2.1   ENGLISH AND COMMUNICATION SKILLS - II

L T P
3 - 2

RATIONALE

Communication skills play an important role in career development. This subject aims at introducing basic concepts of communication besides laying emphasis on developing listening, speaking, reading and writing skills.

LEARNING OUTCOME

After undergoing the subject, the students will be able to:

- Make proper oral presentations.
- Speak confidently.
- Debate properly.
- Write accurate official/business letters.
- Respond to telephone calls effectively.
- Overcome communication barriers.

DETAILED CONTENTS

1. Functional Grammar and Vocabulary   (12 hrs)

    Theory and Practical exercises on following:
    1.1   One word substitution
    1.2   List of words misspelt
    1.3   Prefixes and Suffixes
    1.4   Punctuation
    1.5   Narration
    1.6   Idioms and Phrases

2. Reading   (12 hrs)

    Comprehension, Vocabulary enrichment and grammar exercises based on the following readings:

    Section-I

    - The Refund - Friotz Karinthy
    - Riders to the Sea - J.M. Synge

Section-II

- Night of the Scorpion - Nissim Ezekiel
- Palanquin Bearers - Sarojini Naidu
- Ode on a Grecian Urn – John Keats

3.   Writing   (24 hrs)

   3.1   Precis Writing
   3.2   Correspondence: Business and Official
   3.3   Report Writing: Project report
   3.4   Press Release
   3.5   Memos and Circulars
   3.6   Notices, Agenda and Minutes of Meetings
   3.7   Filling-up different forms such as bank form and on-line form for
            placement etc.

LIST OF PRACTICALS

1. Group discussion on some current topic of interest.
2. Small speech using voice modulation.
3. Seminar
4. Debate
5. Use of recorded CDs of speeches for comprehension.
6. Manners and etiquettes
7. Paper presentation
8. Telephonic conversation: General etiquette for making and receiving calls.

INSTRUCTIONAL STRATEGY

Use of pre-recorded CDs/DVDs should be made to help the students in developing listening skills. Student centred activities such as group discussions, role play should be used to ensure active participation of students in the classroom.

RECOMMENDED BOOKS

1.   Communicating Effectively in English, Book-I by Revathi Srinivas; Abhishek Publications, Chandigarh.
2.   Professional Communication by Kavita Tyagi & Padma Misra; Published by PHI Learning Pvt. Ltd; New Delhi.
3.   Developing Communication Skills (2nd Edition) by Krishna Mohan & Meera Banerji; Published by Macmillan Publishers India Ltd; New Delhi.
4.   Communication Techniques and Skills by R. K. Chadha; Dhanpat Rai Publications, New Delhi.

5. Business correspondence and report writing by RC Sharma and Krishna Mohan; Tata McGraw Hill, New Delhi.
6. High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.
7. Communication Skills by Sanjay Kumar & Pushp Lata; Oxford University Press, New Delhi

Websites for Reference:

1. http://www.mindtools.com/ page 8.html – 99k
2. http://www.letstalk.com.in
3. http://www.englishlearning.com
4. http://learnenglish.britishcouncil.org/en/

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	12	25
2	12	25
3	24	50
Total	**48**	**100**

2.2   APPLIED MATHEMATICS – II

L T P
5 - -

RATIONALE

Applied mathematics forms the backbone of engineering students. Basic elements of Differential calculus and Integral calculus and Operations Research have been included in this course. This will develop analytical abilities to apply in engineering field and will provide continuing educational base to the students.

LEARNING OUTCOMES

After undergoing the subject, students will be able to:

- Calculate the effect of one variable with respect to another variable and write the equation of tangent and normal to a curve at a point by understanding and application of basics concepts of derivatives. After understanding the concept of derivatives they will be able to calculate the maximum and minimum values of a function.
- Calculate the area of a curve bounded by axes, by understanding the applications of basic concepts of integration. They will also be able to find the velocity from acceleration and displacement from velocity.
- Evaluate complex integrals in a simpler way by applying definite integral.
- Calculate the approximate area under a curve by applying Numerical Integration by using Trapezoidal and Simpson's Rules.
- Optimize the utilization of limited resources by applying basics concepts of Linear Programming.
- Solve Engineering and Industrial Problems by understanding and applying the solution of differential equations.
- Apply differential Equations and Numerical methods for higher learning of Mathematics and Engineering Applications.

