SCHEME FOR
SECOND SEMESTER (COMPUTER ENGINEERING)

Sr. No.	Subject	Study Scheme Hrs/Week L	T	P	EVALUATION SCHEME: INTERNAL ASSESSMENT Theory Max. Marks	Practical Max. Marks	EXTERNAL ASSESMENT (EXAMINATION) Written Paper Max. Marks	Hrs.	Practical Max. Marks	Hrs.	Total Marks
2.1*	Communication Skills - II	3	-	2	25	25	100	3	50	2	200
2.2*	Applied Mathematics - II	5	-	-	50	-	100	3	-	-	150
2.3*	Applied Physics - II	4	-	2	25	25	100	3	50	3	200
2.4*	Applied Chemistry –II	3	-	2	25	25	100	3	50	3	200
2.5**	Basic Electrical Engineering	3	-	2	25	25	100	3	50	3	200
2.6**	Analog Electronics-I	4	-	2	25	25	100	3	50	3	200
2.7	Programming in C	3	-	3	25	25	100	3	50	3	200
# Student Centred Activities		-	-	2	-	25	-	-	-	-	25
Total		**25**	**-**	**15**	**200**	**175**	**700**	**-**	**300**	**-**	**1375**

* Common with other diploma programmes
** Common with diploma programmes in Electronics and Communication Engineering, Electronics and Instrumentation,Instrumentation and Control
+ Includes 25 marks for Viva-voce
# Student Centred Activities will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/Disaster Management activities etc.

SYLLABUS: Polytechnic (CSE)

Department: Computer Science & Engineering – 2nd Semester

Subject: Communication skills –II (Theory) **Subject Code: 120021**

Detailed Contents

Unit No.1 Grammar and usage

Topic No.1: Preposition
Topic No.2: Determiners
Topic No.3: Pronouns
Topic No.4: Conjunction
Topic No.5: Simple present tense
Topic No.6: Simple past tense
Topic No.7: Question tags

Unit no. 2 Reading Skills

Topic No. 8: Unseen Comprehension passages

Unit No.3 Writing skill

Topic No.9: Writing notice
Topic No 10: Writing circular
Topic No.11: Writing memo
Topic No.12: Writing agenda for meeting
Topic No.13: Writing minutes of the meeting
Topic No.14: Telephonic message

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3		-	25	-	100	3	-	-	125

RECOMMENDED BOOKS

1. Communicating Effectively in English, Book-I by Revathi Srinivas; Abhishek Publications,Chandigarh.
2. High School English Grammar and Composition by Wren & Martin; S. Chand & CompanyLtd., Delhi.
3. Communication Techniques and Skills by R. K. Chadha; Dhanpat Rai Publications, New Delhi.

INSTRUCTIONAL STRATEGY

Looking into the present day needs of effective communication in every field, it is imperative to develop necessary competencies in students by giving practical tips and emphasis on grammar,vocabulary and its usage in addition to practical exercises. The teacher should give report writingassignments, projects etc. while teaching this subject.

Topic No	Time Allotted(Hrs)	Marks Allotted(%)
1	15	30
2	15	35
3	18	35
Total	**48**	**100**

Subject: Communication skills –II (Practical) **Subject Code: 120021**

List of practical

1 Offering-Responding to Offers
2 Requesting-Responding to Requests
3 Congratulating
4 Expressing Sympathy and Condolences
5 Expressing Disappointments
6 Asking Questions-Polite Responses
7 Apologizing, Forgiving
8 Complaining
9 Persuading
10 Warning
11 Asking for and Giving Information
12 Giving Instructions
13 Getting and Giving Permission
14 Asking For and Giving Opinions

NOTE: **Students will be tested for their oral and written communication competence making them participate in talks, formal exchanges, narrating people, places etc. They may be asked to infer, interpret selected extracts from audio-books/tracks. Students may also be evaluated through a viva conducted by an external examiner.**

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Theory		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	--	-	50	3	75

RECOMMENDED BOOKS

1. Communicating Effectively in English, Book-I by Revathi Srinivas; Abhishek Publications,Chandigarh.
2. High School English Grammar and Composition by Wren & Martin; S. Chand & CompanyLtd., Delhi.
3. Communication Techniques and Skills by R. K. Chadha; Dhanpat Rai Publications, New Delhi.

