit to	specif	v the finit	e state
	machin	ne and	designing th	ne logic	circuit.	1 1		1.		
10. C	ourse Ou	utcom	es: On com	pletion of	of this cou	rse, the students	will be able to)		
i. V	erify and	l analy	ze the input	/output	data of ea	ch logic gate				
ii. V	erify and	l analy	ze the input	/output	data of lo	gic circuits such	as adders, cou	inters, c	oders, etc.	
iii. A	pply the	digita	l circuit desi	gn conc	ept in dev	eloping basic co	mponent of co	omputer	organizati	on,
iv. A	pply the	digita	l circuit desi	gn conc	cept in dev	eloping basic pr	ojects or expen	riments.	00	1
11 .Sr.				LIST OI	Experim	ents			CO covere	a
NO.										
1	Intro	oducti	on to digital	electron	nics lab- n	omenclature of c	ligital ICs,		i	
	specifications, study of the data sheet, gates using TTL ICs concept of									
	Vcc an	d grou	ind, verifica	tion of t	he truth ta	bles of logic gat	es using TTL			
2	Impler	nentat	ion of the gi	ven Bo	olean func	tion using logic	gates in both		i	
			U	SOP as	nd POS fo	rms	-			
3	Verific	ation	of state table	s of RS	, JK, T an	d D flip-flops us	ing NAND &	1	ii	
-				N	OR gates.	r r vs	<i> </i>			
		NUK gates.								

4	Implementation and verification of Decoder/De-multiplexer and Encoder using logic gates	ii
5	Implementation of 4x1 multiplexer using logic gates.	ii
6	Implementation of 4-bit parallel adder using 7483 IC	ii
7	Design, and verify the 4-bit synchronous counter	iii
8	Design, and verify the 4-bit asynchronous counter	iii
9	Static and Dynamic Characteristic of NAND and Schmitt-NAND gate(both TTL and MOS)	iv
10	Study of Arithmetic Logic Unit	iv

1.	Name of the Department: Electrical and Electronics Engineering								
2.	Course	Electrical		L		Τ		Р	
	Name	Technology							
3.	Course			3		0		0	
	Code								
4.	Type of C	Core ($$)	EAS ()	BSC ()	OE ()		OE ()	
	Course								
	(use tick								
	mark)							1	
5.	Pre-	Physics and		6. Free	quency (use tick	Even	Odd	Either	Every
	requisite (if	Mathematics a	at +2	mar	ks)	0	(🗸)	Sem	Sem
	any)	or Equivalent	Level					0	0
								~	Ň
7.	Total Number	er of Lectures,	Tutori	als, Practi	cal (assuming 14	weeks of	one se	mester)	
Lec	tures = 42			Tutorial	s = 0	Practic	cal = 00		

8. Brief Syllabus

Electrical Technology is a field of engineering that deals with the study and applications of laws and theorems in electrical and electronic systems. The course covers the analysis of electrical, analog and digital electronic circuits. Upon completion, students should be able to deal with the various devices and able to construct the circuits for given specification, and also able to analyze and troubleshoot designed electronic circuits using related equipment.

9. Learning objectives:

This course gives an idea to students about analyzing and solving different electrical and electronic circuits by applying different laws and theorems. The objectives are:

- i. To prepare students to know the characteristics of different semiconductor devices
- **ii.** Explain the fundamental principles necessary for the analysis and design of analog integrated circuits at transistor level.
- **iii.** Explain the fundamental principles necessary for design of analog integrated circuits at transistor level.

10. Course Outcomes (COs):

On completion of this course, the student should be able to:

- **i.** Understanding various theorems.
- **ii.** Apply theorems to solve different electrical circuits.
- **iii.** Identify different electronic devices.
- **iv.** Apply subject knowledge and solve electronic device problems.

11. Unit wise detailed content

Unit-1	Number of lectures = 10	Title of the unit: DC Network Laws and Theorems

Concepts of network, Active and passive elements, Ohm's law and its limitations, Kirchhoff's laws, Nodal and Loop methods of analysis, Star to Delta & Delta to Star transformation.

Thevenin's theorem, Norton's theorem, Superposition theorem, maximum power transfer theorem, Millman's theorem.

Unit - 2	Number of lectures = 10	Title of the unit: Single Phase AC Circuits

Sinusoidal signal, Instantaneous and peak values, RMS and average values, crest and peak factor, Concept of phase, representation-polar & rectangular, exponential and trigonometric forms, behaviors of R, L and C components in A. C. circuits.

Series and parallel A.C. circuits, Concept of active and reactive power, power factor, series and parallel resonance, Q factor, cut-off frequencies and bandwidth.

Unit - 3	Number of lectures = 12	Title of the unit: 3-Phase Circuits, Magnetic Circuits &
		Single Phase Transformers.

Three Phase A.C. Circuits, Magnetic Circuits & Transformer: Three phase system and its necessity and advantages, Balanced supply and balanced load, Line and phase voltage/current relations, Three-phase power and its measurement by two Wattmeter method.

Magnetic Circuits: Magnetic Effects of Electric Current; Magnetization Characteristics; Electromagnetic, Induction and Self and Mutual Inductance; Hysteresis and Eddy Current Losses.

Introduction to different Electrical measuring Instruments i.e. Wattmeter, Ammeter, voltmeter and Energy meter

Single Phase Transformers: Construction, Ideal Transformer, Transformer under No-Load and Loading Conditions, Phasor diagram under different Load conditions, Equivalent Circuit of Transformer, O.C and S.C test on transformer, Voltage Regulation Efficiency of a transformer.

Unit - 4	Number of	Title of the unit: DC Machines, 3-Phase induction
	lectures = 10	Motor and Synchronous Machines

DC machines: Construction, EMF Equation, Torque Equation, Circuit Model – Generating and Motoring Modes. Armature Reaction, Methods of Excitation, Characteristics of DC Motors, Speed Control of Shunt Motor (Field and Armature Control), DC Motor Starting, Application of DC Motors.

Three Phase Induction Motor: Types, Principle of operation, Slip-torque characteristics, Applications

Synchronous Machines: Construction, Three Phase Synchronous Machines: Principle of operation of alternator and synchronous motor with applications.

12. Brief Description of self-learning / E-learning component

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

13. Books Recommended:

TEXT BOOKS:

i) Basic Electrical Engineering (2nd Edition), Kothari, TMH.

REFERENCE BOOKS:

i) Basic Electrical Engineering", S N Singh; Prentice Hall International.

- ii) Electrical technology, (Volume I, II), B L Theraja& A K Theraja, S. Chand & Company.
- iii) Electric Machines, I.J. Nagrath and D.P. Kothari, Tata McGraw-Hill Publishing Company Limited.
- iv) Electrical and Electronics Technology, Edward Hughes; Pearson Education.

1. Name	of the De	partment : Elec	trical an	d Electron	ics Engineering					
2.Course	e Name	Electrical Technolog laborator	gy v	L		Т			Р	
3.Course	Code		<u>J</u>	0		0			2	
4. Type o Course (t	of (use k)	Core (√)	EAS ()	BSC ()	OF	ΕO		OE ()	
5. Pi re ar	re- equisite (if ny)	Physics Mathematics = Equivalent Le	and at +2 or vel	6. Fi tio	E	ven ()	$\begin{array}{c} \text{Odd} \\ (\sqrt{)} \end{array}$	Either Sem ()	Ever y Sem ()	
7. T	otal Numl	ber of Lectures	Tutori	als, Practi	cal (assuming 1	4 week	s of or	ne semes	ster)	
Lectures	= 0			Tutorials	s = 00	Pract	ical =	28		
 8. Bi Electrical and theor digital electrical 9. La This cour electronic 10. Carte 	 8. Brief Syllabus Electrical Technology Laboratory is a field of engineering that deals with the study and applications of laws nd theorems in electrical and electronic systems. The course covers the analysis of electrical, analog and ligital electronic circuits. 9. Learning objectives: This course gives an hand on practice to students about analyzing and solving different electrical and electronic circuits by applying different laws and theorems. The objectives are: i. To design and study the characteristics of different semiconductor devices ii. Explain the fundamental principles necessary for the analysis iii. To design of analog integrated circuits at transistor level. 									
	i. Unde	erstanding vario	us theor	ems.						
j	ii. App	ly theorems to so	olve diff	erent electi	rical circuits.					
i	ii. Iden	tify different ele	ctronic o	devices.						
i	iv. Apply subject knowledge and solve electronic device problems.									
11 .Sr. No.			List of	Experime	nts				CO covere	d
1	То	o study and verif	y Kirch	hoff's Volt	age and Current	Laws.			i	
2		To study	and ver	ify Theven	in's theorem.				i	
3	To study and verify Norton's theorem. ii									

4	To study and verify Superposition theorem.	ii
5	To study and verify Maximum power transfer theorem.	ii
6	To study frequency response of RLC series circuit and find out its quality factor and resonance frequency.	ii
7	To study frequency response of RLC parallel circuit and find out its quality factor and resonance frequency.	iii
8	To study O.C and S.C tests on transformer.	iii
9	To study various type of meters.	iv
10	To perform direct load test of a transformer and plot efficiency v/s load characteristics.	iv
11	To perform direct load test of a DC shunt generator and plot load voltage v/s load current curve.	iv
12	To study the working of DC machines	iii

1. Name of the	1. Name of the Department- Electrical & Electronics Engineering								
2. Course Name Signal and System		L		Т		Р			
3. Course Code			3	0		0			
4. Type of	Core (()	EAS ()		BSC ()	OE ()		OE ()	
Course (use tick									
mark)									
5. Pre-requisite	if	Engineeri	ng	6. Freq	uency (use	Even	Odd	Either	Every
any)		Mathemat	ics-II	tick	x marks)	(□)	(√)	Sem()	Sem
									(2)
7. Total Numbe	er of L	ectures, Ti	utorials,	Practica	al (assuming 14	weeks of	one sem	lester)	
Lectures = 42				Tutori	als = 0	Practica	al = 0		
0 0 D	•								

8. Course Description

This subject is about the mathematical representation of signals and systems. The most important representations we introduce involve the frequency domain - a different way of looking at signals and systems, and a complement to the time-domain viewpoint. Indeed engineers and scientists often think of signals in terms of frequency content, and systems in terms of their effect on the frequency content of the input signal.

9. Learning objectives:

The students will learn and understand

- i) Determination of system response for a signal.
- ii) Fourier transform techniques as tool for signal analysis.
- iii) Z transform techniques as tool for signal analysis.

10. Course Outcomes (COs):

On completion of this course, the students will be able to

- i) To Demonstrate an understanding of the relation among the transfer function, convolution, and the impulse response,
- ii) To explain the relationship, and using the relationship to solve forced response problems.
- **iii**) Demonstrate an understanding of the relationship between the stability and causality of systems and the region of convergence of their Laplace transforms.
- iv) To explaining the relationship, and using the relationship to determine the stability and causality of systems

11. Unit wise detailed	11. Unit wise detailed content						
Unit-1	Number of Title of the unit: Introduction to Signals & Systems						
	lectures = 12						
Definition, types of sig	nals and their repre	sentations: continuous-time/discrete-time, periodic/non-					
periodic, even/odd, ene	ergy/power, determi	nistic/ random, one dimensional/ multidimensional;					
commonly used signals	s (in continuous-tim	e as well as in discrete-time): unit impulse, unit step, unit					
ramp (and their inter-re	elationships), expon	ential, rectangular pulse, sinusoidal; operations on					
continuous-time and di	screte-time signals	(including transformations of independent variables)					
Unit – 2	Number of	Title of the unit: Laplace-Transform (LT) and Z-					
	lectures = 10	transform					

One-sided LT of some common signals, important theorems and properties of LT, inverse LT, solutions of differential equations using LT, Bilateral LT, Regions of convergence (ROC), One sided and Bilateral Z-transforms, ZT of some common signals, ROC, Properties and theorems, solution of difference equations using one-sided ZT, s- to z-plane mapping.

Unit – 3	Number of	Title of the unit: Fourier Transforms (FT)
	lectures = 10	

Definition, conditions of existence of FT, properties, magnitude and phase spectra, Some important FT theorems, Parseval's theorem, Inverse FT, relation between LT and FT, Discrete time Fourier transform (DTFT), inverse DTFT, convergence, properties and theorems, Comparison between continuous time FT and DTFT.

Unit – 4	Number of	Title of the unit: Linear Time Invariant
	lectures = 10	

Continuous Time Systems: Linear Time invariant Systems and their properties. Differential equation & Block diagram representation, Impulse response, Convolution integral, Frequency response (Transfer Function), Fourier transforms analysis. Discrete Time System: Difference equations, Block diagram representation, Impulse response, Convolution sum, MATLAB tutorials.

12. Brief Description of self-learning / E-learning component

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

13. Books Recommended

Text Books

i) P. Ramakrishna Rao, 'Signal and Systems' 2008 Ed., Tata McGraw Hill, New Delhi

Reference Books:

\

- i) "Signals and Systems: Continuous and Discrete" by R F Ziemer and D R Fannin
- ii) "Signals and Systems : Pearson New International Edition" by Alan V Oppenheim and S Hamid

1. Name	e of the Dep	artment : Elec	trical an	d Electron	ics Engineering					
2.Course	e Name	Object O Programm	riented	L		Т			Р	
		Lab	8							
3.Course	e Code			0		0			2	
4. Type	of Co	ore (√)	EAS ()	BSC ()		OE ()		OE ()	
Course ((use									
UCK Mar	'K) Pre-	NA		6 F 1	requency (use		Even ()	Odd	Fither	Ever
r	equisite (if	1111		ti	ck marks)			(γ)	Sem ()	
a	ny)				,			()	Sem ()	Sem
										0
7. T	<u>Cotal Number</u>	er of Lectures,	Tutoria	als, Practi	cal (assuming 1	14 w	eeks of or	ne semes	ster)	
Lectures	$\mathbf{s} = 0$			Tutorials	s = 00	Pı	actical =	28		
8. B	Brief Syllabu	15								
Electrica	l Technolog	y Laboratory is	s a field	of enginee	ering that deals	with	the study	and app	plications of	of laws
and theory	rems in elec	ctrical and elec	tronic s	ystems. Th	ne course covers	s th	e analysis	of elect	rical, analo	og and
digital el	ectronic circ	cuits.								
9. L	earning obj	jectives:								
i. '	To understar	nd fundamental	s of pro	gramming	such as variable	es, c	onditional	and iter	ative exect	ition,
;; ¹	methods,etc.	nd fundamental	s of obj	act oriente	d programming	in I	ava inclu	ling def	ining class	20
11.	invoking me	ethods, using cl	ass libra	ries.etc	a programming	111 J	ava, menu	ing den	lilling Classe	-5,
iii.	To have the	ability to write	a comp	uter progra	m to solve spec	ified	d problems	5		
10. C	Course Outc	omes: On com	pletion of	of this cour	rse, the students	wil	l be able to)		
i.	Understand	the features of	C++ sup	porting ob	ject oriented pro	ogra	mming.			
ii.	Understand	the relative me	rits of C	++ as an o	bject oriented pr	rogr	amming la	inguage.		
iii.	Understand f	th features of C	2++ supp	porting obj	ect oriented prog	grar	nming.			
1V. 11 Sr		the relatives m		\mathbf{F}	object oriented p	brog	ramming	anguage	CO covoro	d
11 .51. No			LISU	Experime	1115					u
100										
1	Simple C++ programs to implement various control structures.									
	a. if statement b. switch case statement and do while loop									
	c. for loop d. while loop									
2	Programs	to understand	structur	e &unions.					1	
3	Programs	to understand	nointera	rithmetic					ii	
4	Functions	& Recursion	ronnond						ji	
5	Inline func	ctions							ii	
6	Programs to understand different function call mechanism. ii									

	a. call by reference b. call by value	
7	Programs to understand storage specifiers	iii
8	Constructors & destructors.	iii
9	Use of -this pointer using class	iv
10	Programs to implement inheritance and functionoverriding.	iv
	a. multiple inheritance –accessSpecifiers	
	b. hierarchical inheritance – function overriding /virtualFunction	
11	Programs to overload unary & binary operators as member	iv
	function & non member function.	
	a. unary operator as member function	
	b. binary operator as non member function	
12	Programs to understand friend function & friend Class.	iii
	a. friend Function b. friend class	
13.	Create a C++ program which takes two distances in inch-feet system and	ii
	stores in data members of two structure variables. Then, this program	
	calculates the sum of two distances and displaysit.	

Second semester

1. Name of the Depa	artment- Electrical an	nd Electronics Eng	gineering	2			
2. Course Name	Applied	L	Т		Р		
	Mathematics				0		
3. Course Code		3	U		0		
4. Type of Course (use tick mark)	Core ()	EAS ()		BSC (√)	OE ()	OE ()
5. Pre-requisite (if	+2 math	6. Frequency	Even	Odd		Either	Every
any)		(use	(√)	0		Sem()	Sem ()
		tick marks)	. 14	1 6			
7. Total Number of	Lectures, Tutorials,	Practical (assum	$\frac{110}{14}$	weeks of o	ne seme	ster)	
$\frac{1}{8} C_{ourse} C_{ourse}$		1 utorials = 0	Practi	cal = 0			
8. Course Description	oil ad mothematics and th	oir applications li	ka diffa	rontial agu	untions r	notriv o	nd sot
theory recursive pro	gramming multiple in	ntegrations and I a	nlace tr	ansform b	e the too	liau ix a 1 for sol	lu set
real life problems in	engineering & science	es. Enhance and d	evelop t	he ability	of using	the lang	guage of
mathematics in analy	zing the real world pr	oblems of science	es and er	ngineering			5
9. Learning Object	tives:						
i. To provide ba	asic and theoretical co	mpetencies that is	majorly	y used in C	Compute	r Scienc	ce. To
help students	understand and appre	ciate the basic ma	themati	cal knowle	edge whi	ch is	
fundamental	to Computer Science.				U		
ii. To aware stud	dents about computer,	its functions and	utilities.				
iii. To promote the	he development of con	mputer-related ski	lls for ii	nmediate	applicati	on to ot	her
curricular are	as.						
iv. To facilitate t	he development and a	application of prob	lem-sol	ving skills	s in stude	ents.	
10. Course Outcom	es (COs):						
The students	will be able to:-						
i. Derive mathem	natical models of phys	sical systems.					
ii. Solve different	tial equations using ap	ppropriate method	s.				
iii. Present mather	matical solutions in a	concise and inforr	native n	nanner.			
iv. Solve linear sy	stem of equations by	direct, iterative m	ethods a	and determ	ine eige	n values	s and
eigen vectors	of given square matri	x also inverse of t	he matr	ix using C	ayley Ha	amilton	theorem.
11. Unit wise detaile	ed content						
Unit-1	Number of lectures =	= 10 Title of t	the Unit	t: Matrice	S		
Matrices additions a	nd scalar multiplicati	on matrix multin	lication	Linear su	stem of	equatio	ns rank
of a matrix, determi	nants inverse of mat	rix. Gauss elimin	ation at	nd Gauss	Jordan N	Methods	E-row
methods. Caley Him	alton theorem, Eigen	value & Eigen vec	tor.				, _ 10
J	N	10 5.4	6 41	T T •4	r	T	<u> </u>
Unit - 2	Number of lectures	= 12 Intle	of the	Unit:	Laplace	Tran	storms&
			ation		1	<u> </u>	
Laplace transform &	inverse laplace transi	form: Solution bas	sed on L	Jefinition,	change	of scale	property
Convolution th And	application on LT &	Inverse LT		uve, LI	by mul	upiicati	on by t
Convolution in And	upplication on D1 &						
Unit – 3	Number of lectures	= 10 Title of	the Uni	it: Calcub	15		
				in Suituit	141.J		

Taylor & Maclaurin series for one and two variables (without proof),Partial derivative, Multiple integral: change of order of integration, Double integration in Cartesian & polar form. Triple integration & Beta and Gamma function.

