GURU KASHI UNIVERSITY

Diploma in Computer Science & Engineering

Session:2023-24

Department of Computer Science & Engineering

Programme Structure

Semester: I						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credits**
DCS101	Applied Chemistry – I	Core	3	0	0	3
DCS102	Applied Mathematics - I	Core	3	0	0	3
DCS103	Applied Physics – I	Core	3	0	0	3
DCS104	English and Communication Skills – I	Core	3	0	0	3
DCS105	Engineering Drawing – I	Core	1	0	4	3
DCS106	Applied Chemistry – I Lab	Skill based	0	0	2	1
DCS107	Applied Physics – I Lab	Skill based	0	0	2	1
DCS108	English and Communication Skills – I Lab	Skill based	0	0	2	1
DCS109	General Workshop Practice – I	Skill based	0	0	4	2
DCS110	Basics of Information Technology Lab	Skill based	0	0	2	1
Total			**13**	**0**	**16**	**21**

Semester: II						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credits**
DCS201	English and Communication Skills –II	Skill based	3	0	0	3
DCS202	Applied Mathematics -II	Core	3	0	0	3
DCS203	Applied Physics-II	Core	3	0	0	3
DCS210	Basic Electrical &Electronics Engineering	Core	3	0	0	3
DCS205	English and Communication Skills –II Lab	Skill based	0	0	2	1
DCS206	Applied Physics-II Lab	Skill based	0	0	2	1
DCS211	Basic Electrical &Electronics Engineering Lab	Skill based	0	0	2	1
DCS212	Engineering Drawing-II	Skill based	1	0	4	3
DCS209	General Workshop Practice –II	Core	0	0	4	2
Total			**13**	**0**	**14**	**20**

Semester: III						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credits**
DCS301	Digital Electronics	Core	3	0	0	3
DCS302	Computer Programming Using C	Core	3	0	0	3
DCS303	System Analysis and Design	Core	3	0	0	3
DCS304	Relational Database Management System	Core	3	0	0	3
DCS305	Multimedia and Applications	Core	3	0	0	3
DCS306	Digital Electronics Lab	Skill based	0	0	2	1
DCS307	Computer Programming Using C Lab	Skill based	0	0	2	1
DCS308	Relational Database Management System Lab	Skill based	0	0	4	2
DCS309	Multimedia and Applications Lab	Skill based	0	0	2	1
DCS310	Computer Workshop	Skill based	0	0	2	1
Total			**15**	**0**	**12**	**21**

Semester: IV						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credits**
DCS401	Generic Skills and Entrepreneurship Development	Core	3	0	0	3
DCS402	Data Structures Using C	Core	3	0	0	3
DCS403	Object Oriented Programming Using C++	Core	3	0	0	3
DCS404	Computer Architecture	Core	3	0	0	3
DCS405	Microprocessors	Core	3	0	0	3
DCS406	Internet and Web Technologies	Core	3	0	0	3
DCS407	Data Structures Using C Lab	Skill based	0	0	2	1
DCS408	Object Oriented Programming Using C++ Lab	Skill based	0	0	4	2
DCS409	Microprocessors Lab	Skill based	0	0	2	1
DCS410	Internet and Web Technologies Lab	Skill based	0	0	2	1
Total			**18**	**0**	**10**	**23**

Semester: 5th						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credits**
DCS501	Computer Peripherals and Interface	Core	3	0	0	3
DCS502	Operating Systems	Core	3	0	0	3
DCS503	Computer Networks	Core	3	0	0	3
DCS504	Visual Programming (using VB.NET)	Core	3	0	0	3
DCS505	Computer Peripherals and Interface Lab	Skill based	0	0	2	1
DCS506	Operating Systems Lab	Skill based	0	0	2	1
DCS507	Computer Networks Lab	Skill based	0	0	2	1
DCS508	Visual Programming (using VB.NET) Lab	Skill based	0	0	2	1
DCS509	Minor Project	Skill based	0	0	2	1
DCS510	Industrial Training /Internship (4 Weeks)	Skill based	-	-	-	2
Discipline Elective-I(Any one of the following with its Lab)						
DCS511	Open-Source Technologies	Discipline Elective-I	3	0	0	3
DCS512	Java Programming					
DCS513	Open-Source Technologies Lab		0	0	2	1
DCS514	Java Programming Lab					
Total			**15**	**0**	**12**	**23**

Semester: 6th						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credits**
DCS601	Basics of Management	Core	3	0	0	3
DCS602	Network Security	Core	3	0	0	3
DCS603	Computer Graphics	Core	3	0	0	3
DCS604	Installation, Maintenance and Troubleshooting of Computer Networks	Core	3	0	0	3
DCS605	Computer Graphics Lab	Skill based	0	0	4	2
DCS606	Installation, Maintenance and Troubleshooting of Computer Networks Lab	Skill based	0	0	2	1
DCS607	Major Project	Skill based	0	0	4	2
Discipline Elective-II (Any one of the following with its Lab)						
DCS608	Multimedia System Design	Discipline Elective-II	3	0	0	3
DCS609	.Net Technologies (Using ASP.NET)					
DCS610	Multimedia System Design Lab		0	0	2	1
DCS611	.Net Technologies (Using ASP.NET) Lab					
Total			**15**	**0**	**12**	**21**
Grand Total			**89**	**0**	**76**	**129**

SEMESTER: I

COURSE TITLE: APPLIED CHEMISTRY –I
COURSE CODE: DCS101

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENT:

UNIT-I   **15 Hours**
Basic Concepts of Chemistry: Units and Dimensions, dimensional formulas-dimensional analysis principle of homogeneity of dimensions and their limitations, derived units (with special reference to pressure, volume, temperature, density, specific gravity, surface tension, viscosity and conductivity, thermodynamic parameters-significance and applications), Matter, element, compound and mixtures, atoms, molecules, ions, symbols and formulae, Atomic mass (A), atomic number (Z) isotopes, isobars, isotone (recapitulation only), Mole concept, solution, standard solution, methods to express concentration of solution molar mass, molar volume of gases, strength of solutions in grams per liter, molarity (M), molality (m), mass and volume percentages and mole fraction, Chemical equations, thermo-chemical equations, balancing of chemical equations and simple stoichiometric calculations. Numerical problems based on mole concept and molarity.

Atomic Structure, Periodic Table and Chemical Bonding: Fundamental particles- electrons, protons and neutrons, Bohr's model of atom and its limitations (qualitative treatment only). Wave particle duality and Heisenberg's uncertainty principle (elementary idea only), Modern concept of atom, definition of orbit and orbitals, shapes of s and p orbitals only, quantum numbers (significance only), electronic configuration of elements up to atomic number 30 on the basis of Aufbau Principle, Pauli's Principle and Hund's Rule, Modern periodic law and periodic table, groups and periods. Classification of elements into s, p, d, and f blocks (periodicity in properties are excluded), Chemical bond and cause of

bonding. Ionic bond, valence bond approach of covalent bond, hybridization (sp3, sp2 and sp) sigma (σ) and pi (π) bonds. Metallic bonding – electric, magnetic and dielectric properties based on Band model.

UNIT-II   **10 Hours**

Water: Sources of water, impurities in water (dissolved –gases, salts and suspended), Hardness of water, types of hardness, degree of hardness, units of hardness-ppm, ^{o}Cl, ^{o}Fr – numerical problems. Disadvantages of using hard water in domestic and in industries: Laundry work (action of soap on water), paper, textile and beverage industries. Boiler feed water and its quality - causes and prevention of Scale and sludge formation, Priming and foaming, Boiler corrosion, Caustic embitterment, Softening of hard water by Ion exchange process-dematerialized water advantages and limitations of this method, Desalting of sea water by reverse osmosis (RO) method, Calgon process, Characteristics of drinking water and ICMR, ISI –quality criteria, Water analysis: Quantitative analysis of hardness by EDTA method, alkalinity, and estimation of total dissolved solids (TDS)-numerical problems, Enlist applications of various kinds of water in engineering and chemical industry.

UNIT-III   **10 Hours**

Gas laws, Terminology of Thermodynamics and Equilibrium: Definition of gas and perfect gas, gas laws- Boyle's Law, Charles law &Avagadro's law, Gas constant (R), Terminology of Thermodynamics- thermodynamic system, surroundings, types of systems, extensive and intensive properties, state of a system, state functions, isothermal, adiabatic reversible, irreversible spontaneous and non spontaneous processes, meaning of ΔE, ΔH, ΔS and ΔG, free energy of spontaneous and non spontaneous processes (mathematical derivations are excluded), Elementary idea of zeroth, 1st, 2nd, and 3rd laws of thermodynamics (without mathematical derivation), Applications of free energy change (ΔG) criteria (in metallurgy and electric work without any mathematical derivation), Equilibrium state and its significance statement of Le-Chatelier's principle, equilibrium constant (K) and its applications, Electrolytes, non electrolytes, ionization in aqueous solutions, degree of ionization, ionic product of water (Kw), Concept of pH, pH- scale and industrial applications of pH, Definitions - acids, bases, neutralization and acid base titrations, indicators and choice of indicators for acid base titration., Buffer (acidic, basic and neutral) solutions, enlist applications of buffer solution, Simple numerical problems (only on 4.1, 4.5. 4.6 and 4.7 sections)

UNIT-IV   **10 Hours**

Electrochemistry: Electronic concept of oxidation and reduction, redox reactions, Electrolytes, non-electrolytes and electrolysis, Faraday's Laws of electrolysis and applications in electrometallurgy and electroplating in automobile, Standard reduction potential (SRP), activity series, electrochemical cell and their e.m.f. , Chemistry of commercial electrochemical cells, primary cells - Daniel cell and dry

cell, secondary cell - lead acid storage cell, Wetson-cadmium cell, nicad battery, LiI battery, Hg – button cell and Ag- button cell, Fuel cells, Simple numerical problems related (to only 5.1, 5.3 and 5.4 sections)., secondary cell - lead acid storage cell, Wetson-cadmium cell, nicad battery, LiI battery, Hg – button cell and Ag- button cell, Fuel cells, Simple numerical problems related (to only 5.1, 5.3 and 5.4 sections).

Organic Chemistry: Tetra covalency of carbon in carbon compounds, catenation (definition only), Classification of organic compounds on the bases of functional group, IUPAC nomenclature of simple organic compounds (containing one functional group only) and their common names (if any)

Suggested Readings:

- Chemistry in Engineering by J.C. Kuricose and J. Rajaram, Tata McGraw Hill, Publishing Company Limited, New Delhi.
- Engineering Chemistry by P.C.Jain and Monika Jain, Dhanapat Rai Publishing Company, New Delhi.
- Engineering Chemistry by Shashi Chawla.
- Engineering Chemistry – A text Book by H. K. Chopra and A Parmer- Narosa Publishing House New Delhi.
- Applied Chemistry-I by Dr.P.K. Vij&ShikshaVij, Lords Publications, Jalandhar

Course Title: APPLIED MATHEMATICS–I	**L**	**T**	**P**	**Credits**
Course Code: DCS102	**3**	**0**	**0**	**3**

Total Hours: 45

Course Content

UNIT-I   **10 Hours**
Algebra: Complex Numbers: Complex number, representation, modulus and amplitude. De-movier's theorem, its application in solving algebric equation. Basics and properties of logarithms and its applications in solving problems related to basic logarithmic formulas. Geometrical progression, its nth term and sum of n terms and to infinity. Application of Arithmetic progression and Geometrical progression to Engineering problem such as maximum possible output of the machine, vibration of the spring, finding out capacity of tank etc. Partial fractions (linear factors, repeated linear factors, non-reducible quadratic factors excluding repeated factors)

UNIT-II   **10 Hours**
Permutations and Combinations: Value of ^np_r ^nc_r. Simple problems of formulation of words from given alphabets (with and without repetition), circular permutations etc. Binomial theorem (without proof) for positive integral index (expansion and general form); binomial theorem for any index (expansion without proof) first and second binomial approximation with applications to engineering problems.

UNIT-III   **10 Hours**
Trigonometry: Concept of angles, measurement of angles in degrees, grades and radians and their conversions. Applications of angles such as angle subtended by an arc, diameter of moon etc. T-Ratios of Allied angles (without proof), Sum, difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa). T-Ratios of multiple angles, sub-multiple angles (2A, 3A, A/2). Graphs of Sin x, Cos x, tan x and ex. Applications of Trigonometric terms in engineering problems such as to find an angle of elevation, height, distance etc.

UNIT-IV   **15 Hours**

Co-ordinate Geometry: Cartesian and Polar coordinates (two dimensional), conversion from cartesian to polar coordinates and vice-versa, distance between two points (cartesian co-ordinates), section formulae. Area of triangle when its vertices are given, co-ordinates of centroid, in center of a triangle when the vertices

are given, simple problems on locus. Equation of straight line in various standard forms (without proof), inter section of two straight lines, angle between two lines. Parallel and perpendicular lines, perpendicular distance formula. General equation of a circle and its characteristics. To find the equation of a circle, given: Centre and radius, three points lying on it, Coordinates of end points of a diameter. Equation(s) of a straight line, circle, and conics (ellipse, parabola and hyperbola) and their application in solving engineering problems.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi.
- Engineering Mathematics by Vol. I & II by S Kohli, IPH, Jalandhar.
- Applied Mathematics by RD Sharma.
- Applied Mathematics, Vol. I & II by SS Sabharwal &Sunita Jain, Eagle Parkashan, Jalandhar.
- Comprehensive Mathematics, Vol. I & II by Luxmi Publications.

	L	**T**	**P**	**Credits**
Course Title: APPLIED PHYSICS-I				
Course Code: DCS103	**3**	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT-I   **10 Hours**

Units and Dimensions: Units - fundamental and derived units, systems of units (FPS, CGS, MKS and SI units), dimensional formulae of physical quantities, Dimensional equations and principle of homogeneity, applications to conversion from one system of units to another, checking the correctness of physical relations and derivation of simple physical relations, Error in measurement, random and systematic errors, Application of units and dimensions in measuring length, diameter, Circumference, volume, surface area etc. of metallic and non-metallic blocks, wires, pipes etc (at least two each).

Force and Motion: Scalar and vector quantities – examples, addition and multiplication (scalar product and vector product) of vectors, Force, resolution and composition of forces: resultant, parallelogram law of forces, Newton's laws of motion and their engineering applications, derivation of force equation from Newton's second law of motion; conservation of momentum, impulse. Simple numerical problems, Circular motion: angular displacement, angular velocity and angular acceleration, Relation between linear and angular variables (velocity and acceleration), Centripetal force (derivation) and centrifugal force with their applications.

UNIT-II   **10 Hours**

Waves and Vibrations: Wave motion: transverse and longitudinal wave motion with examples, velocity, frequency and wave length of a wave (relationship $v = n\lambda$) and their applications, Wave equation, $y = r$ sine t, phase, phase difference, superposition of waves and their applications, Simple Harmonic Motion(SHM): definition, expression for displacement, velocity, acceleration, time period, frequency in S.H.M., Free, forced and resonant vibrations with examples, Acoustics of buildings – reverberation, reverberation time, echo, noise, coefficient of absorption of sound, methods to control reverberation time and their applications, Ultrasonic – production (magnetostriction and piezoelectric methods) and their engineering and medical applications

UNIT-III   **12 Hours**

Rotational Motion: Definitions of torque, angular momentum and their relationship, Conservation of angular momentum (qualitative) and its examples, Moment of inertia and its physical significance, radius of gyration, Theorems of parallel and perpendicular axes (statements), Moment of inertia of rod, disc, ring and sphere (Formulae only), Application of rotational motions in transport vehicles, trains and aero plane turbine/engine.

Work, Power and Energy: Work: definition and its SI units, Work done in moving an object on horizontal and inclined plane (incorporating frictional forces) with its application, Power: definition and its SI units, calculation of power with numerical problems, Energy: Definition and its SI units: Kinetic energy and Potential energy with examples and their derivation, Principle of conservation of mechanical energy (for freely falling bodies), transformation of energy from one form to another with its application, Friction: concept, types and its engineering applications, Application of Friction in brake system of moving vehicles, trains, aero planes and other objects.

UNIT-1V   **13 Hours**

Properties of Matter: Elasticity: definition of stress and strain, stress – strain diagram, Hooke's law with its applications, Pressure: definition, its units, atmospheric pressure, gauge pressure, absolute pressure, U-tube, manometers and barometer gauges and their applications, Surface tension: concept, its units, angle of contact, measurement of surface tension by capillary tube method, applications of surface tension, effect of temperature and impurity on surface tension, Fluid motion, Equation of Continuity, Bernoulli's Theorem and their applications. Viscosity and coefficient of viscosity: Buoyant force, buoyancy, Stoke's Law and derivation of terminal velocity, effect of temperature on viscosity and its application in hydraulic systems.