Subject: Applied Mathematics-II (Theory) **SubjectCode:120012**

Detailed Contents

Unit No.1 Differential Calculus

Topic No.1: Definition of unction; Concept of limits
Topic No.2: Differentiation by definition of xn, sin x, cos x, tan x, ex, log x only
Topic No.3: Differentiation of sum, product and quotient of functions. Differentiation of function of a function.
Topic No.4: Differentiation of inverse Trigonometrical functions, Logarithmic differentiation, Exponential differentiation, Successive differentiation (upto third order only)
Topic No.5: Applications :(a) Maxima and minima (b) Equation of tangent and normal to a curve (for explicit Functions only) – Simple problems only

Unit No.2 Integral Calculus

Topic No.6: Integration as inverse operation of differentiation
Topic No.7: Simple standard integrals and related problems
Topic No.8: Simple integration by substitution, by parts and by partial fractions (for linear factors only)
Topic No.9: Evaluation of definite integrals (simple problems)
Topic No.10: Numerical integration by Simpson's Rule and Trapezoidal Rule (simple problems only)

Unit No.3 Ordinary Differential Equations

Topic No.11: Definition, order, degree, linear and non-linear differential equations
Topic No.12: Formation of differential equations (upto second order)
Topic No.13: Solution of first order differential equations by variable separable method only

Unit No.4 Statistics

Topic No.14: Measures of Central Tendency: Mean, Median, Mode
Topic No.15: Measures of Dispersion: Mean deviation, Standard deviation
Topic No.16: Co-efficient of rank correlation

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
5	-	-	50	-	100	3	-	-	150

RECOMMENDED BOOKS

1. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics by Vol. I & II by S Kohli, IPH, Jalandhar
3. Applied Mathematics by Dr. RD Sharma, Dhanpat Rai Publications, Delhi
4. Applied Mathematics, Vol. I & II by SS Sabharwal & Sunita Jain, Eagle Parkashan,Jalandhar
5. Comprehensive Mathematics, Vol. I & II by Laxmi Publications, Delhi.

INSTRUCTIONAL STATREGY

Basic elements of Differential Calculus, Integral Calculus, Ordinary Differential Equations and Statistics can be taught in the light of their applications in the field of engineering and technology. By laying more stress on applied part, teachers can also help in providing continuing education base to the students.

SUGGESTED DISTRIBUTION OF MARKS

Topic No	Time Allotted(Hrs)	Marks Allotted (%)
1	30	40
2	25	30
3	10	10
4	15	20
Total	**80**	**100**

Subject: Applied Physics-II (Theory) **Subject Code: 120024**

Detailed Contents

Unit No.1 Waves and Vibrations

Topic No.1: Definition of wave with examples Types of wave motion, transverse and longitudinal wave motion with examples , Relation between velocity of wave, frequency and wave length of a wave ($v = n \lambda$)

Topic No.2: Simple harmonic motion: definition, expression for displacement, velocity, acceleration, time period frequency in S.H.M.

Topic No.3: Vibration of spring mass system, cantilever and determination of their time period. Free, forced and Resonant vibrations with examples

Unit No.2 Applications of Sound Waves

Topic No.4: Acoustics of buildings-reverberation, reverberation time, echo, noise, coefficient of absorption of sound, methods to control reverberation time

Topic No.5: Ultrasonic's-Methods of production (magnetostriction oscillator only) and their engineering applications to cold welding, drilling, cleaning and SONAR

Unit No.3 Principles of Optics

Topic No.6: Lenses, reflection & refraction of light, refractive index, lens formula (no derivation), real and virtual. image, magnification

Topic No.7: Power of lens, microscope, telescope (definition only)

Topic No.8: Total internal reflection, critical angle and conditions for total internal reflection.