Unit – 4	Number of lectures = 10	Title	of	the	Unit	:Differential	equation	&its
		applic	atio	n				

Exact differentia equation, Application of DE of first order and first degree to simple electric circuits, Linear differential equation of 2nd and higher order., Method of variation, Cauchy's and Lagrendre's linear equations, Application of linear differential equations to electric circuits.

12. Brief Description of self-learning / E-learning component

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

13. Books Recommended:

Text Books

i) N. P. Bali and Manish Goyal, A text book of engineering mathematics, Laxmi publication, 2010 **Reference Books**

i) H.K.Dass, A text book of engineering mathematics, S.Chand& Company LTD

ii) B.S.Grewal, A text book of engineering mathematics, Khanna publication.

iii) Elements of Engineering Mathematics, Liu, Tata Mac Graw Hills.

iv) Kolman B, Busby R.C. and Ross S., Engineering Mathematical Structures for Computer Science, Fifth Edition, Prentice Hall of India, New Delhi, 2006.

1. Name of the Depar	tment- Mechanical	Engineering				
2. Course Name	Design Thinking	L	T P			
3. Course Code	8	3	0		0	
4. Type of Course (us	Type of Course (use tick mark)Core ()PE ()BSC ()OE ()					EAS (✓)
5. Pre-requisite (if	NA	6. Frequency (use	Even Odd Either Eve			
any)		tick marks)	(√)	0	Sem()	Sem ()
7. Total Number of L	ectures, Tutorials,	Practical (assuming 14	weeks of	f one sem	ester)	
Lectures = 42		Tutorials = 0	Practic	al = 0		
8. Course Description	l					
Design thinking is a sy	stematic method of	solving problems. This r	nethod is	unique tl	hat it star	ts and
ends with humans. The	e design thinkers sta	rt by observing, interview	ving or ju	ıst plain e	experienc	ing a
situation. Then, they p	roceed to improve th	he situation of the humar	is by solv	ing probl	ems for t	hem.
This course familiarize	es you with the conc	ept of "innovation" and t	the journe	ey of a de	sign idea	from the
identification of a prob	lem to a final soluti	on that has a positive im	pact on a	large con	nmunity	of users.
9. LearningObjectiv	es:			· 1	1	1 4 1 4
1) To expose the st	udent with state-of-	the-art perspectives, idea	s, concer	ts, and sc	olutions r	elated to
the design and	execution of innova	tion driven projects using	g design	thinking p	principles	5.
II) To develop an a	avance innovation a	ind growth mindset form	of proble	em identii	ication a	na
reiraming, iore	sight, hindsight and	insight generation.			4	
III) I o prepare the n	nindset and disciplin	ie of systemic inspiration	ariven t	y an educ		losity
aimed find new	sources of ideas, no	ew connections and new	models s	pecially of	butside th	leir
	ig atmosphere.	ale and valariant innerration	on nucioo	t/ahallana		
10 Course Outcomes	$(\mathbf{CO}_{\mathbf{S}})$. The student	s will be able to:	on projec	t/chaneng	ge.	
i) Understand the	concepts of design	thinking approaches				
i) Create design th	inking teams and co	uninking approaches.	ssions			
iii) A poly both critic	al thinking and des	ign thinking in parallel to	ssions. Ssions n	rohlems		
iv) Apply some des	ign thinking concen	ts to their daily work		obients.		
11 Unit wise detailed	content	ts to their during work.				
Unit-1	Number of	Title of the unit. Introd	luction t	o Design	Thinkin	σ
	lectures = 10		iucuon i	o Design		5
What Is Design Think	ing? Preparing You	r Mind for Innovation. E	mpathize	Phase: C	ustomer.	Journey
Mapping, Analyze Pha	ase: 5-Whys and Ho	w might we Idea Gene	eration, F	ree Brain	storming	&
Make/Test Phase: Prot	otype, Experimenta	tion.	,		6	
Unit – 2	Number of	Title of the unit: Innov	ation by	Design		
	lectures = 10		·	C		
The Seven Concerns,	Design Thinking ar	nd Collaboration, Challe	nges to I	nnovation	n, Unders	standing

The Seven Concerns, Design Thinking and Collaboration, Challenges to Innovation, Understanding Users, Arriving at Design Insights, Prototyping for User Feedback, The First C: The Cause, Crossing the first Pitfall, Trial and Error, User Feedback for Development, New users, New needs to meet, Knowing the Context.

Unit – 3	Number of	Title of the unit: Context, Comprehension, Check and
	lectures = 11	Cause

The Second C: The Context, The Basic Need, Ingenious Attempt, Further Insights, The Working Rig, Concepts Generation, Experiencing the Product, Refinements.

The Third C: The Comprehension, Understanding Constraints, Positioning the Product, Exploring Possibilities, More Experiment, Understanding the Technology, At the 2nd Valley of Death, Finishing Touches.

The Fourth C: The Check and Cause, the product, the Users and the Context, The Prototyping, User Needs, The Crucial Step Missed.

Unit - 4Number of lectures = 11Title of the unit: Conception, Crafting and Connection								
The Fifth C: The Conception, Synchronic Studies, One Product, many problems, Concept Clusters, From Idea to Product, Prototyping, Material and Technologies, Collaborative Efforts. The Sixth C: The Crafting, Recap, The Manufacturing Challenge, The User Feedback, The Iterative Process. The Seventh C: The Connection, The Seed for Innovation, Pinnacle for Innovation, The Innovation Timeline, The Innovation Champions, The Innovation Domain, The Innovation								
12. Brief Description of self-learning / E-learning component								
The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant								
lectures delivered by subject experts of SGT University.								
The link to the E-Learning portal.								
http://sgtlms.org								
Journal papers; Patents in the respective field.								
13. Books Recommended								
Text Book								
i) Innovation By Design by Chakravarthy, BattulaKalyana, and JanakiKrishnamoorthy, Springer								
India, 2013, ISBN 978-81-322-0901-0								
Reference Books								
i) Innovation by Design: How Any Organization Can Leverage Design Thinking to Produce								
Change, Drive New Ideas, and Deliver Meaningful Solutions by Thomas Lockwood, New								
Page Books, US; 1st edition (28 November 2017), ISBN: 1632651165.								
ii) Innovation by Design by Gerard Gaynor, Amacom, A Division of American Management								
Associ135 West 50th Street New York, NY, United States, ISBN:978-0-8144-0696-0								

1. Name of the Department- Electrical and Electronics Engineering									
2. Course Name	Electronic Devices		L		Т		Р		
3. Course Code			3		0		0		
4. Type of Course (use tick mark)		Core $()$ EAS ()		BSC ()		OE () PE ()			
5. Pre-	Basic Business Studies knowledge		6. Frequency (use		Even	Odd	Either	Every	
requisi			tick marks)		0	0	Sem ()	Sem ()	
anv)									
7. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)									
Lectures = 42 Tutorials = 0			Practical= 0						
8. Brief Syllabus: As a student in the course, you will study the various sub-fields of the discipline including									
digital and analog electronics, electrical power generation, transmission, distribution and utilization, power									
system engineering, electrical machines and drives, control systems, signal processing and power electronics.									
9. Learning objectives:									
The objective of the course is to i) To acquisit the students with the construction, theory and expection of the basic electronic devices such as									
PN junction diode.									
ii) To demonstrate the Bipolar and Field effect Transistors,									
iii) To study Power control devices,									
iv) To study the LED, LCD and other Opto-electronic devices									
10. Course Outcomes (COs):									
Upon completion of this course, graduates will be able to:									
i) Understand the V-I characteristic of diode, UJT and SCR									
ii) Information about the equivalence circuits of transistors iii) Operate the basic electronic devices such as DN impation diode. Director and Field effect Transisters									
iv) Analysis the Power control devices, LED LCD and other Opto-electronic devices									
11. Unit wise detailed content									
Unit-1	Number of lectures = 10		Title of the unit: PN Junction:						
Formation of PN junction, Depletion region, Junction capacitance, Diode equation (no derivation) Effect of									
temperature on reverse saturation current, V - I characteristics and simple applications of i) Junction diode, ii)									
Zener diode, iii) Tunnel diode and iv) Varactor diode.									
Unit – 2	Number of lectures $= 12$		The of the unit: Bipolar Junction Transistor(BJ1)						
PNP and NPN transistors, current components in BJT, BJT static characteristics (Input and Output), Early effect,									
CB , CC , CE configurations of transistor and bias conditions (cut off, active, and saturation regions), CE									
configuration as two port network, h – parameter model and its equivalent circuit. Determination of h – parameters from the characteristics. Load line analysis (AC and DC). Transistor Biasing – Fixed and self bias									
Unit - 3	Number of lectures = 10	Title of the unit: Field Effect Transistor (FET)& Uni							
	Junctio			action Transistor (UJT):					
Construction and working of JFET, output and transfer characteristics of FET, Determination of FET parameters. Application of FET as Voltage variable resistor. Advantages of FET over BJT. MOSFET :: construction and working of enhancement and depletion modes , output and transfer characteristics Application of MOSFET as a switch . Construction and working of UJT and its Characteristics. Application of UJT as a relaxation oscillator.

	0	11	
Unit - 4	Number of lectures = 10	Title of the unit:	Silicon Controlled Rectifier (SCR) &
		Photo electronic Dev	vices:

Construction and working of SCR. Two transistor representation, Characteristics of SCR. Application of SCR for power control. : Construction and Characteristics of Light Dependent Resistor (LDR), Photo voltaic Cell, Photo diode, Photo transistor and Light Emitting Diode(LED).

12. Brief Description of self-learning / E-learning component

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures

delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

13. Books Recommended

Text Books

i) Electronic Devices and circuits-Millman and Halkias,(TMH)

Reference Books:

- i) Principles of Electronics-V.K.Mehta & Rohit Mehta
- ii) Electronic Devices and Circuits-Allen Moltershed(PHI)
- iii) Basic Electronics and Linear Circuits-Bharghava U
- iv) Electronic Devices and Circuits-Y.N.Bapat
- v) Electronic Devices and Circuits-Mithal.
- vi) 7) Experiments in Electronics-S.V.Subramanyam.

1. Name of	the Department	- Electrical a	nd Elect	ronics Engineering					
2. Course N	Name	Electronic Device Lab		L	Т		Р		
3. Course (Code			0	0		2		
4.Type of (mark)	Course (use tick	Core (√)	EAS ()	BSC ()	OE ()	PE	2.0		
5 Pro-root	isita	NA		6 Frequency (use	Even	Odd	Fither	Every	
(if	lisite			tick marks)	$(\sqrt{)}$	\bigcirc	Sem	Sem	
anv)				tick murks)		V	0	0	
7. Total Nu	mber of Lecture	s. Tutorials.	Practic	al (assuming 14 we	eks of a	ne se	mester)	
Lectures =	0	.,,		Futorials = 0	Pract	ical =	= 28	<u>,</u>	
8. Course I	Description		1						
Course int	roduces to Electr	ronic Device	lab; stu	dents will learn to u	ise var	ious s	sub-field	ds of	
the discip	line including o	ligital and	analog	electronics, electr	ical po	ower	genera	tion,	
transmissio	n, distribution an	d utilization,	power	system engineering,	electri	cal m	achines	and	
drives, cont	rol systems, signa	al processing a	and pow	ver electronics.					
10. Lear	ning Objectives:								
i)	To acquaint the	e students with	h the co	nstruction, theory an	d opera	tion c	of the ba	.sic	
	electronic devic	ces such as Pf	N junctio	on diode,					
11) To demonstrate	e the Bipolar a	and Field	a effect Transistors,					
in in	I) TO study Powe	FD I CD and	other O	nto-electronic devic	20				
10 Course	Outcomes (COs	D. On complete	tion of t	bis source, the stude	nto vvill	hash	lator		
i) Unde	Outcomes (COS			LUT and CCD	nts will	be at	ne to:		
1) Unde	erstand the V-I ch	aracteristic of	f diode,	UJI and SCR					
iii) Oper	ate the basic elect	ronic devices	such as	PN junction diode	Rinolar	and F	Field eff	ect	
Trans	sistors	Tome devices	such as	i i gunetion diode, i	Dipolai	and I		cct	
iv) Anal	vsis the Power con	ntrol devices,	LED, L	CD and other Opto-	electron	ic de	vices		
11. S.No	List of Experim	nent	,	1		C	O cove	red	
1.	To draw volt-	ampere cha	racterist	ics of Junction d	iode a	nd i			
	determine the cut	– in voltage	forward	and reverse resistan	ces				
			101.000						
2.	Zener diode V	– I Charac	teristics	– Determination	of Zen	er iii	i		
	breakdown voltag	ge.							
3.	3. Voltage regulator (line and load) using Zener diode.								
4.	BJT input and	output char	acteristi	ics (CE configurat	ion) ai	ndiii			
	determination of	'h' parameter	s.						
5.	FET – Characteri	stics and dete	rminatio	on of FET parameter	s.	ii	i		
6.	UJT characteristi	cs – determin	ation of	intrinsic standoff rat	io.	ii			
7.	UJT as relaxation	oscillator.				ii	ii		
8.	Characteristics of	LDR/Photo	diode/Pl	noto transistor/Solar	cell.	iv	,		
9.	Characteristics of	Photo diode				iv	,		
10.	Characteristics of Solar cell. iv								

1. Na	ame of the Do	epartment : Electr	rical and	l Electro	1. Name of the Department : Electrical and Electronics Engineering						
2.Course	e Name	Analog and D	Digital	L		Т		Р			
		Communica	tion								
3.Course	e Code			3		0		0			
4. T	vpe of Cours	e (use tick mark)		Core ((\mathbf{v})	EAS ()	BSC ()	OE ()	OE ()		
5. P	re-	Analog and	Digital	6.	Frequen	Even	Odd	Either	Every		
r	equisite (if	Electronics	0		cy (use	()	0	Sem ()	Sem ()		
a	ny)				tick		\sim	~ ()	~		
					marks)						
7. T	otal Number	of Lectures, Tuto	orials, F	Practica	l (assuming	g 14 weeks o	of one sen	nester)			
Lectures	= 42		Tutori	als = 0	0	Practical =	00				
8. Brief	Syllabus: Ir	n analog commun	ication a	analog	signal is us	ed for infor	mation tra	ansmission	. Analog		
comm	nunication use	es analog signal w	hose an	nplitude	varies cont	inuously wit	h time fro	om 0 to 10	0. Digital		
comm	nunication use	es digital signal w	hose am	plitude	is of two le	evels either I	Low i.e., () or either	High i.e.,		
1.											
9. Lear	ning objectiv	es:		11 /	c 1.C		1 .1 1	• ,			
1) 1	o give a com	prenensive exposi	ure to a	II types	of amplifie	ers construct	ed with d	iscrete coi	mponents		
SI SI	$\frac{1}{2}$	nd FEIS.		11 /	C '11 (1 41 1	• ,			
II) 1	o give a com	prenensive exposi	ure to a	II types	of oscillato	ors construct	ed with d	iscrete coi	mponents		
SI	uch as BJTs ai	nd FETS.	. 1. 1.		•,						
III) T	o develop a st	trong basis for buil	lding lin	ear circ	uits.						
IV) T	o develop a st	trong basis for digi	ital integ	grated ci	ircuits.		1 /				
10. C	ourse Outcon	mes: On completion	on of the	s course	e, the studen	its will be at	ole to				
		Is course, students	will be			1			•		
1) U	ifforent perom	Terent blocks in c	commun	ication	system and	now noise	arrects co	mmunicati	ion using		
ם (נו	listinguish be	tween different ar	nnlitude	modul	lation schen	nes with the	ir advant	anes disa	lvantages		
	nd application		npinuuu	modul	ation schen	iles with the		ages, uisa	ivantages		
iii) A	nalyze gener	ation and detective	on of I	FM sig	nal and con	mparison be	etween ar	nplitude a	nd angle		
m	odulation sch	iemes.				r					
iv) D	escribe and	determine the pe	erformar	nce of	line codes	and metho	ds to mit	igate inter	r symbol		
in	nterference										
v) re	ecognize diffe	erent layers of O	SI used	in sys	tems and n	etworking,	choose d	ifferent m	odulation		
te	echniques and	select the right me	ethod of	error de	etection and	error correc	tion for da	ata transmi	ssion.		
11. U	nit wise deta	iled content									
Unit-1	Number of	lectures = 10	Title o	of the u	nit: Introdu	uction to co	mmunica	tion syster	ns		
T . 1 .	•	<u> </u>		• .•		• .•		1 1 . 1 1	1 1 1 1		
Introduct	tion to comm	unication systems:	: Comm		on, commur	nication syst	ems, Moo	lulation, b	andwidth		
requirem	ent, Noise. Ez	(ternar noise, inter	nai nois	e, noise	calculation	is, noise rigu	ite, noise i	emperatur	e		
Unit - 2	Number of	lectures = 12	Title	of the u	nit: Amplit	ude Modula	ation				
Amplitud	le Modulatior	n: Amplitude modu	ulation t	heory -	- Frequency	spectrum of	f AM wav	e, represei	ntation of		
AM wav	e, Power rela	ation in the AM v	vave, F	requenc	y and Phase	e Modulatic	n: Theory	of Frequ	ency and		
Phase M	odulation: De	escription of the sy	vstems	mather	natical repre	sentation of	FM. Free	uency sne	ectrum of		
Thase would atom. Description of the systems, mathematical representation of TWI, frequency spectrum of											

FM wave, Phase modulation, Intersystem comparison, Noise and FM: Effect of noise on carrier, preemphasis and de-emphasis, other form of interference, comparison of wide band and narrow band FM

Modulation for Digital Signal: ASK, FSK, and PSK: Introduction, modulation and demodulation circuits and waveforms Pulse Modulation: Types, PWM, Introduction to Data And Network Communication: Introduction, Data Communication System, Data Communication Links: Character Codes, Digital Data Rates, Serial Data Formats, Encoded Data Formats, Error Detection & Correction: Introduction, Asynchronous Data Method, Synchronous Data Error Methods, Error Testing Equipment

Unit 4Number of lectures = 10Open System Network Models	
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Open System Network Models: Introduction, Data Topologies, Data Switching, Types Of Networks, The Open System Interconnection (OSI) Architecture, System Network Architecture (SNA), SNA Operating Sessions, Higher Capacity Data Communication: Introduction, Multiplexing Methods, Sampling Theorem, Quantization, Pulse Code Modulation, Delta Modulation, Digital T Carriers, Companding, Codecs, Fiber Optic Communication: Introduction, Basic Concepts of Light Propagation, Fiber Cables, Light Sources, Optical Detectors, Fiber-Cable Losses,

12. **Brief Description of self learning / E-learning component**: The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

Books Recommended

13. Text Books :

i) Haykin Simon, "Communication Systems", 4th Edition, Wiley publication.