Thermometry: Difference between heat and temperature, Principles of measurement of temperature and different scales of temperature and their Relationship, Resistance thermometers and Pyrometers with their field applications, Expansion of solids, liquids and gases and the respective , coefficients along with relation amongst them, various modes of transfer of heat with examples, Co-efficient of thermal conductivity, determination of thermal conductivity of good conductor (Searle's method) and bad conductor (Lee's disc method)

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Suggested Readings of Physics for Class XI (Part-I, Part-II) N.C.E.R.T
- Suggested Readings of Physics for Class XII (Part-I, Part-II) N.C.E.R.T
- Applied Physics Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, New Delhi
- Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
- Fundamentals of Physics by Resnick and Halliday & Walker, Asian Book Pvt. Ltd., New Delhi

	L	**T**	**P**	**Credits**

Course Title: English and Communication Skills – I
Course Code: DCS104

L	**T**	**P**	**Credits**
3	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT-I   **10 Hours**

Introduction: Definition, Introduction and Process of Communication, Objectives of Communication, Essentials of Communication, Media and Modes of Communication, Channels of Communication, Barriers to Communication, Body language, Humour in Communication, Silence in Communication

Listening: Significance, Essentials, barriers and effectiveness of Listening.

Speaking: Significance, essentials, barriers and effectiveness of Speaking, Introduction to phonetics (Dictionary: meaning and pronunciation of words as given in the standard dictionary using symbols of phonetics)

UNIT-II   **15 Hours**

Reading: Techniques of reading: Skimming, Scanning, Intensive and Extensive Reading, Comprehension, Vocabulary enrichment and grammar exercises based on the following selective readings.
Section-I: Homecoming – R.N. Tagore, the Selfish Giant - Oscar Wilde, the Stick – Justice Surinder Singh.
Section-II: I Have a Dream – Martin Luther King, My struggle for An Education-Booker T Washington, Life Sketch of Sir MokshagundamVisvesvarayya.
Section-III: Ozymandias – P.B. Shelley, Daffodils – William Wordsworth, Stopping by Woods on a Snowy Evening – Robert Frost.
Comprehension exercises on unseen passages, Exercises on interpretation of tables, charts, graphs, signs and pictures etc.

UNIT-III   **10 Hours**

Writing: Significance, essentials and effectiveness of writing, Paragraph of 100-120 words.

UNIT-1V   **10 Hours**

Vocabulary: Vocabulary of commonly used words, Pair of words (Words commonly confused and misused).

Grammar: Identification of parts of speech, using a word as different parts of speech, Correction of in-correct sentences, Tenses, Voice.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Spoken English (2nd Edition) by V Sasikumar& PV Dhamija; Published by Tata MC Graw
- Hills, New Delhi.

- Spoken English by MC Sreevalsan; Published by M/S Vikas Publishing House Pvt. Ltd;
- New Delhi.
- Spoken English –A foundation course (Part-I & Part-II) By Kamlesh Sdanand & Susheela
- Punitha; Published by Orient BlackSwan, Hyderabad
- Practical Course in English Pronunciation by J Sethi, KamleshSadanand& DV Jindal;

Total Hours: 45

Course Title: ENGINEERING DRAWING - I
Course Code: DCS105

L	T	P	Credits
1	0	4	3

COURSE CONTENTS:

UNIT-I   **10 Hours**

Introduction to Engineering Drawing: Introduction to drawing instruments, materials and layout of drawing sheets.

Free Hand Sketching and Lettering: Different types of lines in Engineering drawing as per BIS specifications, Practice of vertical, horizontal and inclined lines, geometrical figures such as triangles, rectangles, circles, ellipses and curves, hexagonal, pentagon with the help of drawing instruments. Practice of vertical, horizontal and inclined lines, geometrical figures such as triangles, rectangles, circles, ellipses and curves, hexagonal, pentagon with the help of drawing instruments. Free hand lettering (Alphabet and numerals) – lower case and upper case, single stroke, vertical and inclined at 75 degrees in different standards, series of 3,5,8 and 12 mm heights in the ratio of 7:4

UNIT-II   **10 Hours**

Dimensioning Technique: Necessity of dimensioning, method and principles of dimensioning (mainly theoretical instructions), Dimensioning of overall sizes, circles, threaded holes, chamfered surfaces, angles, tapered surfaces, holes, equally spaced on P.C.D., counter sink holes, counter bored holes, cylindrical parts, narrow spaces and gaps, radii, curves and arches.

Scales: Scales - their need and importance (Theoretical instructions), Drawing of plain and diagonal scales.

UNIT-III   **10 Hours**

Projection: Theory of projections (Elaborate theoretical instructions), Projection of Points: Production of a point in the first quadrant, Projection of a point in the third quadrant. Projection of Straight Line: Line parallel to both the planes, Line perpendicular to any one of the reference planes, Line inclined to any one of the reference planes. Drawing 3 views of given objects (non-symmetrical objects may be selected for this exercise). Drawing 6 views of given objects (non-symmetrical objects may be selected for this exercise). Identification of surfaces on drawn views and objects drawn, Exercises on missing lines and views.

Note: At least one sheet in third angle projection.

UNIT-IV   **15 Hours**

Sections: Importance and salient features, Methods of representing sections, conventional sections of various materials, classification of sections, conventions in sectioning. Drawing of full section, half section, partial or broken out sections, offset sections, revolved sections and removed sections. Drawing of different conventions for materials in section, conventional breaks for shafts, pipes, rectangular, square, angle, channel, rolled sections, Exercises on sectional views of different objects.

Isometric Views: Fundamentals of isometric projections (Theoretical instructions), Isometric views of combination of regular solids like cylinder, cone, cube and prism.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- A Suggested Readings of Engineering Drawing by Surjit Singh, Dhanpat Rai & Co., Delhi.
- Engineering Drawing by PS Gill, SK Kataria& Sons, New Delhi.
- Elementary Engineering Drawing in First Angle Projection by ND Bhatt, Charotar Publishing House.
- Engineering Drawing I & II by JS Layall, Eagle Parkashan, Jalandhar.

Course Title: APPLIED CHEMISTRY –I LAB
Course Code:DCS106

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practicals

1. Introduction to volumetric analysis, apparatus used in volumetric analysis and molarity based calculations.

2. Preparation of standard solution of oxalic acid {$(COOH)_2.2H_2O$} or potassium permanganate ($KMnO_4$) or potassium dichromate ($K_2Cr_2O_7$)

3. To verify the physical (state, colour, odour solubility, boiling and melting points) properties and few chemical properties of ionic (e.g. $NaCl$) and covalent (kerosene oil or any other such compound may be given) compounds.

4. To determine strength of given solution of sodium hydroxide by titrating against standard solution of oxalic acid using phenolphthalein indicator.

5. To determine total acid number of given oil volumetrically

6. To prepare cup ammonium {$Cu(NH_3)_4SO_4$} and estimate cupric ion in the given solution of copper sulphate solution by spectrophotometeric method..

7. To distinguish between aldehyde and ketone by Tollen's reagent (benzaldehyde and acetone may be used)

8. To verify the first law of electrolysis. (Electrolysis of copper sulphate solution using copper electrode).

9. To prepare iodoform from ethanol or acetone

10. To prepare Bakelite.

11. To prepare the Mohr's salt from ferrous sulphate and ammonium sulphate.

12. Estimation of hardness of water by EDTA method.

13. Estimation of total alkalinity in the given sample of water by titrating against standard solution of sulfuric acid

14. Determination of pH of given solution using pH meter.

	L	**T**	**P**	**Credits**
Course Title: APPLIED PHYSICS-I LAB	0	0	2	1
Course Code: DCS107				

Total Hours: 15

List of Practicals

1. To find the diameter of wire using a screw gauge

2. To find volume of solid cylinder and hollow cylinder using a vernier calipers
3. To determine the thickness of glass strip and radius of curvature using a spherometer
4. To verify parallelogram law of forces
5. To find the time period of a simple pendulum and determine the length of second's pendulum.
6. To find the frequency of a tuning fork by a sonometer
7. To find the velocity of sound by using resonance apparatus at room temperature.
8. To find the Moment of Inertia of a flywheel about its axis of rotation
9. To find the surface tension of a liquid by capillary rise method
10. To determine the atmospheric pressure at a place using Fortin's Barometer
11. To determine the viscosity of glycerin by Stoke's method
12. To determine the coefficient of linear expansion of a metal rod
13. To find the coefficient of thermal conductivity of Bakelite sheet (bad conductor) by Lee's Disc Method
14. To determine the coefficient of thermal conductivity of a copper strip using Searle's Thermal Conductivity apparatus.

Course Title: ENGLISH AND COMMUNICATION SKILLS –I LAB	L	T	P	Credits
Course Code: DCS108	0	0	2	1

Total Hours: 15

List of Practicals
1. **LISTENING**
   - ✓ Using pre-recorded CDs/DVDs with pre-listening exercise to prepare students about what they are going to hear and comprehension based on the audio

   - ✓ Note-taking
   - ✓ Listening for the main ideas
   - ✓ Assessing listening proficiency

2. **SPEAKING**
   - ✓ Exercises on pronunciation of common words as given in the standard dictionary using symbols of phonetics

   - ✓ Greetings for different occasions

   - ✓ Introducing oneself, others and leave taking (talking about yourself)

   - ✓ Just a minute (JAM) sessions: Speaking extempore for one minute on given topics

   - ✓ Paper reading before an audience (reading unseen passages)

   - ✓ Situational Conversation/role-playing with feedback, preferably through video recording

   - ✓ Reading aloud of Newspaper headlines and important articles

   - ✓ Improving pronunciation through tongue twisters

3. **READING**
   - ✓ Paper reading
   - ✓ Poetry recitation

✓ Reading newspaper headlines

4. WRITING

✓ Exercises on spellings

✓ Group exercises on writing paragraphs on given topics

5. VOCABULARY

1. To look up words in a Dictionary: meaning and pronunciation of words as given in the standard dictionary using symbols of phonetics

2. To seek information from an Encyclopedia

	L	**T**	**P**	**Credits**

Course Title: GENERAL WORKSHOP PRACTICE -I

Course Code: DCS109

L	**T**	**P**	**Credits**
0	**0**	**4**	**2**

Total Hours: 30

COURSE CONTENTS:

The following shops are included in the syllabus:

The following shops are included in the syllabus:
1. Welding Shop –I
2. Fitting Shop–I
3. Sheet Metal Shop –I
4. Electric Shop-I
5. Carpentry Shop–I
6. Smithy Shop–I

1. WELDINGSHOP– I

1.1 Introduction and importance of welding as compared to other material joining processes. Specifications and type of welding machines, classification and coding of electrodes, welding parameters, welding joints and welding positions. Materials to be welded, safety precautions.

1.2 Jobs to be prepared

Job I Practice of striking arc (Minimum4beadson100mmlong M.S.flat).

Job II Practice of depositing beads on plate at different current levels. (Minimum 4 beads on M.S. plate at four setting of current level).

Job III Preparation of lap joint using arc welding process.

Job IV Preparation of butt joint using arc welding process. (100mmlong).

Job V Preparation of T Joint using gas or arc welding (100mmx6mmM.S. Flat).

2. FITTINGSHOP– I

2.1 Useofpersonalprotectiveequipmentandsafetyprecautionswhileworking.

2.2 Basic de burring processes.

2.3 Introduction to fitting shop tools, marking and measuring devices/equipment.

2.4 Identification of materials. (Iron, Copper, Stainless Steel, Aluminium etc.)

2.5 Identification of various steel sections (flat, angle, channel, bar etc.).

2.6 Introductiontovariousfittingshopoperations/processes(Hacksawing,Drilling,ChippingandFiling).

Job   I
    Markingofjob,useofmarkingtools,filinganduseofmeasuringinstruments.(Verniercaliper,MicrometerandVernierheight gauge).

Job II Filing a rectangular/square piece to maintain dimensions with in an accuracyof.25 mm.   ±

Job III   Making a cut-out from a square piece of MS flat using hand Hacksawand chipping.

3. SHEETMETALSHOP–I

3.1.Introduction to sheet metal shop, use of hand tools and accessories e.g. different types of hammers, hard and soft mallet, sheet and wire gauge, necessary allowance required during job fabrication, selection of material.

3.2 Introduction and demonstration of hand tools used in sheet metal shop.

3.3 Introduction and demonstration of various machines and equipment used in sheet metal shop e.g. Shearing Machine, Bar Folder, Burring Machine, Turning Machine, Wiring Machine, Setting Down Machine, Forming Machine, Brake etc.

3.4 Introduction and demonstration of various raw materials used in sheet metal shop e.g. black-plain sheet, galvanized-iron plain sheet, galvanized corrugated sheet, aluminum sheet etc.

3.5 Study of various types of nuts, bolts, rivets, screws etc.

Job I Shearing practice on a sheet using hands hears.

Job II Practice on making Single riveted lap joint/Double riveted lap Joint.

Job III   Practice on making Single cover plate chain type, zig-zag type and single rivetted Butt Joint.

4. ELECTRICSHOP-I

4.1 Study, demonstration and identification of common electrical materials with standard ratings and specifications such as wires, cables, switches, fuses, cleats, clamps and allied items, tools and accessories.

4.2 Study of electrical safety measures and protective devices.

Job II dentification of phase, Neutral and Earth wires for connection to domestic electrical appliances and their connections to three pin plugs.

Job II Carrying out house wiring circuit susingfuse, switches, sockets, ceiling rose etc. in batten or P.V.C. casing-caping.

4.3 Study of common electrical appliances such as auto electric iron, electric kettle, ceiling/table fan, desert cooler etc.

4.4 Introduction to the construction of lead acid battery and its working.

Job III Installation of battery and connecting two or three batteries in series and parallel.

4.5 Introduction to battery charger and its functioning.

Job IV Charging a battery and testing with hydrometer and cell tester

5. CARPENTRYSHOP- I

5.1   General Shop Talk

5.1.1 Name and use of raw materials used in carpentry shop: wood & alternative materials

5.1.2 Names, uses, care and maintenance of hand tools such as different types of Saws, C-Clamp, Chisels, Mallets, Carpenter's vices, Marking gauges, Try-squares, Rulers and other commonly used tools and materials used in carpentry shop by segregating as cutting tools, supporting tools, holding tools , measuring tools etc.

5.1.3 Specification of tools used in carpentry shop.

5.1.4 Different types of Timbers, their properties, uses & defects.

5.1.5 Seasoning of wood.

5.1.6 Estimation.

5.2   Practice

5.2.1 Practices for Basic Carpentry Work

5.2.2 Sawing practice using different types of saws

5.2.3 Assembling jack plane — Planning practice including sharpening of jack plane cutter

5.2.4 Chiseling practice using different types of chisels including sharpening of chisel

5.2.5 Makingofdifferenttypesofwoodenpinandfixingmethods.Markingmeasuring and inspection of jobs.

5.3   Job Practice

Job 1 Marking, sawing, planning and chiseling and their practice

Job II Half Lap Joint (cross, Lor T– anyone)

Job III Mortise and Tenon joint (T-Joint)

Job IV Dove tail Joint (Lapor Bridle Joint)

6. SMITHYSHOP-I

6.1   General Shop Talk

6.1.1 Purpose of Smithy shop

6.1.2 Different types of Hearths used in Smithy shop

6.1.3 Purpose, specifications, uses, care and maintenance of various tools and equipments used in hand forging by segregating as cutting tools, supporting tools, holding tools, measuring tools etc.

6.1.4 Types of fuel used and maximum temperature obtained

6.1.5 Types of raw materials used in Smithy shop

6.1.6 Uses of Fire Bricks & Claysin Forging workshop.

6.2   Practice

6.2.1 Practice of firing of hearth/Furnace, Cleaning of Clinkers and Temperature Control of Fire.

6.2.2 Practice on different basic Smithy/Forging operations such as Cutting, Upsetting, drawing down, Setting down, Necking,

Bending, Fullering, Swaging, Punching and Drifting

a) Demonstration—Making cube, hexagonal cube, hexagonal bar from round bar

6.2.3 Practice of Simple Heat treatment processes like Tempering, Normalizing Hardening etc

Job Practice: Job Preparation

Job I   Making a cold/hot, hexagonal/octagonal flat chisel including Tempering of edges.