DETAILED CONTENTS

1.   Differential Calculus   (26 hrs)

    1.1   Definition of function; Concept of limits (Introduction only).

    1.2   Standard Differentiation of x^n , sin x, cos x, tan x, e^x, $\log_a x$ and related formule.

1.3 Differentiation of sum, product and quotient of functions, differentiation of implicit functions, differentiation of parametric functions. Differentiation of function of a function.

1.4 Differentiation of trigonometric, inverse trigonometric functions. Logarithmic differentiation. Exponential differentiation, Successive differentiation (excluding nth order).

1.5 Application of differential calculus in:
   (a) Rate Measures
   (b) Maxima and minima
   (c) Equation of tangent and normal to a curve (for explicit functions only)

2. Integral Calculus   (30 hrs)

2.1 Integration as inverse operation of differentiation with simple examples.

2.2 Standard integrals and related simple problems

2.3 Simple integration by substitution, by parts and by partial fractions (for linear factors only)

2.4 Evaluation of definite integrals (simple problems)

Evaluation of $\int_{0}^{\pi/2} Sin^n x\, dx, \quad \int_{0}^{\pi/2} Cos^n x\, dx, \quad \int_{0}^{\pi/2} Sin^m x\ Cos^n x\, dx$

using formulae without proof (m and n being positive integers only).

2.5 Applications of integration for evaluation of area bounded by a curve and axes (Simple problem).

2.6 Numerical integration by Trapezoidal Rule and Simpson's $1/3^{rd}$ Rule and $3/8^{th}$ Rule.

3. Operations Research   (12 hrs)

3.1 Linear Programming Problems formulations.

3.2 Graphical Method

4. Differential Equations   (12 hrs)

4.1 Definition, order, degree of ordinary differential equations.

4.2 Formation of differential equation (upto 2nd order). Solution of Differential equations with Variable separation and Linear Differential equations.

INSTRUCTIONAL STATREGY

Basic elements of Differential Calculus, Integral Calculus, Operations research and Differential Equations 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.

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, Vol. I & II by SS Sabharwal &Dr Sunita Jain, Eagle Parkashan, Jalandhar

4. Engineering Mathematics, Vol I, II & III by V Sundaram et al, Vikas Publishing House (P) Ltd., New Delhi

5. Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd., Delhi

6. Applied Mathematics I, Archana Sharma, Lords Publications, Jalandhar.

7. Engineering Mathematics by Srimanta Pal and Subodh C. Bhunia; Oxford University Press, New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic	Time Allotted (Hrs)	Marks Allotted (%)
1	26	34
2	30	38
3	12	16
4	12	12
Total	**80**	**100**

2.3   APPLIED PHYSICS – II

L T P
4 - 2

RATIONALE

Applied physics includes the study of a large number of diverse topics related to things that go in the world around us. It aims to give an understanding of this world both by observation and prediction of the way in which objects behave. Concrete use of physical principles and analysis in various fields of engineering and technology

LEARNING OUTCOME

After undergoing this subject, the student will be able to;

a)   Define wave motion its types (Transverse and Longitudinal), Periodic and Simple Harmonic Motion, solve simple problems.

b)   Define the terms: frequency, amplitude, wavelength, velocity of a wave. They will be able to explain diffraction, interference, polarization.

c)   Explain various Engineering, Medical and Industrial applications of Ultrasonics.

d)   Apply acoustics principles to various types of buildings to get best sound effect.

e)   State the laws of reflection and refraction of light, calculate the location of the final image for a concave mirror single thin converging lens**,** design and assemble a microscope using 2 lenses

f)   Measure the refractive index of a liquid or a solid. They will be able to explain total internal reflection as applied to optical fibers.

g)   Define capacitance and its unit. They will be able to explain the function of capacitors in simple circuits, solve simple problems using $C=Q/V$

h)   Explain the role of free electrons in insulators, conductors and semiconductors, qualitatively the terms: potential, potential difference, electromotive force.

i)   Explain electric current as flow of charge, the concept of resistance, measure correctly, using a multimeter, the following: electric current, potential difference, resistance.

j)   List the effects of an electric current and their common applications, State and apply Ohm's law, calculate the equivalent resistance of a variety of resistor combinations, determine the energy consumed by an appliance, distinguish between AC and DC electricity

k)   State the laws of electromagnetic induction, describe the effect on a current-carrying conductor when placed in a magnetic field

l)   Explain how the following operate: moving coil galvanometer, simple DC motor

m)   Apply the knowledge of diodes in rectifiers, adapters IC's and various electronic circuits. Use the knowledge of semiconductors in various

technical gadgets like mobile phones, computers, LED, LCD, solar lights etc.

n) Apply the concept of light amplification in designing of various LASER based instruments and optical sources.

o) Apply the use of optical fibre in Medical field and optical fibre Communication.

