B.TECH- ELECTRONICS & COMMUNICATION ENGINEERING)

STRUCTURE

Bharati Vidyapeeth (Deemed to be University) Pune. Faculty of Engineering & Technology

Programme: B. Tech (Electronics & Communication) Sem-I (2021 Course)

Sr.	Name of Course	1	Teaching Scheme rs./Wee	;		Exan	nination	Scheme	(Marks)			Cred	lits	
No.	No.		P	Т	UE	IA	TW	TW & OR	TW & PR	Total	L	P TW/OR/PR	Т	Total
1	Linear Algebra, Calculus & Solid Geometry	4	0	1	60	40	0	0	0	100	4	0	1	5
2	Chemistry & Economics of Material Science	4	2	0	60	40	50	0	0	150	4	1	0	5
3	Electronic Component & Devices	3	4	0	60	40	0	0	100	200	3	2	0	5
4	Electrical Technology	4	2	0	60	40	25	0	0	125	4	1	0	5
5	5 Computation & Programming Using C		4	0	60	40	0	75	0	175	3	2	0	5
	Total	18	12	1	300	200	75	75	100	750	18	6	1	25

Bharati Vidyapeeth (Deemed to be University) Pune. Faculty of Engineering & Technology

Programme: B. Tech (Electronics & Communication) Sem-II (2021 Course)

Sr.	Name of Course		ning Sch			Exa	minatio	n Scheme	(Marks)			Credits		
No.	0.		P	Т	UE	IA	TW	TW & OR	TW & PR	Total	L	P TW/OR/PR	Т	Total
6	Integral Transforms & Vector Calculus	4	0	1	60	40	0	0	0	100	4	0	1	5
7	Wave Theory & Photonics	4	2	0	60	40	50	0	0	150	4	1	0	5
8	Electronic Communication	3	4	0	60	40	0	100	0	200	3	2	0	5
9	Computer Aided Graphics	4	2	0	60	40	25	0	0	125	4	1	0	5
10	Python Programming	3	3 4 0		60	40	0	75	0	175	3	2	0	5
	Total		12	1	300	200	75	175	0	750	18	6	1	25

Bharati Vidyapeeth (Deemed to be University) Pune. **Faculty of Engineering & Technology**

Programme: B. Tech (Electronics & Communication Engineering) Sem-III (2021 Course)

Sr.	Name of Course		ning Sch rs./Weel			Exa	minatio	n Scheme (Marks)			Credit	s	
No.	Name of Course	L	P	Т	UE	IA	TW	TW &	TW &	Total	L	P	Т	Total
		L	Г	1	UE	IA	1 **	OR	PR	Total	L	TW/OR/PR	1	Total
11	Probability & Statistics	4	0	1	60	40	0	0	0	100	4	0	1	5
12	Switching Theory & Logic Design	4	2	0	60	40	0	0	50	150	4	1	0	5
13	Analog Circuits & Applications	3	2	0	60	40	0	0	50	150	3	1	0	4
14	Signals & Systems	4	2	0	60	40	0	50	0	150	4	1	0	5
15	Process & Control System *	3	0	0	60	40	0	0	0	100	3	0	0	3
16	Vocational Course-I-PCB Design &Assembly	0	0	0	0	0	0	50	0	50	0	2	0	2
17	Data Structures	0	4	0	0	0	0	50	0	50	0	2	0	2
18	Database Management System	0	4	0	0	0	0	50	0	50	0	2	0	2
19	MOOC - I	0	0	0	0	0	0	0	0	0	0	0	0	2
20	Environmental Studies** (Mandatory Audit Course)	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	18	14	1	300	200	0	200	100	800	18	9	1	30

^{*} Industry taught course- I
**This course will have End semester examination of 100 marks

Bharati Vidyapeeth

Bharati Vidyapeeth (Deemed to be University) Pune.

Faculty of Engineering & Technology

Programme: B. Tech (Electronics & Communication) Sem-IV (2021 Course)

Sr.	Name of Course		eachir Schemers./We	e		Exa	mination	Scheme ((Marks)			Credit	s	
No.	Name of Course	L	P	Т	UE	IA	TW	TW &	TW &	Total	L	P	Т	Total
		L	r	1	UE	IA	1 ۷۷	OR	PR	Total	L	TW/OR/PR	1	Total
21	Digital Communication	3	2	0	60	40	0	50	0	150	3	1	0	4
22	Microcontroller & Applications	4	2	0	60	40	0	0	50	150	4	1	0	5
23	EM Waves & Propagation	4	0	1	60	40	0	0	0	100	4	0	1	5
24	Integrated Circuits & Amplifier Design	4	2	0	60	40	0	0	50	150	4	1	0	5
25	Essentials of Data Science*	3	0	0	60	40	0	0	0	100	3	0	0	3
26	Vocational Course-II Domestic Appliances & Maintenance	0	0	0	0	0	0	50	0	50	0	2	0	2
27	Java Programming	0	4	0	0	0	0	50	0	50	0	2	0	2
28	Linux Programming	0	4	0	0	0	0	50	0	50	0	2	0	2
29	Social Activity	0	0	0	0	0	0	0	0	0	0 0		0	2
30	Disaster Management** (Mandatory Audit Course)	0	0	0	0	0	0	0	0	0	0 0 0			0
	Total	18	14	1	300	200	0	200	100	800	18	9	1	30

^{*}Industry taught course-II

^{**}This course will have End semester examination of 100 marks

Bharati Vidyapeeth (Deemed to be University) Pune.

Faculty of Engineering & Technology

Programme: B. Tech (Electronics & Communication) Sem-V (2021 Course)

Sr.	Name of Course	Teaching Scheme (Hrs./Week)				Exa	minatio	on Scheme	(Marks)			Credi	ts	
No.	Traine of Course	L	P	Т	UE	IA	TW	TW &	TW &	Total	L	P	Т	Total
		L	Г	1	UE	IA	1 **	OR	PR	Total	L	TW/OR/PR	1	Total
31	Information Theory & Coding	3	2	0	60	40	25	0	0	125	3	1	0	4
32	Digital Signal Processing	4	2	0	60	40	0	50	0	150	4	1	0	5
33	Embedded System Design	3	2	0	60	40	0	0	50	150	3	1	0	4
34	Fuzzy Logic, Neural Networks & Genetic Algorithms	3	2	0	60	40	25	0	0	125	3	1	0	4
35	Telecom Switching Techniques*	3	0	0	60	40	0	0	0	100	3	0	0	3
36	Vocational Course-III -Calibration & Measuring Instruments	0	0	0	0	0	0	50	0	50	0	2	0	2
37	Project-I(Stage-I)	0	2	0	0	0	0	100	0	100	0	4	0	4
38	Web Development	0	4	0	0	0	0	50	0	50	0 2 0		2	
39	MOOC-II	0	0	0	0	0	0	0	0	0	0	0	0	2
	Total	16	14	0	300	200	50	250	50	850	16	12	0	30

^{*}Industry Taught Course-III

Bharati Vidyapeeth (Deemed to be University) Pune. Faculty of Engineering & Technology

Programme: B. Tech (Electronics & Communication) Sem-VI (2021 Course)

Sr.	Name of Course		hing Scl [rs./Wee			Exa	minatio	on Scheme	(Marks)			Credit	ts	
No.	Name of Course	L	P	Т	UE	IA	TW	TW & OR	TW & PR	Total	L	P TW/OR/PR	Т	Total
40	Computer Communication Networks	3	2	0	60	40	0	50	0	150	3	1	0	4
41	Cellular Technology &4G	4	0	0	60	40	0	0	0	100	4	0	0	4
42	VLSI Design Technology	3	2	0	60	40	0	0	50	150	3	1	0	4
43	Quantitative Techniques Communication and Values	2	2	0	60	40	0	0	0	100	3	0	0	3
44	Industrial IOT&ML*	4	0	0	60	40	0	0	0	100	4	0	0	4
45	Vocational Course-IV RF Cell Planning & Drive Test Analysis	0	0	0	0	0	0	50	0	50	0	2	0	2
46	Project-I (Stage-II)	0	2	0	0	0	0	100	0	100	0	4	0	4
47	Internship**	0	0	0	0	0	0	50	0	50	0	3	0	3
48	48 Power Electronics		4	0	0	0	0	50	0	50	0	2	0	2
	Total		12	0	300	200	0	300	50	850	17	13	0	30

^{*}Industry taught course-IV

^{**} Internship: It is mandatory to complete internship from reputed companies/industries.