Reference Books:

- i) Communication Systems: Analog and Digital by R. P. Singh and B. D. Sapre, Tata-McGraw Hill
- ii) Modern Digital and Analog Communication Systems (4th Edition) by B. P. Lathi and Zhi Ding, Oxford University Press

iii) Electronic Communication Systems by Keddedy and Davis, Tata Mc-Graw Hill Publication

iv) Introduction to Data and Network Communications by Michael A. Miller, Cengage Learning

1. Na	Name of the Department : Electrical and Electronics Engineering									
2.Cou	rse Name		Ana	log and	L	0	Т		Р	
			digit	al						
			com	municatio						
			n lat)						
3.	Course Code				0		0		2	
	-			a ch						
4.	Type of Courtiely mark	rse (us	e	Core (v)	EAS ()	BSC ()	OE ()		PE ()	
5	UCK Mark)	NIA			6 Erecor	onov (uco	Evon	044	Fither	Ever
5.	requisite (if	INA			0. Flequ	6. Frequency (use		Ouu		Lvei
	anv)					ai (15)	(v)	0	Sem ()	y C
	any)									Sem
										0
7.	Total Numbe	r of L	ectur	es. Tutori	als, Practical (assuming 1	4 weeks of or	l ne seme	ster)	
Lectur	res = 0		cerui		Tutorials = (0	Practical =	28	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
8.	Brief Syllabu	IS								
In ana	log communic	ation a	inalog	g signal is	used for inform	nation trans	smission. Ana	alog con	nmunicatio	n uses
analog	signal whose	ampli	tude	varies cont	tinuously with	time from	0 to 100. Dig	gital con	nmunicatio	n uses
digital	signal whose a	amplitu	ide is	of two lev	els either Low	.e., 0 or eith	ner High i.e., 1	1.		
0	Loomingohi		~.							
9. 5)	Learning obj	ective	s:		to all types of	amplifiance	constructed v	with dia	anata aanan	ononto
1)	TO give a con			e exposure	to all types of	ampimers	constructed v	vitin dise	crete comp	onents
	Such as BJ1s		215.		40 all 47770 a af		a a water a stard a			~ ~ ~ ~ * * *
11)	To give a con	nprene and FE		e exposure	to all types of	oscillators	constructed v	vitit dise	crete comp	onents
;;;)	To develop a	allu FL strong	basis	for buildir	ng linear circuit	c				
iv)	To develop a	strong	basis	for digital	integrated circl	s. 1its				
10	. Course Outc	omes:	On c	ompletion of	of this course. t	he students	will be able to)		
i)	Understand d	ifferen	t blo	cks in com	munication sys	stem and ho	ow noise affe	cts com	munication	using
,	different para	meters	•		2					e
ii)	Distinguish b	etweer	n diff	erent ampl	itude modulati	on schemes	with their a	dvantag	es, disadva	intages
	and applicatio	ons.					•		1. 1 1	
111)	Analyze gene	eration	and	detection	of FM signal	and comp	arison betwe	en amp	litude and	angle
iv)	Recognize di	fferent	5. • 1914	ors of OSI	used in system	ns and net	vorking cho	ose diff	erent mod	ulation
10)	techniques an	d selec	t the	right metho	od of error dete	ction and er	ror correction	for data	a transmiss	ion
11 .Sr	•			List of	Experiments			(CO covere	d
No.					•					
1		To stu	dy A	mplitude M	Iodulation and	Demodulatio	on.		ii	
			-	_						
2		To stu	dy Fr	requency M	lodulation and l	Demodulation	on.		iii	
3	To Study	and ol	bserv	e the perfor	rmance of diffe	rent types of	f line codes.		iv	
4	To S	Study a	and Po	erform sam	pling theorem a	and reconstr	uction.		iii	
5		To per	form		1 Transmission	and Recent	ion		i	
5	•	. To perform TDM-PCM Transmission and Reception.								

6	To study Delta Modulation.	iii
7	To study and observe the performance of An-adaptive Delta	iii
	modulator/De-modulator circuits	
8	Study and observe the performance of Digital carrier system—ASK.	iii
9	To Study and observe the performance of Digital carrier system—FSK.	iii
10	To Study and observe the performance of Digital carrier system—PSK.	iii
11.	To study and perform PAM, PWM, PPM.	i
12. B	rief Description of self-learning / E-learning component	
The stude	ents will be encouraged to learn using the SGT E- Learning portal and choos	e the relevant lectures
delivered	by subject experts of SGT University.	
The link	t to the E-Learning portal.	
http://ga	dime org	

http://sgtlms.org Journal papers; Patents in the respective field.

1.	1. Name of the Department : Electrical & Electronics Engineering							
2.	Course Name	Analog electronic circuits	L	Т		P		
3.	Course Code		3	0 0				
4.	Type of Cour mark)	se (use tick	Core $()$	EAS ()	BSC ()	OE ()	OE ()	
5.	Pre- requisite (if any)	Analog and Digital Electronics	6. Frequency (use tick marks)	Even (√)	Odd ()	Either Sem ()	Every Sem ()	
7.	Total Number	r of Lectures, Tuto	rials, Practical (assuming	g 14 weeks	of one sen	nester)		
Lectu	res = 42		Tutorials = 00	Practical	= 00			
8. Br bia am 9. Le i) ii) iii) iv) 10. Co i) iii) iii) iii) iii)	ief Syllabus: (asing circuits for aplifier circuits aplifiers. arning objective To give a com such as BJTs a To give a com such as BJTs a To develop a s To develop a s To develop a s Durse Outcome Understand the Design BJT ar Analyze transi Understand the circuits.	Dbtain the output cl r transistor amplifie and oscillators for ves: prehensive exposur- and FETs. prehensive exposur- and FETs. strong basis for build strong ba	haracteristics of clipper ar rs & explain the transistor different frequencies. Des e to all types of amplifiers e to all types of oscillators ding linear integrated circu ding digital integrated circu of the course, the student of the course, the student ent types of amplifier, oscill d oscillator circuits. nd oscillator circuits. ifferent types of amplifier,	nd clamper switching. sign and ar constructed constructed its. uits. will be able lator and m	circuits. D Design and nalysis of with discr with discr with discr to ultivibrato	Design and d analyze t FET and M rete compo rete compo r circuits.	compare he power MOSFET nents nents tivibrator	
11	. Unit wise deta	ailed content						
Unit-1	Number of	f lectures = 12	Title of the unit: Introdu	uction to co	ommunica	tion syster	ns	
Small FET a firing	signal amplifier mplifiers, chopp circuits and pov	rs - biasing circuits per stabilized amplit ver supplies.	of BJT and FET transistors fiers, case studies – applica	, analysis a tion of curr	nd design o ent amplif	of BJT and iers in SCF	٤	
Unit -	2 Number of	f lectures = 10	Title of the unit: Amplit	ude Modul	lation			
Large	signal amplifier	rs – analysis and des	sign of class A and class B	power amp	lifiers, clas	ss C and cl	ass	
D amp	blifiers, thermal	considerations, tune	ed amplifiers.					
Unit -	3 Number of	1 lectures = 10	Title of the unit: Modul	lation for E	ngital Sigi	nal		
Feedba input a feedba	ack amplifiers – and output impe ack in dc-dc con	- gain with feedback dances; topologies (verters.	 effect of feedback on ga of feedback amplifiers, cas 	ain stability e studies –	, distortion applicatior	, bandwidt 1 of negativ	h, ⁄e	

Unit 4	Number of lectures = 10	Title of the unit : Open System Network Models
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Oscillators – Barkhausen criterion for oscillation – Hartley & Colpitt's oscillators – phase shift, Wien bridge and crystal oscillators - Clapp oscillator – oscillator amplitude stabilization.

Pulse circuits – attenuators – RC integrator and differentiator circuits – diode clampers and clippers – multivibrators - Schmitt Trigger- UJT Oscillator, case studies – application of UJT oscillator in SCR firing circuits and opto-electronic control circuits.

12. Brief Description of self learning / E-learning component:

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org Journal papers; Patents in the respective field.

13. Books Recommended:

Text Books:

Jacob Millman, 'Microelectronics', McGraw Hill, 2nd Edition, Reprinted, 2009.

Reference Books:

- i) David A Bell, 'Fundamentals of Electronic Devices and Circuits', Oxford University Press, Incorporated, 2009.
- ii) Allen Mottershead, 'Electronic Devices and Circuits-An Introduction', PHI, 18th Reprint, 2006.
- iii) Thomas L. Floyd, David M. Buchla, 'Electronics Fundamentals', Pearson Prentice Hall, 7th Edition, 2010.
- iv) Robert.L.Boylestad, 'Electronic Devices and Circuit Theory', Pearson, 10th Edition, 2009.
- v) Sedra Smith, 'Microelectronic Circuits', Oxford University Press, 6th Edition, 2010.
- vi) Jacob Millman and Christos C. Halkias, 'Integrated Electronics: Analog and Digital Circuits and Systems', 2nd Edition, Tata McGraw Hill Education, 2011.

1. Name	e of the D	epart	ment : I	Electr	rical an	d Electron	ics Engineer	ring					
2.Course	e Name		Analo Electr	g onics	Lab	L		Г	Т			Р	
3. C	ourse Co	ode				0		0	0			2	
4.Type o Course (tick mar	f use k)	Core	(√)]	EAS ()	BSC ()	·	OI	Ε ()	PE ()		
5. P ro ai	re- equisite (ny)	(if N	ΪA	6	6. Fre ma	equency (use tickEvenOdd ()rks) $()$			Odd ()	() Either Every Se Sem () ()			
7. T	otal Nur	nber o	of Lectu	res. T	Futoria	als. Practi	cal (assumi	ng 14 v	week	s of one	semes	ster)	
Lectures	s = 0			<u></u>		Tutorials	s = 00	P	ract	$\mathbf{ical} = 28$	3	<u>,,,,</u>	
8. B In this su frequenci oscillator	rief Sylla ubject wo ies, what rs and the	abus orking happe ir wor	of vario ens in F king, stu	ous an ET ar udying	mplifie mplifie g of va	ers is expla ers, Power urious types	ained. Stude amplifiers a s of tuned ar	ents lea and fee nplifie	arn 1 edbao rs.	now BJT ck ampli	work fiers, c	at le liffe	ow and high rent types of
9. L i i i 10. C	 9. Learning objectives: i) To learn different biasing techniques and ii) To learn the behavior of BJT, FET at low and high frequencies. iii) To attain expertise in lab equipment handling and understanding the basic devices. iv) To learn their properties, characteristics in detail. Along with their practical usage in the circuit. 10. Course Outcomes: On completion of this course, the students will be able to 												
i) 10 ii) T iii) T iv) E	o constru o take me xperimer	easure: ntal res	ious ana ment of sults in t	log ci vario he lat	ircuits. ous ana	log circuits	s to compare pretical anal	e. ysis					
11 .Sr. No.	List of	Exper	riments			-					(C O (covered
1	Study of Generat	of lab tor, Po	equipm wer sup	ents a ply, A	and co Active,	omponents: Passive C	CRO, Mul	timete & Brea	r, Fu d Bo	unction bard.			i
2	2 P-N Junction Diode: Characteristics of PN Junction diode-Static and ii dynamic resistance measurement from graph.						ii						
3	3 Applications of PN junction diode: Half & Full wave rectifier- iii Measurement of Vrms, Vdc, and ripple factor-use of filter- ripple reduction (RC Filter)-Clipper & Clamper						iii						
4	Propert the rev reverse	ies of verse resista	junctior characte ance.	ns Zei eristic	ner dio s. Gra	ode charact	teristics. He easurement	avy do of fo	ping rwai	g alters			iii
5	Applica	tion	of Zen	ner d	liode:	Zener d	iode as v	oltage	reg	ulator.			iii

	Measurement of percentage regulation by varying load resistor.	
6	Characteristic of BJT: BJT in CB and CE configuration- Graphical measurement of h parameters from input and output characteristics.	iv
7	Characteristic of FET: FET in common source configuration. Graphical measurement of its parameters Gm & Rd from input and output characteristics.	iii
8	Characteristic of silicon-controlled rectifier.	iii
9	To plot V-I Characteristics of DIAC .	i
10	To draw V-I characteristics of TRIAC for different values of Gate Currents.	i
11.	Study of frequency response of active filters LP, HP & BP	ii

1. Name of the Department- Electrical & Electronics Engineering								
2. Course Name	Workshop Technology Lab		L	T			Р	
3. Course Code			0	0			2	
4. Type o tick mark)	f Course (use	Core ()	EAS (✔)	PE ()	E () OE ()			
5. Pre- requisite (if any)		6. F (use tick	requency marks)	Even $()$	Odd ()	Either Sem ()	Every Sem ()	
7. Total Num	ber of Lectures	, Tutorial	s, Practica	l (assur	ning 1	4 weeks	of one semester)	
Lectures = 0		Tutorial	s = 0	Practi	cal = 2	28		
8. Course	Description							
Workshop technology deals with different processes by which component of a machine or equipment's are made. The subject aims at imparting knowledge and skill components in the field of basic workshop technology. It deals with different hand and machine tools required for manufacturing simple metal components and articles.								
9. Learni	ng objectives:							
i. As the	need of hand on	practice for	or the engin	eers thi	s cours	se has sp	ecial weightage.	
11. To be 1	ndustry ready a	student m	ust have the	e know	ledge c	of various	s welding processes, should	
nave know needs.	vledge about th	e foundry	and variou	is mach	ine to	ols. So t	inis course fulfills all these	
10. Course	Outcomes (CC)s): After t	the complet	tion of t	he cou	rse, the s	tudent shall be able to	
i. Practice	e workshop safe	ty rules eff	fectively.					
ii. Acquire	e knowledge and	l use simp	le measurin	g and g	auging	instrum	ents.	
iii. Acquire	e knowledge and	l use simp	le hand tool	ls				
iv. Operate	e simple drilling	machines	for produci	ing sma	ll holes	3		
v. Operate	e various machir	<u>e tools for</u>	producing	simple	metal	compone	ents and articles	
vi. Acquire	e knowledge and	l practice of	on foundry,	forging	g, joints	s and we	lding	
11. Lab Co	omponent							
Sr. No.	Title						CO covered	
1	To perform n turning, threa	nachining o ding etc. o	operations l	like turn e.	uing, st	ер	v	
2	To make slot	on work p	iece by usin	ng Milli	ing Ma	chine.	iv	
3	To prepare gr Machine.	oves on w	ork piece b	y using	Shape	r	v	
4	To perform so Grinder.	urface finis	shing opera	tion on	Surfac	e	iv, v	
5	To perform d	rilling ope	rations.				iv	
6	6 To make cross lap joint. iii, iv						iii, iv	

7	To make butt joint	i, ii, vi
8	To make Lap joint by using Electric Arc Welding.	i, ii, vi
9	To make butt joint by using Electric Arc Welding	i, ii, vi
10	To practice fitting operations.	ii, iii, vi
11	To make male and female joint.	ii, iii, vi
12	To prepare open box tray.	ii, iii, vi

1. Name of the Department- Electrical & Electronics Engineering								
2. Cour	rse Name	Engineering	L		Т		Р	
		Graphics and						
		Design Lab						
	~ .							
3. Cour	rse Code		0		0		2	
4. Type	e of Course (use tick mark)	Core ()	EAS	PE ()		OE ()	
				(✔)				
5 D	••••	0			Г	0110	D '4	Г
5. Pre-l	requisite (11	Geometry and	6. Frequ	ency (use arks)	Even	Odd ()	Either	Every
any)		Drawing at +2		ai K5)	(\)		Sem ()	Sem ()
		Level						
7. Tota	l Number of	Lectures, Tutoria	ls, Practica	l (assuming	g 14 week	s of one	semester	:)
Lectures	s =0		Tutorials	= 0	Practic	al = 28		
8. Cour	rse Descripti	on						
Engineer	ring Graphics	and design is cons	idered as la	nguage of e	ngineers.	This cou	rse is int	roduced to
provide	basic unders	tanding of importa	unce of des	igning aspe	cts in en	gineering	g applica	tions. The
topics ar	e covered in	a sequence and star	ts from the	basic conce	pts of int	roduction	n to com	outer aided
design a	nd then desig	gning of planes and	d solids. To	wards the e	end of th	e course.	it is exp	bected that
students	would be ma	tured to visualize th	ne engineeri	ng compone	ents from	any drav	ving shee	t, followed
by the p	rojection tech	nniques. A number	of chosen p	problems wi	ll be solv	ved to ill	ustrate th	e concepts
clearly.	0	•	-					1
0 1.00	ning abiasti							
9. Lear i) T	o understand	the basic concepts	of Graphics	1				
ii) T	o develop the	e skills of reading &	z interpretat	ion of Engir	neering D	rawing.		
iii) T	'o construct th	he basic and interm	ediate geom	etry.	U	0		
iv) T	o develop the	e skills of preparing	the engine	ering drawir	ıg.			
10. Cou	rse Outcome	s (COs):						
i) U	Inderstand th	e use of drawing ins	struments an	nd dimensio	ning of g	iven drav	ving.	
	Acquire the vi	sualization skills an	id use of pro	ojection met	hods.	and and id		
\mathbf{III} \mathbf{III} \mathbf{III}	Los of edges	vertices and curves	to construct	t the drawin	s, planes a	and solids	5.	
11. Lab	component	vertices and curves	to construc		<u>g.</u>			
Sr. No.	Title						CO	Covered
1	Different ty	types of lines with illustration and application.				I, II		
2	Use of Drawing instruments and understand the design sheet layout with				Ι			
	dimensioning and lettering.							
3	Applications of drawing commands in AutoCAD.			Ι				
4	Projection of	of points in all the f	our quadran	ts.				II
5	Projection of straight lines parallel, perpendicular, inclined to projection				II, III			

	planes and traces of lines.	
6	Projection of plane in perpendicular and inclined positions.	III
7	Projection of cones and solid cylinders with axes parallel, perpendicular and inclined to both the reference planes.	III, IV
8	Projection of prisms and pyramids with axes parallel, perpendicular, inclined to both the reference planes.	III, IV
10	Design Orthographic projection of simple machine elements and engineering drawings.	IV
11	Design Isometric projection of simple machine elements and engineering drawings.	IV
12	Design Sectional views of simple machine elements and engineering drawings.	IV

Semester III

1.	1. Name of the Department: Electrical and Electronics Engineering							
2.	Course Name	Microprocessor &	Microcontroller		L	Т	Р	
3.	Course Code				3	0	0	
4.	Type of Course (u	se tick mark)	Core $()$	EA	S	BSC	OE ()	OE ()
				0		0		
5.	Pre-requisite (if	Digital Logic	6. Frequency (use	Ev	en	Odd	Either	Every Sem
	any)	Design	tick marks)			()	Sem	()
		Design		()			Sem	
							()	
7.	7. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)							
Le	ctures = 42		Tutorials = 0	Pr	Practical = 00			

8. Brief Syllabus

Microprocessor and microcontrollers are the most useful electronic chips which are used to design and develop processor and computer based automatic smart electronics systems for home and industry application. Students learn CPU architecture, memory interfaces and management, coprocessor interfaces, bus concepts, bus arbitration techniques, interfacing of systems using AD/DA, serial I/O devices, DMA, interrupt control devices, including design, construction, and testing of dedicated microprocessor systems (static and real-time). Upon completion, students should be able to design, construct, program, verify, analyze, and troubleshoot fundamental microprocessor interface and control circuits using related equipment.