DETAILED CONTENTS

1. Wave motion and its applications (08 hrs)

1.1 Wave motion, transverse and longitudinal wave motion with examples, sound and light waves, relationship among wave velocity, frequency and wave length and its application

1.2 Wave equation y = r sin wt, phase, phase difference, principle of superposition of waves

1.3 Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency in S.H.M. concept of simple harmonic progressive wave

1.4 Study of vibration of Cantilever and determination of its time period

1.5 Free, forced and resonant vibrations with examples

1.6 Acoustics of buildings – reverberation, reverberation time, echo, noise, coefficient of absorption of sound, methods to control reverberation time and their applications

1.7 Ultrasonics – Introduction and their engineering and medical applications.

2. Optics (10 hrs)

2.1 Laws of reflection and refraction, refractive index, lens for thin lenses, power of lens, magnification

2.2 Total internal reflection and its applications, Critical angle and conditions for total internal reflection

2.3 Simple and compound microscope, astronomical telescope in normal adjustment, magnifying power.

2.4 Applications of Total Internal Reflection in optical fiber, uses of microscope and telescope.

3. Electrostatics (12 hrs)

3.1 Coulombs law, unit of charge,

3.2 Electric field, Electric lines of force and their properties, Electric flux, Electric potential and potential difference.

3.3 Gauss law: Application of Gauss law to find electric field intensity of straight charged conductor, plane charged sheet and charged sphere.

3.4 Capacitor and its working principle, Capacitance and its units. Capacitance of parallel plate capacitor. Series and parallel combination of capacitors (numericals)

3.5 Dielectric and its effect on capacitance, dielectric break down

3.6 Application of electrostatics in electrostatic precipitation of microbes and moisture separation from air and gases in industry for pollution control (Brief explanation only)

4. Current Electricity   (12 hrs)

4.1 Electric Current and its Unit, Direct and alternating current,

4.2 Resistance and its Units, Specific Resistance, Conductance, Specific Conductance, Series and Parallel combination of Resistances. Factors affecting Resistance, Colour coding of carbon Resistances

4.3 Ohm's law and its verification, superconductivity

4.4 Kirchhoff's laws, Wheatstone bridge and its applications (slide wire bridge only)

4.5 Concept of terminal potential difference and Electro motive force (EMF)

4.6 Heating effect of current, Electric power, Electric energy and its units (related numerical problems), Advantages of Electric Energy over other forms of energy

4.7 Examples of application of DC circuits in various electrical and electronics equipment such as C.R.O, T.V., Audio-Video System, Computers etc.

5. Electromagnetism   (10 hrs)

5.1 Introduction to magnetism, Types of magnetic materials. Dia, para and ferromagnetic materials with their properties,

5.2 Magnetic field and its units, magnetic intensity, magnetic lines of force, magnetic flux and their units

5.3 Concept of electromagnetic induction, Faraday's Laws

5.4 Lorentz force (force on moving charge in magnetic field). Force on current carrying conductor, force on rectangular coil placed in magnetic field

5.5 Moving coil galvanometer its principle, construction and working. Conversion of a galvanometer into ammeter and voltmeter

5.6 Application of electromagnetism in ac/dc motors and generators.

6. Semiconductor physics   (06 hrs)

6.1 Energy bands, Types of materials (insulator, semi conductor, conductor), intrinsic and extrinsic semiconductors, p-n junction diode and its V-I characteristics

6.2 Diode as rectifier – half wave and full wave rectifier (centre taped), semiconductor transistor; pnp and npn (concept only)

6.3 Application of semiconductor diodes (Zenor, LED) and that of transistor as amplifier and oscillator.

7.   Modern Physics   (06 hrs)

      7.1   Lasers: concept of energy levels, ionizations and excitation potentials; spontaneous and stimulated emission; laser and its characteristics, population inversion, Types of lasers; Ruby and He-Ne lasers, engineering and medical applications of lasers.

      7.2   Fibre optics: introduction to optical fibers, light propagation, types, acceptance angle and numerical aperture and applications in communication.