Bharati Vidyapeeth (Deemed to be University) Pune.

Faculty of Engineering & Technology

Programme: B. Tech (Electronics & Communication) Sem-VII (2021 Course)

Sr.	Name of Course	Teaching Scheme (Hrs./Week)				Exa	ıminati	on Schem	e (Marks)		Credits				
No.	Name of Course	L	P	Т	UE	IA	TW	TW & OR	TW & PR	Total	L	P TW/OR/PR	Т	Total	
49	FTTH-Optical communication	4	2	0	60	40	0	50	0	150	4	1	0	5	
50	Radar & Satellite Communication	4	0	1	60	40	0	0	0	100	4	0	1	5	
51	AI & Data Mining*	4	2	0	60	40	50	0	0	150	4	1	0	5	
52	Elective- I	4	2	0	60	40	0	50	0	150	4	1	0	5	
53	Project –II(Stage-I)	0	4	0	0	0	0	200	0	200	0	4	0	4	
54	Android Development	0	4	0	0	0	0	100	0	100	0	2	0	2	
55	Research Paper Publication	0	0	0	0	0	0	0	0	0	0	0	0	2	
56	56 MOOC-III		0	0	0	0	0	0	0	0	0	0	0	2	
	Total		14	1	240	160	50	400	0	850	16	9	1	30	

^{*}Industry taught course-V

Elective-I i) Augmented Reality & Virtual Reality iv) Cyber Security & Forensics

iii) RF & Microwave Communication

ii) Data Centre Engineering

v) Wireless Robotics

Bharati Vidyapeeth (Deemed to be University) Pune.

Faculty of Engineering & Technology

Programme: B. Tech (Electronics & Communication) Sem-VIII (2021 Course)

Sr.	Name of Course		ching Sch Irs./Wee			E	Examinati	on Scheme ((Marks)			Credits	S	
No.	Name of Course	L	P	Т	UE	IA	TW	TW & OR	TW & PR	Total	L	P TW/OR/PR	Т	Total
57	Light Wave Communication	4	0	1	60	40	0	0	0	100	4	0	1	5
58	5G Architecture	4	2	0	60	40	50	0	0	150	4	1	0	5
59	Elective- II	4	2	0	60	40	0	0	50	150	4	1	0	5
60	Block Chain Technology*	4	2	0	60	40	0	50	0	150	4	1	0	5
61	Project-II(Stage-II)	0	04	0	0	0	0	200	0	200	0	6	0	6
62	Cloud Computing	0	04	0	0	0	0	100	0	100	0	2	0	2
63	63 Social Activity		0	0	0	0	0	0	0	0	0	0	0	2
	Total		14	1	240	160	50	350	50	850	16	11	1	30

^{*} Industry taught course-VI

Elective-II

i) Smart Cities

ii) Image Processing & Computer Vision

iii) Biomedical Electronics

iv) Software Defined Networks

v) Software Testing

B.TECH (SEM-I)

SYLLABUS

		B. Tech. Sem. I Electronics & Communication Engineering LINEAR ALGEBRA, CALCULUS AND SOLID GEOMETRY	
	CHING	EXAMINATION SCHEME: CREDITS ALL	OTTED:
	EME:		
Theo	ory: 04	End Semester Examination (UE): Credits: 04 60Marks	
Pract	tical:	Internal Assessment (IA): 40 Marks	
Tuto	rial: 01	Credit:01	
		Total:100 Marks Total Credits:05	
Com	rse Pre-i	requisites:	
		should have knowledge of	
1		algebra.	
2		ary derivative.	
3		geometry.	
Com	usa Ohia	o4: wood	
	rse Obje		
1		consistency of system of equations and concepts of solid geometry. derivative and maxima, minima for several variable	
3		ds of curve tracing and multiple integrals	
3	Metho	ds of curve tracing and multiple integrals	
Com	rse Outc	omes: After learning this course students will be able to	
1		test rank of matrix for consistency of linear system.	
2		tand the partial derivative and apply to find errors and approximate va	lues.
3		e functionality using Jacobian.	
4	Trace o	curves of various types of mathematical functions.	
5	Compu	te the coordinate system and apply it to locus problems.	
6	Evalua	te multiple integrals and apply it evaluate area and volume.	
TINIT	m +		(00 TT)
UNI	T – I	Linear Algebra: Matrices	(08 Hours)
		Rank, Normal form, System of Linear Equations, Linear Dependence and Independence, Linear and Orthogonal Transformations. Eigen values, Eigen Vectors, Cayley – Hamilton Theorem. Application to problems in Engineering.	
UN	IT – II	Partial Differentiation and its applications	(08 Hours)
		Functions of two or more variables, Partial derivatives,	

	Homogeneous functions, Euler's theorem, Total derivative, Change of variables, Errors and Approximations.	
UNIT -III	Jacobian and Maxima and Minima Multivariable Calculus	(08 Hours)
	Partial derivative, Jacobians and their applications, Chain Rule,	
	Functional Dependence. Maxima and Minima of Functions of two	
	variables, Lagrange's method of undetermined multipliers.	
U NIT - IV	Fourier series, Integral Calculus and Curve Tracing	(08 Hours)
	Definition, Dirichlet's conditions, Fourier Series and Half Range Fourier Series, Harmonic Analysis, Differentiation Under the Integral Sign, Error functions. Tracing of Curves, Cartesian, Pola and Parametric Curves. Rectification of Curves.	
UNIT -V	Solid Geometry	(08 Hours)
	Cartesian, Spherical Polar and Cylindrical Coordinate Systems. Sphere, Cone and Cylinder.	
U NIT - VI	Multiple Integrals and their Application	(08 Hours)
	Double and Triple integrations, Applications to Area, Volume,	
	Mean and Root Mean Square Values	
Text Books	:	
	Wartikar and J. N. Wartikar, "Applied Mathematics" (Volumes I and Pune Vidyarthi Griha Prakashan, Pune, 2013.	I II), 7 th
References	Books:	
	Grewal, "Higher Engineering Mathematics", 42th Ed., Khanna Publica	ation,

- 1. B. S. Grewal, "Higher Engineering Mathematics", 42th Ed., Khanna Publication, Delhi
- 2. B.V. Ramana, "Higher Engineering Mathematics", 6th Ed., Tata McGraw-Hill, New Delhi, 2008.
- 3. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Ed., John Wiley & Sons, Inc., 2015.
- 4. Peter V. O'Neil, "Advanced Engineering Mathematics", 7th Ed., Cengage Learning, 2012.
- 5. Michael Greenberg," Advanced Engineering Mathematics", 2nd Ed., Pearson Education, 1998.

Project based learning:

- 1. Find the eigen values and eigen vectorss of any random matrix
- 2. Check the linear dependence / independence of vectors
- 3. Check the consistency and solve the linear equations
- 4. Solve the partial differential equations
- 5. Find the error using the concept of total derivative
- 6. Check the Functional Dependence using the concept of Jacobian
- 7. Find the derivatives of error functions
- 8. Find Maxima and Minima of functions of two variables

9. Use differentiation under the integral Sign to solve integrals
10. Trace the Cartesian curves
11. Trace the polar curves
12. Find the equation of sphere, cone and cylinder using the concept of solid geometry
13. Find root mean square values using integrals
14. Find the volume using triple integrals
15. Find the area using double integral

		B. Tech. Sem. I Electronics CHEMISTRY AND ECON			
	CHIN IEME:	EXAMINATION S	CHEME:	CREDITS ALL	OTTED:
Theo	ory: 04	End Semester Exam 60Marks	ination(UE):	Credits: 04	
Pract	tical:02	Internal Assessment	(IA): 40 Marks		
Tuto	rial:	TW:50 Marks		Credit: 01	
		Total:150 Marks		Total Credits:05	
		requisites:			
The	student	should have knowledge of			
1		ture property relationship, types roperties of polymers, super ca			sification
Cou	rse Ob	ectives:			
1		evelop the interest among the st gineering.	ıdents regarding ch	emistry and their a	pplications
2	To d	evelop confidence among stude	nts about chemistry	, how the knowleds	ge of
3	The s	tudent should understand the co equent studies in the field such a	oncepts of chemistry as E&C Engineering	y to lay the ground g.	work for
Cou	rse Out	comes: After learning this o	ourse students wil	l be able to	
1	Desc	ribe the properties of materials a	and application of se	emiconductor elect	ronics
2		udent will able to understand value of polymers.	arious structure of p	oolymers and their	effect on
3	Apply	constitutive equations of compior at micro and macro levels.	osite materials and	understand mechan	nical
4		plain students the importance of	economics and env	vironmental issues	in material
5	Desig	n and develop sensors using opt	ical methods with o	desired properties.	
6	Identi	fy the grand challenges of greene them.			ake to
UNI	T - I	Semiconductors, insulators a	nd Superconducto	rs	(08Hours)
		Semi conductivity in non-elesemiconductors, Chalcogen phoen Introduction to Superconductors, Properties of superconductors, Electrical insulators or Dielectrical	otoconductors, photoctors, types of Applications of Sup	ocopying process Superconductors,	