Unit No.4 Electrostatics

Topic No.9: Coulomb's law, unit charge Gauss's Law

Topic No.10: Electric field intensity and electric potential (definition and units only)

Topic No.11: Application of Gauss's Law to straight charged conductor, plane charged sheet Capacitance, capacitance of parallel plate capacitor, series and parallel combination of capacitors

Topic No.12: Dielectric and its effect on capacitors, dielectric constant and dielectric breakdown

Unit No.5 Current Electricity

Topic No.13: Definition of electric current, resistance, potential & their units.

Topic No.14: Ohm's law

Topic No 15: Specific resistance, series and parallel combination of resistances, effect of temperature on resistance.

Topic no.16: Kirchhoff's laws, Wheatstone bridge

Topic No. 17: Heating effect of current and concept of electric power

Unit No.6 Semi Conductor Physics

Topic No.18: Types of materials (insulator, semi-conductor, conductor), intrinsic and extrinsic semi conductor, p-n Junction diode and its characteristics

Topic No19: Diode as rectifier-half wave and full wave rectifier, semi conductor transistor pnp and npn (Introduction only)

Unit No.7 Modern Physics

Topic no. 20: Lasers: concept of energy levels, ionizations and excitation potentials; spontaneous and stimulated Emission; population inversion, Laser, types of lasers, ruby laser and applications of laser

Topic no. 21: Fiber optics: Introduction and applications

Topic no. 22: Super conductivity: Phenomenon of super conductivity, Type I and Type II Super conductor and its Applications

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
4		-	25	-	100	3	-	-	125

REFERENCE BOOKS:

1. Concept of Physics by H.C. Verma, Part-1, Bharti Bhawan, New Delhi
2. Concept of Physics by H.C. Verma, Part-2, Bharti Bhawan, New Delhi
3. A Text Book of Applied Physics by RA Banwat and SD Dogra, Eagle Parkashan, Jallandhar
4. Applied Physics by BL Arora, King India Publications, New Delhi

INSTRUCTIONAL STRATEGY

Teacher may use various instructional media like models, charts and graphs while imparting instructions. The field application should be made clear before teaching the basics of waves, sound,light, electrostatics, semiconductor and modern physics etc to develop proper understanding of the physical phenomenon. Use of demonstration will make the subject interesting and develop scientific temper in the students.

SUGGESTED DISTRIBUTION OF MARS FOR FACILITATING THE PAPERSETTER

Sr. No	Topic	Time Allotted (Hrs.)	Marks Allotted (%)
1	Waves and Vibrations	10	14
2	Applications of Sound Waves	10	14
3	Principles of Optics	10	14
4	Electrostatics	12	20
5	Current Electricity	10	16
6	Semi Conductor Physics	06	12
7	Modern Physics	06	10
Total		**64**	**100**

Subject: Applied Physics-II (Practical) **Subject Code: 120024**

LIST OF PRACTICALS

1. To determine and verify the time period of cantilever.
2. To determine time period of Simple Pendulum.
3. To verify ohm's law.
4. To verify law of resistance in series.
5. To verify law of resistances in parallel.
6. To find resistance of galvanometer by half deflection method.
7. To convert a galvanometer into an ammeter of given range.
8. To convert a galvanometer into a voltmeter of given range.
9. To study and verify laws of reflection using mirrors.

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-		2	-	25	-	-	50	3	75

Subject: Applied Chemistry –II (Theory) **Subject Code: 120024**

Detailed Contents

Unit No.1 Metallurgy

Topic No.1: A brief introduction of the terms: Metallurgy (types), mineral, ore, gangue or matrix, flux, slag, concentration (methods of concentrating the ores), ore, roasting, calcinations, smelting and refining of metal.

Topic No.2: Metallurgy of (i) Aluminium (ii) Iron

Topic No.3: Definition of an alloy, purposes of alloying, composition, properties and uses of alloys, monel metal, magnalium, duralumin, alnico, stainless steel and invar.