9. Learning objectives:

- i. To gain an in-depth understanding of the operation of microprocessors and microcontrollers, machine language programming & interfacing techniques with peripheral devices
- ii. To learn the concept of designing computer organization and architecture
- iii. To gain an understanding of applications of microprocessors in designing processor-based automated electronics system.

10. Course Outcomes: On completion of this course, the students will be able to

- i. Explain the internal organization and operation of microprocessors/microcontrollers.
- ii. Program 8086 Microprocessor, 8051 and PIC Microcontrollers for application specific solution

iii. Design microprocessors/microcontrollers-based systems

11. Unit wise detailed content

Unit-1	Number of lectures = 10	Title of the Unit: Introduction				
Inoduction to Microprocessors, Microcontrollers and system design – Assembly and High-Level language						

programming-System Development Environment: assembler, compiler & IDE

Unit - 2	Number of lectures = 12	Title of the Unit: 8086 Microprocessor					
Architectu	Architecture and Programming of 8086 microprocessor: pipelining, Instruction sets, addressing modes -						
Memory a	Memory addressing, decoding and Memory interfacing – Interrupts and interrupts handling.						
Unit - 3	Number of lectures =10 Title of the Unit: I/O and Bus Interfacing						
Interfacing methods – 8255 PPI interface, 8254 timer interface, 8259 PIC and DMA controller interface –							
Bus Interface: electrical characteristics, interfacing ISA bus, EISA, PCI bus, LPT, USB and RS232							
interface.							

Unit - 4 Number of lectures = 10 80	1 Microcontroller
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Introduction to single chip Microcontrollers, Intel MCS-51 family features –8051/8031-architecture – 8051 assembly language programming, addressing modes – Programming interrupts, timers and serial communication – system design with 8051. Application of microprocessor and Microcontrollers in data acquisition systems, process control, signal processing.

12. Books Recommended :

Text Book:

i) Barry B Brey, The intel microprocessor: architecture, programming and interfacing, PHI

Reference Book:

i) Mohammad Ali Mazidi and Janice Gillispie Maszidi "The 8051 Microcontroller and Embedded Systems" Pearson education, 2003, ISBN- 9788131710265, 2nd Edition

1. Name	1. Name of the Department : Electrical and Electronics Engineering											
2.Course	Name	Microp Microo	orocessor	and Lab	L		Т			Р		
3.Course	Code				0		0	0		2		
4. Type o	f	Core ()	EAS ()	BSC ()		OE ()		PE ()		
Course (use											
tick mar	K)											
5.Pre-rec	uisite (i	i f Dig	jital I	Design/	6.Freque	ncy (use tick		Eve	Odd ($$)	Either	Ever	
any)		Cor	nputer C	Drg. &	marks)			n ()		Sem ()	У	
		Arc	h								Sem	
											0	
7.Tot	al Num	ber of Lo	ectures, T	utorial	s, Practica	l (assuming 14	wee	ks of	one semes	ter)		
Lectures	= 0				Tutorials	s = 00	Pr	actica	l = 28	28		
0 0	• • • • •	1										
8. B	rief Syll mal_stru	abus	d operati	on of 1	microcontro	ollers will be a	studi	ied T	he design	methodolc	or for	
software	and har	dware a	nnlication	ion of 1 is will 1	he develop	ed through the	lah	s and	design pr	oiects Ado	litional	
projects f	or gradu	ate stude	ents.		e develop	eu unough une	iuo	5 und	design pi	0,000.00.00	intionai	
1 5	0											
9. L	earning	objectiv	es:		.f							
1. ii	Unde	rstanding	g of the of	peration	of micropr	ocessors						
iii.	Unde	erstandin	g of the o	peration	of machin	e language prog	ram	ming				
iv.	Impl	ementati	on of the	operatio	n of interfa	cing techniques	wit	h perij	pheral devi	ces		
10. C	ourse O	utcomes	: On com	pletion	of this cour	se, the students	will	be ab	le to			
i. Pr	ogramm	ing conc	epts of 80)86 Mic	roprocessor	r, 8051 and PIC	Mic	crocon	trollers			
iii. D	esign mi	crocontr	ollers-bas	ed appli	cation system	ems	stem	•				
iv. In	nplemen	t and dev	velop new	experin	nents on m	icroprocessor/m	icro	contro	ller based	systems.		
11	l. Lab C	ontent										
Sr. No.	Title									CO covere	ed	
1	To Add	l Two Bi	nary Nun	nber Eac	h 2 Bytes I	Long				i,ii		
2	2 To Find The Maximum Number. In A Given String (16 Bytes Long) and ii Store It in Location 0510											
3	3 To Sort A String of A No. of Bytes In Descending Order ii,iii											
4	4 To Multiply An ASCII String Of Eight Numbers By A Single ASCII ii											
	Digit. The Result Is A String Of Unpacked BCD Digits.											
5	To Divide A String Of Unpacked ASCII Digit.						<u>11</u> 					
6	6 A Data String of No. Of bytes (to be specified in CX reg.) Is located					111						
From the Starting Address 0500. The Data String is 10 Be Converted 10 Its Equivalent 2's Complement From And The Result is Be Stored From						rom						
	<u>0600</u> O	<u>nwar</u> ds.										
7	Interfac	cing & P	rogrammi	ng for L	.ED					iii, iv		
8	Interfac	cing & P	rogrammi	ng for L	.CD					iii		

9	Interfacing & Programming for Stepper	iv

1. Name of the D	1. Name of the Department- Electrical & Electronics Engineering						
2. Course	Distribution of	L		Т		Р	
Name	Electrical						
	system						
3. Course Code		3		0		0	
4. Type of Course (use tick mark)		Core $()$	EAS ()	BSC ()		OE ()	PE ()
5. Pre-requisite		6. Frequ	ency (use	Even	Odd	Eithe	Ever
(if		tick n	narks)	0	(✔)	r	У
any)						Sem	Sem
						0	0
7. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)							
Lectures = 42		Tutorials	rials = 0 Practical = 0				
8 Course Descri	ntion						

Electric power distribution system planning, design and operations; load characteristics and distribution transformers; design of sub transmission lines and distribution substations; primary and secondary feeder design considerations; distribution system voltage regulation, protection and reliability; distributed generation and smart grid application.

Learning Objectives:

The students will learn and understand

- i) To Understand about Electric Power Distribution Systems presents a full range of technology.
- **ii**) To use the application topics with the goal of providing students a fundamental understanding of one of the major functions of the electric power system distribution.
- iii) To learn the planning, design, analysis and operational concepts of the distribution system.
- iv) To learn about the concepts about considerations of voltage regulation, protection, and reliability as well as application of distributed generation and smart grid technology.

10. Course Outcomes (COs):

On completion of this course, the students will be able to

- i) To plan distribution systems
- ii) To model distribution systems
- iii) To study distribution systems
- iv) To design and associated equipment and devices.

11. Unit wise detailed content							
Unit-1	Number of lectures = 12	Title of the Unit : General Concepts					
Introduction to distribution systems, Load modelling and characteristics. Coincidence factor, contribution, factor loss factor – Relationship between the load factor and loss factor. Classification of loads (Residential, commercial, Agricultural and Industrial) and their characteristics.							
Unit - 2Number of lectures = 10Title of the Unit : Distribution Feeders							
Design Considerations of Distribution Feeders: Radial and loop types of primary feeders, voltage							

levels, feeder loading; basic design practice of the secondary distribution system.

Unit-3	Number of lectures = 10	Title of the Unit : Substations				
Location of Sub	stations: Rating of distribution s	substation, service area within primary feeders.				
Benefits derived t	hrough optimal location of substat	ions.				
Unit – 4	Number of lectures = 10	Title of the Unit : System Analysis				
Voltage drop and	power-loss calculations: Derivatio	n for voltage drop and power loss in lines, manual				
methods of solution	on for radial networks, three phase	balanced primary lines				
12. Brief Descri	ption of self-learning / E-learning	g component				
The students wi	ll be encouraged to learn using the	e SGT E- Learning portal and choose the relevant				
lectures delivere	ed by subject experts of SGT Unive	ersity.				
The link to the E	E-Learning portal.					
http://sgtlms.org	1					
Journal papers; Pa	atents in the respective field.					
13. Books Reco	mmended					
Text Books						
i) "Elec	tric Power Distribution system, En	gineering" – by Turan Gonen, Mc Graw-hill				
Book Con	npany.					
Reference Books						
i) Electrical Power Distribution and Automation by S.Siyanagaraju, V.Sankar, DhanpatRaj						
& Co, 2006						
ii) Elect	ii) Electrical Power Distribution Systems by V.Kamaraju, Right Publishers.					
iii) Electric Power Distribution – by A.S. Pabla, Tata Mc Graw-hill Publishing company, 4th						
edition, 19	997.					

1. Name of the Department : Electrical and Electronics Engineering											
2.Course Name		Distributi Electrical system lat	on of	L		Т			Р		
3.Course Code				0			0			2	
4. Type of	Core	(1)	EAS ()	BS	C ()	0	Е ()		PE ()	
Course (use											
tick mark)											
5.Pre-requisite			6.	Frequen	cy	Even ()	Odd $()$	Eit	her	Every
(if any)				(use tick marks)					Sei	m ()	Sem ()
7. Total Nur	nber o	of Lectures,	Tutoria	als, Practi	cal (assuming 1	4 wee	eks of one s	emes	ster)	
Lectures = 0				Tutorials	s = (00	Pra	c tical = 28			
8. Brief Syll	abus										
Electric power d	istribut	tion system	plannii	ng, design	and	operations	; loac	l characteri	stics	and	distribution
transformers; des	ign of	sub transn	nission	lines and	distr	ibution sub	statio	ns; primary	y and	d seco	ondary fder
design considera	tions;	distribution	n syste	m voltage	reg	gulation, p	rotect	ion and r	eliab	ility;	distributed
generation and sm	nart gri	d applicatio	n.								
9. Learning	object	ives:									

- i. Electric Power Distribution Systems presents a full range of technology and application topics with the goal of providing students a fundamental understanding of one of the major functions of the electric power system distribution.
- **ii.** Students will learn the planning, design, analysis and operational concepts of the distribution system.
- iii. Students will learn the including considerations of voltage regulation, protection, and reliability.
- iv. Students will learn the application of distributed generation and smart grid technology.

10. Course Outcomes:	On com	pletion of	this course,	the students will be able to	
					_

- i. To plan distribution systems
- **ii.** To model distribution systems
- **iii.** To study distribution systems
- iv. To design and associated equipment and devices. 12 Lab Content

14	2. Lad Content	
Sr. No.	Title	CO covered
1	Characteristics of IDMT Over Current Relay.	i,ii
2	Differential protection of $1-\Phi$ transformer.	ii
3	Testing of CT, PT's and Insulator strings.	ii,iv
4	Finding the sequence impedances of $3-\Phi$ synchronous machines.	ii,iv
5	Finding the sequence impedances of $3-\Phi$ Transformer.	iii
6	Load Flow Analysis using Gauss Seidal (GS) Method.	iv

7	Load Flow Analysis using Fast Decoupled (FD) Method.	ii,iv
8	LG, LL and 3- Φ fault analysis of 3- Φ synchronous machines.	ii
9	Power circle diagrams of a $3-\Phi$ transmission line model.	i
10	ABCD constants and Regulation of a $3-\Phi$ transmission line model.	ii
11	Transient Stability Analysis for Single Machine connected to Infinite Bus by Point by Point method.	ii,iii

1. Name of the Department- Electrical & Electronics Engineering											
2. Course Nan	ne	Network	L			Т		Р			
		Analysis And									
		Synthesis						<u>^</u>			
3. Course Cod	e		3	<u> </u>	TAG O						
4. Type of Col	irse (u	se tick mark)	Core	(٧)	EAS ()	BSC ()	0.11	OE ()	OE ()		
5. Pre-requisit	e (II	Basic Electrical	6. F	requency	use	Even	Odd	Eithe	Ever		
any)		Engineering	t	iick marks	5)	0	(••)	r	y G		
		Engineering						Sem	Sem		
7 Total Numb											
7. 1 oral rumber of Lectures, 1 domains, 1 factoral (assuming 14 weeks of one semester) L optimized 42 Trategiale Discretized											
$\frac{1}{8} Course Desi$	arintia	n	1 4 10	011a15 - 0		Tacu	cal = 0				
Notwork A poly	cripuo	II Synthesis is a field	dofo	nainaarina	that dealer	with the	atudu on	d annliaa	tions of		
Graph theory ty	sis and	parameters and net	u or e	vnthesis a	nd also deals	with the	study an	u applica	uons of		
active and passi	vo pon ve filte	rs Graph theory is	consid	ered to dev	al with the p	oblems a	e uesigii a	llu applic 1 with lar	ation of		
electrical system	ns such	as nower transmis	sion ar	nd distribut	tion system	This cou	issociated	oundation	for the		
students to study	v other	subjects related to b	oth the	e engineeri	ng streams.		iibe iug i	ounduitor	i ioi uie		
-	,	5		U	C						
9. Learning Ob	jective	ès:									
The students will	ll learn	and understand									
i. To learn th	ne cono	cepts of network ana	lysis ii	n electrical	and electron	ics engin	eering.				
ii. To learn li	near ci	rcuit analysis, graph	theor	y and		_	-				
iii. To learn a	bout di	fferent network the	orems.								
iv. Analyze ty	vo por	t networks using Z,	Y, AB	CD and h p	parameters						
10. Course Ou	tcome	s (COs):									
On completion of	of this	course, the students	will be	e able to							
i. Analyze a	n elect	ric network using gr	aph the	eory and di	ifferent netw	ork theor	ems e.g.	Thevenin	'S		
theorem,	super	position theorem, No	odal vo	oltage etc. a	and power sy	stem trar	ISM1SS101	line usin	g		
ABCD p		ers.	drivin	a naint fun	ations						
iii Design act	tive an	d passive filter circu	ite	g point run	cuons						
iv. Explain th	e elect	rical network theorie	es and	verify ther	n through ex	periment	s				
	0 01000		os una	, only unon	in un ough on	perment	5				
11. Unit wise o	letaile	d content									
Unit-1	Nun	ber of lectures = 1	2	Title of	the Unit	: Grapl	n Theor	y & N	letwork		
				Theorem	S						
Graph of a Netw	vork, d	lefinitions, tree, co t	ree, li	nk, basic l	oop and bas	ic cut set	, Inciden	ce matrix	, cut set		
matrix, Tie set n	natrix 1	Duality, Loop and N	odal m	nethods of	analysis.			6			
Super-position	theore	m, Thevenin's the	orem,	Norton's	theorem, m	aximum	power t	ranster t	heorem,		
Reciprocity theo	orem. N	Allman's theorem, o	compe	isation the	orem, Telleg	en's theo	orem				
Unit – 2	Num	ber of lectures = 1	0	Title of t	he Unit: Net	twork Fi	inctions	and Trar	isient		
			~	analysis							
Transform Impe	dances	Network functions	of one	e port and	two port net	works, c	oncept of	poles an	d zeros,		
properties of dri	ving p	oint and transfer fur	nctions	, time resp	onse and sta	bility fro	m pole ze	ero plot, t	ransient		
analysis of ac &	analysis of ac & dc systems.										

Unit – 3	Number of lectures = 10	Title of the Unit: Two Port Networks
Characterization Interrelationship Representation.	n of LTI two port networks ZY, Jos between the parameters, in	ABCD and h parameters, reciprocity and symmetry. ater-connections of two port networks, T & Đ
Unit – 4	Number of lectures = 10	Network Synthesis & Filters

Positive real function; definition and properties; properties of LC, RC and RL driving point functions, synthesis of LC, RC and RL driving point immittance functions using Foster and Cauer first and second forms. Image parameters and characteristics impedance, passive and active filter fundamentals, low pass, high pass, (constant K type) filters, and introduction to active filters.

12. Brief Description of self-learning / E-learning component

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

13. Books Recommended

Text Books

i) Circuit Theory - Analysis and Synthesis by Abhijit Chakrabarti

13. Reference Books

i) Electrical Circuit Theory by B.L.Theraja, M.E.Van.Valkenburg

ii) Fundamentals of Electric Circuits by Charles K. Alexander, Matthew N.O. Sadiku

iii) Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Steven M. Durbin

1. Name of the Department : Electrical and Electronics Engineering											
2.Course	Name	Network		L			Т			Р	
		Analysis	&								
20	0.1	Synthesis I	Lab	0			0				
3.Course	Code			0			0			2	
4.Type of	f Co	ore (√)	EAS ()	BSC () OE ()					PE ())
Course (u	use										
tick marl	k)										
5.Pre-req	uisite (if	Basic	6.F	requency		Even (Odd ()	Eithe	er	Every
any)		Electrical an	d (us	e tick mar	ks)	× ×	,	~	Sem	0	Sem ()
		Electronics								v	~
		Engineering									
7 Total N	umbor of I	actures Tuto	miala D	mantical (a		sing 14 was	ka of	one comest	ton)		
7.10tal N Lectures	= 0	Lectures, Tuto	riais, r	Tutorials	sun = ()()	<u>KS 01</u> Prac	$\frac{\text{one semes}}{\text{stical}} = 28$	ler)		
20000200	0										
8. Bi	rief Syllabu										
Network	Network Analysis and Synthesis Lab is a field of engineering that deals with the study and applications of										
active and	d nassive fil	Iters Graph the	eory is	considered	to d	eal with the	e nrot	olems assoc	ign and	ı app vith	large-scale
electrical	systems su	ch as power tra	ansmiss	ion and dis	strib	ution system	ns. Th	nis course l	lay fou	indat	ion for the
students t	o study othe	er subjects relat	ed to be	oth the engi	neer	ing streams			5		
9. Le	9. Learning objectives:										
i) To l	learn the con	ncepts of netwo	rk anal	ysis in elec	trica	l and electro	onics	engineering	g.		
ii) To	b learn linea	r circuit analys	is, grap	h theory an	d						
\mathbf{III}) 1(\mathbf{iv}) \mathbf{A}) learn abou	t different networks u	vork the $\sin \alpha$	V ARCD	and	h naramatar	c				
10 C	nurse Outc	omes: On com	oletion (of this cour	anu se ti	he students	s will h	e able to			
i) Ana	alvze an elec	ctric network us	sing gra	ph theory a	ind d	lifferent net	work	theorems e.	.g. The	veni	n's
th	eorem, supe	erposition theore	em, No	dal voltage	etc.	and power s	syster	n transmiss	ion lin	e usi	ng ABCD
pa	rameters.										
ii) Sy	nthesize an	electric networ	k using	driving po	oint f	unctions					
iii) De	esign active	and passive fil	ter circi	lits	f., +1	an thearah	0.W.B.O	rimonto			
10) EX	. Lab Cont	tent	k uicofi	es anu veri	iy ti		ехре	ments			
Sr. No.	Title								C	O co	vered
1	To verify 7	Thevenin's theo	rem in	a.c.						i,i	i
2	To verify N	Norton's theore	m in a.c	2.						ii	
3	To verify t	he Superpositio	on theor	em in a.c.						ii,i	V
4	To verify t	he Maximum P	ower T	ransfer The	eorer	n.				ii	
5	Determinat	tion of Z-param	eters of	of a two-port network.					ii	i	
6	To verify a	and determine	Y-para	meters of a	ı par	allel conne	cted t	wo-port		ii	i
7	Determinat	tion of H-naran	neters o	f a two-por	t net	work				iv	7
8	To verify	and determine	ABCD-	parameters	of	a cascade ir	iterco	nnected		iv	7
0	TO VEILLY &	verify and determine ABCD-parameters of a cascade interconnected iv									

	two-port network.	
9	Determination of characteristics impedance of a symmetrical T-network	iv
	using S/C and O/C test.	
10	To determine equivalent parameter of parallel connections of two port	ii
	network and study loading	
	Effect.	
11	Transient Stability Analysis for Single Machine connected to Infinite Bus	iv
	by Point by Point method.	