UNIT – II	Polymers for the Electronics Industry	(08Hours)
	Definition, Classification, Chain Architecture (Linear/Branched, Tacticity, Isomerism), homopolymers, copolymers, graft copolymers and their characteristic properties in reference to their applications. Conduction mechanism, Preparation of conductive polymers, Polyacetylene, Poly (p- phenlylene), Polyhetrocyclic systems, Polyaniline, Poly (Phenylene sulphide), Poly (1,6-heptadiyne), Applications, Photonic applications	
UNIT -III	COMPOSITES	(08 Hours)
	Introduction of Composites, Classification of Composites, Organic Matrix Composites, Metal Matrix Composites (MMC), Ceramic Matrix Materials (CMM), Classification Based on Reinforcements, Fiber Reinforced Composites/Fibre Reinforced Polymer (FRP) Composites, Laminar Composites, Particulate Reinforced Composites (PRC), Classification Based on Reinforcements and Matrices, Classification Based On Matrices, Metal Matrix Composites (MMC), Advantages and Limitations of Composites, Materials, Limitations of Composites	
UNIT -IV	ECONOMICS OF ENGINEERING MATERIALS	(08 Hours)
	Introduction, economic considerations, green design, environmental and societal considerations of materials recycling of metals and non-metals recycling issues, limits of recycling, life cycle analysis and its use in design.	
UNIT -V	SENSORS	(08 Hours)
	MEMS, NEMS, Actuators, Biosensors, construction and working of Biosensors and classification of Biosensors, Advantages of Biosensors, Biochips or Biological computers.	
UNIT -VI	GREEN CHEMISTRY	(08 Hours)
	Introduction, Twelve Principles of Green chemistry, numericals on atom economy, synthesis, adipic acid and indigo. Green solvents (ionic liquid supercritical CO2), and products from natural materials.	
Term Wor	·k·	
	vork shall consist of record of minimum eight experiments.	
1. To d	etermine strength of strong acid using pH meter	
2. Titra	tion of a mixture of weak acid and strong acid with strong base using	

conductometer

- 3. Preparation of polystyrene
- 4. To determine molecular weight of a polymer by viscosity measurement
- 5. To determine radius of macromolecule polystyrene/ polyvinyl alcohol by viscosity measurement.
- 6. Study of corrosion of metals in medium of different pH.
- 7. To determine pH of soil
- 8. To determine Acidity of soil
- 9. Determine the surface concentration of 1-butanol in aqueous solution.
- 10. Preparation of a conducting polymer.
- 11. Preparation of Urea-formaldehyde resins
 - 12. To determine strength of strong acid using pH meter

Text Books

- 1.Bhal & Tuli, "Text book of Physical Chemistry (1995)", S. Chand & Company, New Delhi.
- 2.S. S. Dara, "A textbook of Engineering Chemistry", McGraw-Hill Publication, New Delhi.

Reference Books:

- 1. Jain P.C & Jain Monica, "Engineering Chemistry", Dhanpat Rai & Sons, Delhi, 1992.
- 2. O. G. Palanna, "Engineering Chemistry", Tata McGraw-Hill Publication, New Delhi..
- 3. F. A. Cotton and G. Wilkinson, "Advanced Inorganic Chemistry (6th edition)", John Wiley
- 4. P. Ghosh, "Polymer Science and technology (2nd Edition)", Tata McGRAW Hill, 2008.
- 5. J.M.G.Cowie, "Polymers: Chemistry & Physics of Modern Materials (2nd edition)", Blackie Academic & Professional, 1994.
- 6. Shikha Agarwal, "Engineering Chemistry- Fundamentals and applications", Cambridge Publishers 2015.

Project based learning:

- 1. To Prepare and for synthesis of the following polymers,
- a. Bakelite
- b. Polystyrene
- c. Epoxy Resin
- 2. Synthesis properties and applications of polymer.
- 3.To Prepare Glass Hybrid Fibres, Epoxy Composite material using Hand Layup Method
- 4 To Prepare Fibre Reinforced Composites.
- 5. To study Bio diesel and Bio petrol & extraction process of Bio desial.
- 6. Effect of fertilizers in water
- 7. Preparation of Gold Nanoparticles Using Tea:
- 8. Determination of Mercury in Milk by Cold Vapor Atomic Fluorescence:
- 9. Nitration of Phenols Using Cu(NO₃)₂
- 10 Solvent less and One-Pot Synthesis of Cu(II) Phthalocyanine Complex:
- 11. Density Based Traffic Signal System using Microcontroller and IR Sensors
- 12 Solar Energy Measurement System using Microcontroller
- 13 To develop diagnostic biosensor.
- 14 Electrochemical 3D printing
- 15. Investigating cell mechanics with Fluid FM force spectroscopy.

			n. Sem. I Electronics & Communication E LECTRONIC COMPONENTS AND DE		
	CHIN		EXAMINATION SCHEME:	CREDITS AL	LOTTED:
	EME ory: 03		End Semester Examination (UE):	Credits: 03	
lineo	Theory. 03		60Marks	Cicaris . 03	
Pract	ical:0	4	Internal Assessment(IA):40 Marks		
				Credits: 02	
			Total Marks:200	Total Credits:05	5
C	D				
		e-requisites	s: ave knowledge of		
1					
1	Clas	ss XII level	Physics & Mathematics.		
Com	rse Ol	ojectives:			
1			dents gain the knowledge of basic electronic	passive compo	nents.
2			led description of PN junction behavior at t		
		operation of diodes as rectifiers, clippers and clampers			
3			mprehensive study of bipolar junction transi	stor.	
4			alyze transistor biasing circuits.		
5			acteristics and working of FET and MOSFE	ET	
6	To g	et familiariz	zed with various optoelectronic devices.		
Cour	rse Oı	ıtcomes: Af	fter learning this course students will be a	able to	
1			Passive components.		
2		onstrate kno	owledge of working of diode with application	ons such as recti	fier, clipper
3	Ana	lyze the char	racteristics of BJTs in various configuration	s (CB, CE, and	CC).
4	Desi	gn the biasi	ng circuits like fixed bias and voltage divide	er bias.	
5			eration of FET and MOSFET.		
6	Dem	onstrate kno	owledge of working of optoelectronic device	es.	
TINIT	т т	Passive Co	omnononts		(06 Hours)
UNI	1 – 1	Passive Co	omponents		(vo nours)
		component		struction and on and	
UNIT	'-II	Diode and	applications		(06 Hours)
		Classificat	ion of material based on band gap theory, ty	pes of	

	semiconductors (p-type and n-type), PN junction Diode: basic structure and operating principle, current-voltage characteristic, Zener breakdown, Avalanche breakdown. Diode Applications: Rectifier circuits: Half-wave and full-wave rectifiers. Full wave Rectifier with capacitor filter. Diode as clipper: series and parallel forms of clipper circuits, biased clipper, Diode as a clamper.	
UNIT -III	Bipolar Junction Transistor	(06 Hours)
	Introduction to Bipolar Junction Transistors, it's construction and working mechanism, configuration of BJT in Common Base, Common Emitter and Common Collector configuration. Input—output characteristics in all three configurations with relevant V-I expressions and definitions of DC gains.	
UNIT -IV	Transistor biasing and applications	(06 Hours)
	Need of biasing, DC load line analysis, operating point, Thermal runaway. Requirements of a biasing circuit, Different biasing circuits: fixed bias, collector to base bias & voltage divider bias. Stability factor, General expression for stability factor, stability factor for biasing circuits, Transistor as an amplifier.	
IINITO X	DETER MACRETE	(06 Hours)
UNIT -V	FET & MOSFET	(06 Hours)
	FET: Types of FET, JFET Structure, Construction and working mechanism of JFET, V-I characteristics and transfer characteristics, Parameters of JFET. MOSFET: Types of MOSFET, MOSFET Structure, Working of Depletion and Enhancement type MOSFETs, Drain and Transfer Characteristics of D-MOS and E-MOS.	
UNIT-VI	Optoelectronic devices	(06 Hours)
	Construction, V-I characteristics and applications of LED, LDR, Photodiode, Phototransistor, Photoconductive cell, Photovoltaic cell, optocoupler.	
Term Worl	7.	
	ork shall consist of record of minimum eight experiments.	
	plot V-I characteristics of PN junction diode	
	plot V-I characteristics of half wave rectifier	
	plot V-I characteristics of Full wave rectifier using Capacitor filter.	
	plot input-output characteristics of CE configuration of BJT.	
	analyze biasing techniques of BJT: Fixed bias and voltage divider bias	
	plot frequency response of single stage CE amplifier and find its band	
/.10	plot frequency response of single stage FET amplifier and find its band	ıwıath