Unit No.2 Fuels

Topic No.4: Definition of a 'Fuel', characteristics of a good fuel and classification of fuels with suitable examples

Topic No.5: Definition of Calorific value of a fuel and determination of calorific value of a solid fuel with the help of Bomb calorimeter. Simple numerical problems based upon Bomb-calorimeter method of finding the Calorific values

Topic No.6: Brief description of 'Proximate' and 'Ultimate' analysis of a coal. Importance of conducting the proximate and ultimate analysis of a fuel

Topic No.7: Merits of gaseous fuels over those of other varieties of fuels

Topic No.8: Manufacture, composition, properties and uses of (i) Water gas (ii) Oil gas (iii) Biogas

Topic No.9: Composition, calorific values and applications of (i) LPG (ii) CNG (iii) Power alcohol

Topic No.10: Fuel rating; Octane number for petrol, Cetane number for diesel

Unit No.3 Corrosion

Topic No.11: Definition of corrosion

Topic No.12: Theories of corrosion i.e. (i) direct chemical action theory and (ii) electro chemical theory

Topic No.13: Passivity

Topic No.14: Prevention of corrosion by; Alloying, Providing metallic coatings, Cathodic protections :(a) Sacrificial (b) Impressed voltage method

Topic No. 15: Heat treatment (quenching, annealing, tempering & normalizing)

Unit No.4 Lubricants

Topic No.16: Definition of (i) lubricant (ii) lubrication

Topic No.17: Classification of lubricants

Topic No.18: Principles of lubrication; fluid film lubrication, boundary lubrication, extreme pressure lubrication

Topic No.19: Properties of lubricants; Physical properties: viscosity, viscosity index, flash-point, fire-point, cloud-point, pour point, oiliness, volatility, emulsification. Chemical properties:Total acidity number (TAN), saponification and iodine value,coke number and aniline point.

Topic No.20: Criterion for selection of a good lubricant

Unit No.5 Glass

Topic No.21: Glass: Chemical composition, types of glasses and their applications

Topic No.22: Manufacture of ordinary glass and lead glass

Unit No.6 Classification and Nomenclature of Organic Compounds

Topic No.23: Classification of Organic Compounds, functional group, Homogolus Series, IUPAC-Nomenclature of various homogolous series i.e. alcohols, aldehydes, ketones, carboxylic acids, and phenols. (First six members of each series only)

Unit No.7 Polymers & Plastics

Topic No.24: Definition of polymer, monomer & degree of polymerization

Topic No.25: Brief introduction of addition & condensation polymers with suitable examples (PVC, Polyester, Teflon, Nylon 66, Bakelite)

Topic No.26: Definition of plastic & type of plastics (thermo & thermo setting plastics) with suitable examples.

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3	-	-	25	-	100	3	-	-	175

TEXT BOOKS:

1. Chemistry in Engineering by J.C. Kuriacose and J. Rajaram; Tata McGraw-Hill Publishing Company Limited, New Delhi
2. Engineering Chemistry by Dr. S. Rabindra and Prof. B.K. Mishra ; Kumar and Kumar Publishers (P) Ltd. Bangalore-40
3. A Text Book of Applied Chemistry-I by SS Kumar; Tata McGraw Hill, Delhi

RECOMMENDED BOOKS

1. Progressive Applied Chemistry –I and II by Dr. G.H. Hugar; Eagle Prakashan, Jalandhar
2. Engineering Chemistry by Jain PC and Jain M, Dhanpat Rai Publishers, Delhi
3. Chemistry of Engineering by Aggarwal CV
4. Chemistry for Environmental Engineers by Swayer and McCarty, McGraw Hill, Delhi
5. A Text Book of Applied Chemistry-I by Sharma and Others; Technical Bureau of India, Jalandhar
6. A Text Book of Applied Chemistry-II by Dr. J K Sharma (Hindi version), Abhishek Publications, Sec. 17-C, Chandigarh

INSTRUCTIONAL STATREGY

Teacher may take help of various models and charts while imparting instructions to make the concepts clear. More emphasis may be laid on discussing and explaining practical applications of various chemical processes and reactions. In addition, students should be encouraged/motivated to study those processes in more details, which may find practical applications in their future professional life.