      7.3   Introduction to nanotechnology, nanoparticles and nano materials.

LIST OF PRACTICALS (To perform minimum Eight experiments)

1.   To find the time period of a simple pendulum
2.   To determine and verify the time period of Cantilever
3.   To find the focal length of convex lens by displacement method.
4.   To determine the magnifying power of an astronomical telescope
5.   To verify ohm's laws by drawing a graph between voltage and current.
6.   To verify laws of resistances in series and parallel combination.
7.   To find resistance of galvanometer by half deflection method
8.   Conversion of Galvanometer into an Ammeter and Voltmeter of given range.
9.   To measure very low resistance and very high resistances using Slide Wire bridge
10.   To draw characteristics of a pn junction diode and determine knee and break down voltages
11.   Use of CRO in plotting AC and DC waveforms.
12.   To find wave length of the laser beam.
13.   To find numerical aperture of a plastic optical fiber.

INSTRUCTIONAL STATREGY

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, dc circuits, electromagnetism, and semiconductor physics etc to develop proper understanding of the physical phenomenon**.** Use of demonstration can make the subject interesting and develop scientific temper in the students.

RECOMMENDED BOOKS

1.   Text Book of Physics (Part-I, Part-II); N.C.E.R.T., Delhi
2.   Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
3.   A Text Book of Optics, Subramanian and Brij Lal, S Chand & Co., New Delhi
4.   Practical Physics, by C. L. Arora, S Chand publications
5.   Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic	Time Allotted (hrs)	Marks Allotted (%)
1	08	12
2	10	16
3	12	18
4	12	18
5	10	16
6	06	10
7	06	10
Total	**64**	**100**

2.4   BASIC ELECTRONICS

L T P
4 - 2

RATIONALE

This subject gives the knowledge of fundamental concepts and principles of basic electronics and aims at providing the students with basic understanding of various types of materials such as conductors, semiconductors and insulators, extrinsic and intrinsic semi-conductors, p-n junction, need of rectifiers, significance and use of filters in rectifiers, basic structure and working principle of tunnel diodes, LEDs, varactor diodes, LCD; working of transistors in various configurations; fundamental knowledge of FETs and MOSFETs etc. and their applications. The teacher should give emphasis on understanding of concepts by explaining the various terms used in the subject. Practical exercises have been included in order to reinforce various concepts. Industrial/field exposure must be given by organizing industrial visit.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- Identify and able to take readings on various electronics equipments(multimeter, CRO, signal generator, LCR meter)
- Plot the VI characteristics of pn junction diode and Zener diode
- Measure voltage gain, input and output impedance in a single state CE amplifier circuit.
- Fabricate half wave, full wave and bridge rectifier and observe waveforms of each
- Plot the waveforms of the rectifier circuit with different filters
- Plot input and output characteristics of transistor in CB and CE mode
- Plot the characteristics of FET based amplifier
- Measure voltage gain, input and output impedance in a single state CE amplifier circuit

DETAILED CONTENTS

1.   Semiconductor Physics: (12 hrs)

    1.1   Review of basic atomic structure and energy levels, concept of insulators, conductors and semi conductors, atomic structure of Germanium (Ge) and Silicon (Si), covalent bonds

    1.2   Concept of intrinsic and extrinsic semi conductor, process of doping.

    1.3   Energy level diagram of conductors, insulators and semi conductors; minority and majority charge carriers.

    1.4   P and N type semiconductors and their conductivity, effect of temperature on conductivity of intrinsic semi conductors.

2.	Semiconductor Diode:	(12 hrs)

2.1	PN junction diode, mechanism of current flow in PN junction, forward and reverse biased PN junction, potential barrier, drift and diffusion currents, depletion layer, concept of junction capacitance in forward and reverse biased condition.

2.2	V-I characteristics, static and dynamic resistance and their value calculation from the characteristics.

2.3	Application of diode as half-wave, full wave and bridge rectifiers. Peak Inverse Voltage, rectification efficiencies and ripple factor calculations, shunt capacitor filter, series inductor filter, LC and RC filters.

2.4	Types of diodes, characteristics and applications of Zener diodes. Zener and avalanche breakdown.

3.	Introduction to Bipolar-Transistors:	(12 hrs)

3.1	Concept of a bipolar transistor, its structure, PNP and NPN transistors, their symbols and mechanism of current flow; Current relations in a transistor; concept of leakage current;

3.2	CB, CE, CC configurations of a 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;

3.3	Transistor as an amplifier in CE Configuration; concept of DC load line and calculation of current gain and voltage gain using DC load line.