8.To plot optical characteristics of LED and LDR
9.To plot optical characteristics of Photodiode and phototransistor
10.To plot transfer characteristics of Optocoupler
Text Books:
1.Robert Boylestad, Electronic Devices and Circuit Theory, Pearson Publication.
2. V.K.Mehta, Principles of Electronics, S Chand & Company Ltd. New Delhi.
3. Millman, Halkies, Electronic Devices and Circuits, TMH publication
Reference Books:
1. Thomas L. Floyd, "Electronic Devices", Pearson
2. Ben G. Streetman and Sanjay Banerjee, "Solid State Electronic Devices", Pearson
Education India
3. Malvino, "Electronic Principle", McGraw Hill Education
4. Sedra & Smith, "Microelectronics Engineering", Oxford University Press
Project Based Learning:
Build the following circuits -
PN junction diode in forward and reverse biasing mode.
2. Conversion of AC to pulsating DC using half wave rectifier.
3. AC to DC converter using Full wave rectifier (Center tap Transformer)
4. AC to DC converter using Bridge Rectifier with capacitor filter
5. BJT in CE configuration.
6. Check stability of operating point using fixed bias method.
7. Check stability of operating point using Voltage divider bias method.
8. BJT Amplifier circuit.
9. FET Amplifier Circuit.
10. Optical characteristics of LED and LDR.
11. Optical characteristics of Photodiode and Phototransistor.
12. Characteristics of optocoupler.
13. Zener diode in forward and reverse biasing mode.
14. BJTs as a digital switch
15. Automatic Street Light controller

		B. Tec	h. Sem. I Electronics & Communication ELECTRICAL TECHNOLOGY		
TEACHING SCHEME:			EXAMINATION SCHEME:	CREDITS ALLOTTED	
Theory: 04			End Semester Examination (UE): 60Marks	Credits: 04	
Practical: 02			Internal Assessment (IA): 40 Marks		
Tutor	ial:-		TW: 25 Marks	Credit: 01	
			Total Marks:125	Total credits:05	
Cour	se Pre	e-requisites	s:		
The S	tuden	ts should h	ave knowledge of		
1		c physics.			
2		c mathema	tics		
Cour		jectives:			
1		•	cal circuit basics, network theorems, AC	fundamentals, ele	ctrical
	mac	hines, trans	formers, batteries, two port networks.		
	I				
Cour	se Ou	tcomes:	After learning this course students will	be able to	
1			and currents in a given network using var	rious network red	uction
			network theorems		
2			ers relating to a given series or a parallel r	esonant circuit.	
3			c circuits and types of transformer.		
4			C and DC electrical machines.		
5		sify types of			
6	To fi	nd any of tl	ne two port parameters of a given two port	t networks.	
UNIT	ГТ	Introducti	on to Electrical Circuits and Network Theo	rems	(08 Hours)
UNI	1 – 1	Inti oddeti	on to Electrical Circuits and Network The	of chis	(00 110015)
		Dependent elements, Network Star-to-De Node and Theorem,	oncepts, Voltage and Current Sources, It sources, Voltage-Current relationships Source Transformation and Source shift Reduction techniques-Series, Parallel, elta, Delta-to-Star Transformations, Kin Mesh Analysis, Super node and Super manner Norton's Theorem, Superposition Theorem	ip for passive ting techniques, Series-Parallel, rehhoff's Laws, tesh. Thevenin's	
UNIT	–II	AC Fun	damentals and circuits:		(08Hours)

Two port parameters: Z, Y, ABCD and H-parameters, Conditions for Reciprocity and Symmetry, Inter-relationship between two-port parameters, Interconnections between two port parameters.

Term Work:

The term work shall consist of record of minimum eight experiments.

- 1. To verify Thevenin's, Norton's and Superposition Theorem.
- 2. To find Steady State response of RL,RC and RLC circuits
- 3. To find resonant frequencies of series and parallel circuit.
- 4. Load test on single phase transformer.
- 5. OS & SC test on single phase transformer to find efficiency and regulation
- 6. Load test on DC machine.
- 7. Speed control of DC motor
- 8. Study of different types of starters for DC & AC Machine
- 9. Testing and maintenance of batteries
- 10. To find Z and Y parameters of given two port networks.
- 11. To find H and ABCD parameters of given two port networks.

Text Books:

- 1. B. L. Theraja, 'A Textbook of Electrical Technology', Vol.1, S. Chand & Company Ltd. New Delhi.
- 2. V. K. Mehta, 'Basic Electrical Engineering', S Chand & Company Ltd. New Delhi.
- 3. I. J. Nagarath and Kothari, 'Theory and applications of Basic Electrical Engineering', Prentice Hall of India Pvt. Ltd.
- 4. D. Roy Choudhury, 'Network and Systems', New Age International Publishers, Second Edition.
- 5. Ravish Singh, "Network analysis and Synthesis, M. Graw Hill Education (India) Private Limited.

Reference Books:

- 1. Edward Huges, 'Electrical Technology' Pearson
- 2. D. P. Kothari, J Nagarath, 'Basic Electrical Engineering'. TMC
- 3. M. E. Van Valkenburg, 'Network Analysis', PHI, 3rd Edition

Project based learning:

- 1. Design a small circuit to study superposition theorem.
- 2. Design small circuit to study Thevenin's Theorem.
- 3. Design Small circuit to study Norton's Theorem.
- 4. Design small circuit to study R-C series circuit.
- 5. Design small circuit to study R-L series circuit.
- 6. Design small circuit to study R-L-C series circuit.
- 7. Design of small R-L parallel circuit for study.
- 8. Design of small R-C parallel circuit for study.
- 9. Design of small R-L-C parallel circuit for study.
- 10. Design small two winding transformer.
- 11. Design small electromagnet.
- 12. Design of small chemical battery.
- 13. Design of small two port network for study of ABCD parameters.
- 14. Design of small electric circuit to study Kirchhoff's voltage laws.
- 15. Design of small electric circuit to study Kirchhoff's current laws

			. Sem. I Electronics & Communication En MPUTATION AND PROGRAMMING US			
	CHIN EME:		EXAMINATION SCHEME: CREDITS		ALLOTTED:	
	Theory: 03		End Semester Examination(UE): 60Marks	Credits: 03		
Pract	ical: 0	4	Internal Assessment (IA): 40 Marks			
Tutor	rial:		TW&Oral: 75 Marks	Credit: 02		
			Total Marks:175 Marks	Total Credits	:05	
Cour	se Pr	e-requisites	S:			
1			possess knowledge about basic fundamentals icrosoft office development tools.	of computer a	nd	
Cour	se Ob	jectives:				
			ave knowledge of			
1	This	s course wi	ll introduce the concepts of C language softw	vare developm	ent and	
	cor	ompiling tool. By the end of the course, student will be familiar with various and amentals of C- language.				
	1011		or e language.			
Cour	se Ou	tcomes:	After learning this course students will be	able to		
1			basic concept of C programming.			
2			grams using conditional statement.			
3			ogramming.			
4	Use	Functions is	n programming.			
5	Writ	e basic prog	grams using Pointers.			
6	Writ	e basic prog	grams using structures.			
UNI	T – I	Introduc	tion:		(06 Hours)	
		Basic of C: Structure of a C program, identifiers, basic data types				
		and sizes. Constants, variables, arithmetic, relational and logical				
		programs.	Managing input and output operations, Samp	•		
UNIT	– II	Conditional Statements and Loops:			(06 Hours)	
		Decision	making within a program, conditions, if state	ement, if-		
		else stater	nent, loops: while loop, do while, for loop.N	ested		
		loops, infi	nite loops, switch statement, sample program	ns.		