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPERSETTER

Sr. No	Topic	Time Allotted (Hrs)	Marks Allocation (%)
1	Metallurgy	08	16
2	Fuels	10	20
3	Corrosion	06	14
4	Lubricants	06	14
5	Glass	04	08
6	Classification of organic compounds and their nomenclature	06	12
7	Polymers and plastics	08	16
	total	**48**	**100**

Subject: Applied Chemistry-II (Practical) **Subject Code: 120024(P)**

LIST OF PRACTICALS

1. Gravimetric analysis and study of apparatus used
2. To determine the percentage composition of a mixture consisting of a volatile and a non-volatile Substances
3. Determine the viscosity of a given oil with the help of "Redwood viscometer"
4. Determine the flash point of the given oil with the help of Abel's Flash Point Apparatus
5. Estimate the amount of moisture in the given sample of coal
6. Estimate the amount of ash in the given sample of coal
7. Electroplate the given strip of Cu with Ni
8. Confirmation test of alcohol, aldehydes, carboxylic acid
9. To determination the total acidity number of a lubricant
10. Detection of metal iron in the rust (solution of rust in concentrated HCl may be given)
11. To study the effect of metal coupling on corrosion of metals

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-		2	-	25	-	-	50	3	75

Subject: Basic Electrical Engineering (Theory) **Subject Code: 120828**

Detailed Contents

Unit No.1 DC Circuits

Topic No.1: Concept of electricity, various applications of electricity, advantages of electricity over other types, Definition- voltage, current, potential difference, power, energy and their units.

Topic No.2: Ohm's law and its practical applications, concepts of resistance, conductance, resistivity and their units, Effect of temperature on resistance, temperature coefficient of resistance

Topic No.3: Series and parallel combination of resistors, wattage consideration, simple problems

Topic No.4: Kirchhoff's current law and Kirchhoff's voltage law and their applications to Simple circuits.

Topic No.5: Conversion of electrical circuits from Star to Delta and Delta to Star.

Unit No.2 DC Circuit Theorems

Topic No.6: Thevenin's theorem, Norton's theorem, super position theorem, maximum Power transfer Theorem

Topic No.7: Application of network theorems in solving d. c circuit problems.

Unit No.3 Voltage and Current Sources

Topic No. 8: Concept of voltage sources- symbol, graphical representation and Characteristics of constant/ ideal and practical sources

Topic No. 9: Concept of current sources- symbol, graphical representation and characteristics of Constant/ideal and practical current sources.

Topic No.10: Basic idea about primary and secondary cells, Construction, working and applications of Lead-Acid battery, Nickel- Cadmium cell and Silver-Oxide cells

Unit No.4 Electro Magnetic Induction

Topic No.11: Concepts of magnetic field produced by flow of current, Magnetic circuit, concept of magneto- motive force (MMF), flux, reluctance, permeability, analogy between electric and magnetic circuit.

Topic No.12: Faraday's laws of electro-magnetic induction, principles of self and mutual induction, self and mutually induced e.m.f, simple numerical problems

Topic No.13: Concept of current growth, decay and time constant in an inductive (RL) circuit.

Topic No.14: Energy stored in an inductor, series and parallel combination of inductors.

Unit No.5 AC Fundamentals

Topic No.15: Concept of alternating voltage and current, Difference between a.c and d.c

Topic No.16: Concept of cycle, frequency, time period, amplitude, instantaneous value average value, r.m.s. value, maximum value, form factor and peak factor, Representation of sinusoidal quantities by phasor diagram, Equation of sinusoidal wave form (with derivation)

Topic No.18: Effect of alternating voltage applied to a pure resistance, pure inductance and pure capacitance

Unit No.6 AC Circuits

Topic No.17: Concept of Inductive reactance, Capacitive reactance and impedance

Topic No.18: Alternating voltage applied to resistance and inductance in series

Topic No.19: Alternating voltage applied to resistance and capacitance in series.

Topic No.20: Impedance triangle and phase angle, Solutions and phasor diagrams for simple RLC circuits (series and parallel), Series and parallel resonance conditions (with derivation)

Topic No.21: Power in pure resistance, inductance and capacitance, power in combined RLC circuits. Power factor, active and reactive power and the significance, importance of power factor.

Topic No.22: Definition of conductance, susceptance and admittance

Unit No.7 Various Types of Power Plants

Topic No.30: Principle of power generation in thermal, hydro and nuclear power stations and their comparative study

Topic No.31: Elementary block diagram of thermal, hydro and nuclear power stations.