4.	Transistor Biasing Circuits:	(06 hrs)

Concept of transistor biasing and selection of operating point. Need for stabilization of operating point. Different types of biasing circuits.

5.	Single Stage Transistor Amplifier:	(10 hrs)

Single stage transistor amplifier circuit, concept of dc and ac load line and its use. Explanation of phase reversal of output voltage with respect to input voltage.

6.	Field effect Transistors	(12 hrs)

Construction, operation and characteristics of FETs and their applications.

6.1	Construction, operation and characteristics of a MOSFET in depletion and enhancement modes and its applications.

6.2	C MOS - advantages and applications

6.3	Comparison of JFET, MOSFET and BJT.

6.4	FET amplifier circuit and its working principle. (No Derivation).

LIST OF PRACTICALS

1.   Operation and use of the following instruments:

      Multi-meter, CRO, Signal generator, LCR meter, Regulated Power Supply by way of taking readings of relevant quantities with their help.

2.   Plotting of V-I characteristics of a PN junction diode

3.   Plotting of V-I characteristics of a Zener diode

4.   Measurement of the voltage gain, input and output impedance in a single state CE amplifier circuit.

5.   Design of following circuit on breadboard and observe the output of :
      a. Half-wave rectifier circuit using one diode

      b. Full-wave rectifier circuit using two diodes

      c. Bridge-rectifier circuit using four diodes

6.   Plotting of the wave shape of full wave rectifier with

      a. Shunt capacitor filter

      b. Series inductor filter

      c. RC filter

7.   Plotting of input and output characteristics and calculation of parameters of transistors in CE   configuration.

8.   Plotting of input and output characteristics and calculation of parameters of transistors in CB   configuration.

9.   Plotting of V-I characteristics of a FET based amplifier.

10.   Measurement of voltage gain, input and output impedance in a single state CE amplifier circuit.

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 Multi-meter, CRO, Signal generator, LCR meter, 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.

RECOMMENDED BOOKS

1. Basic Electronics and Linear Circuit by NN Bhargava, Kulshreshta and SC Gupta, Tata McGraw Hill Education Pvt Ltd., 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 Education Pvt Ltd., New Delhi.
4. Principles of Electronics by SK Bhattacharya and Renu Vig, SK Kataria and Sons, Delhi
5. Electronics Devices and Circuits by Millman and Halkias; McGraw Hill.
6. Principles of Electronics by Albert Paul Malvino; Tata McGraw Hill Education Pvt Ltd., New Delhi.
7. Basic Electronics – Problems and Solutions by Albert Malvino and David J. Bates; Tata McGraw Hill Publishing Company Pvt Ltd, New Delhi.
8. Basic Electronics by J.S. Katre, Sandeep Bajaj, Tech. Max. Publications, Pune.
9. Analog Electronics by DR Arora, Ishan Publications, Ambala City.
10. Electronic Principles by SK Sahdev, Dhanpat Rai & Co., New Delhi
11. Analog Electronics by JC Karhara, King India Publication, New Delhi
12. Electrical Devices and Circuits by Rama Reddy, Narosa Pulishing House Pvt. Ltd., New Delhi
13. Electronic Devices and Circuits by Dharma Raj Cheruku and Battula Tirumala Krishna: Pearson Education (Singapore) Pvt Ltd., Indian Branch, 482 F.I.E Patparganj, Delhi- 92
14. Basic Electronics by JB Gupta, SK Kataria and Sons, New Delhi
15. Grob's Basic Electronics- A text Lab Manual (Special Indian Edition) by Schultz, Tata McGraw Hill Education Pvt Ltd, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	12	20
2	12	20
3	12	20
4	6	5
5	10	15
6	12	20
Total	**64**	**100**

2.5   COMPUTER WORKSHOP

L T P
- - 6

RATIONALE

The course aims at making the students familiar with various parts of computers and how to assemble them, and different types of peripherals desired. In addition, the course will provide the students with necessary knowledge and skills in computer software installation and maintenance to make him diagnose software faults.