TINITE TIT		(06 Hanna)
UNIT -III	Arrays & Strings	(06 Hours)
	Arrays - concepts, declaration, definition, accessing elements,	
	storing elements, Strings and string manipulations, 1-D arrays, 2-	
	D arrays and character arrays, string manipulations, Array	
	applications: Matrix Operations.	
UNIT -IV	Functions:	(06 Hours)
	Basics, parameter passing, storage classes- extern, auto, register,	
	static, scope rules, user defined functions, recursive functions,	
	Recursive solutions for Fibonacci series, example c programs.	
	Passing arrays & strings to functions.	
UNIT -V	Pointers:	(06 Hours)
01111 - 1	concepts, initialization of pointer variables, pointers and function	(00 Hours)
	arguments, passing by address, address arithmetic, Character	
	pointers and functions, pointers to pointers, pointers and	
	multidimensional arrays.	
	munuamensionai arrays.	
UNIT -VI	Structures and Linked list	(06Hours)
	Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self-referential structures, unions, typedef, bit-fields, program applications. Concept of linked lists, Types & Advantages linked list, creating a linked list, Inserting and Deleting linked list, Applications of linked list	
Term Wor	rk:	
	vork shall consist of record of minimum eight experiments.	
1. W	rite a C program to take user Input and print it on the screen.	
	a. Perform a C program to perform various mathematical and logica b. Perform a C program to find whether the entered input number is	
	form a C program to find out	
	me numbers. te and perform C program to find out Fibonacci series.	
	Form and write a C program to find out Armstrong number.	
	Form a C programs to print different patterns.	
	Form and write a C program to do factorial using recursion.	
	Form a C program to sort the given array in Ascending & Descending	order.
8. Perf	Form C programs to perform various operations on 2-D arrays	

9. Perform a C program to perform different operations on strings.
10. Use of Pointers
a. Write a C program to swap numbers using pointers
b. Write a C program to show the use of pointers in arrays.
c. Write a C program to use functions using pointers.
11. Perform a C program to show the use of structure and linked list
12. Perform a C program to create student mark sheet using structures and linked list.
Text Books:
1. E Balagurusamy, "Programming in ANSIC",5 th Edition-TMH
Reference Books:
1. Yashwant Kanitkar , "Let Us C",PBP
Project based learning:
1. Bank Management System
2. Diary management System
3. Calendar using C
4. Contact Management System
5. Library Management System
6. Snake Game
7. Bus Reservation system
8. Customer Billing system
9. Hospital Management system
10. Cyber management
11. Cricket score display
12. Employee management system
13. Pacman Game
14. Quiz game
15. Phone-book application
16. Election System
17. Flight ticket booking
18. Tourism Management system
19. Simple Result system
20. Stock Management system

B.TECH (SEM-II) SYLLABUS

			n. Sem. II Electronics & Communication Engine GRAL TRANSFORMS AND VECTORCALCU	
TEACHING SCHEME:			EXAMINATION SCHEME: CRED	ITS ALLOTTED:
Theory: 04			End Semester Examination(UE): Credits 60Marks	s:05
Practi	ical:		Internal Assessment(IA): 40 Marks	
Tutor	ial: 01		Credit:	01
			Total Marks: 100 Marks Total C	Credits: 05
Cour	se Pre	e-requisites	S:	
The s	tudent	ts should ha	ave knowledge of	
1		grals.		
2		rier series.		
3	Vect	tor algebra.		
Cour	se Ob	jectives:		
1		•	ve differential equations	
2			ques of integral transform.	
3	line,	surface an	d volume integrals.	
Cour	se Ou	tcomes:	After learning this course students will be able	to
1			nethods for first order first degree differential equa	
2	Unde	erstand the	modeling of physical systems and find the solution	ns.
3	Solve	e the nth or	der linear differential equation.	
4	Com	pute the int	egral transform for various functions.	
5	Appl	y the Lapla	ce transform for solving differential equations	
6	Unde	erstand vect	or calculus and apply it to evaluate line, surface ar	nd volume integrals.
	_	D • 66		(00.77
UNIT -	-1	Different	ial Equation	(08 Hours)
		an ordinar	n of the ordinary differential equations(ODEs), Solary differential equation, Equations of the first order, Linear differential equation, Bernoulli's equation erential equations, Equations reducible to exact	der and
UNIT-	-II	Applicati	ons of Differential Equation	(08 Hours)
			ons of DE to Orthogonal Trajectories, Newton's Kirchoff's Law of Electrical Circuits, Motion	

	Gravity, Rectilinear Motion, Simple Harmonic Motion, One— Dimensional Conduction of Heat.	
UNIT - III	Linear Differential Equations	(08 Hours)
	Solution of nth order LDE with Constant Coefficients, Method of Variation of Parameters, Cauchy's &Legendre's DE, Solution of Simultaneous & Symmetric Simultaneous DE, Modeling of Electrical Circuits.	
UNIT -IV	Z-transform	(08 Hours)
	Fourier Transform (FT): Complex Exponential Form of Fourier series, Fourier Integral Theorem, Sine & Cosine Integrals, Fourier Transform, Fourier Sine and Cosine Transform and their Inverses. Introductory Z-Transform (ZT): Definition, Standard Properties, ZT of Standard Sequences and their Inverses. Solution of Simple Difference Equations.	
UNIT -V	Laplace Transform	(08 Hours)
	Definition of LT, Inverse LT. Properties & theorems. LT of standard functions. LT of some special functions viz., Periodic, Unit Step, Unit Impulse, ramp, jump, . Problems on finding LT& inverse LT. Applications of LT and Inverse LT for solving ordinary differential equations.	
UNIT-VI	Vector Calculus	(08 Hours)
	Physical Interpretation of Vector Differentiation, Vector Differential Operator, Gradient, Divergence and Curl, Directional Derivative, Solenoidal, Irrotational and Conservative Fields, Scalar Potential, Vector Identities. Line, Surface and Volume integrals, Work-done, Green's Lemma, Gauss's Divergence Theorem, Stoke's Theorem, Applications to Problems inElectro-Magnetic Fields.	

Text Books:

2. P. N. Wartikar and J. N. Wartikar, "Applied Mathematics (Volumes I and II)", 7th Ed., Pune Vidyarthi Griha Prakashan, Pune, 2013.

References Books:

- 1. B. S. Grewal, "Higher Engineering Mathematics", 42th Ed., Khanna Publication, Delhi
- 2. B.V. Ramana, "Higher Engineering Mathematics", 6th Ed., Tata McGraw-Hill, New Delhi, 2008.
- 3. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Ed., John Wiley & Sons, Inc., 2015.

)12.
	chael Greenberg, "Advanced Engineering Mathematics", 2 nd Ed., Pearson ducation, 1998.
	nsed learning:
	Formation of differential equations
	Evaluate the electric circuit problem using differential equations
3.	Evaluate the heat conduction in 1-D using differential equations
4.	Evaluate the rectilinear motion problem using differential equations
5.	Evaluate the simple harmonic problem using differential equations
6.	Obtain the solution of Simultaneous & Symmetric Simultaneous DE
7.	Obtain the solution of Simple Difference Equations using Z-transforms
8.	Find the Directional Derivatives
9.	Find work done using Green's theorem
10.	Find scalar potential using vectors
11.	Evaluating integrals using Green's theorem, Gauss's and stoke's theorem
12.	Use Laplace transform to solve differential equations
13.	Use Laplace transform to solve integrals equations
14.	Use Fourier transform to solve integrals
15.	Applications of vector integration to solve problems in Electro-Magnetic Fields.
16.	Find the conditions for Solenoidal and irrotational vector fields