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3	-	-	25	-	100	3	-	-	125

RECOMMENDED BOOKS

1. Electrical Technology, Fifth Edition by Edward Hughes, Longman Publishers
2. Electrical Technology by BL Theraja, S Chand and Co, New Delhi
3. Basic Electrical and Electronics Engineering by SK Sahdev; Dhanpat Rai and Sons, New Delhi
4. Experiments in Basic Electrical Engineering by SK Bhattacharya, KM Rastogi; New Age International (P) Ltd.; Publishers New Delhi
5. Principles of Electrical Engineering by BR Gupta, S Chand and Co, New Delhi
6. Electrical Engineering by DR Arora; Ishan Publications, Ambala
7. Basic Electrical Engineering by PS Dhogal, Tata Mc Graw Hill, New Delhi
8. Basic Electrical Engineering by JB Gupta; SK Kataria and Sons, New Delhi
9. Experiments in Basic Electrical Engineering by GP Chhalhotra, Khanna Publishers, New Delhi
10. Basic Electrical Engineering by T.S. Anand, North Publications, Jalandhar.

DISTRIBUTION OF MARKS FOR FACILITATING PAPER SETTER

Sr.No.	Unit Name	Time Allotted (Hrs)	Marks Allotted (%)
1	DC Circuits	07	15
2	DC Circuit Theorem	04	10
3	Voltage and Current Sources	04	10
4	Electro Magnetic Induction	08	15
5	AC Fundamentals	12	20
6	AC Circuits	10	20
7	Various Types of Power Plants	03	10
Total		**48**	**100**

Subject: Basic Electrical Engineering (Practical) **Subject Code: 120826**

LIST OF PRACTICALS

1. Familiarization of measuring instruments viz voltmeter, ammeter, CRO, Wattmeter and multi-meter and other accessories
2. Verification of ohm's law
3. To measure (very low) resistance of an ammeter and (very high) resistance of a voltmeter
4. To verify in d.c circuits:
   a. Thevenin's theorem,
   b. Norton's theorem,
   c. Super position theorem,
   d. Maximum power transfer theorem,
5. To observe change in resistance of a bulb in hot and cold conditions, using voltmeter and ammeter.
6. Verification of Kirchhoff's Current Law and Kirchhoff's Voltage Law in a dc circuit
7. To find the ratio of inductance of a coil having air-core and iron-core respectively and to observe the effect of introduction of a magnetic core on coil inductance
8. To find the voltage current relationship in a single phase R-L and R-C Series circuits, draw their impedance triangles and determine the power factor in each case.
9. To test a lead - acid storage battery and measure its specific gravity.
10. Measurement of power and power factor in a single phase R.L.C. circuit and to calculate active and reactive power.
11. Visit to a nearby Power Station(s).

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	-	-	50	3	75

Subject: Analog Electronics-I (Theory) **Subject Code: 120826**

Detailed Contents

Unit No.1 Semi conductor physics

Topic No.1: Review of basic atomic structure and energy levels, concept of insulators, Conductors and semi-Conductors, atomic structure of Ge and Si, covalent bonds

Topic No.2: Concept of intrinsic and extrinsic semi conductor, P and N type impurities, doping of impurity.

Topic No.3: P and N type semiconductors and their conductivity. Effect of temperature conductivity of intrinsic semi conductor.

Topic No.4: Energy level diagram of conductors, insulators and semi conductors minority and majority carriers

Unit No.2 Semiconductor diode

Topic No.5: PN junction diode, mechanism of current flow in PN junction, Drift and Diffusion current, depletion layer, forward and reverse biased PN junction, potential barrier, concept of junction capacitance in forward and reverse bias concept.

Topic No.6: V-I characteristics, static and dynamic resistance and their calculation from Diode characteristics

Topic No.7: Diode as half wave, full wave and bridge rectifier. PIV, rectification efficiencies and ripple factor calculations, shunt filter, capacitor filter, series inductor filter, LC Filter and RC Filters

Topic No.8: Types of diodes – Zener Diode, Varactor Diode, Photo Diode, LED, LCD Characteristics and applications of Zener diode. Zener breakdown and Avalanche breakdown.