Job II Production of utility goods e.g. hexagonal bolt / square shank boring tool, fan hook (long S-type) [Two jobs are to be done by the students].

Job III To prepare a cube from a M.S. round by forging method.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Workshop Technology I, II, III, by S K Hajra, Choudhary and A K Chaoudhary. Media Promoters and Publishers Pvt. Ltd., Bombay
- Workshop Technology by Manchanda Vol. I, II, III India Publishing House, Jalandhar.
- Manual on Workshop Practice by K Venkata Reddy, KL Narayana et al;

MacMillan India Ltd. New Delhi

- Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi
- Workshop Technology by B.S. Raghuwanshi, Dhanpat Rai and Co., New Delhi
- Workshop Technology by HS Bawa, Tata McGraw Hill Publishers, New Delhi

SEMESTER-I

Course Title: **BASICS OF INFORMATION TECHNOLOGY LAB**	**L**	**T**	**P**	**Credits**
Course Code: **DCS110**	**0**	**0**	**2**	**1**

Total Hours: 15

List of Experiments:
1. Various Components of a Computer.
2. Introduction to Microsoft Word & Presentation
3. Make a simple presentation on your college,
4. use 3D effects , on prescribed presentation
5. Applications of Ms-Office Ms-Word
6. Ms-Excel
7. Ms-PowerPoint
8. Create web pages for your college using different tags.
9. Web Browser and E- Mail

10. Conversion of a word documents into PDF/ Image conversion using image file format.

Transaction Modes
Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
- Information Technology for Management by Henery Lucas, 7th edition, Tata Mc Graw Hills, New Delhi
- Computers Fundamentals Architecture and Organisation by B Ram, revised Edition, New Age International Publishers, New Delhi
- Computers Today by SK Basandara, Galgotia publication Pvt ltd. Daryaganj, New Delhi.
- MS-Office 2000 for Everyone by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., New Delhi

SEMESTER-II

Course Title: ENGLISH AND COMMUNICATION SKILLS -II	L	T	P	Credits
Course Code: DCS201	3	0	0	3

Total Hours: 45

The curriculum aims to develop the use of English for three major purposes social interaction, academic achievement and professional use. Listening, speaking, reading, and writing skills cannot be thought of as independent skills. They are generally perceived as interdependent where one skill often activates the other skills as well as the paralinguistic skills required for the achievement of effective communication. It is believed that the most effective way to achieve these purposes is through the adoption of a thematic, integrated, content-based approach to teaching and learning.

COURSE CONTENTS:

UNIT-I   **10 Hours**

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

Section-I: The Portrait of a Lady - Khushwant Singh, the Lost Child by Mulk Raj Anand, The Refugees – Pearl S. Buck.

Section-II: Life Sketch of Dr. Abdul Kalam, Abraham Lincoln's letter to his son's Headmaster.

Section-III: All The World's A Stage – W. Shakespeare, Say Not, The Struggle NoughtAvaileth – A.H. Clough, Pipa's Song – Robert Browning, A Viewpoint – RP Chaddah. Comprehension exercises on unseen passages

UNIT-II   **15 Hours**

Writing: The Art of Précis Writing, Correspondence: Business and Official, drafting: Report Writing: Progress report and Project report, Inspection Notes, Notices: Lost and found; Obituary; Auction, Memos and Circular, Notices, Agenda and Minutes of Meetings, use of internet and E-Mails, Press Release, applying for a Job: Resume writing; forwarding letter and follow-up. Writing Telephonic messages, Filling-up different forms such as Banks and on-line forms for Placement etc.

UNIT-III   **10 Hours**

Vocabulary: Vocabulary of commonly used words, Glossary of Administrative Terms (English and Hindi), One word substitution, Idioms and Phrases,

Prefixes and Suffixes, Punctuation, Narration, Forms of verbs: Regular and irregular.

UNIT-IV **10 Hours**

Employable skills: Importance of developing employable and soft skills; List and tips for developing of employable skills.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Spoken English (2nd Edition) by V Sasikumar& PV Dhamija; Published by Tata MC Graw Hills, New Delhi.
- Spoken English by MC Sreevalsan; Published by M/S Vikas Publishing House Pvt. Ltd; New Delhi.
- Spoken English –A foundation course (Part-I & Part-II) By KamleshSdanand&SusheelaPunitha; Published by Orient BlackSwan, Hyderabad
- Practical Course in English Pronunciation by J Sethi, KamleshSadanand& DV Jindal; Published by PHI Learning Pvt. Ltd; New Delhi.
- A Practical Course in Spoken English by JK Gangal; Published by PHI Learning Pvt. Ltd; New Delhi.

Course Title: **APPLIED MATHEMATICS -II**	**L**	**T**	**P**	**Credits**

Course Code: DCS202

3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT-I   **10 Hours**

Algebra: Determinants: Elementary properties of determinants up to 3rd order, consistency of equations, Crammer's rule. Matrix: Algebra of matrices, Inverse of a matrix, matrix inverse method to solve a system of linear equations in 3 variables. Application of Matrix in computer programming.

Differential Calculus: Definition of function; Concept of limits.

$$\text{Four standard limits} \quad \underset{x \to a}{Lt} \quad \frac{x^n - a^n}{x - a},$$

$$\underset{x \to 0}{Lt} \frac{\sin x}{x}, \quad \underset{x \to 0}{Lt} \frac{a^x - 1}{x}, \quad \underset{x \to 0}{Lt} (1+x)^{1/x}$$

Differentiation of x^n, sin x, cos x, tan x, e^x, $\log_a x$ (Please take one example of differentiation by definition), Differentiation of sum, product and quotient of functions. Differentiation of function of a function, Differentiation of trigonometric inverse functions. Logarithmic differentiation. Exponential differentiation, Successive differentiation (excluding nth order), Application of differential calculus in: Rate Measures, Errors and increments, Maxima and minima, Equation of tangent and normal to a curve (for explicit functions only).

UNIT-II   **15 Hours**

Integral: Integration as inverse operation of differentiation with simple examples. Simple integration by substitution, by parts and by partial fractions (for linear factors only). Evaluation of definite integrals (simple problems)-

$$\text{Evaluation of} \int_{0}^{\pi/2} \sin^n x \, dx, \quad \int_{0}^{\pi/2} \cos^n x \, dx, \quad \int_{0}^{\pi/2} \sin^m x \, \cos^n x \, dx$$

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

Applications of integration for: Simple problem on evaluation of area bounded by a curve and axes. Calculation of volume of a solid formed by revolution of an area about axes. (Simple problems). To calculate average and root mean square value of a function and Area by Trapezoidal Rule and Simpson's Rule.

UNIT-III   **10 Hours**

Statistics and Probability: Measures of Central Tendency: Mean, Median, Mode with example of daily life, Measures of Dispersion: Mean deviation, Standard deviation. Probability definition and addition law of probability, theorem and simple numerical problems, General view of normal probability curve (No numericals), Explanation of different sampling techniques (No numericals).

UNIT-IV   **10 Hours**

Differential Equations: Solution of first order and first degree differential equation by variable separation method (simple problems). Differential equations of homogeneous equation.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi.
- Engineering Mathematics by Vol. I & II by S Kohli, IPH, Jalandhar
- Applied Mathematics by Dr. RD Sharma
- Applied Mathematics, Vol. I & II by SS Sabharwal &Sunita Jain, Eagle Parkashan, Jalandhar
- Comprehensive Mathematics, Vol. I & II by Laxmi Publications
- Engineering Mathematics by Dass Gupta

Course Title: APPLIED PHYSICS-II	**L**	**T**	**P**	**Credits**
Course Code: DCS203	**3**	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT-I   **10 Hours**
Optics: Review of basic optics laws: Reflection and Refraction, Refractive index and magnification, image formation in lenses, lens formulae (thin lens only),power of lens, total internal reflection and their applications, Simple concepts of interference, diffraction, Polarization and their applications like Commercial equipment, optic glasses and its manufacturing and use of Polari meter in sugarcane industry and distilleries (No explanation required), Simple and compound microscope, astronomical telescope, magnifying power and its calculation (in each case) and their applications.

UNIT-II   **10 Hours**

Electrostatics: Coulombs law, unit charge and electric lines of force, Electric flux and Gauss's Law, Electric field intensity and electric potential, Electric field due to point charge, straight charged conductor, plane charged sheet and charged sphere (Inside and outside the sphere), Capacitance, types of capacitors, capacitance of parallel plate capacitor, series and parallel combination of capacitors, Dielectric and its effect on capacitance, and dielectric break down, Pollution, different types of pollution and polluting agents, Use of Electronics in reducing Air and Water pollution e.g. precipitation of microbes and moisture reparation from air and gases in industry (small explanation only).

UNIT-III   **15 Hours**

DC Circuits: Concept of electricity, various applications of electricity, Current, voltage, resistance, potential difference and e.m.f, power, electrical energy and their units, advantages of electrical energy over other forms of energy and Alternating Current and Direct Current, Ohm's law and its applications, specific resistance, effect of temperature on resistance, co-efficient of resistance, series and parallel combination of resistors an Resistance, Definitions of Conductance and Super Conductor's, Kirchhoff's laws, Wheatstone bridge principle and its applications, Heating effect of current and concept of electric power, energy and their units, related numerical problems and their applications, Examples of DC Circuits e.g. Various electrical and electronic equipment CRO, T.V., Audio system, Computers (Only examples, no explanations).

Electromagnetism: Magnetic field and its units, magnetic intensity, magnetic

lines of force, magnetic flux and their units, Permeability and susceptibility and their applications. Electromagnetic Induction, Lanz's law and its uses like dynomo, Right hand and left hand rules, Magnetic lines of force due to straight conductor, Solenoid and Circular coil. Force on a current carrying rectangular coil placed in magnetic field and its uses in moving coil galvanometer, electric motor (Concept only). Lorentz force, Force on a current carrying conductor (straight and rectangular), Moving coil galvanometer its principle, construction and working.

UNIT-IV   **10 Hours**

Semiconductor physics: Energy bands, intrinsic and extrinsic semiconductors, p-n junction diode and its characteristics, Diode as rectifier – half wave and full wave rectifier, semiconductor transistor pnp and npn (concept only).

Modern Physics: Lasers: concept of energy levels, ionizations and excitation potentials; spontaneous and stimulated emission; lasers and its characteristics, population inversion, types of lasers, Helium- Neon and ruby lasers their engineering and medical applications, Fibre optics: introduction to optical fiber materials, types, light propagation and applications in communication.

Transaction Modes
Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- Suggested Readings of Physics for Class XI (Part-I, Part-II) N.C.E.R.T
- Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi
- Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
- Fundamentals of Physics by Resnick, Halliday and Walker, Asian Book Pvt. Ltd., New Delhi.
- Fundamentals of Optics by Francis A. Jenkins & Harvey E White, McGraw Hill
    International Editions, Physics Series.

Course Title: **BASIC ELECTRICAL & ELECTRONICS ENGINEERING** Course Code: DCS210	**L**	**T**	**P**	**Credits**
	3	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENT:

UNIT-I   **10 Hours**

Application and Advantage of Electricity: Difference between ac and dc, various applications of electricity, advantages of electrical energy over other types of energy

Basic Electrical Quantities: Definition of voltage, current, power and energy with their units, name of instruments used for measuring above quantities, connection of these instruments in an electric circuit

UNIT-II   **15 Hours**

AC Fundamentals: Electromagnetic Induction-Faraday's Laws, Lenz's Law; Fleming's rules, Principles of a.c. Circuits; Alternating emf, Definition of cycle, frequency, amplitude and time period. Instantaneous, average, r.m.s and maximum value of sinusoidal wave; form factor and Peak Factor. Concept of phase and phase difference. Concept of resistance, inductance and capacitance in simple a.c. circuit. Power factor and improvement of power factor by use of capacitors. Concept of three phase system; star and delta connections; voltage and current Relationship (no derivation) capacitance.

UNIT-III   **10 Hours**

Electric Motor: Description and applications of single- phase and three-phase motors. Connection and starting of three-phase induction motors by star-delta starter. Changing direction of rotation of a given 3 phase induction motor. Motors used for driving pumps, compressors, centrifuge, dyers etc. Totally enclosed submersible and flame proof motor.

UNIT-IV   **10 Hours**

Semiconductor Diode: PN Junction, mechanism of current flow in PN junction, drift and diffusion currents, depletion layer, potential barrier, effect of forward and reverse biasing in a PN junction. Use of diode as half wave and full wave rectifiers (centre tapped and bridge type), relation between DC output

and AC input voltage, rectifier efficiency. Concept of ripples, filter circuits – shunt capacitor, series inductor, and pie (π) filters and their applications, Various types of diodes such as zener diode, light emitting diode, photo diode; their working characteristics and applications. Zener diode and its characteristics. Use of zener diode for voltage stabilization

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- Basic Electrical Engineering by PS Dhongal; Tata McGraw Hill Publishers, New Delhi
- A Text Book of Electrical Technology, Vol. I and II by BL Thareja; S Chand andCo., New Delhi
- Basic Electricity by BR Sharma; Satya Prakashan, New Delhi
- Basic Electrical Engineering by JB Gupta, S Kataria and Sons, Delhi
- Experiments in Basic Electrical Engineering by SK Bhattacharya and KMRastogi, New Age International Publishers Ltd., New Delhi

Course Title: ENGLISH AND COMMUNICATION SKILLS –II LAB

Course Code: DCS206

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practicals:

1. **LISTENING**
   - ✓ Pre-recorded CDs of famous speeches and dialogues: Comprehension exercises based on the audio
   - ✓ Note-taking
   - ✓ Drawing inferences
   - ✓ Summarizing

2. **SPEAKING**
   - ✓ Voice Modulation: Horizons (pitch, tone, volume, modulation) \
   - ✓ Word stress, rhythm, weak and strong form, pauses, group-sense, falling sounds, accent, influence of mother tongue etc.
   - ✓ Situational Conversation/role-playing with feedback, preferably through video recording
   - ✓ Telephonic Conversation: Types of calls, agreeing and disagreeing, making and changing appointments, reminding, making complaints and handling complaints, general etiquettes,
   - ✓ A small formal and informal speech
   - ✓ Seminar
   - ✓ Debate

3. **VOCABULARY**
   - ✓ Vocabulary of commonly used words, Glossary of Administrative Terms (English and Hindi),
   - ✓ One word substitution,
   - ✓ Idioms and Phrases
   - ✓ Prefixes and Suffixes
   - ✓ Punctuation
   - ✓ Narration
   - ✓ Forms of verbs: Regular and irregular

4. **EMPLOYABLE SKILLS**
   - ✓ Group discussions
   - ✓ Presentations, using audio-visual aids (including power-point)
   - ✓ Interview techniques: Telephonic interviews, Group interviews,

face to face Interviews.
- ✓ Mannerism and etiquette etc.

Course Title: APPLIED PHYSICS-II LAB
Course Code: DCS207

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practicals

1. To find the focal length of convex lens by displacement method.
2. To determine the magnifying power of an astronomical telescope
3. To verify ohm's laws by drawing a graph between voltage and current.
4. To verify laws of resistances in series and in parallel connection.
5. To find resistance of galvanometer by half deflection method
6. To measure very low resistance and very high resistance using Wheat Stone bridge.
7. To determine the capacity of a parallel plate capacitor by discharging through a voltmeter and also find out the tine constant of the given capacitor.
8. To draw characteristics of a pn junction diode and determine knee and break down voltages.
9. To find wave length of He Ne semiconductor LASER.
10. Use of CRO in plotting AC/DC

Course Title: **BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB**	**L**	**T**	**P**	**Credits**
Course Code: **DCS211**	**0**	**0**	**2**	**1**

Total Hours: 15

List of Practicals:

1. Connection of a three-phase motor and starter with fuses and reversing of direction of rotation
2. Connection of a single-phase induction motor with supply and reversing of its direction of rotation
3. Connection and reading of an electric energy meter
4. Use of ammeter, voltmeter, wattmeter, and multi-meter
5. Measurement of power and power factor in a given single phase ac circuit
6. Study of different types of fuses, MCBs and ELCBs
7. Study of zener as a constant voltage source and to draw its V-I characteristics
8. To draw V-I characteristics of a (i) NPN transistor (ii) thyristor (SCR)
9. Study of construction and working of a (i) stepper motor and (ii) servo moto

Course Title:	ENGINEERING DRAWING-II	L	T	P	Credits
		1	0	4	3

Course Code: DCS212

Total Hours: 45

COURSE CONTENT:

Note:
1. First angle projection is to be followed
2. Minimum 15 sheets to be prepared
3. BIS Code SP 46 -1988 should be followed

Instructions relevant to various drawings may be given along with appropriate demonstration, before assigning drawing practice to the students
1. 20 percent of drawing sheets to be prepared on the third angle projection
2. Punjab State Board of Technical Education may recommend any of the CAD software viz. Solid Works, Pro Engineer, CATIA, NX, Inventor-AutoCAD etc.
3. The State Directorate of Technical Education may allocate funds for the purchase of computer systems and CAD software for drawing classes.
4. Continuous evaluation be done by the teachers for exercises/work done on CAD software. For this proper record may be maintained for its inclusion in the internal assessment.