Semester IV

1. Name of the Depa	artment: Elect	trical an	d Elec	tronic	es E	Ingineer	ring			
2. Course Name N	Aeasurements a	nd Instru	trumentation		L	~	Τ		Р	
3. Course Code					3		0		0	
4. Type of Course (use tick mark))	Core	e (√)		EAS ()	BSC ()		OE ()	PE ()
5. Pre-requisite (if	Basi	e Eleo	ctrical	6. F	reo	quency	Even	Odd	Either	Every Sem
any)	and	Elect	ronics	(1	use	tick	()	0	Sem ()	0
	Engi	neering		n	nar	ks)		v		
7.Total Number of L	ectures, Tuto	rials, Pra	actical	(assu	mi	ng 14 wo	eeks of o	one sem	ester)	L
Lectures = 42			Tutor	ials =	00]	Practic	al = 00	
8. Brief S	Syllabus									
This course deals with	h the basics of	Electrica	al and	Electr	oni	c measu	ring inst	trument	s used in I	aboratory and
industry. In the pr	rocess they]	earn di	fferent	type	e (of instr	uments	like I	PMMC, N	Moving Iron,
Electrodynamometer	which include	s voltme	eter, a	mmete	er,	wattmet	er, ener	gy met	er, power	factor meter,
frequency meter, Q m	ieter, etc. Stude	ents will	also le	arn ab	oou	t differe	nt AC ai	nd DC b	oridges to	obtain various
electrical parameters.										
9. Learning objectives:										
i) To know	<i>w</i> the necessity	of differ	ent me	asurin	ıg i	nstrumer	nts and t	heir des	ign princip	ole.
ii) To unde	erstand the wor	king prin	nciple of	of diffe	erei	nt measu	ring inst	trument	s and tech	nical solutions
to handl	le different erro	ors.								
iii) To learn	the architectu	re of adv	anced	measu	irin	g instrui	ment.	1.1.	1	
IV) To learn	1 working princ	ciple of a	dvance	ed mea	asu	ring inst	rument a	ind then	r applicatio	ons.
i) Learn u	s: On complete inits dimension	on of this	s cours darde	e, the	stu rroi	dents wi	asics of	e lo: f_differ	ent types	of measuring
instrume	ents to measure	differer	nt elect	rical o	1101	ntities	Jusies 0.	i unici	ent types	of measuring
ii) To learn	about and bas	ics of dif	fferent	tvpes	of	measurii	ng instru	ments.		
iii) Apply th	heir knowledge	to meas	ure ele	ctrica	l qu	antities	using sta	andard a	analog	
iv) Apply t	their knowled	ge to m	easure	elect	rica	l quant	ities usi	ng star	ndard digi	tal measuring
instrume	ents.									
11. Unit wise detailed	d content									
Unit-1 Number of	lectures =	Title of	the U	nit: P	hilo	osophy o	of Measu	uremen	t & Analo	g
12		Measur	rement	t of El	lect	rical Qu	lantities	5		
Unit & dimensions, s	standards, Erro	ors, Char	acteris	tics o	f Iı	nstrumer	nts and	measure	ement syst	em, basics of
statistical analysis. Pl	MMC instrume	ent, DC	ammet	er, DO	Cν	oltmeter	, Ohm 1	neter, N	Moving Iro	on instrument,
Electrodynamics Wattmeter, errors and remedies, Three Phase Wattmeter, Power in three phase system,										
Energy meter										
Unit - 2 Number	of lectures = 1	10	Title o	of the	Un	it :Meas	suremen	ıt: Insti	rument Tr	ansformer
Instrument Transform	ner and their	applicat	tions i	n the	ех	tension	of inst	rument	range, In	troduction to
measurement of speed	l, frequency an	d power	factor.							
Unit - 3 Number	of lectures = 1	10	Measu	ireme	ent	of Parai	meters			
Different methods o	of measuring	low. me	edium	and 1	hig	h resista	ances, r	neasure	ment of i	inductance &

capacitance with the help of AC Bridges- Wheatstone, Kelvin, Maxwell, Hay's, Anderson, Owen, Heaviside, Campbell, Schering, Wien bridges, Wagner Earthling device, Q Meter.

Unit - 4	Number of lectures = 10	AC Potentiometer & Magnetic Measurement

Polar type & Co-ordinate type AC potentiometers, application of AC Potentiometers in electrical measurement. Ballistic Galvanometer, Flux meter.

12. Brief Description of self learning / E-learning component:

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

13. Books Recommended:

Text book:

i) A.K. Sawhney, "Electrical & Electronic Measurement & Instrument", Dhanpat Rai & Sons

Referencc books:

ii) E.W. Golding & F.C. Widdis, "Electrical Measurement & Measuring Instrument", A.W.Wheeler & Co. Pvt. Ltd. India.

iii) Forest K. Harries, "Electrical Measurement", Willey Eastern Pvt. Ltd. India

1. Name of the Dep	partment : Elec	ctrical and	d Electroni	cs E	ngineering					
2.Course Name	Measurer & Instrume Lab	nents L				Т		Р		
3.Course Code	ode 0 0						2			
4.Type of C	Core $()$	EAS ()		BS	C ()	0	E ()		PE ())
Course (use tick mark)										
5.Pre-requisite (if any)	Basic Electrical a Electronics Engineering	nd (use	requency e tick marl	equency tick marks)Even (\sqrt) Odd ()		Odd ()	Eith Sen	Either Every Sem () Sem (
7.Total Number of	Lectures, Tuto	orials, Pr	actical (as	sun	ning 14 wee	ks of	one semes	ter)		
Lectures = 0			Tutorials	= 0	00	Pra	ctical = 28			
 8.Brief Syllabus This course teaches physical parameter thermocouples, piez 9.Learning objective i) To provide k ii) To provide k iii) To provide the iii) To provide the iv) To measure of 10.Course Outcome i) Generate approximation (11) iii) Implement the iv) Generate approximation (11) iv) Generate (11) iv) Generate	 3.Brief Syllabus This course teaches the working of measurement systems and different types of sensors and transducers, physical parameters used in Industry and normal measurement applications. Understanding of hermocouples, piezoelectric and pyro-electric transducers and their applications. 9.Learning objectives: i) To provide knowledge about sensors. ii) To provide the knowledge about actuators. iii) To provide hands on experience. iv) To measure different signal using sensor and processing them in required form. 10.Course Outcomes: On completion of this course, the students will be able to i) Generate appropriate design procedure, suitable for signal conversion to interface with computer. ii) Design appropriate circuits by using conventional formulas used in signal conditioning and conversion. iii) Implement their design in bread board and test it. iv) Generate appropriate design procedure to obtain a required measurement data for temperature, force, humidity, displacement and sound. 									
Sr. No. Title								(CO co	vered
1 Design an	nd testing of Dig	gital Con	nparator						i,i	i
2 Design an voltage co	nd testing of \overline{Vo}	ltage to f	requency c	conv	erter and $free$	equen	cy to		ii	
3 Design an	nd testing of san	nple and	hold circui	t.					ii	i
4 Design an	nd testing of Fla	sh type A	Analog to D	Digit	al Converte	rs			iv	7
5 Design an	nd testing of ins	trumenta	tion amplif	fier u	using OP-Al	MP			ii	
6 Displacent	nent measurement	ent using	potention	neter	and LVDT	and	plotting		ii	
7 Study of C	Characteristics	and calib	ration of st	rain	gauge and l	Load	Cell		ii	i

8	Measurement of strain using resistive type strain gauges with	iv
	temperature compensation and various bridge configurations.	
9	Temperature measurement using Thermocouple, Thermistor and RTD	iii
	and comparing the characteristics.	
10	Comparison of capacitive and resistive type transducer for humidity	iv
	measurement with their characteristics.	
11	Measurement of sound using microphones and sound level meter.	i,ii

2.Course Name Power Electronics L T P 3.Course Code 3 0 0 4.Type of Course (use tick mark) Core $(\sqrt{)}$ EAS () BSC () OE () PE () 5.Pre-requisite (if any) Analog Electronics 6.requency tick marks) (use () Even () Odd () Either Sem () Every Sem () 7.Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester) Itorials = 00 Practical = 00 8.Brief Syllabus Ender the tent is the ballity of the tent is the ballity of the tent is the tent is the ballity of the tent is the ten													
3.Course Code 3 0 0 4.Type of Course (use tick mark) Core (√) EAS () BSC () OE () PE () 5.Pre-requisite (if any) Analog Electronics 6.requency tick marks) (use () Even () Odd () Either Sem () Every Sem () 7.Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester) 0 Image: Constant of the second of th													
4.Type of Course (use tick mark) Core (√) EAS () BSC () OE () PE () 5.Pre-requisite (if any) Analog Electronics 6.requency tick marks) (use () Even () Odd Sem () Either () Every Sem () 7.Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester) Image: Comparison of the semester of the sem semester of the sem semester													
5.Pre-requisite (if any) Analog 6.requency (use Even Odd Either Every Sem Electronics tick marks) () () Sem () () () 7.Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester) Image: Comparison of the semester is a semicircal in the semicircal in the semicircal is a semicircal in the semicircal in the semicircal is a semicircal in the semicircal in the semicircal is a semicircal in the semicircal in the semicircal is a semicircal in the													
Electronics tick marks) () () Sem () () 7.Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester) Image: Constraint of the second secon													
7.Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester) Lectures = 42 Tutorials = 00 Practical = 00 8.Brief Syllabus													
Lectures = 42Tutorials = 00Practical = 008.Brief Syllabus													
8.Brief Syllabus													
Power Electronics acquire understanding and ability to analyze power semiconductor devices, gate drive													
circuits, ac-dc converters & ac-ac and dc-ac converters. This course may also be useful for the practicing													
engineers who want to refresh their understanding in power electronics.													
9.Learning objectives:													
The students will learn and understand:													
i) To learn about the basic concepts of power electronics.													
iii) To learn about their characteristics, turn-on of SCR, gate characteristics													
iv) To develop AC-DC Converters, DC - DC Converters, AC-AC and DC-AC Converters.													
10. Course Outcomes: On completion of this course, the students will be able to													
i) Articulate the basics of power electronic devices													
ii) Express the design and control of rectifiers, inverters.													
iii) Design of power electronic converters in power control applications													
iv) Ability to express characteristics of SCR, BJT, MOSFET and IGBT.													
v) Ability to express communication methods.													
vi) Ability design AC voltage controller, Cyclo - Converter, Chopper circuits and Inverter circuit													
II. Unit wise detailed content Unit 1 Number of lectures = 10 Title of the Unit: Dewer Semiconductor Devices													
The of the Ohit: Fower Semiconductor Devices													
Applications of power electronics: types of converters ideal switch: power diodes SCR Triac and their													
characteristics, di/dt, dv/dt limitations and snubber circuits, other power semiconductor devices and their													
characteristics.													
Unit - 2Number of lectures = 10Measurement: Gate Drive Circuits													
Methods of turn-on & off SCR, gate characteristics, simple R, RC and UJT trigger circuits, driver and													
isolation circuits, cosine and ramp control circuits, simple digital trigger circuit, commutation of SCR													
$Cont - 3 \qquad \text{Number of lectures} = 12 \qquad \text{AC-DC Converters} & \text{DC - DC Converters}$													
AC-AC Converter: Principle of ac phase control, circuit configurations, waveforms for 1-ph mid-point and													
bridge converters, full and semi converters, analysis of single phase ac-dc converter with R and RL loads,													
performance evaluation of phase controlled converters, introduction to three phase converters: semi and full													
converter topologies, dual-converters.													
DC - DC Converters : Basic principle of d.c. choppers: TRC and CLC methods; switching regulators: buck													

Unit - 4	Number of lectures = 10	AC-AC and DC-AC Converters							
Introduction to AC voltage regulators, integral cycle control and phase control, cyclo-converters. Series,									
parallel and bridge inverter circuits, PWM inverters: types of control and harmonic reduction.									
12. Brief Description of self learning / E-learning component:									
The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures									
delivered by subject experts of SGT University.									
The link to the E-Learning portal.									
http://sgtlms.org									
Journal papers; Patents in the respective field.									
13. Books Recommended									
Text Books:									
i) M.H. Rashid, Power Electronics; PHI Learning, New Delhi.									
References Book:									
i) Jai P Agarwal, Power Electronics Systems, Addison Wesely.									
ii) V. R. Moorthy, Power Electronics, Oxford University 2007 Press.									
iii) M. S. JamilAsghar, Power Electronics, PHI Learning.									
iv) G.K.Dubey, et al, Thyristorised Power Controllers; New Age International, New Delhi.									

2.Course	Name	Power	Power			L				Р			
		Electronics	Electronics Lab										
3.Course Code				0	0		0			2			
4.Type of	f C	Core $()$	EAS (AS () BSC ()			OE ()			PE ()			
Course (use												
tick marl	k)												
5.Pre-req	uisite (if	Semiconduct	onducto 6.Frequency Even $()$ Odd		Odd ()	Either Every		Every					
any)	-	r Devices ar	nd (us	(use tick marks)						Sem () Sem ()			
		Circuits						U.	U U				
7.Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)													
Lectures = 0				Tutorials = 00				Practical = 28					
8.Brief Syllabus													
Basic concept review of electrical machines; single phase transformers. 3-phase transformer; various types of													
connection of three phase transformer, Phase-Conversion & phase-shifting transformers, Swinburne's &													
Hopkinson's test of DC shunt M/Cs.													
9.Learning objectives:													
The students will learn and understand													
i) To familiarize the different types of characteristics of various types Power Electronic Device													
ii) To realize various power electronic converters.													
iii) To realize the triggering circuits for specific applications.													
10.Course Outcomes : On completion of this course, the students will be able to													
i) Interpret different characteristics of an SCR.													
ii) Implement the phase controlled switching using DIAC and TRIAC.													
iii) To realize different type of triggering circuits for particular application.													
 IV) 10 use UJ1 as a relaxation oscillator and for triggering circuits. v) To implement different types of converters for various applications like speed control of DC motor. 													
v) To implement unrerent types of converters for various applications like speed control of DC motor.													
11	Lab Con	ntent						I	~				
Sr. No.	Title								C	O co	vered		
1	Static Characteristics of SCR									i			
2	TRIAC and AC phase control								ii				
3	UJT based relaxation oscillator and trigger circuit								iv				
4	4 R, RC trigger circuits and speed control of Universal motor.								V				
5	Uncontrolled AC-DC Converter									iii,v			
6	Monostable based trigger circuits.								I,ii				
7	Speed control of DC motor by a phase controlled converter.									V			
8	MOSFET based flyback DC-DC converter.								Iv,v				
1.	Name of the	Department	Electrical and Electronics Engineering										
-----------------	---	----------------------	--	---------------	--------	--------	--------------	--------------					
2.	Course	Research Methodology	L		Т		Р						
	Name	and IPR											
2	Course		3		0		0						
5.	Code		5		0		U						
4.	Type of Cou	rse (use tick mark)	Core ()	EAS $()$	BSC ()		OE ()	PE ()					
5.	Pre-		6. Fre	equency	Even	Odd ()	Either	Every					
	requisite (if		(use tick		(√)		Sem ()	Sem					
	any)		ma	rks)				0					
7.	7. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)												
Lectures $= 42$		Tutorials $= 00$		Practical = 0									
8.E	8.Brief Syllabus:												

The aim of the course is to make students understand the importance of Research Paper Writing. Also, it covers all the concepts which involved in writing the Research Paper.

9Learning objectives:

The objectives of the course are:

- i) The students are able to recognize the steps involved in doing research work.
- ii) The students will be able to collect data using various media and using the best possible sample available.
- iii) The students would learn to propose their Hypothesis and build models for the problem.
- iv) The students would be able to correctly document their findings in the form of a report.

10.Course Outcomes:

After completion of this course, the student will be able to:

- i) Recognize the various steps involved in research.
- ii) Collect datca from samples, Examine and Analyze the data.
- iii) Develop models for problems.
- iv) Explain the entire process in the form of a report.

11.Unit wise detailed content

Unit-1	Number of lectures = 12	Title of the unit: Introduction		
Research - Types, Research process and steps, Hypothesis, Research Proposal and aspects. Research				

Research - Types, Research process and steps, Hypothesis, Research Proposal and aspects.Research Design- Need, Problem Definition, Variables, Research Design concepts, Literature survey and review, Research design process, Errors in research. Research Modeling- Types of models, model building and stages, Data consideration.

Unit - 2	Number of lectures = 10	Title of the unit: Sampling

Sampling and data collection- Techniques of sampling, Random, Stratified, Systematic, Multistagesampling, Primary and secondary sources of data. Design of questionnaire.

Unit - 3	Number of lectures = 10	Title of the unit: Data Collection and Experiments

Design of Experiments- Objectives, strategies, Factorial experimental design, designing engineering experiments, basic principles-replication, randomization, blocking, guidelines for design of experiments.

Unit - 4	Number of lectures = 10	Title of the unit: Models and Hypothesis & Report
		writing

Single factor experiment- Hypothesis testing, analysis of Variance component (ANOVA) for fixed effect model; Total, treatment and error of squares, Degrees of freedom, Confidence interval; ANOVA for random effect model, estimation of variance components, Model adequacy checking.

Structure and components of Scientific Reports, Types of Report, Technical Reports and Thesis; Different steps in the preparation – Layout, structure and Language of typical reports; Illustrations and tables, Bibliography, Referencing and foot notes.

12.Brief Description of self learning / E-learning component

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

13.Books Recommended

Text Book:

i) Research Methodology – Methods and Techniques – C.R. Kothari, New Age International, New Delhi, 2004.

Reference Book:

- i) Design and Analysis of Experiments Douglas C. Montgomery, Wiley India, 8th Edition, 2012.
- ii) Practical Research: Planning Design Paul D. Leddy, London, 1980.