Unit No.3 Introduction to Bipolar transistor

Topic No.9: Concept of bipolar transistor, structure, PNP and NPN transistor, their symbols and mechanism of current flow, current relations in transistor, concept of leakage current

Topic No.10: CB, CE, CC configuration of the transistor, Input and output characteristics in CB and CE configurations, Input and output dynamic resistance in CB and CE configurations, Current amplification factors. Comparison of CB, CE and CC Configurations

Topic No.11: Transistors as an amplifier in CE Configurations, d.c load line and calculation of current gain, voltage gain using d.c load line

Unit No.4 Transistor Biasing Circuits

Topic No.12: Concept of transistor biasing and selection of operating point. Need for stabilization of operating point, Different types of biasing circuits.

Unit No.5 Single Stage Transistor Amplifier

Topic No.13: Single stage transistor amplifier circuit, a.c load line and its use in calculation of currents and voltage gain of a single stage amplifier circuit. Explanation of phase reversal of output voltage with respect to input voltage. h- Parameters and their significance.

Topic No.14: Calculation of current gain, voltage gain, input impedance and output impedance using h-parameter

Unit No.6 Field Effect Transistors

Topic No.15: Construction, operation and characteristics of FET and its application

Topic No.16: Construction, operation and characteristics of MOSFET in depletion and Enhancement modes and its applications

Topic No.17: C MOS- advantages and applications, Comparison of JFET, MOSFET and BJT.

Topic No.18: FET amplifier circuit and its working principle.

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
4	-	-	25	-	100	3	-	-	125

RECOMMENDED BOOKS

1. Basic Electronics and Linear Circuit by NN Bhargava and Kulshreshta, Tata McGraw Hill Publishing Co, New Delhi.
2. Principles of Electrical and Electronics Engineering by VK Mehta; S Chand and Co., New Delhi
3. Electronic Components and Materials by SM Dhir, Tata McGraw Hill Publishing Co, New Delhi
4. Electronics Devices and Circuits by Millman and Halkias; McGraw Hill.
5. Principles of Electronics by Albert Paul Malvino; Tata McGraw Hill Publishing Co, New Delhi.
6. Electronic Devices and Circuits by Bhupinder Jit Kaur; Modern Publishers, Jalandhar
7. Analog Electronics – I by DR Arora, North Publications, Jalandhar.

INSTRUCTIONAL STRATEGY

The aim of this subject is to provide the knowledge of the fundamental concepts related to basic electronics. The teacher should give more emphasis on understanding of concepts and the measuring of various terms used in the subject. The students be made familiar with diodes, transistors, resistors, capacitors, inductors etc. and various measuring instruments such as Multimeter, CRO, Signal generator, Regulated Power Supply etc. Practical exercises should be included to reinforce the various concepts. Practical applications of semiconductor diodes, transistors, field effect transistors etc must be elucidated to the students.

DISTRIBUTION OF MARKS FOR FACILITATING PAPER SETTER

Sr.No.	Unit Name	Time Allotted (Hrs)	Marks Allotted (%)
1	Semi conductor physics	12	10
2	Semiconductor diode	12	20
3	Introduction to Bipolar transistor	12	20
4	Transistor Biasing Circuits	06	10
5	Single Stage Transistor Amplifier	10	20
6	Field Effect Transistors	12	20
Total		**48**	**100**

Subject: Analog Electronics-I (Practical) **Subject Code: 120826**

LIST OF PRACTICALS

1. Familiarization with operation of following instruments:
   Multi-meter, CRO, Signal generator, Regulated Power Supply by taking readings of relevant quantities with their help.
2. Plot V-I characteristics for PN junction diode and calculate its dynamic and static resistances
3. Plot V-I characteristics of Zener diode
4. Observe the wave shape of following rectifier circuit
   a. Half wave rectifier
   b. Full wave rectifier
   c. Bridge rectifier
5. Plot the wave shape of full wave rectifier with
   a. Shunt capacitor filter
   b. Series inductor filter
   c. RC filter
6. Plot input and output characteristics and calculate parameters of transistors in CE configuration.
7. Plot input and output characteristics and calculate parameters of transistors in CB configuration.
8. Plot V-I characteristics of FET amplifier.
9. Measure the Q-Point and note the variation of Q-Point
   a. by increasing the base resistance in fixed bias circuit.
   b. by changing out of bias resistance in potential divider circuit.
10. Measure the Voltage Gain, input, output impedance in single stage CE amplifier circuit.