1.   Detail and Assembly Drawing

1.1. Principle and utility of detail and assembly drawings
1.2. Introduction to CAD Software
1.3. Practical exercise on drawing from detail to assembly or vice versa using wooden joints as example with CAD Software

2.   Threads   (Min.02 sheets)
2.1   Nomenclature of threads, types of threads (metric). Single and multiple start threads
2.2   Forms of various external thread sections such as V, Square, Acme, Knuckle, Metric, Seller and Buttress thread
2.3   Simplified conventions of left hand and right hand threads, both external and internal threads
2.4   Draw at least one sheet using CAD Software

3.   Nuts and Bolts   (Min.02 sheets)

3.1   Different views of hexagonal and square headed bolts and nuts
3.2   Assembly of nuts and bolts with washers
3.3   Draw at least one sheet using CAD Software
4.   Locking Devices   (01 sheet)
4.1   Lock nuts, Castle nuts, Sawn nuts, Split pin lock nut

4.2   Spring washers, locking plates.
4.3   Draw different locking devices using CAD Software

5.   Screws, Studs and Washers   (01 sheet)
5.1   Drawing various types of machine screws
5.2   Drawing various types of studs
5.3   Drawing various types of washers
5.4   Redraw the above sheet using CAD Software

6.   Keys and Cotters   (Min.03 sheets)
3.3   Various types of keys and their application. Preparation of drawings of various
       keys   and cotters
1.   Various types of joints (a) Sleeve and Cotter joint (b) Kunckle joint (c) Spigot and Socket joint
2.   Draw any one joint using CAD Software

7.   Rivets and Rivetted Joints   (02 sheets)
7.1   Types of general purpose rivet heads
7.2   Types of rivetted joints - lap, butt (single cover plate and double cover plate), chain and zig-zag riveting.
7.3   Caulking and fullering of rivetted joints.
7.4   Draw any one type of rivetted joint using CAD Software

RECOMMENDED BOOKS

- A Text Book of Engineering Drawing by Surjit Singh, Dhanpat Rai & Co., New Delhi

- Engineering Drawing by PS Gill, SK Kataria& Sons, New Delhi

- Elementary Engineering Drawing in First Angle Projection by ND Bhatt, Charotar Publishing House

- Engineering Drawing I & II by JS Layall, Eagle Parkashan, Jalandhar

- AutoCAD 2010: For Engineers & Designers by Prof. Sham Tickoo& D. Sarvanan, Wiley India Pvt. Ltd., Delhi

Course Title: GENERAL WORKSHOP PRACTICE -II	**L**	**T**	**P**	**Credits**
Course Code: DCS211	**0**	**0**	**4**	**2**

Total Hours: 30

COURSE CONTENTS
1. Carpentry and painting shop-II
2. Fitting shop -II

3. Welding shop -II

4. Electric shop -II

5. Smithy shop –II or Electronic shop-II

6. Sheet Metal Shop –II

Note:

1. The branches e.g. Civil Engineering, Electrical Engineering, Mechanical Engineering,

   Mechanical (RAC), Production and Industrial Engineering will do **Smithy Shop -II** instead of Electronic shop- II

   and

2. The branches e.g. Electronics and Communication Engineering, Electronics (with Specialization in Microprocessor), will do **Electronic shop- II** instead of Smithy Shop-II .
3. The instructor is to first explain the introductory part given at the beginning under each shop followed by demonstration and practice by students.

1.   Carpentry and Painting Shop - II

1.1 Introduction to joints, their relative advantages and uses. Job I Preparation of Dovetail joint and glued joint.

Job II Preparation of Mitre Joint

Job III Preparation of a lengthening Joint

Job IV Preparation of atleast one utility job with and without lamination.

1.2 Demonstration of job showing use of Rip Saw, Bow saw and Tenon saw, method of sharpening various saws.

1.3 Demonstration of job on Band Saw and Circular Saw, Chain and Chisel, Universal wood working machine, Saw re-sharpening machine, Saw Brazing unit.

1.4 Importance and need of polishing wooden items, Introduction to polishing materials.

Job V Preparation of surface before polishing including prime coat. Job VI Polishing on wooden items.

2 Fitting Shop – II

2.1 Introduction to various types of threads (internal, external)-single start, multi- start, left hand and right hand threads.

2.2 Description and demonstration of various types of drills, taps and dies Selection of dyes for threading, selection of drills and taps for tapping operations.

Job I Making internal and external threads on a job by tapping and dieing operations (manually)

2.3 Precautions while drilling soft metals, e.g. Copper, Brass, Aluminium etc.
Job II Drilling practice on soft metals (Aluminum, Brass and Copper)

2.4 Care and maintenance of measuring tools like calipers, steel rule, try square, vernier calipers, micrometer, height gauge, combination set. Handling of measuring instruments, checking of zero error, finding of least count.

Job III Preparation of a job by filing on non- ferrous metal up to

an accuracy of 0.1mm

Job IV Preparation of job involving thread on GI pipe/ PVC pipe and fixing of different types of elbow, tee, union, socket, stopcock, taps, etc

3.   Welding Shop – II

3.1   Introduction to gas welding, spot welding and seam welding and machinery and equipment used. Adjustments of different types of flames in gas welding, demonstration and precautions about handling welding equipment.

Job I Practice in handling gas welding equipment (Low pressure and High pressure) and welding practice on simple jobs.

3.2   Common welding joints generally made by gas welding.

Job II   Preparation Butt joint by gas welding.

Job III Preparation of small cot frame from conduit pipe by electric arc welding/gas welding.

Job IV   Preparation of square pyramid from MS rods by welding (type of welding to be decided by students themselves).
Job V   Exercise of preparing a job on spot/seam welding machine.

4   Electric Shop – II

4.1   Importance of three-phase wiring and its effectiveness.

Job I Laying out 3 phase wiring for an electric motor or any other 3 phase machine.

1.1   Estimating and costing of power connection.

Job II Connecting single-phase energy meter and testing it. Reading and working out the power consumption and the cost of energy.

Job III Checking continuity of connection (with tester and series lamp) location of faults with a multimeter) and their rectification in simple machines and/or other electric circuits fitted with earthing.

Demonstration of dismantling, servicing and reassembling a table fan/ceiling fan/air   cooler/mixer/electric iron, Electric heater, geyser, electric oven, air conditioner etc.

Job IV Dismantling, servicing and reassembling of any of the above electrical appliances.

Job V Testing Single phase/three phase electrical motor by using voltmeters, ammeter, clip on meter, tachometer etc.

Job VI Reversing the rotation of a motor.

5.   Smithy Shop – II

5.1   Introduction to various heat treatment processes e.g annealing, hardening, tempering, normalizing etc.

5.2   Description of various types of power hammers and their usage (Demonstration only).

Job I   To forge a ring to acquaint the students with forge welding
Job II   To forge a chisel and acquaint the students with simple idea of hardening and tempering
Job III To forge squares on both ends of a circular rod
Job IV To forge a single/double ended spanner
Job V To prepare a job involving drawing down process

OR

6.2   Electronic Shop- II

Demonstrate the jointing methods. mounting and dismantling as well as uses of the items mentioned below:

Various types of single, multi-cored insulated screened power, audio video, co-axial, general purpose wires/cables

Various types of plugs, sockets connectors suitable for general purpose audio

and video use, 2 and 3 pin mains plug and sockets.

Banana-plugs, and sockets, BNG, RCA, DIN, UHF, Ear phone speaker connector, telephone jacks and similar male and female connectors and terminal strips.

c) Various types of switches such as: normal/ miniature toggle, slide, push button, piano key, rotary, micro switches, SPST, SPDT, DPST, DPDT, band selector, multi way Master Mains Switch.

d) Various types of protective devices such as : Wire fuse, cartridge fuse, slow acting/fast acting fuse, HRC fuse, thermal fuse, single/multiple circuit breakers, over and under current relays.

6.3 Identification and familiarisation with active and passive components; colour code and types of resistor, capacitors and potentiometers (including VDR, LDR, and thermistor). Identification of components including LED, LCD, UJT, FET, Coils, relays, switches (SPDT, DPDT, etc.) connectors, micro switches, read relays, transformers (mains, audio and RF, etc) Linear and Digital ICs, Thyristors, etc.

6.3   Demonstrate the following:

1) To make perfect solder joints and soldering on PCBs

2) To remove components/wires by unsoldering.

3) To assemble components on boards, chassis, tape strips.

4) Various laying methods of cables

5) Exposure to modern soldering and de-soldering processes

6) Field visits to relevant work-places

Job I   De-solder, remove and clean all the components,
         wires from given equipment, a PCB or a tap strip
         using the following:
Job II   Soldering Iron
Job III   Temperature Control Soldering Iron
Job IV   De-soldering   Pump
Job IV   De-soldering   Strip
Job V   Wiring of a small circuit on a PCB/tag st
Job VI Rip involving lacking, sleeving and use of identifier tags

6.   Sheet Metal Shop-II

6.1   Introduction to various metal forming processes e.g.
      Spinning, Punching, Blanking, cup drawing
6.2   Introduction to soldering and brazing.
6.3   Introduction to metal spinning process.

Job I Preparation of job involving shearing, circular shearing,
      rolling, folding, beading and soldering process e.g. Funnel
      or any other job involving above operations.

Job II Exercise on job involving brazing process

Job III Spinning a bowl/cup/saucer

Job IV Visit to a sheet metal industry e.g. coach builders etc.

Transaction Modes
Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group
Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and
Cooperative Learning

Suggested Readings

- Workshop Technology I,II,III, by S K Hajra, Choudhary and A K Choudhary. Media Promoters and Publishers Pvt. Ltd., Bombay
- Workshop Technology by Manchanda Vol. I,II,III India Publishing House, Jalandhar.
- Manual on Workshop Practice by K Venkata Reddy; MacMillan India Ltd. New Delhi .
- Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi
- Workshop Technoogy by B.S. Raghuwanshi, Dhanpat Rai and Co., New Delhi
- Workshop Technology by HS Bawa, Tata McGraw Hill Publishers, New Delhi

SEMESTER-III

Course Title: DIGITAL ELECTRONICS	**L**	**T**	**P**	**Credits**
Course Code: DCS301	**3**	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT-I   15 Hours

Introduction: Distinction between analog and digital signal, Applications and advantages of digital signals.

Number System: Binary, octal and hexadecimal number system: conversion from decimal and hexadecimal to binary and vice-versa. Binary addition, subtraction, multiplication and division including binary points. 1's and 2's complement method of addition/subtraction, sign magnitude method of representation, floating point representation

Codes and Parity: Concept of code, weighted and non-weighted codes, examples of 8421, BCD, excess-3 and Gray code. Concept of parity, single and double parity and error detection, Alpha numeric codes: ASCII and EBCDIC.

UNIT-II   15 Hours

Logic Gates and Families: Concept of negative and positive logic, Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates, NAND and NOR as universal gates, Logic family classification: Definition of SSI, MSI, LSI, VLSI, TTL and C MOS families and their sub classification. Characteristics of TTL and C MOS digital gates. Delay, speed, noise margin, logic levels, power dissipation, fan-in, power supply requirement and comparison between TTL and C MOS families.

Logic Simplification: Postulates of Boolean algebra, De Morgan's Theorems. Various identities. Formulation of truth table and Boolean equation for simple problem. Implementation of Boolean (logic) equation with gates, Karnaugh map (upto 4 variables) and simple application in developing combinational logic circuits**.**

UNIT-III   15 Hours

Arithmetic circuits: Half adder and Full adder circuit, design and implementation. Half and Full subtracter circuit, design and implementation. 4 bit adder/subtracter. Adder and Subtractor IC (7484).

Decoders, Multiplexeres and De Multiplexeres: Four bit decoder circuits for 7 segment display and decoder/driver ICs. Multiplexers and De-Multiplexers, Basic functions and block diagram of MUX and DEMUX. Different types and ICs.

Latches and flip flops: Concept and types of latch with their working and applications, Operation using waveforms and truth tables of RS, T, D, and Master/Slave JK flip flops. Difference between a latch and a flip flop, Flip flop ICs.

UNIT-IV   **15 Hours**

Counters: Introduction to Asynchronous and Synchronous counters, Binary counters, Divide by N ripple counters, Decade counter, Pre settable and programmable counters, Up/down counter, Ring counter with timing diagram, Counter ICs.

Shift Register: Introduction and basic concepts including shift left and shift right, serial in parallel out, serial in serial out, parallel in serial out, parallel in parallel out. Universal shift register, Buffer register, Tristate Buffer register, IC 7495.

A/D and D/Converters: Working principle of A/D and D/A converters, Brief idea about different techniques A/D conversion and study of: Stair step Ramp A/D converter, Dual Slope A/D converter, Successive Approximation A/D Converter. Detail study of: Binary Weighted D/A converter R/2R ladder D/A converter, Performance characteristics of A/D and D/A converter. Applications of A/D and D/A converter.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Digital Electronics and Applications by Malvino Leach, Tata McGraw Hill Education Pvt. Ltd, New Delhi.
- Digital Logic Designs by Morris Mano, Prentice Hall of India, New Delhi.

- Digital Electronics by Soumitra Kumar Mandal, Tata McGraw Hill Education Pvt. Ltd.
- Digital Electronics by Tokheim, Tata McGraw Hill Education Pvt. Ltd.

Course Title: **COMPUTER PROGRAMMING USING C**	**L**	**T**	**P**	**Credits**
Course Code: DCS302	**3**	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT-I   15 Hours

Algorithm and Programming Development: Steps in development of a program, Flow charts, Algorithm development, Program Debugging.

Program Structure: I/O statements, assign statements. Constants, variables and data types, Operators and expressions, Standards and Formatted, Use of Header & Library files

Control Structures: Introduction, Decision making with IF – statement, IF – Else and Nested IF, While and do-while, for loop, Break and switch statements.

UNIT-II   10 Hours

Functions: Introduction to functions, Global and Local Variables, Function Declaration, Standard functions, Parameters and Parameter Passing, Call – by value/reference, Recursion.

Arrays: Introduction to Arrays, Array Declaration and Initialization, Single and Multidimensional Array. Arrays of characters.

UNIT-III   10 Hours

Pointers: Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointers and Arrays.

Structures and Unions: Declaration of structures, Accessing structure members, Structure Initialization, Arrays of structures, Unions.

UNIT-IV   10 Hours

Strings: Introduction, Declaring and Initializing string variables, Reading and writing strings, String handling functions, Array of strings.

Files: Introduction, File reading/writing in different modes, File manipulation

using standard function types.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Programming in ANSI C by E Balaguruswami, , Tata McGraw Hill Education Pvt Ltd , New Delhi
- Application Programming in C by RS Salaria, Khanna Book Publishing Co (P) Ltd. New Delhi
- Programming in C by Gottfried, Schaum Series, , Tata McGraw Hill Education Pvt Ltd , New Delhi
- Programming in C by Stefin G. Coachin
- Programming in C by R Subburaj, Vikas Publishing House Pvt. Ltd., Jangpura, New Delhi

Course Title: SYSTEM ANALYSIS AND DESIGN	**L**	**T**	**P**	**Credits**
Course Code: DCS303	**3**	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT-I   **10 Hours**
Introduction: Concept of system. Types of systems Open and Closed, Static and dynamic with examples.

Overview of System Analysis and Design: Systems Development life cycle, brief Introduction to feasibility, design implementation and testing and maintenance.
UNIT-II   **10 Hours**

Preliminary Investigations: Project selection, scope definition and preliminary investigation.
UNIT-III   **10 Hours**

Feasibility Study: Technical and economic and operational feasibility, cost and benefit analysis.