		B. Tec	h. Sem. II Electronics & Communic WAVE THEORY AND PHOT		
	TEACHING EXAMINATION SCHEME: CREDITS ALL SCHEME:			OTTED:	
Theory: 04		=	End Semester Examination(UE): 60Marks	Credits: 04	
Prac	ractical:02 Internal Assessment(IA): 40 Marks				
Tuto	orial:		TW:50 Marks	Credit: 01	
			Total:150 Marks	Total Credits:05	
Cou	rse Pr	e-requisite	s:		
The	studen	ts should h	ave knowledge of		
1	Stuc	lents are ex	spected to have a basic understanding	of physics and calculu	S.
		jectives:			
1		-	wledge of basic concepts in physics re	•	applications
	in a	broader se	nse with a view to lay foundation for t	he Electronics and	
	Con	nmunicatio	n Engineering.		
Cou	rse Ou	itcomes:	After learning this course students	will be able to	
1			oblems associated with architectural ac		remedies
			nic as a tool in industry for non destruc		
2	_		solve the engineering problems on El		
3			tency and understanding of the princip	ples and applications of	of lasers and
4		optics.			!
4			physics problems to electronic phenor		nysics
5			erties of photon in communication eng		
6	Inter	pret the ne	ed, importance and scope of non conv	entional and alternate	energy
	resou	irces.			
		Ι			
UN	IT – I	Acoustic	s and Ultrasonics		(08 Haura)
		Acquetic	Intensity Loudness Absorption	and its	Hours)
			s: Intensity, Loudness, Absorption		
			ation, Reverberation and Reverber acoustics of buildings and their ren	· ·	
		_	of noise, Sound level meter, Strategies		
		pollution	<u> </u>	on controlling noise	
		-	c waves and properties, Methods of U	ltrasonic production	
			estriction and Piezoelectric), Applicati	-	
			ing and medicine.		

UNIT – II	Electromagnetic Wave	(08 Hours)
	Displacement current, Maxwell's equations (derivation), Wave equation for electromagnetic waves, Propagation in free space, Poynting theorem, Characteristic of Transverse electric and magnetic waves, Skin depth, Rectangular and circular waveguides.	
UNIT - III	Lasers and Fibre Optics	(08 Hours)
	Lasers introduction, Characteristics of Lasers, Einstein's coefficients and their relations, Lasing action, Working principle and components of CO ₂ Laser, Nd -YAG Laser, Semiconductor diode Laser, Excimer Laser and Free electron Laser, Applications in remote sensing. Principle of Optical fiber, Acceptance angle and acceptance cone, Numerical aperture, V-number, Types of optical fibers (Material, Refractive index and mode), Photonic crystal fibers, Fiber optic communication, Fiber optic sensors.	
UNIT - IV	Quantum Mechanics and Crystal Physics	(08 Hours)
	Quantum mechanics: Inadequacies of Classical Mechanics, De Broglie hypothesis for matter waves, Heisenberg's uncertainty principle, Schrödinger's wave equation, Particle confinement in 1D box (Infinite Square well potential). Crystal Physics: Crystal directions, Planes and Miller indices, Symmetry elements, Quasi crystals, Diamond and HCP crystal structure, Packing factor, Reciprocal lattice, Diffraction of X-rays by crystal planes, Laue method and powder method	
UNIT -V	Photonics	(08Hours)
	Quantum properties of radiation and matter, Photon properties, Duality nature of electromagnetic radiation, Group/phase velocity and dispersion, matter and its interaction, light modulation, Coherence-different types, Two-beam interference and interferometry, Multi-wave interference, Fabry-Perot interferometer, Fraunhofer diffraction, Fresneldiffraction, semiconductor junction characteristics, semiconductor light sources, semiconductor lightdetectors.	
UNIT - VI	Green Energy Physics	(08 Hours)
	Introduction to Green energy, Solar energy: Energy conversion by photovoltaic principle, Solar cells, Wind energy: Basic components and principle of wind energy conversion systems, Ocean energy: Wave energy, Wave energy conversion devices, Tidal energy, single and double basin tidal power plants, Ocean ThermalElectric	

Conversion (OTEC), Geothermal energy: Geothermal sources (hydrothermal, geo-pressurized hot dry rocks, magma), Biomass: Biomass and bio-fuels, bio-energies from wastages, Fuel cells: H₂O₂, Futuristic Energy: Hydrogen, Methane Hydrates, Carbon capture and storage (CCS).

Term Work:

The term work shall consist of record of minimum eight experiments.

- 1. To determine the velocity of sound
- 2. Measurement of average SPL across spherical wavefront and behaviour with the distance
- 3. Expansion chamber muffler: investigation of muffler response as a filter in the low frequency approximation by determining insertion loss
- 4. Interference of sound using PC speakers
- 5. Determination of velocity of sound in liquid by ultrasonic interferometer
- 6. Ultrasonic probe a study
- 7. Determination of divergence of a laser beam
 - 8. Particle size by semiconductor laser
 - 9. Determination of wavelength of laser by diffraction grating
 - 10. Determination of Planck's Constant by photoelectric effect
 - 11. To study Hall effect and determine the Hall volatge
 - 12. Calculation of conductivity by four probe method

Text Books:

- 1.M N Avadhanulu, P G Kshirsagar and TVS Arun Murthy, "A Textbook of Engineering Physics", S. Chand Publishing (2018)
- 2. R K Gaur and S L Gupta, "Engineering Physics", Dhanpat Rai Publishing Co Pvt Ltd (2015)
- 3. Arthur Beiser, Shobhit Mahajan and S. Rai Choudhury, "Concepts of Modern Physics", McGraw Hill Education (2017)

Reference Books:

- 1. Jearl Walker, David Halliday and Robert Resnick, "Fundamentals of Physics", Wiley and Sons (2013)
- 2. Francis Jenkins and Harvey White, "Optics", Tata Mcgraw Hill (2017)
- 3. John W. Jewett, "Principles of Physics", Cengage publishing (2013)
- 4. C. Kittel, "Introduction to Solid State Physics", Wiley and Sons (2004)
- 5. H. V. Keer, "Principles of Solid State Physics", New Age International (1993)
- 6. B. B. Laud, "Laser and Non-Linear Optics", New Age International Private Limited (2011)
- 7. Dr. S. K. Kulkarni, "Nanotechnology: Principles and Practice", Capital Publishing Company (2014)
- 8.C.M. Srivastava and C. Srinivasan, "Science of Engineering Materials", New Age International Pvt. Ltd. (1997)
- 9. David R. Griffiths, "Introduction to Electrodynamics", Pearson (2013)
- 10. Boyle, "Renewable Energy: Power for a Sustainable Future", Oxford University Press (2012)

Project based learning:

- 1. Measurement and effect of environmental noise in the college
- 2. Construction and application of heat sensor in process control
- 3. Design and simulation of automatic solar powered time regulated water pumping
- 4. Solar technology: an alternative source of energy for national development

5. The study on the effect of length on the resistance of a copper wire (verification of ohms law r directly proportional to l)
6. Possible effects of electromagnetic fields (emf) on human health
7. The design and construction of the hearing aid device
8. Design and construction of digital distance measuring instrument
9. Design and construction of automatic bell ringer
10. Design and construction of sound or clap activated alarm
11. Electronic eye (Laser Security) as autoswitch/security system
12. Determination of velocity of O-ray and E-ray in different double refracting materials
13. Quantum confinement effect in wide band semiconductors
14. Small wind turbines as a source of electricity
15. LiFi- wireless data transfer system using light

	В	Tech. Sem. II Electronics & Communication ELECTRONIC COMMUNICATION	0		
TEACHING SCHEME:		G EXAMINATION SCHEME:	CREDITS ALLOTTED:		
Theory: 03		End Semester Examination (UE): 60Marks	Credits: 03		
Practi	cal:04	Internal Assessment (IA): 40 Marks			
		TW & Oral: 100 Marks	Credits: 02		
		Total Marks:200 Marks	Total Credits:05		
Cours	se Pre	-requisites:			
The st	tudent	s should have knowledge of			
1		d State Devices			
2	Bas	ic Physics			
3	Bas	ic Mathematics			
Cours	se Obj	ectives:			
1	To	ntroduce the concepts of analogue communication system	ns.		
2		To equip students with various techniques related to analogue communication such as modulation, demodulation.			
3	To	To study noise, transmission media etc.			
<u>C</u>	O	A 64 1 A 1	- 4-		
Cours		comes: After learning this course students will be able ine the basic concept of communication system, need of r			
1		ninologies in communication systems.	nodulation, some		
2		sify the transmission media used in communication system	m.		
3		ine the different modern communication systems.	<u></u>		
4		sify the different sources of noise.			
5		sify& compare the amplitude modulation & demodulation	n techniques.		
6	Clas	sify & compare the Angle modulation & demodulation te	chniques.		
UNIT	Γ – I	Fundamentals of Communication Engineering	(06 Hours)		
		Signals:Basics of signal representation & its analysis, I	Sandwidth of		
		Signals, Signal Shapes in Communication, Ele			
		spectrum & typical applications, System: Baseband S			
		band Systems, Communication System: Block	-		
		communication systems, Analog Versus Digital Co	_		
		System, Modulation and Demodulation in Communicat			
		Need of Modulation, Classification of modulation			
		Terminologies in Communication Systems.			