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
	-	2	-	25	-	-	50	3	75

Subject: Programming in C (Theory) **Subject Code: 120825**

Detailed Contents

Unit No.1 Algorithm and Programming

Topic No.1: Problem solving techniques – algorithms and flowcharts
Topic No.2: Basics of programming
Topic No.3: Steps in development of a program
Topic No.4: Program compilation and debugging

Unit No.2 Program Structure

Topic No.5: Input/output statements
Topic No.6: Assignment statements, constants, variables
Topic No.7: Data types, operators and expressions
Topic No.8: Use of header files and library functions

Unit No.3 Control Structures

Topic No.9: Decision making with if – statement, if – else and Nested if
Topic No.10: while and do while
Topic No.11: Until, for loop, switch and break statements

Unit No.4 Functions

Topic No.12: Introduction to functions, global and local variables
Topic No.13: Function definition, declaration and function call
Topic No.14: Parameters and parameter passing techniques – call by value/ reference

Unit No. 5 Arrays

Topic No.15: Introduction to arrays, array declaration and initialization
Topic No.16: single and multidimensional array, arrays of characters

Unit No. 6 Pointers

Topic No.17: Introduction to pointers, address operator and pointers
Topic No.18: Declaring and initializing pointers, assignment through pointers
Topic No. 20: Pointers and functions, pointers and arrays

Unit No. 7 Structures and Unions

Topic No. 21: Declaration of structures, accessing structure members
Topic No. 22: Structure initialization, arrays of structure
Topic No. 23: Unions, differences between structure and union

Unit No. 8 Strings

Topic No.24: Declaring and initializing string variables
Topic No. 25: Reading and writing strings
Topic No. 26: **S**tring handling functions, array of strings

Unit No. 9 Files

Topic No. 27: Introduction, file reading/writing in different modes
Topic No. 28: **F**ile manipulation using standard function types

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3	-	-	25	-	100	3	-	-	125

TEXT BOOKS:

1 Programming in C by Schaum Series, McGraw Hills Publishers, New Delhi.

2. Let Us C by Yashwant Kanetkar; BPB Publication, New Delhi.

3. Exploring C by Yashwant Kanetkar; BPB Publications, New Delhi.

REFERENCE BOOKS:

1. Programming in C by R Subburaj, Vikas Publishing House Pvt. Ltd., Jangpura, New Delhi.
2. Programming with C Language by C Balaguruswami, Tata McGraw Hill, New Delhi.
3. Programming in C by BP Mahapatra, Khanna Publishers, New Delhi

INSTRUCTIONAL STRATEGY

Students should be given clear idea about the basic concepts of programming. In practical session student should be asked to write algorithm and then write program for the algorithm and run on computer. It is required that students should maintain records (files with printouts).

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	6	12
2	6	14
3	8	16
4	6	12
5	**5**	10
6	**5**	19
7	4	8
8	4	10
9	4	8
Total	**48**	**100**

Subject: Programming in C (Practical) **Subject Code: 120825**

LIST OF PRACTICALS

1. Programming exercises on executing and editing a C program.
2. Programming exercises on defining variables and assigning values to variables.
3. Programming exercises on arithmetic and relational operators.
4. Programming exercises on arithmetic expressions and their evaluation
5. Programming exercises on formatting input/output using printf and scanf.
6. Programming exercises using if statement.
7. Programming exercises using if – Else.
8. Programming exercises on switch statement.
9. Programming exercises on do – while statements.
10. Programming exercises on for – statement.
11. Programming exercises on function – Call by value/reference
12. Programs on one-dimensional array.
13. Programs on two-dimensional array.
14. Simple programs on string handling functions.
15. Simple programs using pointers.
16. Simple programs using structures.
17. Simple programs for reading from a file and writing into a file

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	3	-	25	-	-	50	3	75