Requirement Specifications and Analysis: Fact finding techniques, data flow diagrams, data dictionaries, decision trees and tables.
UNIT-IV   **15 Hours**

Detailed Design: Module specification, file design, data base design.

Testing and Quality Assurance: Maintenance, unit and integration testing techniques, design objectives, quality factors such as reliability etc.

Transaction Modes
Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Structured System Analysis and Design by ISRD Group, Tata McGraw Hill Education Pvt Ltd, New Delhi
- System Analysis and Design by Awad, Galgotia Publications, New Delhi
- System Analysis and Design Vol. I & II by Lee, Galgotia Publications
- System Analysis and Design with Case Tools by Len Fertuck WCB Publications 1992.

Course Title: Relational Database Management System	**L**	**T**	**P**	**Credits**
Course Code: DCS304	**3**	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT-I   **10 Hours**
Introduction: Database Systems; Database and its purpose, Characteristics of the database approach, Advantages and disadvantages of database systems. Classification of DBMS Users; Actors on the scene, Databas Administrators, Database Designers, End Users, System Analysts and Application Programmers, Workers behind the scene (DBMS system designers and implementers, tool developers, operator and maintenance personnel).

UNIT-II   **15 Hours**

Database System Concepts and Architecture: Data models, schemas, instances, data base state. DBMS Architecture; the External level, the conceptual level, the internal level, Mappings. Data Independence; Logical data Independence, Physical data Independence. Database Languages and Interfaces; DBMS Language, DBMS Interfaces. Classification of Database Management Systems.

Data Modeling using E.R. Model (Entity Relationship Model): Data Models Classification; File based or primitive models, traditional data models, semantic data models. Entities and Attributes, Entity types and Entity sets, Key attribute and domain of attributes, Relationship among entities.
UNIT-III   **10 Hours**

Relational Model: Relational Model Concepts: Domain, Attributes, Tuples and Relations. Relational constraints and relational database schemes; Domain constraints, Key constraints and constraints on Null. Relational databases and relational database schemes, Entity integrity, referential integrity and foreign key.

Normalization: Non-loss decomposition and functional dependencies, First, Second and Third normal forms, Boyce/Codd normal form**.**

Database Access and Security: Database security, process controls, database protection, 2-phase command protocols, 2-phase working protocols, grant and revoke.

UNIT-IV   **10 Hours**

MYSQL/SQL (Structured Query Language): SQL * Plus. DDL (Data Definition Languages): Creating Tables, Creating a table with data from another table, Inserting values into a table, updating columns of a Table, Deleting Rows, Dropping a Table. DML (Data Manipulation Language): Database Security and Privileges, Grant and Revoke Command, Maintaing Database Objects, Commit and Rollback, various types of select commands, various types of join.

PL/SQL: Introduction to PL/SQL, Advantage of PL/SQL, PL/SQL Block Structure, PL/SQL Architecture, Fundamentals of PL/SQL, PL/SQL Data types, Variables and constants, scope of variables, Assignment & expression, operators, operator precedence.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Fundamentals of Database Management Systems by Dr RenuVig and EktaWalia, - an ISTE, Publication, New Delhi.
- Database Management Systems by arun K Maunder and P Bhattacharya, Tata McGraw Hill Education Pvt Ltd, New Delhi.
- Introduction to DBMS by ISRD Group, Tata McGraw Hill Education Pvt Ltd, New Delhi.
- Database Management Systems by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., New Delhi.

Course Title: MULTIMEDIA AND APPLICATIONS	**L**	**T**	**P**	**Credits**
Course Code: DCS305	**3**	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT-I   **10 Hours**
Introduction: Introduction to multimedia, hypertext, hyper graphics, animation, application in education and training, science and technology, kiosks, business and games.

UNIT-II   **10 Hours**

Multimedia Hardware: Multimedia PC configuration, features and specifications of sound and video interfaces, OCR, touch-screen, scanners, digital cameras, speakers, printers, plotters, optical disks and drives as CDROM and DVD. Multimedia networks.

UNIT-III   **15 Hours**

Multimedia Software: Image and sound file formats, multimedia file formats, compression, standards and techniques, features of software to read and write such files. Video file formats & compression standards, multimedia operating systems.

Using Image Processing Tools: Photo-shop workshop, image editing tools, specifying and adjusting colors, using gradient tools, selection and move tools, transforming path drawing and editing tools, using channels, layers, filters and actions.

UNIT-IV   **10 Hours**

Multimedia Authoring Tools: Types of Authoring programmers'– Icon based, Time based, Story boarding/scripting and object oriented working in macromedia flash, exploring interface using selection of PEN tools. Working with drawing and painting tools, applying color viewing and manipulating time line, animating, processing, guiding layers, importing and editing sound and video clips in flash.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Principles of Multimedia by Parikh, Tata McGraw Hill Education PvtLtd , New Delhi
- Multimedia Technologies by Banerji, Tata McGraw Hill Education Pvt Ltd , New Delhi
- Multimedia An Introduction by Villam Casanova and Molina; Prentice Hall of India, New Delhi
- Multimedia Making it work by Vaughan, Tay
- Fundamentals of Multimedia by Li and Drew, Pearson Publications

Course Title: DIGITAL ELECTRONICS LAB	**L**	**T**	**P**	**Credits**
Course Code: DCS306	**0**	**0**	**2**	**1**

Total Hours: 15

List of Practicals:

1. Verification and interpretation of truth tables for AND, OR, NOT NAND, NOR and Exclusive OR (EXOR) and Exclusive NOR (EXNOR) gates.
2. Realization of logic functions with the help of NAND or NOR gates - Design of a NOR gate latch and verification of its operation.
3. To design a half adder using XOR and NAND gates and verification of its operation Construction of a full adder circuit using XOR and NAND gates and verify its operation.
4. 4 bit adder, 2's complement subtractor circuit using a 4 bit adder IC and an XOR IC and verify the operation of the circuit.
5. To design a NOR Gate Latch and verification of its operation.
6. Verification of truth table for positive edge triggered, negative edge triggered, level triggered IC flip-flops (At least one IC each of D latch, D flip-flop, JK flip-flops).
7. Verification of truth table for encoder and decoder ICs, Mux and DeMux.
8. To design a 4 bit SISO, SIPO, PISO, PIPO shift registers using JK/D flip flops and verification of their operation.
9. To design a 4 bit ring counter and verify its operation.
10. Asynchronous Counter ICs: Verification of truth table for any one universal shift register IC
    a. Use of IC 7490 or equivalent TTL: (a) divide by 2 (b) divide by 10 Counter
    b. Use of IC 7493 or equivalent TTL: a) divide by 2 (b) divide by 8 Counter (c) divide by 16 Counter.

Total Hours: 30

Course Title: COMPUTER PROGRAMMING USING C LAB
Course Code: DCS307

L	T	P	Credits
0	0	4	2

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. Programs on one-dimensional array.

12. Programs on two-dimensional array.

13. Programs for putting two strings together.

14. Programs for comparing two strings.

15. Simple programs using structures.

16. Simple programs using pointers.

17. Simple programs for reading from a file and writing into a file.

Course Title: Relational Database Management System Lab	**L**	**T**	**P**	**Credits**
Course Code: DCS308	**0**	**0**	**4**	**2**

Total Hours: 30

List of Practicals:

1. Exercises on creation and modification of structure of tables.
2. Exercises on inserting and deleting values from tables.
3. Exercises on querying the table (using select command).
4. Exercises on using various types of joins.
5. Exercises on using functions provided by database package.
6. Exercises on commands like Grant, Revoke, Commit and Rollback etc.
7. Introductory exercises on PL/SQL.
8. Design of database for any application using oracle.

Course Title: MULTIMEDIA AND APPLICATIONS LAB	**L**	**T**	**P**	**Credits**
Course Code: DCS309	**0**	**0**	**2**	**1**

Total Hours: 15

List of Practicals:

1. Installation of various multimedia software like Photoshop, Flash, Director or any open source software.
2. Installing and use of various multimedia devices:
     a. Scanner
     b. Digital camera, web camera
     c. Mike and speakers
     d. Touch screen
     e. Plotter and printers
     f. DVD
     g. Audio CD and Video CD
3. Reading and writing of different format on CD/DVD.
4. Transporting audio and video files.
5. Using various features of Flash.
6. Using various features of Photo-shop.
7. Making multimedia presentations combining, Flash, Photo-shop, such as department profile, lesson presentation, games and project presentations.

Course Title: COMPUTER WORKSHOP	L	T	P	Credits
Course Code: DCS310	0	0	2	1

Total Hours: 15

Part-A (Hardware)

1. Familiarization with various components and parts of personal computers, mother board details, hard disk drive, floppy disk drive. CD Rom drive, DVD, keyboard, display devices, various chips (memory chips and CPU); serial and parallel ports, inkjet, USB Ports, Fire wire, Bluetooth, Dot matrix and Laser printers, Modems, connectors and cables.
2. Assembly and Dissembling of PCs: Power supply, linear power supply and switch mode power supply, trouble shooting of SMPS.
3. Setting up of basic infrastructure for computers (including power layout, air conditioning, earthing etc.

Part-B (Software)

4. Installation of various operating system
5. s, LINUX/ windows latest versions. Familiarization of their features with practical demonstrations. Installation and configuration of device drivers. Disk management.
6. Installation of latest version of application software like MS-Office/open office, Adobe Photoshop, Corel Draw, Macromedia Flash etc.
7. Installation and configuration of latest version of database software like Oracle, MySQL/ SQL Server etc.
8. Introduction to Virus/Spyware/Worm/Trojan Horse, their detection, prevention and   b

SUGGESTED READINGSS:

- PC Upgrade and Maintenance Guide by Mark Minasi, BPB Publication.
- Hardware Bible by Winn Rosch, Techmedia Publications.
- IBM PC and Clones by B GovindaRajalu. Tata McGraw Hill Education PvtLtd , New Delhi.
- Electronic Instrumentation and Measurement Techniques by WD Cooper and Adhelfrics. Prentice Hall of India, New Delhi.
- Common Computer Circuits and Faults Vol. 1 by M. Lotia, BPB Publications, New Delhi.

SEMESTER IV

Course Title: GENERIC SKILLS AND ENTREPRENEURSHIP DEVELOPMENT	L	T	P	Credits
Course Code: DCS401	3	0	0	3

Total Hours: 45

OBJECTIVES:

Generic Skills and Entrepreneurship Development is one of the courses from "Human Science" subject area. Generic skills have emerged as an important component of employability skills, which enable an individual to become and remain employable over lifetime and to lead happy and prosperous life. Entrepreneurship development aim at developing conceptual understanding for setting-up one's own business venture/enterprise. This aspect of Human Resource Development has become equally important in the era, when wage employment prospects have become meager. Both the subject areas are supplementary to each other and soft skills are required to be developed in diploma pass outs for enhancing their employability and self confidence.

COURSE CONTENTS:

UNIT-I 8 Hours

Introduction to Generic Skills: Importance of Generic Skill Development (GSD), Global and Local Scenario of GSD, Life Long Learning (LLL) and associated importance of GSD.

UNIT-II 14 Hours

Managing Self: Knowing Self for Self Development- Self-concept, personality, traits, multiple intelligence such as language intelligence, numerical intelligence, psychological intelligence etc., Managing Self – Physical- Personal grooming, Health, Hygiene, Time Management, Managing Self – Intellectual development -Information Search: Sources of information, Reading: Purpose of reading, different styles of reading, techniques of systematic reading, Note Taking: Importance of note taking, techniques of note taking, Writing: Writing a rough draft, review and final draft. Managing Self – Psychological, Stress, Emotions, Anxiety-concepts and significance, Techniques to manage the above.

Managing in Team: Team - definition, hierarchy, team dynamics, Team related skills- sympathy, empathy, co-operation, concern, lead and negotiate, work well with people from culturally diverse background, Communication in group - conversation and listening skills.

UNIT-III 9 Hours

Task Management: Task Initiation, Task Planning, Task execution, Task close out, Exercises/case studies on task planning towards development of skills for task management

Problem Solving: Prerequisites of problem solving- meaningful learning, ability to apply knowledge in problem solving, Different approaches for problem solving. Steps followed in problem solving. Exercises/case studies on problem solving.

UNIT-IV   **14 Hours**

Entrepreneurship: Introduction , Concept/Meaning and its need, Competencies/qualities of an entrepreneur, Entrepreneurial Support System e.g., District Industry Centres (DICs), Commercial Banks, State Financial Corporations, Small Industries Service Institute (SISIs), Small Industries Development Bank of India (SIDBI), National Bank of Agriculture and Rural Development (NABARD), National Small Industries Corporation (NSIC) and other relevant institutions/organizations at State/National level. Market Survey and Opportunity Identification (Business Planning)- How to start a small scale industry, Procedures for registration of small-scale industry, List of items reserved for exclusive manufacture in small-scale industry, Assessment of demand and supply in potential areas of growth, Understanding business opportunity, Considerations in product selection, Data collection for setting up small ventures. Project Report Preparation- Preliminary Project Report, Techno-Economic Feasibility Report, Exercises regarding "Project Report Writing" for small projects.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Generic skill Development Manual, MSBTE, Mumbai.
- Lifelong learning, Policy Brief (www.oecd.orf).
- Lifelong learning in Global Knowledge Economy, Challenge for
- Developing Countries – World Bank Publication

Course Title: DATA STRUCTURE USING C	L	T	P	Credits
Course Code: DCS402	3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT-I   **11 Hours**

Fundamental Notations: Problem solving concept, top down and bottom up design, structured programming, Concept of data types, variables and constants, Concept of pointer variables and constants.

Arrays: Concept of Arrays, Single dimensional array, two dimensional array storage strategies of multidimensional arrays, Operations on arrays with Algorithms (searching, traversing, inserting, deleting).

UNIT-II   **9 Hours**

Linked Lists: Introduction to linked list and double linked list, Representation of linked lists in Memory, traversing a linked list, searching linked list, Insertion and deletion into linked list, Application of linked lists, doubly linked lists, Traversing a doubly linked lists, Insertion and deletion into doubly linked lists.

UNIT-III   **11 Hours**

Stacks, Queues and Recursion: Introduction to stacks, Representation of stacks, Implementation of stacks, Uses of stacks, Introduction to queues, Implementation of queues (with algorithm), Circular Queues, De- queues, Recursion.

UNIT-IV   **14 Hours**

Trees: Concept of Trees, Concept of representation of Binary tree, Binary search trees Traversing, Binary Trees (Pre order, Post order and In order), Searching, inserting and deleting binary search trees.

Sorting and Searching: Introduction, Search algorithm (Linear and Binary), Concept of sorting, Sorting algorithms (Bubble Sort, Insertion Sort, Quick Sort, Selection Sort, Merge Sort, Heap Sort) and their comparisons.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- Data Structure using C by Manoj Kumar Jambla, Eagle Publishing House, Jalandhar.
- Data Structures and Algorithm Using C by RS Salaria, Khanna Book Publishing Co. (P) Ltd. New Delhi.
- Data Structure using C by ISRD Group, Tata McGraw Hills Education PvtLtd , New Delhi.
- Data Structures by SanjivSofat, Khanna Publishers, New Delhi.

Course Title: **OBJECT ORIENTED PROGRAMMING USING C++**	**L**	**T**	**P**	**Credits**
Course Code: **DCS403**	**3**	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT-I   **15 Hours**

Introduction and Features: Fundamentals of object oriented programming – procedure oriented programming Vs. object oriented programming (OOP). Object oriented programming concepts – Classes, reusability, encapsulation, inheritance, polymorphism, dynamic binding, message passing, and data hiding.

Language Constructs: Review of constructs of C used in C++ : variables, types and type declarations, user defined data types; increment and decrement operators, relational and logical operators; if then else clause; conditional expressions, input and output statement, loops, switch case, arrays, structure, unions, functions, pointers; preprocessor directives.

UNIT-II   **10 Hours**

Classes and Objects: Creation, accessing class members, Private Vs Public, Constructor and Destructor Objects.

Member Functions: Method definition, Inline functions implementation, Constant member functions, Friend Functions and Friend Classes, Static functions.

Overloading Member Functions: Need of operator overloading, operator overloading, in stream / out stream operator overloading function overloading, constructor overloading.

UNIT-III   **10 Hours**

Inheritance: Definition of inheritance, protected data, private data, public data, inheriting constructors, and destructors, constructor for virtual base classes, constructors and destructors of derived classes, and virtual functions, size of a derived class, order of invocation, types of inheritance, single inheritance, hierarchical inheritance, multiple inheritance, hybrid inheritance, multilevel inheritance.