UNIT – II	Transmission Media and Propagation Mechanisms	(06 Hours)
Wired Media: Twisted Pair, Optical fiber: Structure of a Fiber Optic Cable, Propagation Modes of Fiber Optic Cable, Calculation of Number of Modes in a Fiber, Optical Fiber Index Profile, Optical Fiber's Numerical Aperture (NA), Wireless Media, Wireless Propagation: Ground Wave Propagation, Sky Wave Propagation, Propagation Mechanism.		
UNIT - III	Modern Communication System Introduction to modern communication system: Operation of communication system, need of modern communications. Communication Technologies: The Internet, Basics of Networks, Optical communication: Introduction to optical communication, Development in optical communication, Wireless communications: Introduction to wireless communication, Wireless communication technologies, Mobile cellular communications, Satellite Communications: Basic principle of operation of satellite communication, Satellite orbits, Introduction to Underwater Communication, Radar.	(06 Hours)
UNIT -IV	Noise	(06 Hours)
	Introduction, Sources of noise: External Noise, Internal Noise, Noise calculations(thermal noise), Noise figure: Signal to Noise ratio, definition of noise figure, Classification of noise figure, noise Figure from equivalent noise resistance, Noise Temperature.	
UNIT -V	Amplitude Modulation & Demodulation	(06 Hours)
	Amplitude Modulation: Introduction, Mathematical expression for AM, Modulation index, Frequency spectrum and bandwidth of AM, Time domain representation of AM Power relation in AM, Generation of AM signal: Double sideband full carrier (DSBFC), Double sideband suppressed carrier (DSBSC), SSB, Generation of SSB: Filter method, phase shift method, Third method, Block diagram & working principle of AM Transmitters, AM Receivers: Performance's characteristic of receivers, Tuned radio frequency (TRF) receiver, Super heterodyne receiver, Demodulation of AM Signal.	
UNIT -VI	Angle Modulation & Demodulation	(06 Hours)
, , , ,	Introduction, Types of angle modulation techniques, Mathematical expression of FM, Modulation index for FM, Frequency spectrum and bandwidth of FM, Narrow band and wide band FM, Pre emphasis and de-emphasis, Generation of frequency modulation techniques: Direct method and indirect method, Pulse analog modulation techniques: Pulse Amplitude Modulation (PAM),Pulse	<u>, , , , , , , , , , , , , , , , , , , </u>

Width Modulation, Pulse Position Modulation, Demodulation of Pulse analog modulated signal, Comparison of AM, FM and PM, Block diagram & working principle of FM Transmitters, Block Diagram& working principle of FM receiver.

Term Work:

The term work shall consist of record of minimum eight experiments.

- 12. Generate AM signals, study their time- and frequency-domain characteristics, and measure their modulation indices (Under modulation, Perfect modulation & Over modulation)
- 13. Demonstrate the modulation &demodulation process of DSB-SC.
- 14. Demonstrate the modulation &demodulation process of SSB-SC.
- 15. Generate & analyze frequency modulated signal & demodulate using FM demodulator.
- 16. Analysis of standard signals (square and triangular) and Modulated signals (all types of AM, FM) using spectrum analyzer.
- 17. Demonstrate the Pulse Amplitude Modulation & demodulation & their waveforms.
- 18. Demonstrate the Pulse Width Modulation & demodulation & their waveforms.
- 19. Demonstrate the Pulse Position Modulation & demodulation & their waveforms.
- 20. Examine the operation of PAM-TDM.
- 21. Study of Super heterodyne (AM) Receiver.

Textbooks:

- 1. S.Haykin, "Communication System" (IV Edition), John Wiley & Sons.
- 2. A.B. Carlson, "Communication Systems", McGraw-Hill.
- 3. B.Lathi, "Modern Analog And Digital Communication Systems", Oxford Univ. Press.
- 4. Taub & Schilling, "Communication Systems", TMH.
- 5. Kennedy, Davis, "Electronic Communication Systems", (4/e), McGraw Hill, Reprint 2008.
- 6. <u>Djafar K. Mynbaev, Lowell L. Scheiner</u>, "Essentials of modern communications", Wiley.

Reference Books:

1. Matin, Mohammad Abdul, "Communication Systems for Electrical Engineers", springer.

Project Based Learning:

- 1. Testing the connectivity of circuit using DMM.
- 2. Testing of devices using DMM.
- 3. Construct a circuit for sound amplifier.
 - 4. Design of regulated power supply.
 - 5. Construct a circuit for Analog signal multiplier using Op-amp.
 - 6. Construct a circuit for Analog signal divider using Op-amp.
 - 7. Construct a circuit for Walkie-talkie.
 - 8. Construct a circuit for Wireless power transfer.
 - 9. Construct a circuit for Crystal oscillator tester.
- 10. Construct a circuit for Mobile incoming call indicator.
- 11. Construct a circuit for FM transmitter.
- 12. Construct a circuit for AM Modulator.
- 13. Construct a circuit for PAM Modulator.
- 14. Construct a circuit for single transistor FM transmitter.

15. Construct a circuit for solar energy operated mobile charger.

	B. Tech. Sem. II Electronics & Communication Engineering COMPUTER AIDED GRAPHICS				
	CACHINGSCHEM	EXAMINATION SCHEME:	CREDITS ALLO	TTED:	
<u>E:</u>					
Th	eory: 04	End Semester Examination (UE):	Credits: 04		
_	1.02	60Marks			
	actical:02	Internal Assessment(IA): 40 Marks	G 11: 01		
Tu	torial:	TW: 25 Marks	Credit: 01		
		Total Marks:125 Marks	Total Credits:05		
Co	urse Pre-requisites:				
	e students should hav				
1	Mathematics	<u> </u>			
Co	urse Objectives:				
1		asic principles of engineering drawing	and highlight the im	portance	
		Graphics in engineering.			
2		phical skills for communication of conc	epts & idea through	technical	
	drawings.				
Co	ourse Outcomes: A	fter learning this course students wi	ll bo able to		
1		damental concepts of Drawing, differer		vec and	
1		e with practical application.	it types of files, curv	cs and	
2		cept of Orthographic projections and a	oply it to draw detail	views by	
	using 1st angle proje		. 1 7	,	
3	Understand the con-	cept of isometric projection and apply i	t to construct 3D vie	w of a	
	component.				
4		cept of projections of Point, Line and p		aw its	
5		1 st angle projection method and to locatept of projections of different types of		draw ite	
3		$1^{\rm st}$ angle projection method.	solius and apply to	uraw 118	
6		cept of Development of Lateral surface	s; and apply to deve	lopment of	
	simple Solids.	1		<u>.</u>	
Ul	NIT – Lines and	0 0	Drawing and	(08	
	I Engineerin		C 1. 1	Hours)	
		to Engineering Drawing, Type			
		ng, Layout and size of drawing sheets,			
		Curves-Ellipse drawing by Focu			
	Method and	Method and Concentric Circle Method, Involutes of a circle, Cycloid,			
	Archimedea	n Spiral, Helix on cone and Cylinder.			
	Introduction to Auto CAD commands.				