1.	1. Name of the Department			Electrical and Electronics Engineering						
2.	Subject Name		Research	L		Т		Р		
	1 vanne		and IDP I ab							
3.	Subject Code			0		0		2	2	
4.	Type of	Subje	ect	Core ()	EAS $()$	BSC ()		OE ()	PE ()	
5.	Pre-		Research	Frequency	(use tick	Even	Odd ()	Either	Every	
	requisite	e (if	Methodology	marks)		(√)		Sem	Sem	
	any)		and IPR					0	0	
6.	Total Ni	ımbei	r of Lectures, Tut	iorials, Pract	ical, Assum	ing 14 we	eks in sen	nester		
Lectu	res = 00		,	Tutorials =	= 00	Practica	l =28			
7.	Learnin	g obje	ectives:							
The of	bjectives o	of the o	course are:							
	i) The students are able to recognize the steps involved in Identifying research problem.									
	ii) The students will be able to collect data using various media and using the best									
	possible sample available.									
	iii) The students would learn to propose their Hypothesis and build models for the									
	problem.									
0	IV) 1	ne stu	idents would be ab	ole to correcti	y document	their findi	ngs in the	form of a	a report.	
0.	Learnin mplotion (g out	course the studen	te will be abl	a to					
On con	i) (i)	'hoose	the topic for writi	ing research i	o io Naper					
	і) С іі) Г)evelo	n models for prob	lems	paper.					
	іі) Т	The stu	dents would learn	to write the i	esearch pap	er				
	iv) E	xplair	the entire process	s in the form	of a report.	01.				
9.	Lab Cor	itent	F							
Sr. No	р. 1	litle						CO c	overed	
1	ŀ	How to	choose topic for	research				I,ii		
2	ŀ	How to	o collect data for th	ne particular i	research pro	blem		I,ii		
3	V	Vriting	g Abstract					I,ii		
4	V	Vriting	g Literature review	V				I,ii		
5 Explaining and writing m			nethodology				i.ii			
6	ŀ	How to	analyze the data	collected				I,ii		
7 Presentation of analysis an			and findings				I,ii			

8	How to write result and conclusion	Ii,iii
9	References in research article	Iii,iv

Semester V

1. Name of the Department- Electrical & Electronics Engineering								
2. Course	Autor	nation	L		Т		Р	
Name	in Ma	chinery						
3. Course			3		0		0	
Code								
4. Type of Course (use tick		Core	EAS ()	BSC ()		OE ()	PE ()	
mark)		(√)						
5. Pre-requisite (if Basics of		6. Free	quency	Even	Odd	Eithe	Ever	
any) Automati		(use		0	(✔)	r	У	
on		ticl	k marks)			Sem	Sem	
							0	0

7. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)

Lectures = 42	Tutorials = 0	Practical = 0
9 Comme Description		

8. Course Description

A study of the applications of industrial automation systems, including identification of system requirements, equipment integration, motors, controllers, and sensors. Coverage of set-up, maintenance, and testing of the automated system.

Learning Objectives:

The students will learn and understand

- i) To introduce the importance of automation techniques manufacturing and process industries.
- ii) To impart the role of PLC in industry automation.
- iii) To expose to various control techniques employed in process automation.
- iv) To develop automation system for manufacturing and process industries.

10. Course Outcomes (COs):

On completion of this course, the students will be able to

- i) Familiar with various automation technologies in manufacturing and process industries.
- ii) Understand various automation tools and methods in the manufacturing industry.
- iii) Implement various control and automation methods in process industries.
- iv) Familiar with various communication technologies in manufacturing and process industries.

11. Unit wise detailed content

Unit-1	Number of lectures = 10	Title of the Unit: Introduction

Automation in production system, Principles and strategies of automation, Basic elements of an automated system, Advanced automation functions, Levels of automations, Automated flow lines and transfer mechanisms, Analysis of transfer lines without storage, Automated flow lines with storage buffers.

Unit – 2	Number of lectures = 12	Title of the Unit:
		Automation in Process Industries

Introduction to computer based industrial automation- Direct Digital Control (DDC), Distributed Control System (DCS) and supervisory control and data acquisition (SCADA) based architectures. SCADA for process industries includes understanding of RTUs, Pumping stations, Evacuation processes, Mass Flow Meters and other flow meters, Leak-flow studies of pipelines, Transport Automation.

Unit – 3	Number of lectures = 10	Title of the Unit	:	
		Programmable	Logic	Controller
		(PLC)-		

Block diagram of PLC, Programming languages of PLC, Basic instruction sets, Design of alarm and interlocks, Networking of PLC, Overview of safety of PLC with case studies. Process Safety Automation: Levels of process safety through use of PLCs, Integrating Process safety PLC and DCS, Application of international standards in process safety control.

Unit – 4	Number of lectures = 11	Title of the Unit:
		Distributed Control System-

Local Control Unit (LCU) architecture, LCU Process Interfacing Issues, Block diagram and Overview of different LCU security design approaches, Networking of DCS. Introduction to communication protocols- Profibus, Field bus, HART protocols. Data gathering, Data analytics, Real-time analysis of data stream from DCS, Historian build, Integration of business inputs with process data, Leveraging RTU (as different from PLCs and DCS)

12. Brief Description of self-learning / E-learning component

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

13. Books Recommended

Text Books

i) M.P.Groover, "Automation, Production Systems and Computer Integrated Manufacturing", 5 th Edition, Pearson Education, 2009.

Reference Books

- i) Curtis D. Johnson, "Process Control Instrumentation Technology", 8th Edition, Pearson New International, 2013.
- ii) Lukas M.P, "Distributed Control Systems", Van Nostrand Reinhold Co., New York, 1986.
- iii) John W. Webb and Ronald A. Reis, "Programmable Logic Controllers: Principles and Applications", 5th Edition, Prentice Hall Inc., New Jersey, 2003.
- iv) Krishna Kant, "Computer Based Industrial Control", 2nd Edition, Prentice Hall, New Delhi, 2011.

1. Name of th	e Departm	ent :]	Elect	trical an	nd Electr	onics	Engir	neeri	ng				
2.Course	Automation in L							Р					
Name	Machine	rv La	h										
3 Course		1 <u>9</u> <u>L</u> u	0	0				0		2			
Code				0				0			2		
4.Type of Cou	rse (use	Core	()		EAS)	BSC	20	OE ()		PE ()	
tick mark)		0010						0	020			,	
tick mark)													
5.Pre-	Semicondu	icto	6.F	requen	cy	E	ven ())	Odd $()$	Eit	her	Every	
requisite (if	r Devices	and	(use	e tick n	narks)					Se	m ()	Sem ()	
any)	Circuits										V	Ŷ	
7. Total N	Number of 1	Lectu	res,	Tutori	als, Pra	ctical	(assu	min	g 14 weeks	of or	ne sem	ester)	
Lectures = 0				Tutor	ials = 0	0		Pra	ctical = 28				
8. Brief S	yllabus		. .						1 1	1		C .	
A study of th	e applicatio	$\frac{1}{2}$	t inc	lustrial	automa	tion s	ystem	ns, 11	ncluding ic	lentifi	cation	of system	
requirements,	equipment	inte	grati	on, m	otors, c	ontro	llers,	and	sensors.	Cov	erage	of set-up,	
<u>naintenance</u> , a	na testing o	on the a	auto	mated s	system.								
i) Impar	t knowledge	es:	anem	nitter de	sign								
i) Europa	una ta diffar	$- \prod u_{i}$			sign mina la								
$\mathbf{H} = \mathbf{H} \mathbf{L} \mathbf{X} \mathbf{P} \mathbf{O} \mathbf{S}$						nguag							
iii) Able t	o provide ad	dequa	te kr	nowledg	ge in SC.	ADA	and L	JCS					
iv) Study	of HART a	and Fi	eld	bus prot	tocol								
10. Course	Outcomes	: On c	comp	oletion	of this co	ourse,	the st	tuder	its will be a	able to)		
i) Gain con	fidence in d	levelo	pme	ent of co	onventio	nal/ w	ireles	s Io7	based trai	nsmitt	er suit	ed for real	
time pr	ocesses		c 1'(CC (4 11	•	11 4	c	1.4				
ii) Get exp	osure in de	sign o	of altill	lierent c	D C D	rs sun	able 1	IOT TE	eal time pro	ocesse	s.		
iv) Gain k	ne program	nning 5 Lodd	SKIII Jor I	s using	FLC, D	ung all	u SCF	ADA					
10) Ualii Ki 11 Lai	Content			Logic pi	ogramm	inig.							
Sr. No.	Title										CO co	vered	
	11010											, er eu	
1	Design a	nd c	leve	lopmen	t of t	WO	wire	tem	perature		i		
	Transmitte	er.											
2	Design and	d deve	elopi	ment of	IoT base	ed tra	nsmitt	ter.			i		
3	Cascade a	and f	eedt	back co	ontroller	desi	gn fo	or re	eal time		I,	ii	
	process tra	iner.											
4	Feed forw	vard a	and	ratio c	controlle	r des	ign f	or r	eal time		I,	ii	
	process tra	iner.											
5	Developm	ent o	of .	combin	ational	and	Development of combinational and sequential logic					11	
	application	n usin	g mi	nimum	PLC lar	application using minimum PLC languages.							
6	6 Development of Ladder logic programme for control of real						es.		iv				
	time processes.						es. for c	ontro	ol of real		i	V	
7	time proce	sses.	<u>f</u> 0		for the second	amme	$\frac{1}{1}$ for c	ontro	ol of real		i'	v	
7	time proce	esses. ent c	of S	CADA	fic progr	amme	es. for c	ontro	ol of real eal time		iv ii	v i	

9	P&I diagram development using simulation processes	iv
	software for complex	
10	Study of Distributed Control Systems and different instruction sets.	ii
11	Development of Cascade, ratio and feedback controller using DCS simulation software	ii
12	Development of HMI and annunciator circuits using DCS simulation software	I,ii

1.	1. Name of the Department: Electronics and Communication Engineering								
2.	Course Name	Arduino	L		Т		Р		
3.	Course Code		3		0		0		
4.	Type of Course (u	Core $()$	EAS ()	BSC ()		OE ()	PE ()		
5.	Pre-requisite (if	Microprocessor	6. Freque	ency (use	Even	Odd	Either	Every Sem	(
	any)	knowledge &	tick m	arks)			Sem)	
		understanding			()	(\mathbf{v})	()		
7. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)									
Lectures = 42		Tutorials $= 00$		Practica	l = 00				

8. Brief Syllabus

This workshop aims to demystify the Arduino microcontroller through hands-on work in the lab creating simple machines with embodied behaviors. The Arduino is a versatile resource for physical projects for students in all disciplines. This course brings students over the beginner's threshold to a basic understanding of the use, terminology, and potential of the Arduino.

9. Learning objectives:

- i) The main objective of this training course is to equip participant of fundamental understanding of embedded systems with Arduino.
- ii) Have good understanding of microcontroller, specifically of Arduino microcontrollers
- iii) Confidently construct and troubleshoot a microcontroller circuit for various applications
- iv) Participants will get the skills of how to communicate with Arduino boards over different interfaces

10. Course Outcomes: After completion of this course, student will be able to

- i) Determine the need of suitable processor & sensors to deal a problem
- ii) To design an appropriate design & solution.
- iii) To develop the hardware module capable to fulfill the need of application

11. Course Contents		
Unit 1	No.of Lectures: 10	Title of Unit: Introduction to Embedded Systems

Introduction to Open Source platform, Introduction of Electronic Components, Introduction to Sensors, Introduction to Computational Devices, Introduction to embedded system

Unit 2	No. of Lectures: 8	Title of Unit: Introduction to Sensors

Sensor, Various Basic Industrial Sensors: IR Analog Sensor, IR Digital Sensor, Color IR _TSOP Sensor, Light Sensor, Sound Sensor, Interfacing of sensor; Computational Devices & uses of Various Computation Device.

Unit 3	No. of lectures: 9	Title of Unit: Interfacing-I							
Actuator & its Interfacing, Interfacing of DC Motor & DC Geared Motor, Interfacing of Stepper Motor &									
Servo Motor, Drive	motor using H-Bridge Motor	Drive & Advanced Motor Driver							
Unit 4	No. of lectures: 10	Title of Unit: Interfacing-II							

Introduction to Programming Languages, Write programming code for blinking LED's and LCD devices, Program ADC and DAC for the communication in real time applications, program for Keypad, analog

Voltage Sensor, digital Buzzer Module.

12. Books RecommendedText Book:i) Beginning Arduino – Michael McRoberts

Reference Book:

i) Arduino Cookbook by Michael Margolis

1. Name of the Department : Electrical and Electronics Engineering												
2. (Course Na	me	Aurdino I	Lab	b L			Т			Р	
3.	Course Co	ode			0			0			2	
4.Type	of	Core	(\sqrt)	EAS ()	BS	C ()		OE ()		PE ())
Course	e (use											
tick ma	ark)											
4. 1	Pre-requis	ite S	emiconduc	to :	5. Freque	enc	Even ()	Odd $()$	Eit	her	Every
((if any)	r	Devices an	nd	y (use t	tick				Se	m ()	Sem ()
		C	Circuits		marks))						
6. 7	6. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)											
Lectur	es = 0				Tutorials	s = (00	Pra	actical = 28			
7. 1	Brief Sylla	bus			1			I				
The Ar	duino is a	versat	tile resource	e for ph	ysical proj	ects	for students	s in	all discipline	es. T	his co	urse brings
student	s over the	begint	ner's thresho	old to a	basic unde	erstar	nding of the	use	, terminolog	y, an	d pote	ntial of the
Arduin which t	0. The SKI	ns and	in arts and to	echnolo	in this cou	irse a	are presente	a n	om an inter	disci	piinar	y approach
8. 1	Learning of	bjecti	ves:		53.							
	0	U										
At the e	end of this	lab yo	u should be	able to:								
	i)	Desci	rihe the basi	e functi	oning of th	e "ct	andard" Ar	huin	a microcontr	oller	board	
	1) ii)	Desci	ribe the cana	hilities	of the Snat	rtron	ics Experim	iente	r Shield	oner	UUaru	
	iii)	Desci	ribe how it r	elates to	the Ardui	no.			i omeia.			
9. (Course Ou	tcome	es: On comp	letion o	f this cours	se. th	e students v	vill t	be able to			
v) (Configure t	he Arc	duino IDE to	o comm	unicate wit	h the	e Arduino h	ardw	are			
vi)	Use the Ar	rduino	IDE to load	(provic	led sample	s and	d user-writte	en) p	rograms			
vii)	Use Com	pile pr	ovided samp	oles and	user-writte	en) p	rograms	• , ,	`			
VIII) To	down	load and exe	ecute pr	ovided sam	ples	and user-w	rittei	n) programs			
	11. Lab C	onten	t									
Sr. No	. Title										CO co	vered
1	Introdu	ction t	o C Progran	nming							i	
2	Using S	Standa	rd I/O								i	
3	Using C	Conditi	ionals								I,	ii
4	Using I	Loops									I,i	i
5	Intro to	Addre	esses, Pointe	ers and I	Handles						I,i	ii
6	Hello A	rduin	0								I, i	iv
7	Arduin	o Digit	tal Output								I,i	v
8	Arduin	o Digit	tal Input								I,i	v
9	Arduin	o Anal	og Input								Iii,	iv
10	Arduin	o Reac	tion Timer								Ii,	iii

1. Name of the	Department- Electrical and	d Electror	nics Engin	eering				
2.Course Name	Internet of things	L		Т		Р		
						-		
3.Course Code		3		0		0		
2. Type of Cour	rse (use tick mark)	Core $()$	EAS ()	BSC ()		OE ()	OE ()	
3. Pre-	NIL	4. F	requency	Even	Odd	Either	Every	
requisite (if any)		(use tick	marks)	0	(√)	Sem ()	Sem ()	
5. Total Number	er of Lectures, Tutorials, Pi	ractical (a	ssuming 14	4 weeks	of one	semester)		
Lectures = 42		Tutorial	s = 00	Practic	al = 00			
6. Brief Syllabu	IS							
An overview of prote	ocols involved in Internet of	Things de	vices and a	applicati	ons. He	lp clarify	with IoT	
layer technology stat	ck and head-to-head compar	risons. The	e Internet o	of Thing	s cover	rs a huge	range of	
industries and use c	cases that scale from a sin	gle constr	ained devi	ce up t	o mass	ive cross-	-platform	
deployments of emb	edded technologies and clou	ud systems	s connectin	g in rea	l-time.	At the sa	me time,	
dozens of alliances	and coalitions are forming	in hopes	of unifyir	ig the fi	actured	l and org	anic IoT	
landscape.								
7. Learning obje	ctives: The objective of this	course is						
i) To impart know	vledge on IoT Architecture a	nd						
ii) To study varie	ous protocols.							
iii) To study their	rimplementations							
8. Course Outcon	mes: On completion of this c	ourse, the	students w	ill be ab	e to			
i) Understand the	Architectural Overview of I	oT.						
ii) Understand the	IoT Reference Architecture							
iii) Understand the	e Real World Design Constru	aints.						
iv) Understand the	e various IoT Protocols (Dat	alink, Netv	work, Tran	sport, Se	ssion, S	Service)		
9. Unit wise det	ailed content							
Unit-1	Number of lectures = 10	Title of t	he Unit: O	verview	7			
IoT-An Architectura	al Overview- Building an	architect	ture, Main	design	princ	iples and	needed	
capabilities, An Io	Γ architecture outline, sta	ndards co	onsideration	ns. M21	M and	IoT Tee	chnology	
Fundamentals- Device	ces and gateways, Local an	d wide ar	ea network	ting, Da	ta man	agement,	Business	
processes in IoT, Eve	erything as a Service(XaaS),	M2M and	IoT Analyt	tics, Kno	wledge	Managen	nent	
Unit - 2	Number of lectures = 12	Title of t	he Unit: H	Reference	e Arch	itecture		
IoT Architecture-Sta	ate of the Art – Introduc	tion, Stat	e of the	art, Ref	erence	Model a	und	
architecture, IoT ref	erence Model - IoT Refere	ence Archi	itectureIntr	oduction	, Funct	tional Vie	ew,	
Information View, D	eployment and Operational	View, Oth	ner Relevai	nt archite	ectural	views. Re	al-	
World Design Const	raints- Introduction, Technic	al Design	constraints	s-hardwa	re is po	opular aga	in,	
Data representation a	nd visualization, Interaction	and remot	e control.					
Unit - 3	Number of lectures = 10	Title of t	he Unit: I	OT Data	Link	Layer & I	Network	
		Layer Pi	rotocols					
PHY/MAC Layer(30	GPP MTC, IEEE 802.11, I	EEE 802.	15), Wirele	essHAR	Г, <mark>Z-</mark> Wa	ve,Blueto	oth Low	
Energy, Zigbee Smar	rt Energy, DASH7 - Networ	rk Layer-I	Pv4, IPv6,	6LoWP	AN, 6T	isch,ND	, DHCP,	
ICMP, RPL, CORPL, CARP								
Unit - 4	Number of lectures = 10	Title of t Protocol	he Unit: T s	ranspor	t & Ses	ssion Lay	er	
Transport Laver (TC	CP. MPTCP. UDP. DCCP	SCTP)-(T	LS. DTLS) - Sess	sion La	ver-HTTF	P. CoAP.	
XMPP. AMOP. MO	$\mathbf{TT} \mathbf{UNIT} \mathbf{V} - \mathbf{SERVICE} \mathbf{I} \mathbf{A}$	YER PRO	DTOCOLS	& SECI	JRITY	(12 hours)) Service	
Laver -oneM2M. ET	SI M2M. OMA. $BBF - Sec$	curity in Id	oT Protoco	ls - MA	C 802	15.4 . 6L	oWPAN	
RPL. Application La	yer.	· j 1					,	

10. Brief Description of self learning / E-learning component

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

11. Books Recommended

Text book:

i) Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1 st Edition, Academic Press, 2014.