UNIT-IV   **10 Hours**

Polymorphism and Virtual Functions: Importance of virtual function, function call binding, virtual functions, implementing late binding, need for virtual functions, abstract base classes and pure virtual functions, virtual destructors.

File and Streams: Components of a file, different operation of the file, communication in files, creation of file streams, stream classes, header files, updating of file, opening and closing a file, file pointers and their manipulations, functions manipulation of file pointers, detecting end-of- file.

Introduction to Standard Template Library (STL).

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings
- Mastering C++ by KR Venugopal and Rajkumar, T Ravishankar; Tata McGraw Hill Education PvtLtd , New Delhi.
- Object Oriented Programming in C++ by E. Balaguruswamy, Tata McGraw Hill Education PvtLtd , New Delhi.
- C++ by Robert Lafore, Galgotia Publications Pvt. Ltd., Daryaganj, New Delhi.
- Object Oriented Programming and C++ by R Rajaram; New Age International (P) Ltd., Publishers, New Delhi.
- Schaum's Outline of Programming with C++ by John R. Hubbard.

Course Title: **COMPUTER ARCHITECTURE**	**L**	**T**	**P**	**Credits**
Course Code: **DCS404**	**3**	**0**	**0**	**3**

Total Hours: 45

OBJECTIVES:

The subject provides the students with the knowledge of detailed organization of currently available personal computers in order to understand their functioning and maintenance. The students will also get familiar with different types of mother boards, architecture and bus standards.

COURSE CONTENTS:

UNIT-I   **8 Hours**

Data Representation: Data Types-Number System, 1's Complement, 2's Complement, BCD Code, Gray Code.

UNIT-II   **9 Hours**

Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Introduction to RISC, CISC architecture, Pipeline processing.

Arithmetic Operations: Introduction, Addition, Subtraction, Multiplication and Division algorithm.

UNIT-III   **14 Hours**

Input-Output Organization: Input-output interface, I/O bus and interface for module, I/ O vs. memory bus. Isolated Vs memory mapped, IP modes of data transfer, first in first out buffer, priority interrupt, daisy chaining priority, parallel priority interrupt priority encoder, interrupt cycle, direct memory access DMA controller, DMA transfer.

UNIT-IV   **14 Hours**

Memory Organization: Memory hierarchy; main memory, memory address, map, RAM and ROM chips, memory connection to CPU, auxiliary memory, associative memory, read and write operation, cache memory, associative mapping, virtual memory, memory management hardware, memory segmentation.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Computer Architecture by Rafiquzzaman, M; Prentice Hall of India, New Delhi.

- Computer Architecture by Carter, SOS: Tata McGraw Hill Education Pvt Ltd , New Delhi
- Structured Computer Organisation by Tanenbaum, Andrew S.; Prentice Hall of India, New Delhi.
- Computer Organization and Architecture by Linda Labur, Narosa Publishing House Pvt. Ltd., Darya Ganj, New Delhi.
- Computer system Architecture by Morris Mano

Course Title: MICROPROCESSOR
Course Code: DCS405

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT-I   **11 Hours**

Evolution of Microprocessor: Typical organization of a microcomputer system and functions of its various blocks. Microprocessor, its evolution, function and impact on modern society

Architecture of a Microprocessor (With reference to 8085 microprocessor): Concept of Bus, bus organization of 8085, Functional block diagram of 8085 and function of each block, Pin details of 8085 and related signals, Demultiplexing of address/data bus generation of read/write control signals, Steps to execute a stored programme.

UNIT-II   **10 Hours**

Memories and I/O interfacing: Memory organization, Concept of memory mapping, partitioning of total memory space. Address decoding, concept of I/O mapped I/O and memory mapped I/O. Interfacing of memory mapped I/O devices. Concept of stack and its function. Basic RAM Cell, N X M bit RAM, Expansion of word length and capacity, static and dynamic RAM, basic idea of ROM, PROM, EPROM and EEPROM.

UNIT-III   **15 Hours**

Programming (with respect to 8085 microprocessor): Brief idea of machine and assembly languages, Machines and Mnemonic codes. Instruction format and addressing mode. Identification of instructions as to which addressing mode they belong. Concept of Instruction set. Explanation of the instructions of the following groups of instruction set. Data transfer group, Arithmetic Group, Logic Group, Stack, I/O and Machine Control Group. Programming exercises in assembly language. (Examples can be taken from the list of experiments).

Instruction Timing and Cycles: Instruction cycle, machine cycle and T-states, Fetch and execute cycle.

Interrupts: Concept of interrupt, Maskable and non-maskable, Edge triggered and level triggered interrupts, Software interrupt, Restart interrupts and its

use, Various hardware interrupts of 8085, Servicing interrupts, extending interrupt system

UNIT-IV   **9 Hours**

Data transfer techniques: Concept of programmed I/O operations, sync data transfer, async data transfer (hand shaking), Interrupt driven data transfer, DMA, Serial output data, Serial input data.

Peripheral devices: 8255 PPI and 8253 PIT, 8257 DMA controller, 8279 Programmable KB/Display Interface, 8251 Communication Interface Adapter, 8155/8156.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Digital Electronics and Applications by Malvino Leach; Publishers McGraw Hills, New Delhi
- Digital Logic and Computer Design by Mano, M Morris; Prentice Hall of India, New Delhi
- Digital Integrated Electronics by Herbert Taub and DonalsSachilling; Prentice Hall of India Ltd., New Delhi
- Microprocessor and Microcontrollers by Dr BP Singh, Galgotia Publications, New Delhi
- Introduction to Microprocessors by Mathur, Tata McGraw Hill, New Delhi

	L	**T**	**P**	**Credits**

Course Title: INTERNET AND WEB TECHNOLOGIES
Course Code: DCS406

L	**T**	**P**	**Credits**
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT-I   **10 Hours**

Internet Basics: Specification and technical details for establishing Internet. Types and functions of modems, IP addressing, internet domains, domain name server, TCP/IP protocols, Internet service providers, Intranets, E-mail, Telnet, FTP, IRC, NNTP, Video conferencing, e- commerce.

Internet Connectivity: Telephone line, cable, leased line, ISDN, VSAT, RF link.

UNIT-II   **15 Hours**

World Wide Web (WWW): World Wide Web and its evolution, web page, web server, HTTP protocol. Examples of web servers. Navigation Tools: Mozilla Firefox, Google Chrome, Internet Explorer, Uniform Resource Locator (URL). Hypertext, hyperlinks and hypermedia, URL, its registration, browsers, search engines, proxy servers.

Internet Security: Basics of authentication and authorization. Introduction to firewall, various techniques of encryption and decryption, SSL (Secure Socket Loyer).

UNIT-III   **10 Hours**

Developing Portals Using HTML: Introduction to HTML-5 and CSS-3 Basic structure of HTML, designing a web page, inserting links images, horizontal rules, comments Formatting text, title, headings colours, fonts, sizes, simple tables and forms. HTML tags, hyperlinks. Adding graphics and images, image maps, image files. Using tables, forms, style sheets and frames.

UNIT-IV   **10 Hours**

Client-side Scripting: Using Java Script, Java Script Event Modeling, Document Object Model (DOM), Validating Forms using Java script.

Server-side Scripting: PHP: GET POST Method, Control Structures.

Dream weaver: Basic features of Dreamweaver.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Internet and Web Technologies by Rajkamal, Tata McGraw Hill Education PvtLtd , New Delhi.
- Internet 6-in-1 by Kraynak and Habraken, Prentice Hall of India Pvt. Ltd., New Delhi.
- Using the Internet IV edition by Kasser, Prentice Hall of India Pvt. Ltd., New Delhi.
- Using the World Wide Web, (IInd edition) by Wall, Prentice Hall of India Pvt. Ltd., New Delhi.
- Internet for Everyone by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., New Delhi.

Course Title: DATA STRUCTURE USING C LAB	**L**	**T**	**P**	**Credits**
Course Code: DCS407	**0**	**0**	**2**	**1**

Total Hours: 15

List of Practicals:
1. Inserting and deleting elements in an array
2. Insertion and deletion of elements in linked list
3. Insertion and deletion of elements in double linked list
4. Stack implementation using arrays
5. Stack implementation using pointers
6. Queue implementation using arrays
7. Queue implementation using pointers
8. Linear search in a given list
9. Binary search in a given list
10. Implementation of binary search tree
11. Implementation of bubble sort algorithm
12. Implementation of insertion sort algorithm
13. Implementation of quick sort algorithm
14. Implementation of selection sort algorithm
15. Conversion from infix and post-fix notation
16. Implementation of factorial of a number using recursion
17. Implementation of Fibonacci series using recursions

Course Title: OBJECT ORIENTED PROGRAMMING USING C++ LAB

Course Code: DCS408

L	T	P	Credits
0	0	4	2

Total Hours: 30

List of Practicals:

1. Programming exercises on control flow statements in C++
2. Programming exercises on arrays, strings, function and pointers in C++
3. Writing programs to construct classes and deriving objects
4. Writing programs for constructors, destructors, using public and private access specifies
5. Programming exercises on operator overloading, type conversions and inheritance.
6. Programming exercises on functional overloading
7. Writing programs on steam computation and life operations
8. Implementation of a mini project in C++
9. Introduction to latest ANSI C++ Compiler and elaboration of short comings of Turbo C++ Compiler

Course Title: MICROPROCESSOR LAB
Course Code: DCS409

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practicals:
1. Familiarization of different keys of 8085 microprocessor kit and its memory map
2. Steps to enter, modify data/program and to execute a programme on 8085 kit
3. Writing and execution of ALP for addition and substation of two 8 bit numbers
4. Writing and execution of ALP for multiplication and division of two 8 bit numbers
5. Writing and execution of ALP for arranging 10 numbers in ascending/descending order
6. Writing and execution of ALP for 0 to 9 BCD counters (up/down counter according to choice stored in memory).
7. Interfacing exercise on 8255 like LED display control
8. Interfacing exercise on 8253 programmable interval timer
9. Interfacing exercise on 8279 programmable KB/display interface like to display the hex code of key pressed on display
10. Study and use of interfacing 8 bit A/D card and D/A card in sampling, wave generation, multiplexer, de-multiplexer and counter
11. Use of 8085 emulator for hardware testing.

Course Title: INTERNET AND WEB TECHNOLOGIES LAB
Course Code: DCS410

L	T	P	Credits
0	0	2	1

Total Hours: 15

COURSE CONTENTS:
List of Practicals:
1. Configuring computer system to access internet.
2. Managing social networking profile and e-mail account.
3. Using WWW for accessing relevant information.
4. To demonstrate the use of TELNET, FTP, IRC.
5. Creating Web pages using HTML.
6. Creating web pages using Dream Weaver.
7. Demonstration of audio-video conferencing.
8. Demonstration of e-commerce transaction.
9. Validation of user queries and responses in the Forms using Java Script or VB script.
10. Create a Homepage with frames, animation, background sound and hyperlinks.
11. Develop hitometer for each client i.e. number of visitors. Visit to a site.
12. Designing simple server side program which accept some request from the client and respond.
13. Establishing sessions between servers and clients.
14. Design fill-out form with text, check box, radio buttons etc and embed Java script to validate users input.
15. Develop simple server side program in Server Script which accept some request from the client and respond.
16. Develop interface with database (MYSQL etc) for online retrieval and storage of data through PHP.

SEMESTER-V

Course Title: **COMPUTER PERIPHERALS AND INTERFACE**	**L**	**T**	**P**	**Credits**
Course Code: **DCS501**	**3**	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT 1   15 Hours

Video Display: The basic principle of working of video monitors (CRT, LCD, LED), video display adapters, video modes, Video display EGA/VGA/SVGA/PCI adapters and their architecture, Overview of raster scan, vector graphic, their main difference and relative advantages, Concept of reduction and bandwidth of monitors refreshing of screen.

Hardware Organization of PCs: Types of motherboard and their details (Form Factor, Chipset), types of processors (INTEL, AMD) and their compatibility with motherboards, serial and parallel ports, PS/2, USB Ports, Interconnection between units, connectors and cables.

UNITII   11 Hours

Storage Devices: Types of Hard Disk Drives- EIDE, SATA, SCSI, SAS External Hard Disk. Constructional features and working of hard disk drive, optical (CD, DVD, Blue Ray) disk drive and Flash Drive, Logical structure of Hard Disk and its organization, boot record.

Input Devices: Detailed working principle and troubleshooting of various input devices such as keyboard, mouse, and scanner. Basic principle of touch screen, light pen, digitizers. Drivers for various input devices and their role.

UNIT III   10 Hours

Output Devices: Overview of printer and its classification, impact and non-impact printer, principle and working of desk Jet, dot matrix, line Printer and laser printers (Monochrome and Colour), plotter (Piezoelectric and Thermal), and modems. Software drivers for various output devices and their role.

Power Supplies: Explain the working of SMPS used in computers. On-Line/Off-Line/Line-Interactive/uninterrupted power supplies (UPS), basic principle of working their importance and maintenance.

UNIT IV   9 Hours

The Basic Input/output System: What is BIOS? Function of BIOS, software interrupts, testing and initialization, configuring the system.

Other Technologies: Mobile, digital camera, web camera, smart card, ATMs,

CDMA etc., Blue Tooth, infrared, Wi-Fi, WiMax. Some aspects of cost performance analysis while procuring the computer.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Hardware Trouble Shooting and Maintenance by B. GovindaRajalu, IBM PC and Clones, Tata McGraw Hill 1991
- Computer Peripheral & Interfacing by Gourav Gupta, Eagle Prakashan, Jalandhar.
- The waite group writing MS DOS Device, Drives byRobert, S Lai: Addison, Wesley Publishing Co. 2nd Ed. 1992.
- Hardware and Software of Personal Computers by SK Bose; Wiley Eastern Limited, New Delhi.
- Microprocessors and Interfacing by Hall, Douglas: McGraw Hill

Course Title: OPERATING SYSTEMS	**L**	**T**	**P**	**Credits**
Course Code: DCS502	**3**	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT I   **8 Hours**

Overview of Operating Systems: Definition of Operating Systems, Types of Operating Systems, Importance of Operating Systems, Memory organization, linking, loading and executing control program.

UNIT II   **10 Hours**

Functions of Operating System: Process Management Functions (Principles and Brief Concept); Job Scheduler, Process Scheduler, Process synchronization. Memory Management Function (Principles and Brief Concept); Introduction, Single Process System, Fixed Partition Memory, System Loading, Segmentation, Swapping, Simple Paging System, Virtual Memory.

UNIT III   **15Hours**

I/O Management Functions (Principles and Brief Concept); Dedicated Devices, Shared Devices, I/O Devices, Storage Devices, Buffering, Spooling. File Management; Principles and Brief Concept, Types of File System; Simple file system, Basic file system, Logical file system, Physical file system. Dead Lock; Condition for Dead lock, Dead Lock Preventions, Dead Lock Avoidance.

UNIT IV   **12 Hours**

Linux Operating System: Introduction, history of Linux and Unix, Linux Overview, Structure of Linux, Linux releases, open linux, system requirements, file structures, processor scheduling and memory management in UNIX.

Linux Commands and Filters: Shell: concepts of command options, input, output redirecting and network file, process and communication commands like: mkdir, cd, ls, who, whoami, cat, more, tail, head, mv, chmod, grep, wc, sort, kill, write, wall, mail, news.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Operating Systems by Achyut S Godbole and AtulKahate: Tata McGraw Hill Education PvtLtd , New Delhi
- Operating System by Hemant Kapila, Eagle Prakashan, Jalandhar.
- System Programming by John J Donovan, Tata McGraw Hill Education PvtLtd , New Delhi

- Linux – The Complete Reference by Ruichard Peterson, Tata McGraw Hill, New Delhi
- Operating Systems by Stallings Tata McGraw Hill.

Course Title: COMPUTER NETWORKS
Course Code: DCS503

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT 1   **10Hours**

Networks Basics: What is network, Models of network computing, Networking models, Peer-to –peer Network, Server Client Network, LAN, MAN and WAN, Network Services, Topologies, Switching Techniques.

OSI Model: Standards, OSI Reference Model, OSI Physical layer concepts, OSI Data-link layer concepts, OSI Networks layer concepts, OSI Transport layer concepts, OSI Session layer concepts, OSI presentation layer concepts, OSI Application layer concepts.