LEARNING OUTCOME

After undergoing the subject, the student will be able to:

- Identify various computer components.
- Define various parts of computer.
- Describe and differentiate various Motherboard Processors, RAM, Secondary storage devices.
- Install various components of computer.
- Maintain and repair (troubleshoot) various computer components.
- Assemble and de-assemble computer system.
- Install operating system i.e. MS-Window and Linux.
- Diagnose the various faults in computer system i.e. SMPS, HDD, RAM.
- Identify various cables used for connection.
- Outline and underline the dimensions (space requirements) for setting a computer centre.
- Set-up a low cost computer centre.
- Install and configure various application software.
- Define and identify various virus and clean the system using various antivirus software.

DETAILED CONTENTS
The following shops are included in the syllabus:
1. Computer Shop
2. Electronic & Electrical Shop

1.**Computer Shop**

Part-A (Hardware)

1.1   Familiarization with various components and parts of personal computer: Mother board details, hard disk drive, floppy disk drive. CD ROM drive, DVD, Blucray keyboard, display devices, various chips (memory chips and CPU); serial and parallel

ports, inkjet, USB Ports, SATA Fire wire, Bluetooth, Dot matrix and Laser printers, Modems, connectors and cables

1.2 Assembly and Dissembling of PCs, power supply, linear power supply and switch mode   power supply, trouble shooting of SMPS.

1.3 Setting up of basic infrastructure for computers (including power layout, air conditioning, earthing etc.

Part-B (Software)

1.4   Introduction to FOSS, installation of various operating systems, LINUX/MS windows latest versions. Setting up multiboot system/dual boot system. Familiarization of their features with practical demonstrations. Creat window system image. Installation and configuration of device drivers. Disk management

1.5   Installation of latest version of application software proprietary/free software like MS-Office/open office, Adobe Photoshop, Corel Draw, Macromedia Flash etc.

1.6   Installation and configuration of latest version of database software like Oracle/ MySQL/ SQL Server etc.

1.7   Introduction to Virus/Spyware/Worm/Trojan Horse , their detection, prevention and cure.

1.8   Installation, uninstallation and use of Antivirus software.

1.9   Visit to computer manufacturing industry

2. ELECTRONICS & ELECTRICAL SHOP

2.1   Introduction to single phase and three phase supply and wiring system. Importance of three phase supply and wiring system.

2.2 Introduction and working principle of UPS

2.3   Identification and familiarization with the following electronic instruments:
   a)   Multimeter analog and digital (Three and half digit)
   b)   Single beam simple CRO, Signal Generator and Function Generator; function of every knob on the front panel
   c)   Audio-oscillator having sine and square wave output
   d)   Regulated Power supply -- fixed voltage and variable voltage, single output as well as dual output.

2.4   Use of multimeters to test components and measurement of circuits, voltage, resistance.

2.5   Use of familiarisation with CRO, signal generator, function generator and Audio oscillator.

2.6   To make regulated power supply on general purpose PCB.

INSTRUCTIONAL STRATEGY

As the subject is practice oriented, sufficient exercises on assembling and dissembling of computer system should be given.. Field visits to the places where assembly of computers is taking place will be helpful to the students. Visits to the manufacturing units of CVT or UPS will also be helpful to the students.

RECOMMENDED BOOKS

1)   PC Upgrade and Maintenance Guide by Mark Minasi, BPB Publication
2)   Hardware Bible by Winn Rosch, Techmedia Publications
3)   IBM PC and Clones by B Govinda Rajalu. Tata McGraw Hill Education Pvt Ltd , New Delhi
4)   Electronic Instrumentation and Measurement Techniques by WD Cooper and Adhelfrics. Prentice Hall of India, New Delhi
5)   Common Computer Circuits and Faults Vol. 1 by M. Lotia, BPB Publications, New Delhi
6)   Monitor and Fault Diagnosis Vol. 1 and II. M. Lotia, BPB Publications, New Delhi
7)   Unix System Administration by Unleashed. Tech. Media Publications, New Delhi
8)   Understanding Unix Tech Media Publications, New Delhi
9)   Linux Unleashed Tech Media Publications, New Delhi
10)   Unix Configuration and Installation DPB Publications, New Delhi
11)   Teach Yourself Unix BPB Publications, New Delhi
12)   Study Guide Windows Server and Workstation 4 Tech Media Publications, New Delhi
13)   Complete Guide to Window and Workstation by Peter Norton. Tech Media Publications, New Delhi
14)   Complete Guide to Windows by Peter Norton. Tech. Media Publications, New Delhi
16)   Training Guide for Windows by MCSE, Tech Media Publications, New Delhi

2.6   ENVIRONMENTAL STUDIES

L T P
3 - -

RATIONALE

A diploma holder must have knowledge of different types of pollution caused due to industries and constructional activities so that he may help in balancing the eco system and controlling pollution by various control measures. He should also be aware of environmental laws related to the control of pollution. He should know how to manage the waste. Energy conservation is the need of hour. He should know the concept of energy management and its conservation.