Reference Book:

i) Peter Waher, "Learning Internet of Things", PACKT publishing, BIRMINGHAM – MUMBAI. ii.Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer

iii.Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118- 47347-4, Willy Publications

iv. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-onApproach)", 1 st Edition, VPT, 2014.

1. Name	1. Name of the Department : Electrical and Electronics Engineering											
2.Course	Name	Internet of	L			Т			Р			
2.000150		Things Lab	Things Lab							1		
3 Course	Code			0			0			2		
5.Course	Couc			0			U			2		
4.Type of	f Cor	e (√)	EAS ()	BS	C ()		OE ()		OE ()	
Course (use											
tick marl	k)											
5.Pre-req	uisite (if	Semiconducto) 6.F	requency		Even (√)	Odd ()	Eit	her	Every	
any)	-	r Devices and	d (us	e tick mar	ks)	Ň			Se	m ()	Sem ()	
		Circuits								V	~	
7.Total N	lumber of Le	ectures, Tutor	ials, P	ractical (a	ssum	ing 14 wee	eks o	f one seme	ster)			
Lectures	= 0			Tutorials	s = 0	0	Pra	actical = 28				
8.Brief S	yllabus											
An overv	iew of protoc	ols involved in	Intern	et of Thing	gs de	vices and a	pplic	ations. Hel	p clar	ify wit	h IoT layer	
technolog	gy stack and l	head-to-head c	compar	risons. The	Inte	rnet of Thi	ings	covers a hu	ige ra	inge o	f industries	
and use of	cases that sca	ale from a sin	igle co	onstrained	devi	e up to m	assiv	ve cross-pla	atform	ı deple	oyments of	
embedded	d technologies	s and cloud sys	stems of	connecting	in re	al-time. At	the :	same time,	dozen	s of al	liances and	
	are forming	in nopes of uni	lying	ine fracture	a an	d organic I		ndscape.				
11. L Tł	he students wi	ill learn and un	dersta	nd								
i) To	o get introduc	ed with hardw	are & s	software fo	r the	IoT applic	ation	developme	ent bo	ard.		
ii) To	o be familiar v	with communio	cation	protocol								
iii) To	o explore the	hardware & so	ftware	features.								
iv) D	esign & devel	lop any hardwa	are app	lications.								
12. C	ourse Outcor	mes: On comp	letion of	of this cour	se, tl	ne students	will	be able to				
i) U	nderstand the	characteristics	s of Io7	Г applicatio	ons d	evelopment	t boa	rd & softwa	are.			
ii) U	nderstand the	properties of I	OT de	velopment	soft	ware.						
iii) U	nderstand the	interfacing wi	th sens	sors & actu	ators	•						
iv) U	nderstand the	designing and	develo	oped the lo	Г ар	plications.						
Sr No	Lab Contel	nt									worod	
51. 10.	The										vereu	
1	Study and un	nderstanding o	f devel	lopment bo	ard f	or IoT appl	icati	ons.		I,i	V	
2	Explore the	software used	for pro	gramming	and	its program	ming	g model.		ii	Ĺ	
3	Interaction v	vith analog/dig	ital co	mmunicati	on po	ort.				iv	J	
4	Interfacing of	of LED's								Ι		
5	Interfacing c	of switches to c	control	the operati	on o	f LED's.				I,i	ii	
6	Interfacing of	of DC motors								Iv	V	
7	Interfacing of	of matrix keybo	oard w	ith IoT pro	cesso	or			iii			
8	Interfacing of	of LCD module	e							I,i	ii	
9	Uses of ADC	C characteristic	cs							iv	V	
10	Interfacing v	with analog ser	isors							ii		

11	Interfacing with digital sensors.	iii
12	Interfacing with temperature sensors	iii
13	Interfacing with multiple sensors & actuators.	iii
14	Interfacing with different communication modules.	iv

Semester VI

1. Name of the Depa	1. Name of the Department- Electrical & Electronics Engineering									
2. Course Name	Electrical	L		Т		Р				
	Machines									
3. Course Code		3		0		0				
4. Type of Course (u	Core $()$	EAS	BSC ()		OE ()	OE ()				
			0							
5. Pre-requisite (if	Basic Electrical	6. Frequency	r (use	Even	Odd	Eithe	Ever			
any)	Engineering	tick mark	ks)	(•)	0	r	У			
						Sem	Sem			
						0	0			
7. Total Number of	Lectures, Tutorials	s, Practical (assu	uming 1	4 weeks o	of one se	mester)				

Lectures = 42

8. Course Description

Basic concept review of electrical machines; single phase transformers. Auto-transformer; various types of connection of three phase transformer Phase-Conversion & phase-shifting transformers, construction and working of D.C. machines.

Tutorials = 0

Practical = 0

9. Learning Objectives:

The students will learn and understand

- i) To understand the basic working principle of electrical machines
- ii) To analyse the performance of synchronous and
- iii) To analyse the performance of induction machines

10. Course Outcomes (COs):

On completion of this course, the students will be able to

- i) Master modern signal processing tools including vector spaces, bases and frames, operators, signal expansions and
- ii) Classical signal processing tools including Fourier and z transforms, filtering, and sampling.
- iii) Apply the above tools to real-world problems including spectral analysis, filter design, noise cancellation, signal compression, rate conversion, feature extraction, inverse problems, machine learning and
- iv) To justify why these are appropriate tools.

11. Unit wise detailed content

11. Chit wise detailed content						
Unit-1 Number of le	ectures = 10 Ti	tle of the Unit: Transformers				

Principle, construction of core, winding & tank, operation, testing of single phase transformer, equivalent circuit, phasor diagram, parameters determination, P.U. representation of parameters, regulation, losses & efficiency, separation of iron losses. Parallel operation of single phase transformers. Auto-transformer: Principle, construction, comparison with two winding transformers, application.

Various types of connection of three phase transformers, their comparative features, Zig-Zag connection. Parallel operation of single phase & three phase transformers, Auto-transformer: Principle, construction, comparison with two winding transformers, application. Nature of magnetizing current, plotting of magnetizing current from B-H curve, Inrush current, harmonics,

effect of construction on input current, connection of three phase transformer. Phase-Conversion: Three to two phase, three to six phase and three to twelve phase conversions. Introduction to three winding, tap-changing & phase-shifting, transformers.

Unit – 3	Number of lectures = 10	Title of the Unit: D.C. MACHINES:

Elementary DC machine, principle & construction of D.C. generator, simplex lap and wave windings, E.M.F. equation, armature reaction, compensating winding, commutation, methods of excitation, load characteristics, parallel operation.

Unit – 4	Number of lectures = 10	Title of the Unit: DC Motors:

Principle of DC Motors, torque and output power equations, load characteristics, starting, speed control, braking, testing, efficiency & applications.

12.Brief Description of self learning / E-learning component:

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

13.Books Recommended

Text Books

i) Electric Machines: I.J.Nagrath and D.P.Kothari, TMH, New Delhi.

Reference Books:

i) Electric Machinery, Fitzgerald & Kingsley, MGH.

- ii) Theory of alternating current machinery, A.S. Langsdorf, TMH.
- iii) Performance & Design of D.C. Machines: A.E. Clayton & N.N. Hancock; ELBS)

iv) Electrical Machines - (Vol - II) By B L Theraja, S Chand

1. Name of the Department : Electrical and Electronics Engineering											
2.Course Name	e	Electrical Machines La	L T						Р		
3.Course Code				0			0		2		
4.Type of	Cor	e (√)	EAS ()	BS	C ()		OE ()		PE ()
Course (use tick mark)											
5.Pre-requisite	(if	Basic	6.F	requency		Even (Odd ()	Eitl	her	Everv
any)	(Electrical an	d (us	e tick mar	ks)	_ · · · · (. •)		Ser	n ()	Sem ()
		Electronics							~ ~ ~ ~	()	~~~~~ ()
		Engineering									
7.Total Numbe	r of Le	ectures. Tuto	rials. P	ractical (a	sum	ing 14 wee	ks o	f one seme	ster)		
Lectures = 0				Tutorials	s = 0	0	Pra	actical = 28			
9 Dwiof Syllab	<u> </u>										
Basic concept r	.s eview c	of electrical m	achines	single nh	ase ti	ansformers	3-1	hase transf	ormer	· vario	ous types of
connection of	hree p	hase transform	mer, Pl	nase-Conve	ersior	1 & phase-	shift	ing transfo	rmers.	Swii	nburne's &
Hopkinson's te	st of D	C shunt M/Cs.	,			I		0	,		
9.Learning obj	ectives	:									
At the e	nd of th	nis lab Student	ts will t	be able to:							
i) To unde	rstand 1	the basic worl	king pri	nciple of el	ectri	cal machin	es				
ii) To analy	vse the	performance (of 1 pha	use and							
$\frac{10}{10} Course Out}$	comes:	On completi	$\frac{015Pl}{015th}$	is course the	he st	idents will	hea	hle to			
Upon	The stuc	tents will be a	ble to:-								
i) Convert	3 Phas	e into six pha	se by us	sing 3 singl	e pha	ase transfor	mer	5.			
ii) Perform	load te	est on DC shu	nt gener	rator.	- P						
iii) Perform	ned Wa	ard Leonard m	nethod of	of speed con	ntrol						
11. Lab	Conte	nt								~~~	-
Sr. No. Title									(CO co	overed
1 Conv	ersion	of 3 Phase to	six pha	se using 3 s	ingle	e phase tran	sfor	mers		i	
2 To st	udy thr	ee phase recti	fiers &	supply con	figur	ation in 3 p	hase	es.		i	
3 To pe	To perform Sumpner's Back to back test on 1-phase transformers.										
4 Paral	Parallel operation of two 1-phase transformers i										
5 To co	To convert three phase to 2-phase By Scott-connection i										
6 To pe	To perform load test on DC shunt generator. ii										
7 Spee	Speed control of DC shunt motor. ii										
8 Swin	burne's	s test of DC sh	unt mo	otor.						i	i
9 Hopk	inson's	s test of DC sł	nunt M/	Cs						ii	i
10 Ward	Leona	rd method of	speed c	ontrol.						ii	i

1. Name of t	he Depart	tment- Electrical & I	Electronics I	Engineeri	ng				
2. Course Na	ıme	Analog and	L		Т			Р	
		Linear							
		Integrated							
3. Course Co	ode		3		0			0	
4. Type of C	ourse (use	e tick mark)	Core $()$	EAS ()	BSC	C ()		OE ()	OE ()
5. Pre-requis	site (if	,	6. Freque	ncy (use	Eve	en	Odd	Either	Every
any)			tick m	arks)	(🗸	•)	0	Sem	Sem
					Ì	,		0	0
7. Total Nun	nber of Lo	ectures, Tutorials, Pr	ractical (ass	uming 14	weeks of	f one	e semeste	er)	
Lectures = 4	2		Tutorials	= 0	Pra	actic	al = 0		
8. Course De	escription								
A linear integ	grated circ	uit (linear IC) is a so	lid-state ana	log device	e characte	erize	d by a th	eoretically	y infinite
number of pos	sible oper	ating states. It operate	es over a con	ntinuous r	ange of i	nput	levels. Ir	n contrast,	a digital
IC has a finite	number of	f discrete input and ou	itput states.						
9. Learning C	biectives	•							
i) To und	lerstand th	e basics of linear inte	grated circui	ts and ava	uilable IC:	s			
ii) To und	lerstand th	e characteristics of the	e operational	amplifie	r.				
iii) To app	ly operation	onal amplifiers in line	ar and nonli	near appli	cations.				
iv) To acq	uire the ba	asic knowledge of spe	cial function	IC.					
10.0									
10. Course C	Dutcomes	(COs):	1 11 4						
Upon complet	ion of this	course, students will	be able to	tion of on					
ii) Desch	n simple (OPAMP based circuit	s characteris	ties of all	OFAME	•			
iii) Implen	nent vario	us analog signal proce	s. essing circuit	S.					
iv) Analyz	e and desi	ign various types of A	DCs and DA	ACs.					
v) Analyz	e and con	struct various applicat	tion circuits	using 555	timer.				
11 TI	ما مد ما ما	aantant							
II. Unit wise	Numb	content on of loctures – 10	Title of	f the Unit	. Onorat	iono	l Amplif	ion	
Unit-1	INUITIO	ef of fectures = 10	1 fue of		. Operat	1011a	1 Ampin	IEI	
Block diagram	of a typic	cal op-amp – character	ristics of idea	al and pra	ctical op-	amp	- parame	eters of op	amp
– inverting and	- inverting and non-inverting amplifier configurations - frequency response - circuit stability.								
Unit – 2	Number	r of lectures = 12	Title	of the	Unit:	Appl	lications	of Ope	erational
DC and AC ar	nplifiers -	summing amplifier –	difference a	mplifier –	voltage f	follo	wer – dif	ferentiator	·
integrator- cla	mper - cli	oper-filters. Oscillato	ors, sine wave	e, square v	wave, tria	ingul	ar wave.	saw tooth	wave
generation, Sc	hmitt trigg	ger, window detector.	,	· 1	- ,	0			

Unit – 3	Number of	Title of the Unit: A/D and D/A converter and PLL
	lectures = 10	

Analog-to-digital, digital-to-analog, sample and hold circuits; voltage controlled oscillator, phase locked loop – operating principles, applications of PLL

Unit – 4	Number of	Title of the Unit: Timer and Regulators							
	lectures = 10								
IC555 Timer, monostabl	IC555 Timer, monostable and astable modes of operation; voltage regulators - fixed voltage								
regulators, adjustable voltage regulators - switching regulators.									
12. Brief Description of	of self-learning / E-le	earning component							
The students will be en	couraged to learn usi	ng the SGT E- Learning portal and choose the relevant lectures							
delivered by subject ex	perts of SGT Univers	sity.							
The link to the E-Learn	ing portal.								
http://sgtlms.org									
Journal papers: Patents	in the respective field	1.							
rr,	T T								
13.		Books Recommended							
Text Books:									
i) Gayakwad R.A., Edition, 2009.	'Op-amps & Linear I	ntegrated Circuits', Prentice Hall of India, New Delhi, 4 th							
Reference Books:									
i) Sergio Franco,' I Hill, 3rd Edition,	Design with Operation 2002.	nal Amplifiers and Analog Integrated Circuits', Tata McGraw							
ii) Sedra Smith, 'Mi	ii) Sedra Smith, 'Microelectronic Circuits', Oxford University Press, 6th Edition, 2009.								
iii) R P Jain, 'Moder) R P Jain, 'Modern Digital Electronics', Tata McGraw-Hill Education, 3rd Edition, 2003.								
iv) 2. Roy Choudhur	y and Shail Jain, 'Lir	near Integrated Circuits', 4th Edition, New Age International							
Publishers, 2010.									

1. Name of the Department : Electrical and Electronics Engineering											
2.Course	Name	Analog Linear Inte Circuits Lab	and egrated	nd L ed			Т			Р	
3.Course	Code			0			0			2	
4.Type of	f	Core (√)	EAS ()	BSC	C ()	0	Е ()		PE ())
tick marl	use k)										
5.Pre-reo	uisite (if	Semiconduc	to	6. Frequ	en	Even (Odd ()	Eit	her	Everv
any)		r Devices a	nd	cy (use					Ser	n ()	Sem ()
		Circuits		tick marks							
7 T	otal Num	ber of Lectures	Tutori	als Practic	<u>′</u> .al (a	ssuming 1	4 wee	ks of one s	emes	ster)	
Lectures	= 0		1 40011	Tutorials	= 0	0	Prac	$\frac{\text{the of one s}}{\text{ctical}} = 28$,,	
8 R1	rief Svlla	hus		<u> </u>							
The Ardu students of Arduino. which me	8. Brief Syllabus The Arduino is a versatile resource for physical projects for students in all disciplines. This course brings students over the beginner's threshold to a basic understanding of the use, terminology, and potential of the Arduino. The skills and concepts taught in this course are presented from an interdisciplinary approach which merges practices in arts and technology.										
9. L	earning o	objectives:									
A	t the end	of this lab Studen	ts will b	be able to:							
i) ii)	To und To und	erstand the basics erstand the charac	of linea	ar integrated	d circ ratio	uits and av	ailabl er.	e ICs			
iii) To appl	ly operational am	plifiers	in linear and	d nor	linear appl	icatio	ns.			
iv) To acqu	uire the basic kno	wledge	of special f	uncti	on IC.					
10. C	ourse Ou	tcomes: On com	pletion	of this cour	se, th	e students	will b	e able to			
Upon con	npletion of	of this course, stu	dents w	rill be able t							
1) D(ii) D	escribe th	e various ideal ar	a practi	ical charact	eristi	cs of an OI	AMI	,			
iii) In	nlement	various analog si	onal pro	nts. Dessing cir	cuits						
iv) A	nalyze an	d design various	types of	ADCs and	DA	Cs.					
v) A	nalyze an	d construct vario	us appli	cation circu	its u	sing 555 tir	ner				
11	l. Lab Co	ontent									
Sr. No.	Title								(CO co	vered
1]	nverting, Non inv	verting a	nd differen	tial a	mplifiers.				i	
2]	integrator and Dif	ferentia	tor.						i	
3	Instrumentation amplifier I,ii							ii			
4	1	Active low-pass, I	High-pa	ss and band	l-pass	s filters.				I,i	ii
5	1	Astable and Mono	stable r	nultivibrato	ors us	ing Op-am	р			I,i	ii
6	, L	Schmitt Trigger u	sing op-	amp.						I,	ii
7	I	Phase shift and W	ien brid	ge oscillato	ors us	ing Op-am	p.			I,i	ii
8	Astable and Monostable multivibrators using NE555 Timer. I,ii										

9	PLL characteristics and its use as Frequency Multiplier, Clock synchronization	iii,iv
10	R-2R Ladder Type D- A Converter using Op-amp.	iv

1. Name of the Department- Electrical and Electronics Engineering								
2 .Course	Programming	L			Т		Р	
Name	Language –							
	Python							
3. Course		3			0		0	
Code								
4. Type of Course	e (use tick mark)	Core	e (√)	EAS ()	BSC ()		OE ()	PE ()
5. Pre-requisite (if any)	Operating System	6. Frequency (use tick marks)		cy (use rks)	Even ()	Odd (□)	Either Sem ()	Every Sem ()
7. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)								
Lectures = 42			Tutorials	= 0	Practic	al = 00		

8. Brief Syllabus: The course begins with the concepts of Python Programming Language with Libraries. Python is next generation multi-purpose programming language that allows different users to create applications of various domains. Students will be able to learn primary fundamentals of python programming and potential of python is to achieve modern computing requirements.

9. Course Objectives:

- i) Master the fundamentals of writing Python scripts.
- ii) Learn core Python scripting elements such as variables and flow control tructures.
- iii) Discover how to work with lists and sequence data.
- iv) Use Python to read and write files.