UNIT 1I   **14 Hours**

Introduction to TCP/IP: Concept of physical and logical addressing, Different classes of IP addressing, special IP address, Sub netting and super netting, Loop back concept, IPV4 and IPV6 packet Format, Configuring IPV4 and IPV6.

Protocol Suites: Models and Protocols, Network IPX/SPX, Intranet Protocols.

Network Architecture: ARC net specifications, Ethernet Specification and Standardization: 10 Mbps (Traditional Ethernet), 10 Mbps (Fast Ethernet) and 1000 Mbps (Gigabit Ethernet), Introduction to Media Connectivity (Leased lines, ISDN, PSTN, RF, VSAT, Optical and IPLC).

UNIT III   **10Hours**

Network Connectivity: Network connectivity Devices, NICs, Hubs, Repeaters, Multiplexers, Modems, Routers and Protocols, Firewall, ATM, VOIP and Net-to-Phone Telephony, Laws and Protocols.

Network Printing: Print Services.

Network Administration / Security: -Client/Server Technology, Server Management, RAID management and mirroring, Huffman codes, Cryptography.

UNIT IV   **9 Hours**

Network Trouble Shooting Techniques: Trouble Shooting process, Trouble Shooting Tools: PING, IPCONFIG, IFCONFIG, NETSTAT, TRACEROOT, Wiresharp/ Dsniffer/ Pcop.

Wireless Networking: Basics of Wireless: Wireless MAN, Networking, Wireless LAN, Wi-Fi, WiMax (Broad-band Wireless) and Blue-Tooth technology.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Computer Networks by Tanenbaum, Prentice Hall of India, New Delhi
- Data Communications and Networking by Forouzan, (Edition 2nd and 4th), Tata McGraw Hill Education Pvt Ltd , New Delhi
- Data and Computer Communication by William Stallings, Pearson Education, New Delhi
- Local Area Networks by Peter Hudson

Course Title: VISUAL PROGRAMMING (USING VB.NET)	L	T	P	Credits
Course Code: DCS504	3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT I   **9 Hours**

Introduction to Microsoft. Net Framework: Introduction to client server architecture, Introduction to .NET framework, feature of .Net framework, architecture and component of .Net, elements of .Net. Common Language Runtime (CLR), Common Type System (CTS), Common Language Specifications (CLS), Microsoft Intermediate Language (MSIL), Just In Time Compiler.

VB.NET Integrated Development Environment: VB.NET Development Environment, Creating Applications, Building Projects Using simple components, Running VB .NET applications.

UNIT II **15 Hours**

VB.NET Basics: Visual Basic .NET Programming Language-Variables & Data Type, Strings, Arithmetic Operators, Building the project, Common Control Controls, Functions Call and Arguments, Select Case, Loops, Nesting of Loops, Decision Structures, Error handling using Try.. Catch Block.

Windows Applications: Developing Windows Applications: Introduction to Windows Applications, Using Windows Forms, Visual Inheritance, Windows Forms, Text Boxes, Buttons, Labels, Check Boxes, and Radio Buttons, List Boxes, Combo Boxes, Picture Boxes,

UNIT III **10 Hours**

Splitters: Scrollbars, Splitters, Timer, Menus, Built-in Dialogs, Image List, Tree Views, List Views, Toolbars, Status Bar and Progress bars.

Database Connectivity: Database Programming with ADO.NET: ADO.NET Object Model, Database: Connections, Data adapters and datasets, Data Reader, Connection to database with server explorer, Multiple Table Connection, Data binding with controls like Text Boxes, List Boxes, Data grid etc. Navigating data source,

UNIT IV **11 Hours**

Data View: Data Grid View, Data form wizard, Data validation, Connection Objects, Command Objects, Data Adapters, DatasetClass.

Crystal Reports: Crystal reports, Connection to Database, Table, Queries, Building Report, Modifying Report, Formatting Fields and Object.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Visual Basic.NET by C Muthu, Tata McGraw Hill Education PvtLtd , New Delhi.
- Visual Basic.NET Step by Step by Michael Halvorson.
- Visual Programming by Vipan Arora, Eagle Prakashan, Jalandhar.
- Applications of .NET Technologies, by ISRD Group, Tata McGraw Hill Education PvtLtd , New Delhi.
- Visual Programming using VB.NET by PritiSrivastav- Ishan Publication.

Course Title: **COMPUTER PERIPHERAL AND INTERFACE LAB**	**L**	**T**	**P**	**Credits**
Course Code: **DCS505**	**0**	**0**	**2**	**1**

Total Hours: 15

COURSE CONTENTS:
List of Practicals:

1. To study the construction and working of CRT, LCD, LED (colored and black and white monitor) and it's troubleshooting.
2. To Study the components and internal parts, working of hard disk and CDROM, DVD, Flash Drives
3. To study the operations and components and internal parts of Key Board, mouse and their troubleshooting.
4. Study of components and internal parts and working of DMP, Inkjet printer and Laser printer and various installations of printers.
5. To study the SMPS circuit and measure its various voltages. Connecting SMPS to mother-board and other devices.
6. Study the operation and maintenance of UPS.
7. Exercise on assembling a PC with peripherals and testing the same.
8. Setup and configuration of ROM BIOS
9. Visit to nearby industry

Course Title: OPERATING SYSTEMS LAB

Course Code: DCS506

L	T	P	Credits
0	0	2	1

Total Hours: 15

COURSE CONTENTS:

1. Directory commands

2. File commands
3. Process management
4. Using file permission commands
5. Mail commands
6. Editing file system rights in a Linux environment.
    - ✓ Interfacing with the network (Ethernet)
    - ✓ Preparing of network cables including hubs, connectors etc.
    - ✓ Establishment of LAN network for homogeneous systems
    - ✓ Establishment of LAN network for heterogeneous systems
    - ✓ Use of protocols and gateways in establishing LAN
    - ✓ Writing small programs such as file security, file transfer, remote testing
    - ✓ Trouble shooting of networks
    - ✓ Writing login scripts

Course Title: COMPUTER NETWORKS LAB	**L**	**T**	**P**	**Credits**
Course Code: DCS507	**0**	**0**	**2**	**1**

Total Hours: 15

COURSE CONTENTS:

List of Practicals:

1. Recognize the physical topology and cabling (coaxial, OFC, UTP, STP) of a network.
2. Recognition and use of various types of connectors RJ-45, RJ-11, BNC and SCST
3. Making of cross cable and straight cable
4. Install and configure a network interface card in a workstation.
5. Identify the IP address of a workstation and the class of the address and configure the IP Address on a workstation
6. Managing user accounts in windows and LINUX
7. Study and Demonstration of sub netting of IP address
8. Use of Net stat and its options.
9. Connectivity troubleshooting using PING, IPCONFIG, IFCONFIG
10. Installation of Network Operating System (NOS)
11. Visit to nearby industry for latest networking techniques

Required Software

➢ Windows Server/Linux Server

Required Tools and Supplies

1. Crimping tool, crone Tool, Cable tester,
2. RJ 45 connectors, RJ-11, BNC, SCST
3. Coaxial Cable, UTP, STP, OFC cable
4. Screw Driver Kit
5. Switch/Hub
6. Manageable Switch.

Course Title: VISUAL PROGRAMMING (USING VB.NET) 3 LAB

Course Code: DCS508

L	T	P	Credits
0	0	2	1

Total Hours: 15

COURSE CONTENTS:

List of Practicals:

1. Exercise on opening projects.
2. Exercise on all the menus of opening window of VB .NET
3. Exercise on all basic Controls.
4. Exercise on designing form.
5. Exercise on Database Connectivity.
6. Exercise on Creating Crystal reports.

Course Title: MINOR PROJECT	**L**	**T**	**P**	**Credits**
Course Code: DCS509	**0**	**0**	**2**	**1**

Total Hours: 15

COURSE CONTENTS:

Minor project work aims at exposing the students to the various industries dealing with computers. It is expected from them to get acquainted with computer environment possess desired attitudes. For this purpose student during middle of the course are required to be sent for a period of two to four weeks at a stretch in different establishments. Depending upon the interest of students they are sent for exposure to:

1. Industrial practices in installation and maintenance of computers and computer Networks.
2. Fabrication of computers.
3. Fault diagnosis and testing of computers.
4. Industrial practices in respect of documentation and fabrication.
5. A variety of computers and peripherals in assembly organizations.
6. Software package development organizations.
7. Maintenance of database.
8. Write a stored procedure or functions which can be attached as the library objects to the main projects.
9. Write a procedure function to convert number of words.
10. Write a procedure function to convert all data function (create your own) Database connectivity, (SQL server, Oracle, Access), Library classes in C++ (same application)., use of graphics in C++, Encryption decryption program, Active-X controls in VB.

Note: The teachers may guide /help students to identify their minor project work and chalk out their plan of action well in advance.

As a minor project activity each student is supposed to study the operations at site and prepare a detail project report of the observations/processes/activities by him/her. The students should be guided by the respective subject teachers; each teacher may guide a group of 4 to 5 students.

Course Title: INDUSTRIAL TRAINING	L	T	P	Credits
Course Code: DCS510	-	-	-	2

Total Hours: 30

COURSE CONTENTS:

Industrial Training aims at exposing the students to field practices, size and scale of operation and work culture at practical sites. For this purpose, students at the end of fourth semester are required to be sent for a period of 4 weeks to industry.

Each student is supposed to study the material and technology used at site and prepares adetailed report of the observation of process seen by him/her. These students should besupervised and guided by respective subject teachers. Each teacher may guide a group offour to five students.

The teacher along with field supervisors will conduct performance assessment of students. The components of evaluation will include the following.

a) Punctuality and regularity   15%
b) Initiative in learning new things 15%
c) Relationship with workers   15%
d) Industrial training report   55%

Course Title: OPEN SOURCE TECHNOLOGIES	**L**	**T**	**P**	**Credits**
Course Code: DCS511	**3**	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT I   **10 Hours**

Introduction: Introduction to Open Source Technologies like LINUX, Apache, My SQL, PHP, etc. Comparison of open source and proprietary Software, difference between freeware and open source. Concept of GPL (General Public License).

UNIT II   **12 Hours**

Practice with Linux Commands: CP, rm, chmod, mic, password, Is, grep and restore (egep and grep), sort, cmp, diff, tar, CPio, dump, find, Cron, Crontab, mount, umount, compress, unzip, cat, gzip.

UNIT III   **15 Hours**

Shell Programming: Introduction to Korn shell, Bourne shell, C shell and their functionality, Mata characters, redirection, file name substitution, pipes, common Built in Commands like Eval, Execc, Umask, etc. and shell programming in context of any of three shells.

UNIT IV   **8 Hours**

Communication Commands (utilities): Telnet, talk write, mail, wall, finger, stp, rcp, rlogin, configuration of DHCP.

Introduction to C/C++ Programming in Linux environment.

Introduction to Apache Server with PHP and My SQL.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- www.sourceforge.net
- UNIX for programmes, Graham Glow, PHI.
- Open Source Technologies by Sugandhi Malhotra, Eagle Prakashan, Jalandhar.
- PHP and My SQL Bible
- Open Source Technology by Rahul Sahni- Ishan Publication

Course Title: JAVA PROGRAMMING	**L**	**T**	**P**	**Credits**
Course Code: DCS512	**3**	**0**	**0**	**3**

Total Hours: 45

COURSE CONTENTS:

UNIT I   **12Hours**

Introduction to Java: A brief history, how Java works?, Java Virtual Machine (JVM), Java In Time (JIT) compiler, Java features, using Java with other tools, native code, Java application types, comparison with C and C++.

Working with data types, control flow statements, arrays, casting, and command line arguments.

UNIT II   **10 Hours**

Java Classes and Memory Management: Introduction to Classes, inheritance, encapsulation and polymorphism, constructors and finalizers, garbage collection, access specifier.

Interfaces and Packages: Using Java interface, using Java packages.

UNIT III   **13Hours**

Exception Handling and Stream Files: Over view of exception handling, method to use exception handling, method available to exceptions (The throw statement, the throws class, finally class), creating your own exception classes.

UNIT IV   **10Hours**

Threads and Multi-threading: Overview, thread basics – creating and running a thread, the thread control methods, the threads life cycle and synchronization.

Introduction to Applet, Application and JDK: Java applets Vs Java applications, building application with JDK, building applets with JDK, HTML for Java applets, managing input-output stream.

Connectivity: Java Data Base Connectivity (JDBC).

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Mastering Java by John Zukowski; BPB Publication, New Delhi.
- The Complete Reference by Patrick Naughton, Tata McGraw Hill Education

PvtLtd, New Delhi.
- Java Programming by Balagurusamy, Tata McGraw Hill Education PvtLtd, New Delhi.
- Java Programming by Anu Roy- Ishan Publication.
- The Complete Reference Java by HerbelSchildt; McGraw Hill, New Delhi.

Course Title: OPEN-SOU RCE TECHNOLOGIES LAB

Course Code: DCS513

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practicals:
1. Practice of Linux commands-I
2. Practice of Linux commands-II
3. Shell programming-I
4. Shell programming-II
5. Experiments with communication commands.
6. WAP on Text handling in C Programming under Linux environment.
7. WAP to find Prime numbers in C++/C Programming under Linux environment.
8. Program related to file handling in C/C++ under Linux environment.
9. Configuration of DHCP (Dynamic Host Control Protocol)
10. Programming with Arrays in C/C++ under Linux
11. Download and Installation of LAMP (Linux Apache My SQL PHP) Packages.
12. Any Website using PHP My SQL with Apache Web Server.

Course Title: JAVA PROGRAMMING LAB

Course Code: DCS514

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practicals:

1. This tells whether a number is even or odd. Take a range from 1 – 50
2. Display the output which is given below:
   a.
   b. *
   c. * *
3. Write a program which sorts an array of type integer to determine the sum of the following harmonic series for a given value of n: 1+1/2+1/3...........+1/n the value of n should be given interactively through the keyboard.
4. Write a programme to convert the given temperature in Fahrenheit to Celsius using the following conversion formula
   C = F.32/1.8 and display the value in a tabular form.
5. Write a programme to find all the numbers and sum of all integers greater than 100 less than 200 that are divisible by 7.
6. Given a list of marks ranging from 0 to 100, write a programme to compute and print the number of student should have obtained marks (a) in the range 81 to 100 (ii) in the range 61 to 80 (c) in the range 41 to 60 (d) in the range 0 to 40. The programme should use a minimum number of if statement.
7. Admission to a professional course is subject to the following conditions:
   Marks in mathematics >=60
   Marks in physics >=50
   Marks in chemistry >=40
   Total in all 3 subjects >=200 (OR)
   Total in mathematics and physics >=150 given the marks in the 3 subjects. Write the programme to process the application to list the eligible candidates
8. The number in the sequence 1 1 2 3 5 8 13 21 .... Are called Fibonacci numbers. Write programme using a do ..... while loop to calculate and print the first m Fibonacci numbers (Hint: after the first 2 numbers in the series, each number is the sum of the 2 preceding the numbers) .
9. Write a programme to evaluate the following investment equation V=P (1+r)n and print the tables which would give the value of V for various combination of the following values of P, r and n.

10. Write a program which will store the students roll no. names and total marks in the database

11. Write a program which will display all those records whose marks are above 75%

12. Write a programme to draw the following using Applet:

13.   Exercises on implementing Java Classes.
14.   Exercises on exceptional handling
15.   Exercises on creating and running threads
16.   Exercises on database Connectivity.

SEMESTER-VI

Course Title: BASICS OF MANAGEMENT	**L**	**T**	**P**	**Credits**
Course Code: DCS601	**3**	**0**	**0**	**3**

Total Hours: 45

OBJECTIVES:

The diploma holders are generally expected to take up middle level managerial positions, their exposure to basic management principles is very essential. Topics like Structure of Organization, Leadership, Motivation, Ethics and Values, Customer Relationship Management (CRM), Legal Aspects of Business, Total Quality Management (TQM), Intellectual Property Rights (IPR) etc. have been included in the subject to provide elementary knowledge about these management areas.

COURSE CONTENTS

UNIT I   **13 Hours**

Principles of Management: Introduction, definition and importance of management, Functions of Management, Planning, Organizing, Staffing, Coordinating, Directing, Motivating and Controlling. Concept and Structure of an Organization Types of industrial organization: Line organization, Functional organization, Line and Functional organization. Hierarchical Management Structure: Top, middle and lower level management, Departmentalization Introduction and its advantages.

Work Culture: Introduction and importance of Healthy Work Culture in organization, Components of Culture, Importance of attitude, values and behavior, Behavioral Science – Individual and group behavior, Professional ethics – Concept and need of Professional Ethics.