UNIT – II	Orthographic Projection	(08 Hours)
	Basic principles of orthographic projection (First and Third angle	
	method). Orthographic projection of objects by first angle projection	
	method only. Procedure for preparing scaled drawing, sectional views	
	and types of cutting planes and their representation, hatching of sections.	
	(Also using AutoCAD commands)	
	(7130 using 714to-2715 communus)	
UNIT - III	Isometric Projections	(08 Hours)
	Isometric view, Isometric scale to draw Isometric projection, Non-	
	Isometric lines, and construction of Isometric viewfrom given	
	orthographic views and to construct Isometric view.	
	(Also using AutoCAD commands)	
***		(00
UNIT - IV	Projections of Points, Lines and Planes	(08 Hours)
	Projections of points, projections of lines, lines inclined to one	
	reference plane, Lines inclined to both reference planes. (Lines in	
	First Quadrant Only), Traces oflines.	
	ProjectionsofPlanes- projectionofperpendicularandobliqueplanes	
	(polygonal and circular surfaces), Obtaining true shape of plane	
	surface.	
	(Also using AutoCAD commands)	
UNIT -V	Projection of Solids	(08 Hours)
	Introduction of solids- Types of solids, Projection of solid inclined	,
	both references plane, Projection of common solids such as prism,	
	pyramid, cylinder and cone.	
	(Also using AutoCAD commands)	
TINITE		(00
UNIT - VI	Development of Lateral Surfaces of Solids	(08 Hours)
	Introduction to development of lateral surfaces and its Industrial	
	application, draw the development of lateral surfaces of cone,	
	pyramid andprism.	
	(Also using AutoCAD commands)	
Term Wo	rk:	
	work shall consist of record of minimum eight experiments.	
	pes of lines, Dimensioning practice, free-hand lettering, 1 nd and3 rd angle	methods
•	ngineering curves.	

- 3. Orthographic Projections.
- 4. Isometric views.
- 5. Projections of Points, Lines and planes.
- 6. Projection of Solids.
- 7. Development of lateral surfaces

Text Books:

- 1. N. D. Bhatt, "Elementary Engineering Drawing", Charotar Publishing house, Anand India,
- 2. Munir Hamad ,"AutoCAD 2020 Beginning and Intermediate", Mercury Learning & Information Publication, 2019.
- 3. Venugopal K ,"Engineering Drawing and Graphics",., New Age International publishers.

Reference Books:

- 1. K.L.Narayana & P. Kannaiah , "Text Book on Engineering Drawing" , Scitech Publications, Chennai.
- 2. WarrenJ. Luzzader, "Fundamentals of Engineering Drawing", Prentice Hall of India, New Delhi,
- 3. M. B. Shah and B.C. Rana, "Engineering Drawing", 1st Ed, Pearson Education, 2005
- 4. P. J. Shah, "Engineering Drawing", C. Jamnadas and Co., 1stEdition,1988
- 5. P.S.Gill ,"Engineering Drawing(GeometricalDrawing)",10thEdition,S.K.KatariaandSons,2005

Project Based Learning

Following is the list topic for project based learning (Not Limited to) based on the syllabus contents:

To obtain industrial drawings to identify the types of lines, dimensioning methods and method of projection.

- 2. To develop the model/charts based on engineering curves.
- 3. To prepare model/chart for identification of engineering curves in nature for industrial, societal, etc application.
- 4. To demonstrate different methods of orthographic projection.
- 5. To demonstrate projection of Points.
- 6. To demonstrate projection of Lines.
- 7. To demonstrate projection of Planes.
- 8. To demonstrate projection of Solids.
- 9. To demonstrate developments of surfaces for solids.
- 10. To demonstrate industrial application of development of surfaces such as steam carrying pipes, Ducts of air conditioning systems, etc.
- 11. To demonstrate Isometric projection method through model of a cube.

		B. Tecl	h. Sem. II Electronics & Commu PYTHON PROGRAMI		
	CHIN EME:		EXAMINATION SCHEME:	CREDITS ALLOTTE	ED:
Theory: 03			End Semester Examination: 60 Marks	Credits: 03	
	ical:04	1	Internal Assessment: 40 Marks		
Tuto	rial:		TW& Oral: 75 Marks	Credits: 02	
			Total Marks:175 Marks	Total Credits:05	
Cour	rse Pro	e-requisite	s:		
The s	studen	ts should ha	ave knowledge of		
1			d have basic knowledge of program	nming.	
	1		5 1 0	<u>_</u>	
Cour	rse Ob	jectives:			
1	This	course wil	l introduce the concepts of Python	language software devel	opment
	tool	By the end	d of the course, student will be fam		
		on languag			
			After learning this course stude		
1		erstand the basic concept of Python programming.			
2		e basic programs using control statement.			
3		exception handling.			
4			ented programming.		
5			grams using arrays.		
6	Use 1	Python for	simple applications.		
TINIF	Tr T				(0.0
UNI	T – I		on Basics:		(06 Hours)
			hon Introduction, Python Installation, Relational operators,		
		Bitwise operators, Logical operators Python Data Types - Numbers			
		(Integer, Floating Point, Complex Numbers), Strings, Lists, Tuples,			
		Dictionari	ies, List comprehensions, Python (Control Statements	
	IT – I	Python Core:		(06 Hours)	
		Python Modules & Functions, Lambda, Scope, Python File			
		Handling, Python Regular Expressions, Sequence Types, Input			
		and outpu Objects	t, Recursion, Flow Control, Immu	table and Mutable	
TINT	IT -	Duthan E	voontion Handlings		(04
UIN.	11 -	rymon E	xception Handling:		(06

III		Hours)			
	Meaning of Exception, Exception Hierarchy Diagram, Types of				
	Exception- Checked Exception, Unchecked Exception, Exception				
	Handling -TRY, CATCH, FINALLY, Raising an Exception, User				
	Defined Exceptions				
UNIT -	OOPS, UML & OOAD:	(06			
IV	oors, evill a cons.	Hours)			
	Object Oriented Programming (OOPs) - Class & Object,				
	Abstraction, Inheritance, Polymorphism, Encapsulation, Object				
	Oriented (OO) Modelling, Object Oriented Analysis & Design				
	(OOAD)				
UNIT -V	PYTHON MULTI-THREADING:	(06			
		Hours)			
	Threads in Python (a) Kernel Threads(b) User Space Threads or				
	User Threads, Advantages of Threading, Thread States: Life Cycle				
	of a Thread, Thread & Threading Modules, Forking &				
	Synchronizing Threads, Networking				
UNIT -	Python Packages and Graphics:	(06			
VI	1 ython I ackages and Grapines.	Hours)			
	Numpy: Introduction, datatypes, arrays, arrays manuplation,				
	ploting, testing anddebugging, Sharing Data using Sockets,				
	pycharm in python ,Simple applications of python				
751 XXI	•				
The term vo					
	work shall consist of record of minimum eight experiments.				
	Evaluate any given expression involving arithmetic operators Evaluate any given expression involving logical operators				
	Develop python functions to produce given patterns such as diamond, py	vramid			
	triangles.	yrannu,			
	Usage of different functions present in "math" module				
	Vrite a function that takes two numbers as input parameters and returns	their least			
	common multiple.	41:			
	Vrite a function that takes two numbers as input parameters and returns Greatest common divisor.	their			
	Vrite a function that returns the sum of the digits of a number, passed to	it as an			
	argument.				
	Vrite a program that takes a sentence as an input and displays the numb	ers of			
	words in the sentence.				
	Program to interchange first and last elements in a list program to print even numbers in a list				
	Ways to sort list of dictionaries by values in Python – Using lambda fu	nction			
	12. Example using "matplotlib" module				
13. Example using "NUMPY" module					
	Evaluate any given expression involving arithmetic operators				
Text Book	7.00				
TEXT DOOR	.				

- 1. Learning Python 5th Edition, Oreilly Publication.
- 2. Magnus Lie Hetland, "Beginning Python: From Novice to Professional", Third Edition, Appress Publication
- 3. Allen Downey, Jeffrey Elkner, Chris Meyers, "Learning with Python", DreamtechPublication.
- 4. Paul Berry, "Head-First Python: A Brain-Friendly Guide" (2nd Edition), O'Reilly Media
- 5. Magnus LieHetland, "Python Algorithms: Mastering Basic Algorithms in the Python Language", Apress Pub.

Project Based Learning

- 1. Design and development of Mad Libs generator.
- 2. Design and development of electronic mail system (Read, write, send and delete operations).
- 3. Design and development of store billing system.
- 4. Design and development of typing speed check web application.
- 5. Design and development of windows application for music player.
- 6. Design and development of windows Quiz Application.
- 7. Design and development of web application for daily expense tracker.
- 8. Design and development of student portfolio management & CV generator system.
- 9. Design and development of windows based to do list or sticky notes.
- 10. Design and development of assignment plagiarism checker.