LEARNING OUTCOME

After undergoing the subject, the student will be able to:

- Comprehend the importance of ecosystem and sustainable
- Demonstrate interdisciplinary nature of environmental issues
- Identify different types of environmental pollution and control measures.
- Take corrective measures for the abetment of pollution.
- Explain environmental legislation acts.
- Define energy management, energy conservation and energy efficiency
- Demonstrate positive attitude towards judicious use of energy and environmental protection
- Practice energy efficient techniques in day-to-day life and industrial processes.
- Adopt cleaner productive technologies
- Identify the role of non-conventional energy resources in environmental protection.
- Analyze the impact of human activities on the environment

DETAILED CONTENTS

1.   Basics of ecology, eco system and sustainable development   (03 hrs)

2.   Conservation of land reforms, preservation of species, prevention of advancement of deserts and lowering of water table, rain water harvesting, maintenance of ground water, deforestation – its effects and control measures
                                                                                                                (04 hrs)

3.   Pollution: Sources of pollution - natural and man made, causes, effects and control measures of pollution (air, water, noise, soil, radioactive and nuclear) and their units of measurement. Prevention of Pollution :Introduction to Cleaner Production Technologies, , Waste Minimization Techniques, Concept of Zero Discharge
                                                                                                                (12 hrs)

4.   Solid waste management, classification of refuse material, sources, effects and control measures.Introduction to E-waste Management   (06 hrs)

5. Environmental Legislation - Water (prevention and control of pollution) Act 1974, Air (Prevention and Control of Pollution) Act 1981 and Environmental Protection Act 1986, Role and Function of State Pollution Control Board, Environmental Impact Assessment (EIA) (08 hrs)

6. Energy Conservation: Introduction to Energy Management, Energy Conservation, Energy efficiency & its need. Introduction to Energy Conservation Act 2001 and Energy Conservation (Amendment) Act 2010 & its importance. Role of Non-conventional Energy Resources (Solar Energy, Wind Energy, Bio Energy, Hydro Energy) in environmental protection. (10 hrs)

7. Impact of Energy Usage on Environment: – Global Warming, Green House Effect, Depletion of Ozone Layer, Acid Rain. Eco-friendly Material, Recycling of Material, Concept of Green Buildings, (05 hrs)

INSTRUCTIONAL STRATEGY

In addition to theoretical instructions, different activities pertaining to Environmental Studies like expert lectures, seminars, visits etc. may also be organized.

RECOMMENDED BOOKS

1. Environmental and Pollution Awareness by Sharma BR; Satya Prakashan, New Delhi.
2. Environmental Protection Law and Policy in India by Thakur Kailash; Deep and Deep Publications, New Delhi.
3. Environmental Pollution by Dr. RK Khitoliya; S Chand Publishing, New Delhi
4. Environmental Science by Deswal and Deswal; Dhanpat Rai and Co. (P) Ltd. Delhi.
5. Engineering Chemistry by Jain and Jain; Dhanpat Rai and Co. (P) Ltd. Delhi.
6. Environmental Studies by Erach Bharucha; University Press (India) Private Ltd., Hyderabad.
7. Environmental Engineering and Management by Suresh K Dhamija; SK Kataria and Sons, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	03	05
2	04	08
3	12	25
4	06	12
5	08	18
6	10	22
7	05	10
Total	**48**	**100**

2.7   DESKTOP PUBLISHING (DTP) FUNDAMENTALS

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RATIONALE

This course will enable the students to familiarize with the features and use of application packages such as Page Maker, Corel Draw or any other equivalent latest package(s). They will develop skills in handling the software.

Note: Since this is a practical oriented subject, there will be no theory paper. It is suggested that the teacher should explain the following topics during the practical classes itself.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- Explain the concepts related to desktop publishing software and publishing markets.
- Design visiting cards and advertisement pamphlets.
- Design wedding cards, flex and printed designer boxes.
- Design multi-page document and drawing pictures for the books.
- Add special effects in drawing.
- Generate special effects to various types of text in various documents.
- Add various symbols to a design and creating different patterns.