UNIT II   **10Hours**

Leadership and Motivation: Leadership: Definition and Need of Leadership, Qualities of a good leader, Manager vs. leader, Motivation: Definition and characteristics of motivation, Factors affecting motivation, Maslow's Need Hierarchy Theory of Motivation, Job Satisfaction.

Legal Aspects of Business: Introduction and Need, Labour Welfare Schemes: Wage payment: Definition and types, Incentives: Definition, need and types, Factory Act 1948, Minimum Wages Act 1948.

UNIT III   **15 Hours**

Management Scope in different Areas: Human Resource Development: Introduction and objective, Manpower Planning, recruitment and selection, Performance appraisal methods. Material and Store Management:

Introduction, functions and objectives of material management, Purchasing: definition and procedure, Just in time (JIT). Marketing and Sales: Introduction, importance and its functions, Difference between marketing and selling, Advertisement- print media and electronic media, Market-Survey and Sales promotion. Financial Management – Introduction: Concept of NPV, IRR, Cost-benefit analysis, Elementary knowledge of Income Tax, Sale Tax, Excise duty, Custom duty, Provident Fund, Maintenance Management , Concept , Preventive Maintenance.

UNIT IV   **12 Hours**

Miscellaneous Topics: Customer Relationship Management (CRM): Definition and Need, Types of CRM, Customer satisfaction. Total Quality Management (TQM): Inspection and Quality Control, Concept of Quality Assurance, TQM. Intellectual Property Rights (IPR): Introduction, definition and its importance, Infringements related to patents, copyright, trade mark.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Principles of Management by Philip Kotler TEE Publication
- Principles and Practice of Management by ShyamalBannerjee: Oxford and IBM Publishing Co, New Delhi.
- Financial Management by MY Khan and PK Jain, Tata McGraw Hill Publishing Co., 7, West Patel Nagar , New Delhi.
- Modern Management Techniques by SL Goel: Deep and Deep Publications PvtLimited,Rajouri Garden, New Delhi.

Course Title: NETWORK SECURITY
Course Code: DCS602

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT I   **12 Hours**

Introduction: Need for securing a network; attacks from within and external, introduction to cyber crime, cyber law-Indian Perspective (IT Act 2000), cyber ethics, ethical hacking. What is hacking?Attacker, phreaker etc.

Securing Data over Internet: Introduction to basic encryption and decryption, concept of symmetric and asymmetric key cryptography, overview of DES, RSA and PGP. Introduction to Hashing: MD5, SSL, SSH, HTTPS, Digital Signatures.

UNIT II   **10 Hours**

Virus, Worms and Trojans: Definitions, preventive measures – access central, checksum verification, process neutering, virus scanners, neuristic scanners, application level virus scanners, deploying virus protection.

Computer Network Attacks: Active Attacks, Passive Attacks, Stealing Passwords, Social Engineering, Bugs and Backdoors, Authentication Failures, Protocol Failures, Information Leakage, Denial-of- Service Attacks, Botnets, Phishing Attacks.

UNIT III   **11 Hours**

Firewalls: Definition and types of firewalls, defining access control policies, address translation, firewall logging, firewall deployment.

Intrusion Detection System (IDS): Introduction; IDS limitations – teardrop attacks, counter measures; Host based IDS set up.

Virtual Private Network (VPN): Basics, setting of VPN, VPN diagram, configuration of required objects, exchanging keys, modifying security policy.

UNIT IV   **12 Hours**

Disaster and Recovery: Disaster categories; network disasters – cabling, topology, single point of failure, save configuration files; server disasters – UPS, RAID, Clustering, Backups, server recovery.

OS Vulnerabilities: Study of Linux and Windows OS Vulnerabilities. Importance of Original Software (Due to patches for Loopholes, Security Vulnerabilities).

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Cryptography and Network Security by Forouzon, Tata Mc Graw Hill Education Pvt Ltd, New Delhi
- Cryptography and Network Security by AtulKahate, Tata Mc Graw Hill Education Pvt Ltd, New Delhi
- Mastering Network Security by Christ Breton; BPB Publication, New Delhi.
- Web-sites by Chris Breton, BPB Publication, New Delhi
- Network Firewalls by KiranjeetSyan; New Rider Publication .
- Internet Security, New Rider Publication .
- Network Security by Sood& Mahajan; Eagle Prakashan Jalandhar

	L	**T**	**P**	**Credits**
Course Title: COMPUTER GRAPHICS	**3**	**0**	**0**	**3**
Course Code: DCS603				

Total Hours: 45

COURSE CONTENTS:

UNIT I   **13 Hours**

Graphic Systems: Display devices, display processors graphics software coordinate representation, graphics functions and standards.

Scan conversion and Output Primitives: Scan converting the point, Scan converting the straight line - Bresenham's line algorithm, Scan converting a circle - Defining a circle, Bresenham's circle algorithm, Region filling - introduction, flood filling, boundary filling, Side effects of scan conversion. Graphic primitives in C, Point plotting, line drawing algorithms – DDA algorithms, Bresenham's line algorithms, circle-generating algorithms.

UNIT II   **11 Hours**

Two-Dimensional Transformations: Basic transformations-translation, scaling, rotation, matrix representations and homogeneous coordinates, composite transformations – scaling relative to a fixed pivot, rotation about a fixed pivot point, general transformation equations, other transformation – reflection and shearing.

UNIT III   **9 Hours**

Windowing and Clipping Techniques: Windowing concepts, clipping algorithms, area clipping, line clipping, polygon clippings, text clipping, blanking, window to-viewpoint transformation, Cohen Sutherland clipping algorithm.

UNIT IV   **12 Hours**

Three Dimensional Graphics: Three dimensional transformation, wire frame model, hidden line and hidden surface elimination (z-buffer algorithm), curve fitting and tracing)

Perspective and Transformations: Perspective and Parallel transformations, vanishing points, perspective anomalies.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Principles of Interactive Computer Graphics by WM Newman and RF

Spraull

- Theory and problems of Computer Graphics by Roy APlastock and Gordon Kalley. McGraw Hill Publishers, Schaum's Outline series.
- Interactive Computer Graphics by Harengton
- Computer Graphics Programming Approach by Steven Harrington

Course Title: INSTALLATION, MAINTENANCE AND TROUBLESHOOTING OF COMPUTER NETWORKS Course Code: DCS604	L	T	P	Credits
	3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT I   **15 Hours**

Installation: Environmental requirements of computer system and peripherals. Site preparation and design of computer rooms. Testing specifications and installation of computer systems and peripherals.

Repair, Servicing and Maintenance Concepts: Introduction to servicing and maintenance concepts. Meantime between failures (MTBF) meantime the repair maintenance policy, factors affecting the performance of computer, potential problems preventive maintenance and corrective maintenance. Preventive maintenance schedule. Circuit tracing techniques. Concept of shielding grounding and power supply requirements and considerations of computers and its peripherals.

UNIT II   **10Hours**

Fundamental Trouble Shooting Procedures: Fault location; fault finding aids, service Manuals, test and measuring instruments, special tools.

Networking: LAN failure, cabling connectivity, hub, bridge, switches, managing network services TCP/IP, Address management, DNS, Domain, Work Group.

UNIT III   **12 Hours**

Trouble shooting of computers, component and peripherals: Managing Network Services: TCP/IP, address Management, DNS, DOMAIN, Workgroup (Create workgroup), and Networkaddresses Management of Gateway, Map Network drive, client-server technology, Network Neighborhood. Installation and troubleshooting of Routers, Access Point, LAN Cards Input/output channels, Hub, Switches,Sharing of devices on Networks, Installation and management of network sharing tools i.e. squidpoxy, managing IP addresses, 2-Tier, 3-Tier Network Architecture.

UNIT IV   **8 Hours**

Establishment of LAN/WAN: Sub-netting of IP address, Access Point Configuration, Router Configuration, Configuration of manageable switch.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- PC Upgrading, Maintenance and Troubleshooting Guide by SK Chauhan, SK Kataria and Sons, New Delhi.
- Troubleshooting and Maintenance of electronic Equipment by K. Sudeep Singh: SK Kataria and Sons, New Delhi.
- Installation & Maintenance of Computer Networks by Sood& Mahajan; Eagle Prakashan Jalandhar.

Course Title: COMPUTER GRAPHICS LAB

Course Code: DCS605

L	T	P	Credits
0	0	4	2

Total Hours: 30

COURSE CONTENTS:

List of Practicals:

1. To draw a line
2. To move a character about a line
3. To move two characters in. opposite direction.
4. To draw a circle
5. To move a character along circumference
6. To move along radius.
7. To use 2-d translation technique,
8. To use 2-d scaling technique
9. To use 2-d rotation technique.
10. To use 2-d reflection technique.

Course Title: INSTALLATION, MAINTENANCE AND TROUBLESHOOTING OF COMPUTER NETWORKS LAB
Course Code: DCS606

L	T	P	Credits
0	0	2	1

Total Hours: 15

COURSE CONTENTS:
List of Practicals:

1. Installation of modems and startup a new internet connection in a standalone machine.
2. Sharing of Internet by VPN (Virtual Private Network)
3. Study of troubleshooting and maintenance of computer systems
4. Installation and study of ISDN, PSTN lines, V-sat, RF-link
5. Study of BNC, RJ-45 connectors
6. Study of cables and their connecting structure (i.e. simple or cross cable (color coding of cables)
7. Study and management of Network resources,
8. Study and Installation of Firewall in your system
9. Sharing of resources on LAB

Course Title: MAJOR PROJECT	**L**	**T**	**P**	**Credits**
Course Code: DCS607	0	0	4	2

Total Hours: 15

COURSE CONTENTS:

Major Project Work aims at developing innovative skills in the students whereby they apply in totality the knowledge and skills gained through the course work in the solution of particular problem or by undertaking a project. The individual students have different aptitudes and strengths. Project work, therefore, should match the strengths of students. For this purpose, students should be asked to identify the type of project work, they would like to execute. It is also essential that the faculty of the respective department may have a brainstorming to identify suitable project assignments for their students. The project assignment can be individual assignment or a group assignment. There should not be more than 3 students if the project work is given to a group. The students should identify themselves or accept the given project assignment at least two to three months in advance. The project work identified in collaboration with industry should be preferred. Each teacher is expected to guide the project work of 5–6 students.

The project assignments may consist of:

1.   Installation of computer systems, peripherals and software
2.   Programming customer based applications
3.   Web page designing including database connectivity
4.   Database applications
5.   Networking (Cabling, Hubs, Switch etc)
6.   Software Development
7.   Fabrication of components/equipment (computer related components)
8.   Fault-diagnosis and rectification of computer systems and peripherals
9.   Bringing improvements in the existing systems/equipment
10.   Projects related to Multimedia
11.   Projects related to Computer Graphics
12.   Web Hosting
13.   Configuration of Network Operating System(Windows, Linux)
14.   Configuration of servers (Proxy, DNS etc)

Important Points:

1. This criterion must be followed by the internal and external examiner and they should see the daily, weekly and monthly reports while awarding

marks as per the above criteria.

2. The criteria for evaluation of the students have been worked out for 100 maximum marks. The internal and external examiners will evaluate students separately and give marks as per the study and evaluation scheme of examination.

3. The external examiner, preferably, a person from industry/organization, who has been associated with the project-oriented professional training of the students, should evaluate the student's performance as per the above criteria.

4. It is also proposed that two students or two projects which are rated best be given merit certificate at the time of annual day of the institute. It would be better if specific nearby industries are approached for instituting such awards.

The teachers are free to evolve another criterion of assessment, depending upon the type of project work.

The students must submit a project report of not less than 50 pages (excluding coding). The report must follow the steps of Software Engineering Concept
It is proposed that the institute may organize an annual exhibition of the project work done by the students and invite leading Industrial organizations in such an exhibition. It is also proposed that two students or two projects which are rated best be given merit certificate at the time of annual day of the institute. It would be better if specific industries are approached for instituting such awards.

Course Title: MULTIMEDIA SYSTEM DESIGN	L	T	P	Credits

Course Code: DCS608

3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT I   **10Hours**

Introduction to Multimedia Systems: What is Multimedia?, History of Multimedia, Quality criteria and specifications of different capturing devices, Communication devices, Storage devices, Display devices, Elements of Multimedia and different multimedia file formats, Applications of multimedia – benefits and problems.

UNIT II   **11 Hours**

Multimedia Hardware and Software Essentials: Classes of Multimedia Systems, Components of a Multimedia System: Quality Criteria and specifications of different Capturing Devices, Communication Devices, Storage Devices and Display Devices.

Multimedia Project Planning and Design: Planning Steps and Process, Concept development, Goals Definition, Target Audience, Storyboard Creation, Navigation and user interface designing. Example case study.

UNIT III   **13 Hours**

Content Designing and development: Concept of data compression, Text encoding, Audio encoding techniques, Types of images, Capturing images using camera/scanner, coding techniques for Moving Images, Editing , Editing of images audio, text, video and graphics.

Multimedia Authoring Tools: Types of Authoring Programs - Icon-based, Time-based, Storyboarding / Scripting and object oriented. Example case study.

UNIT IV   **11 Hours**

Multimedia Application Development Using Director: Interface and Working Environment: Using cast window, Score window, Stage, Cast window, Creating Cast members, Using text window, Paint window, Vector Shape window, using the tool palette. Setting movie properties, Control Panel, Property inspector, Behavior inspector, Library Palette, Sprite properties, Frame properties and transitions. Animation techniques: Animation using key-frame and tweening, Cast to time, Space to time. Importing media elements: Adding sound, video and transitions to movie, Inserting markers and adding behavior.

Transaction Modes

Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested Readings

- Multimedia making it Work, TayVaghan, Tata McGraw Hill Publishing Co, New Delhi
- Multimedia Technologies by Ashok Banerji and Ananda Mohan Ghosh, Tata McGraw Hill Education PvtLtd , New Delhi
- T. Hofstetter, Multimedia Literacy, McGraw-Hill, Third Edition. 2001.
- David Hillman, Multimedia Technology and Applications, Delmar Publishers, 1998, ISBN 082738498X.
- Multimedia System Design by G.P. Singh; Eagle Prakashan Jalandhar

Course Title: .NET TECHNOLOGIES (Using ASP.NET)	L	T	P	Credits
Course Code: DCS609	3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT I   **10 Hours**

.NET in Context: Vision and Goal of .Net, Building Blocks of .Net, Overview of .Net applications, Microsoft SQL Srerver and .Net, Interoperability between .Net and COM+.

UNIT II   **12 Hours**

Overview of the .Net Framework: .Net Evolution, .Net Framework Architecture, Common Type System, Meta Data, Common Language Runtime, .Net Class Framework, Garbage Collection.

UNIT III   **13 Hours**

Execution under .Net: MSIL, Intermediate Language (IL), JIT Compilation.

Engineering Applications (using language C#): Window forms and the .Net framework and Controls, Web forms, ASP .Net.

UNIT IV   **10 Hours**

Working with Data in .Net (with Microsoft SQL Server): System Data, System .Xml using ADO.Net.

Engineering Web Services: Web Services, building blocks of web services, creating web services, consuming web services.

Suggested Readings

- Introducing .NET by James Conard, Patrick Rengler, BirnEranics, Jay ElynnWron Publications
- Microsoft Visual C# .Net Step- by-Step, by sharp and Jagger, PHI
- Introducing Microsoft .Net, 3rd Edition by Platt, PHI
- Visual Basic .Net by Tony gaddis, Scott Jones Publishers
- . Net Technologies by G.P. Singh; Eagle Prakashan Jalandhar

	L	T	P	Credits
Course Title: MULTIMEDIA SYSTEM DESIGN LAB	0	0	2	1
Course Code: DCS610				

Total Hours: 15

COURSE CONTENTS:

List of Practicals:

1. Students are required to use various features of Director through small applications.
2. Design and develop multimedia presentation of your institute.
3. Design and develop multimedia lessons useful for teaching various topics in any of the subjects they have already studies.
4. Design some interactive multimedia application.

Course Title: .NET TECHNOLOGIES (USING ASP.NET) LAB	L	T	P	Credits
Course Code: DCS611	0	0	2	1

Total Hours: 15

COURSE CONTENTS:

List of Practicals:

1. Installation of .net
2. Exploring the various features of .net
3. Ability to work and start various tasks and features of .net framework.
4. Able to work and develop program in ASP. net
5. To explore in detail