11. Course Outcomes:

On completion of this course, the students are expected to learn

- i) To learn basics of Python.
- ii) To develop console application in python.
- iii) To develop database application in python.
- iv) To develop basic machine learning application.

12. Unit wise detailed content

Unit-1	Title of the Unit: Python programming Basic								
Python interpreter	non interpreter IPython Basics. Tab completion. Introspection								
%run command, magic commands, matplotlib integration, python programming, language semantics,									
scalar types. Contr	scalar types. Control flow,								
Data Structure,	functions, files: tuple, list, built-in	sequence function, dict, set, functions,							
namescape, scope,	namescape, scope, local function, returning multiple values, functions are objects, lambda functions,								
error and exception handling, file and operation systems									
Unit - 2	Number of lectures = 10	Title of the Unit : NumPy: Array and vectorized							

computation:

Multidimensional array object. Creating ndarrays, arithmetic with numpy array, basic indexing and slicing, Boolean indexing, transposing array and swapping axes, universal functions, arrayoriented programming with arrays, conditional logic as arrays operations, file input and output with array

Unit - 3	Number of lectures = 10	Title of the Unit: Pandas

Pandas data structure, series, DataFrame, Index Object, Reindexing, dropping entities from an axis, indexing, selection and filtering, integer indexes, arithmetic and data alignment, function application and mapping, soring and ranking, correlation and covariance, unique values, values controls and membership, reading and writing data in text format

Unit - 4	Number of lectures = 10	Title of the Unit: Visualization
		with Matplotlib:

Figures and subplots, colors, markers, line style, ticks, labels, legends, annotation and drawing on sublots, matplotlib configuration

Plotting with pandas and seaborn: line plots, bar plots, histogram, density plots, scatter and point plots, facet grids and categorical da

13. Brief Description of self learning / E-learning component:

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field

14. Books Recommended:

TextBook:

i) Learning Python: Powerful Object-Oriented Programming by Lutz M - Shroff; Fifth edition

Reference books:

i) Python: The Complete Reference by Martin C. Brown - McGraw Hill Education; Forthedition

ii) Pandas for Everyone: Python Data Analysis by Daniel Y. Chen - Pearson Education; Firstedition

1. Name	1. Name of the Department : Electrical and Electronics Engineering										
2.Course	Name	Programmi	ng	L			Т	T P			
		Language -	Python								
3.Course	Code			0			0			2	
4.Type of		Core $()$	EAS ()	BS	C ()		DE ()		PE ())
Course (u	ise										
5.Pre-req	uisite (if	Basic	6.F	requency	l	Even (√)	Odd ()	Eitl	ner	Every
any)		Electrical a	nd (us	e tick mar	ks)				Sen	n ()	Sem ()
		Electronics									
		Engineering	5								
7.Tota	al Numbe	er of Lectures, "	Futorial	s, Practica	l (as	suming 14	weeł	s of one ser	neste	r)	
Lectures	= 0			Tutorials	5 = (00	Pra	ctical = 28			
8.Brie	ef Syllabu	IS		I			I				
Python is	s next ge	eneration multi-	purpose	programm	ning	language	that	allows different	erent	users	to create
potential of	of python	is to achieve mo	odern co	mputing red	quire	ements.vario	ous	itals of pyu	ion p	logiai	inning and
9.Learnin	ng objecti	ves:									
I. I	Master the	e fundamentals of	of writing	g Pythonsci	ripts						
II. L	earn core	Python scriptin	g elemei	nts such as	varia	ables and flo	ow co	ontrolstructu	res.		
III. D	Discover h	ow to work with	n lists an	d sequence	data						
$\frac{IV.}{10 Course}$	Vrite Pyth	on functions to	facilitate	codereuse	he st	udents will	he al	le to			
10.00015	c Outcom			<u>13 COUISC, 11</u>							
After cor	npletion of	of this course, st	udent wi	ill be able to	0						
I. I II. T	o learn ba	console application	ation in 1	ovthon							
III. T	o develop	o database applie	cation in	python							
	develop	basic machine le	earninga	pplication							
Sr. No.	<u>. Lab Col</u> Title	nient							(vered
1	Impleme	nt a Python prog	gram to (Calculate G	CD	of two num	bers.	1 1		1	
2	Implement a Python Program to calculate the square root of a number by i Newton's Method.										
3	Implement a Python program to calculate the exponentiation of a ii										
4	Para Implement a Python Program to calculate the maximum from a list iii										
5	Impleme	nt a Python Prog	gram to p	perform Sea	arch					ii	
6	Implement a Python Program to perform Liner search iv										

7	Implement a Python Program to perform Binary search	iii
8	Implement a Python Program to perform insertion sort.	ii
9	Implement a Python Program to perform selection sort.	iv
10	Implement a Python program to multiply matrices.	iii
11	Implement a Python program to Calculate the most frequent words in a text read from a file.	ii
12	Implement function overloading with different function signatures	iv
13	Implement concept of class, instances and inheritance.	iv
14	Implement internal and external library.	iii
15	Solve algorithmic problems by program using different problem solving strategies.	iii
16	Search content using regular expression library in python.	iv
17	Implement Matrix multiplication using multi-threading in python	iii

Semester VII/VIII

1. Name of the Dep	oartment:	Electronic	s and Com	munication Eng	ineering					
2. Course Name	Cor	ntrol Syste	m	L		Т		Р		
3. Course Code				3	0		0			
4. Type of Course	(use tick n	nark)		Core $()$	EAS	BSC ()	OE	PE	
5 Pre-requisite (if	anv) Sig	male	& 6 Fre	auency (use	Even	Cor	FASO			OF ()
5. Tre-requisite (ii	Sys	stem	tick	x marks)	0	e()	LAS	D		OE ()
7. Total Nu	mber of L	ectures. T	utorials. P	ractical (assun	l 1 ng 14 v	veeks of	one sem	ester)		
Lectures = 42		<u> </u>	Tutoria	als = 00		Practica	l = 00			-
8. Brief Syllabus										-
Study of analog and	computer	[•] controlled	d systems,	classical and n	nodern c	ontrol sy	stem des	sign m	ethods,	
state space, dynamic	s of linear	systems, a	and frequen	cy domain anal	ysis and	design to	echnique	s. Ana	lysis of	
linear feedback syste	ems, their	characteris	stics, perfor	rmance, and sta	bility. T	he Routh	-Hurwitz	z, Roo	t-locus,	
Bode, and Nyquist te	chniques a	re used for	r judge the	stability of the	system.					
	•			-	•					
9. Learning object	ives: The s	tudents wi	ll learn and	lunderstand						
i) Methodology f	or modelin	ig mechani	cal, electric	cal, and other ty	pes of dy	namic sy	ystems us	sing		
frequency do	main and	a maahani	aal alaatri	al and other tw	mag of dr	momio	atoma u	ing at	ata	
space technic		ig mechani	cal, electric	cal, and other ty	pes of dy	manne sy	ystems us	sing su	ale-	
iii) Principles of	feedback c	ontrol to a	variety of	scientific discir	lines.					
10. Course Outcom	es: On com	pletion of	this course	, the students w	ill be abl	e to				-
i) Know the me	thodology	for modeli	ing dynami	c systems						
ii) Work with st	ate-space n	nodels and								
iii) Work with th	eir applicat	tion to free	luency don	nain models.						
iv) Design feedb	ack control	llers and co	ompensator	rs to achieve de	sired perf	formance	specific	ations		_
11. Unit wise detail	ed content	10		G 41 • 4 · T 4	1 (1					-
Unit-1 Numbe	r of lectur	res = 10	Title of	t the unit: Intro	oduction	to Cont	rol Syste	em		
Open loop & close	d control;	servomec	hanism, Pl	hysical example	es. Trans	sfer func	tions, B	lock d	liagram	1
algebra, and Signal	flow grap	h, Mason'	s gain form	mula Reduction	of para	meter va	riation a	and eff	fects of	
disturbance by using	negative fo	eedback.								
Unit - 2 Number of lectures = 12 Title of the unit: Time Response analysis										
Standard test signals	, time resp	ponse of fi	irst and sec	cond order syst	ems, Des	sign spec	ification	s of 1 ^s	st & 2 nd	1
order systems: Der considerations for hi	ivative er gher order	ror, deriv systems.	ative outp	out, integral e	rror and	PID c	ompensa	tions,	design	
Unit – 3 Numb	er of lectu	res = 10	Title of	f the unit: Con	cept of S	tability of	& Algeb	raic C	riteria	1
Concept of Stability.	Necessarv	condition	for Stabili	ty, Routh Hurw	itz Stabil	ity Crite	rion, Rel	ative S	tability	1
Analysis, and Stabi	ity of Sys	stems mod	eled in Sta	ate variable for	m. Root	locus, S	Sensitivit	y of r	oots of	

Characteristic equations.								
Unit – 4	Number of lectures = 10Title of the unit: Frequency response Analysis and state space analysis							
Polar and in	verse polar plots, Bode plots,	Stability in Frequency Domain: Nyquist stability criterion;						
assessment of	t relative stability: gain margin	and phase margin;						
12. Brief Des	scription of self learning / E-le	earning component						
The studen	ts will be encouraged to learn u	sing the SGT E- Learning portal and choose the relevant						
lectures del	ivered by subject experts of SG	T University.						
The link to	the E-Learning portal.							
http://sgtlm	s.org Journal papers; Patents in	the respective field.						
13. Books Recommended								
Text boo	k:							
i) Nagrath & Gopal, "Control System Engineering", 4th Edition, New age International, ISBN:								
0130980412. 8.								
Reference Books:								
i) K. Og ii) Norm	 i) K. Ogata, "Modern Control Engineering", Prentice Hall of India, 3rd edition ISBN: 0132273071 ii) Norman S. Mise, Control System Engineering 4th edition, Wiley Publishing Co, ISBN: 							

0132273071.

1. Name of the Department : Electrical and Electronics Engineering								
2.Course	Name	Control lab	System	L		Т	Р	
3.Course	Code			0		0	2	
4. Type o	of Co	ore (√)	EAS ()	BSC ()	OE ()	PE ()	
Course (use							
uck mar	к)							
5.Pre-rec	quisite (if	Analog circ	cuit 6. F	requency	Even () Odd ($$) Either Every	
any)			(us	e tick mark	(s)		Sem () Sem ())
7.Total N	Sumber of I	ectures. Tu	torials, P	ractical (as	suming 14 wee	eks of one seme	ster)	
Lectures	= 0			Tutorials	= 00	Practical = 28	3	
0 D:- f C								
Study of	ynaous analog and c	computer cor	ntrolled sy	stems class	ical and mode	n control system	n design methods, st	tate
space, dy	namics of li	near systems	s, and free	quency dom	ain analysis an	d design techni	ques. Analysis of line	ear
feedback	systems, th	eir character	ristics, pe	rformance,	and stability. T	The Routh-Hurv	witz, Root-locus, Bo	ode,
and Nyqu	ist techniqu	es are used for	or judge t	he stability of	of the system.			
9. Lea	rning object	ives:						
i. Me	thodology fo	or modeling i	mechanic	al. electrical	and other type	es of dynamic s	vstems using frequen	cv
do	omain and	inouching i		ui, electreui	, and other type	is of a finance s	stems using nequen	le y
ii. Me	thodology fo	or modeling 1	mechanic	al, electrical	, and other type	es of dynamic s	stems using state-	
sp 	ace techniqu	les.	1.4	• • • • •				
iii. Prii	nciples of fee	edback contr	ol to a var	riety of sciei	the students wi	8. 11 ha ahla ta		
10. Cou		es. On comp		uns course,	the students wi			
After co	mpletion of	this course, s	student w	ill be able to				
i. K	now the met	hodology for	r modelin	g dynamic s	ystems			
	Ork with sta	te-space mod	dels and	ency domai	n models			
iv. D	esign feedba	ick controller	rs and cor	npensators t	o achieve desir	ed performance	specifications	
11	l. Lab Cont	ent		1		•	-	
Sr. No.	Title						CO covered	
1	Plot the po	le-zero confi	guration i	n s-plane fo	r the given tran	sfer function.	i	
2	Determine	the transfer	function	for given c	losed loop sys	stem in block	ii	
2	diagram re	presentation.	of civer	transfor for	notion and find	la dalar tima	т::	
3	rise time n	eak time and	l neak ove	ershoot	iction and find	is delay time,	1,11	
4	Determine	the time re	esponse (of the give	n system subi	ected to any	iii	
	arbitrary in	put.	1	0	J			
5	Draw the B	ode Plot for	a given s	ystem and d	etermine the sta	ability	iii	
6	Draw the root locus for a given system						iv	

7	Determine the stability of a given system by routh Hurwitz criterion.	Iii,iv
8	Draw the polar plot for a given system.	ii
9	Determine the 1 st order response of a given system	ii
10	Determine the 2 nd order response of a given system	Iii,iv

1. Name of the Depar	tment- Computer S	Science & Engineering						
2. Course Name	Java	L	Т)		
2.0.0.1	Programming	2				•		
3. Course Code	o tielz mark)	$\frac{3}{2}$				ł		
4. Type of Course (us	e lick mark)	Core(V) EAS() BSC	- () Even	$\frac{OE()}{Odd}$	OE () Fither	Every		
anv)		tick marks)	(\Box)	0	Sem()	Sem		
			(-)	\checkmark	V V	(2)		
7. Total Number of L	ectures, Tutorials,	Practical (assuming 14 weeks	s of one se	emester)				
Lectures = 42		Tutorials = 0	Practical	$\mathbf{l} = 0$				
8. Course Description			•					
This course of study bu	illds on the skills ga	ined by students in Java progra	imming S	tudents	will desi	gn		
object-oriented applica	tions with Java and	will create Java programs using	g nands-oi	n, engag	ing			
11. Learning objectiv	es:							
i. This module gi	ves students the skil	ls to understand java program	ning.					
ii. This module gi	ves students the kno	wledge to understand java pro	gramming	Ţ				
iii. How to write Ja	va code according (to Object-Oriented Programmi	ng princip	les				
iv. How to design	GUI applications an	d Applets using AWT.						
10. Course Outcomes	(COs):	· · ·						
i. Describe Java c	concepts.							
ii. Identify various	s data types.							
iii. Evaluate variou	is java concept using	g programs.						
11. Unit wise detailed	content		1.6 4		r			
Unit-1	Number of lectures – 12	Title of the unit: Importance	and featu	ires of J	lava			
Importance and featu	res of Java · Introdu	uction to IVM Language Cons	truct of ia	va inclu	ding			
Keywords, constants, y	ariables and looping	g and decision making construct	ct. Classes	and the	ir			
implementation, Introd	uction to JVM and	its architecture including set of	instructio	ns.				
Introducing classes, o	bjects and method	s: defining a class, adding varia	ables and a	methods	,			
creating objects, constr	ructors, class inherit	ance.						
Arrays and String: Ca	reating an array, one	e and two dimensional arrays, s	tring array	and me	ethods			
TL. 4 0	NULLE		T 110					
Unit - 2	Number of lectures = 10	Title of the unit: Exception F	landling					
Exception Handling:	Fundamentals excer	ption types, uncaught exception	s, throw, t	throw, fi	nal,			
built in exception, crea	ting your own excep	otions,	, ,	,	,			
Multithreaded Progra	amming: Fundamer	ntals, Java thread model: priorit	ies, synch	ronizati	on,			
messaging, thread class	ses, Runnable interf	ace, inter thread Communication	on, suspen	ding, res	suming ar	nd		
stopping threads.								
Unit – 3	Number of loctures – 10	Title of the unit: Input/Outp	ut Progra	mming				
Innut/Outnut Dragna	$\frac{1}{1}$	Para Rute and Character Stree	m prodof	inad stra	oma Doo	dina		
and writing from conse	ble and files Netwo	rking . Basics networking class	ses and in	nicu suc terfaces	using iay	unig va net		
package, doing TCP/IP	and Data-gram Pro	gramming, RMI (Remote Met	hod		using jav	a.1101		
Invocation).	una Data Grann 110							
Unit – 4	Number of	Title of the unit: Event Hand	lling					
	lectures = 10							
Event Handling: Different Mechanism, the Delegation Event Model, Event Classes, Event								
Listener Interfaces, Adapter and Inner Classes, Working with windows, Graphics and Text, using AWT controls, Layout managers and menus, handling Image, animation, sound and video, Java Applet.

The Collection Framework: The Collection Interface, Collection Classes, Working with Maps & Sets.

12. Brief Description of self-learning / E-learning component

The students will be encouraged to learn using the SGT E- Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

http://sgtlms.org

Journal papers; Patents in the respective field.

13. Books Recommended

Text Books

i) Patrick Naughton and Herbertz Schildt, —Java-2: The Complete Referencell, TMH, Tenth edition

Reference Books

i) E. Balaguruswamy, -Programming withJava: APrimer^{||},McGraw-Hill; Sixth edition, 2019.

2019. ii) Core Ieve: An Int.

ii) Core Java: An Integrated Approach, New: Includes All Versions upto Java 8, R. Nageswara Rao, DreamTech Press, 2016.

1. Name of the Department : Electrical and Electronics Engineering												
2.Course Name			Java		L			Т			Р	
			Programmin	g Lab								
3.Course Code					0			0			2	
4.Type of C		Cor	re (√)	EAS (EAS ()		BSC ()		OE ()		PE ()	
Cour	se (use											
tick n	nark)											
5.Pre-requisite (if		6.Frequenc		Even () Odd ($$		Either Every		Every
any)					(use tick mark		(s)				n ()	Sem ()
7.Tot	al Number	of L	ectures, Tuto	rials, P	ractical (as	ssum	ing 14 wee	ks of	one semest	ter)		
Lectures = 0					Tutorials = 00			Practical = 28				
8.Brief Syllabus												
The course emphasis programming in the Java programming language and knowledge of object-												
oriented paradigm in the Java programming language make the students expertise the use of Java in a variety												
of tec	hnologies ar	nd on	different plat	forms.								
9.Lea	rning objec	ctives	5:									
	i)How to		a Iava aada aa	aardin	to Object	Orio	ntad Dragra	mmir	a nrinainla	0		
ı. ii	How to desi	ion C	HII application	ns and	annlets usi	no A	meu Flogia WT	11111111	ig principle	8		
10. Course Outcomes: On completion of this course, the students will be able to												
i. Describe Java concepts.												
	ii. Ide	entify	v various data	types.								
	iii. Ev	aluat	te various java	l concep	ot using pro	gran	ns.					
11.La	b Content										<u> </u>	J
Sr. No	The									C	.U co	verea
1	Make a java Program to check even or Odd Number											
2	Implement Function overloading concept.								I,ii			
3	Fibonacci Series in Java							I,i	ii			
4	Prime Number Program in Java								iii			
5	Palindrome Program in Java								ii	i		
6	Factorial Program in Java								iii			
7	Write a program to implement the concept of inheritance having a base class							se class	I,ii			
	representing a person, derived from this class make two classes, one about											
	the students and other about employees. Input & output this information							rmation				
0	about stude	about students & employees										
0	Make a pre	Make a program using applets which will handle mouse events on client										
7	side.	side.							1			

	10	Make a program using applets which will handle key events on client side.	Ii,iii
1			