TOPICS TO BE EXPLAINED THROUGH DEMONSTRATION

1.   Introduction

Overview of Desktop Publishing (DTP), Introduction of various keys in the keyboard and their functions.

2.   Page Maker /Publisher/Scribus

Document needs, creating a document, editing and formatting a document, saving and printing a document, inserting text and graphics, inserting columns, fonts and styles, integrating images and graphics from a drawing package in the document, making transparencies, elements, frame option, arrange text, image control, expert tracking, indent/tabs, styles, type styles, layout, tool bar (page setting)

3.   Corel Draw/Inkscape

3.1   Introduction, exploring Corel Draw screen, using dialog boxes, using roll ups, create/open file, save file, import/export files, print file

> ➢ Use of ribbon bar, use of tool box, select object, shaping objects using zoom tool, filling objects, outline objects, use of line tool
> ➢ Setting up new drawing, setting multi-page document, undo/redo mistakes, repeat, cut, copy, paste, delete, duplicate, clone
> ➢ Insert object, paste special, copy attributes from select all, drawing objects, selecting objects
> ➢ Page setup, insert/delete page, use of layers, roll up, grid and scale set up, guideline set up

3.2   Formatting objects

> ➢ Arranging objects: align, order, group, ungroup
> ➢ Arranging objects: combine, break apart, weld, intersection, trim, separate
> ➢ Mode edit: to line, to curve, stretch, rotate, align, convert to curves
>
> ➢ Creating special effects: Transform roll up, clear transformation, add perspective, envelope roll up
> ➢ Creating special effects: blend roll-up, extrude roll up, counter roll up, power line, power-clip clear effects
> ➢ Working with text: Character, paragraph text, frame, setting of tabs, indents, bullets, spacing in paragraph text

LIST OF PRACTICALS

1.   Using windows explorer and other windows elements
2.   Creating and opening a document in page maker/publisher/scribus
3.   Formatting and editing a document
4.   Saving and printing a given document
5.   Insertion of text and graphics in a given document from external source
6.   Using columns utility, to give the document column look
7.   Using various fonts and styles to make a document more beautiful
8.   Use of page maker to make transparencies
9.   Formatting a given file by using undo/redo, repeat, cut, copy, paste, delete, duplicate and clone utilities
10.   Inserting objects in the drawing, aligning, ordering, grouping and ungrouping of those objects
11.   Use of combine, break apart, weld, intersection, trim and separate tools in a given drawing
12.   Use of mode edit tools i.e. to line, to curve, to stretch, and rotate
13.   Creating special effects i.e. transform roll-up, envelop roll up, add perspective, extrude roll up, contour roll up, power line, power clip, clear effects
14.   To insert character and paragraph text in a drawing and frame, setting of tabs, indents, bullets and spacing in paragraph text
15.   Filling of text to a given path, aligning it to base line, straighten text and edit text

16.   Using tools such as spell checker, and thesaurus
17.   Using find and replace text utility and type assist
18.   Adding various symbols to a drawing and creating different patterns.

INSTRUCTIONAL STRATEGIES

This subject is completely practical oriented. Stress is to be given to impart hands on experience to the students. With this subject, the students will be able to create, edit, format and print a document with the help of page maker, corel-draw etc.

RECOMMENDED BOOKS

1.   Learning Desktop Publishing by Ramesh Bangia; Khanna Book Publishing Co. Pvt. Ltd., New Delhi

2.   Desktop Publishing From A to Z by Bill Grout and Osborne; McGraw Hill

3.   DTP (Desktop Publishing) for PC user by Houghton; Galgotia Publishing House Pvt. Ltd., Daryaganj, New Delhi.

TRAFFIC AWARENESS & ROAD SAFETY CAMP (II)

A diploma holder must have knowledge of various types of traffic rules and regulations. Road safety education is vital for people of all ages. As a responsible citizen, you should be aware of each and every road safety rules. Observation is the key skill you need in ensuring road safety By obeying safety rules and regulations, you can save yourself and others on the road. This camp covers the basic concepts of traffic rules and safety. Lectures will be delivered on following broad topics with the coordination of Distt. Traffic police. There will be no exam for this camp.

1. **Time management**
2. **Traffic light signals**
3. **Speed limits of vehicles**
4. **Schedule of offences**
5. **Dividing lines**
6. **Proper road Maintenance and Warnings**
7. **Test yourself**